Appendix 10b

TECHNICAL REPORT

Task 10b: Federal Transit Administration Environmental Assessment

December 2014

New Hampshire

Capitol Corridor Rail & Transit Alternatives Analysis (Parts A & B)

State Project Numbers 16317 and 68067-A

New Hampshire DOT Department of Transportation

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List of Acronyms

ADA	Americans with Disabilities Act
AHWD	Automatic Highway Warning Devices
APE	Area of Potential Effect
B&M	Boston and Maine Railroad
BMP	Best Management Practices
BX	Boston Express
CAA	Clean Air Act
CBP	Central Business Performance
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2e	Carbon Dioxide Equivalent
CTC	Centralized Traffic Control
CWA	Clean Water Act
CWR	Continuous Welded Rail
dBA	Decibels
DCS	Data Communication System
DFIRMs	Digital Flood Insurance Rate Maps
DPM	Diesel Particulate Matter
EA	Environmental Assessment
EDR	Environmental Data Resources, Inc.
EJ	Environmental Justice
ESA	Environmental Site Assessment
FHWA	Federal Highway Administration

FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GHG	Greenhouse Gases
GIS	Geographic Information System
GPS	Global Positioning System
HAPs	Hazardous Air Pollutants
HSIPR	High-Speed Intercity Passenger Rail
L_{dn}	Day-Night Noise Levels
LLPs	Landowner Liability Protections
LOS	Level of Service
LUST	Leaking Underground Storage Tank
MACRIS	Massachusetts Cultural Resource Information System
MassGIS	Massachusetts Geographic Information System
MBTA	Massachusetts Bay Transportation Authority
MESA	Massachusetts Endangered Species Act
MHC	Massachusetts Historical Commission
MOVES	Motor Vehicle Emission Simulator
mph	miles per hour
MSAT	Mobile Source Air Toxics
NAAQS	National Ambient Air Quality Standards
NEGS	New England Southern Railroad
NEPA	National Environmental Policy Act
NH GRANIT	New Hampshire Geographically Referenced Analysis and Information Transfer System
NHB	New Hampshire Natural Heritage Bureau
NHDES	New Hampshire Department of Environmental Services
NHDOT	New Hampshire Department of Transportation
NHESP	Massachusetts Natural Heritage and Endangered Species Program
NHL	National Historic Landmark
NHML	New Hampshire Main Line
NHPA	National Historic Preservation Act
NHRTA	New Hampshire Rail Transit Authority
NO_2	Nitrogen dioxide
NORAC	Northeast Operating Rules Advisory Committee
NO_x	Nitrogen oxide
NRHP	National Register of Historic Places
O_3	Ozone
PAC	Project Advisory Committee
PAH	Polycyclic Aromatic Hydrocarbons
PAR	Pam Am Railways
PCBs	Polychlorinated Biphenyls
PM	Particulate Matter
POM	Polycyclic Organic Matter
PSIP	Public and Stakeholder Involvement Plan
PSNH	Public Service of New Hampshire
PTC	Positive Train Control
RCRA	Resource Conservation and Recovery Act

REC	Recognized Environmental Condition
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
TMDLs	Total Maximum Daily Loads
TOD	Transit-Oriented Development
tpy	tons per year
TSM	Transportation Systems Management
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geologic Survey
UST	Underground Storage Tanks
VdB	Vibration Velocity Level
VMT	Vehicle Miles Travelled
VOCs	Volatile Organic Compounds
WPA	Massachusetts Wetlands Protection Act

Project Purpose and Need Summary

Increasing transportation demand and growing concerns about mobility, economic development, and quality-of-life have led New Hampshire and Massachusetts citizens and officials to explore transit and/or intercity passenger rail service options in the 73-mile corridor (Capitol Corridor) between Boston, Massachusetts and Concord, New Hampshire.[1] The purpose of this Capitol Corridor Rail and Transit Alternatives Analysis (AA) Study is to evaluate a diverse set of rail and bus options to improve connectivity by leveraging existing transportation infrastructure, including Pan Am Railways (PAR), Route 3, and I-93. Investment in an improved transportation strategy is needed for several reasons:

- Projected population growth will result in increased roadway congestion
- New Hampshire's existing transportation network does not effectively connect existing modes
- The regional economy is singularly dependent on roads for movement of goods and passengers
- Improved transportation options will attract employers to New Hampshire and improve employment options for New Hampshire residents
- Young New Hampshire professionals are leaving the area to be closer to employment and cultural/social opportunities associated with larger urban centers
- New Hampshire's growing senior population needs more "car-light" mobility options
- Residential development patterns resulting from population growth may negatively impact the region's existing quality-of-life
- The existing transportation network cannot accommodate increased levels of demand without negative environmental consequences

Task Objectives

The New Hampshire Department of Transportation (NHDOT), through a funding grant from the Federal Transit Administration (FTA), evaluated transit alternatives for the Capitol Corridor. This Environmental Assessment (EA) addresses build and no build alternatives for transit service between Boston, Massachusetts and Manchester, New Hampshire. Including the No Build alternative, 12 alternatives were screened by the project team during the preliminary screening phase, with input from project stakeholders. Six of the alternatives focused on commuter rail, three were specific to intercity passenger rail service, and three were comprised of improvements to the existing intercity bus service.

EA Objectives

This EA focuses on the Manchester Regional Commuter Rail. The Intercity 8 analysis is detailed in Appendix 10a to the AA Final Report, *Environmental Assessment, New Hampshire Capitol Corridor Rail and Transit Alternatives Analysis,* prepared for the FRA. The environmental impacts examined in the EA

[1] The report "Task 2: Project Purpose and Need" (Appendix 2 to the AA Final Report) provides an in-depth evaluation of the Capitol Corridor's historical, current, and future state, and how Massachusetts and New Hampshire citizens would benefit from a transit investment strategy responsive to transportation needs and the region's economic, social, and environmental climate

for Manchester Regional Commuter Rail cover the other alternatives presented (the Nashua Minimum Commuter Rail, and Bus on Shoulder). No preferred alternative was selected in the Study, and the four options noted above (plus No Build) were recommended for further debate and discussion. The focus in the EA on the Manchester Regional Commuter Rail is for analytical purposes only, and that alternative should not be seen as the preferred investment, a decision on which will be made after extended debate and discussion.

The Manchester Regional Commuter Rail service option would provide a mix of commuter train service for Nashua with a lower frequency regional service provided north to Manchester. Massachusetts Bay Transportation Authority (MBTA) service would be extended 30 miles to downtown Manchester, with intermediate stops at South Nashua, Nashua Crown Street and Manchester-Boston Regional Airport (Manchester Airport or MHT). The service adds four new stations to the line with 16 weekday trains for Manchester and 34 for Nashua. A layover facility for four train sets would be constructed in the vicinity of Manchester. Ridership response to this service initiative is anticipated to include new riders attracted to rail service provided to the proposed New Hampshire stations. It is assumed that some current MBTA rail passengers living in New Hampshire would shift to these new stations from the existing MBTA Lowell, Massachusetts and North Billerica, Massachusetts stations. It is also anticipated that many or most passengers from the discontinued Boston Express (BX) Route 3 service would shift to the commuter railroad. Ridership impacts on the BX I-93 main line services to Londonderry, North Londonderry, and Salem would be likely negligible.

The Study team developed preliminary estimates of ridership, operating costs, and capital costs along with land use, economic development, and environmental impacts of the nine rail and three bus alternatives to screen the alternatives to a more manageable number for final evaluation. The following alternatives were selected for more detailed analysis: Intercity 8, Manchester Regional Commuter Rail, Nashua Minimum Commuter Rail, and Bus on Shoulder.

The purpose of this EA is to identify potential environmental, social, and economic impacts associated with the proposed project and determine appropriate mitigation measures. Table 1 summarizes the impacts related to Manchester Regional Commuter Rail.

Table 1: Summary of Manchester Regional Commuter Rail Resource Impacts and Proposed Mitigation

Resource	Impact	Mitigation
Air Quality	Improved air quality through vehicle trips shifting to intercity rail	A number of sustainable mitigation measures that can be implemented to improve air quality
Noise and Vibration	453 moderate noise impacts and 630 severe impacts due to the warning horns; four potential daytime construction impacts and up to 309 potential nighttime construction impacts have been identified as a result of the analysis conducted pursuant to the FTA guidelines; no significant vibration impacts are expected	Mitigation measures will be applied for each impact during the next phase of Study
Hazardous Waste Sites	Short-term adverse impacts may occur during construction of rail and station sites due to potential for movement of contaminated soils or material	Phase I Environmental Site Assessments (ESAs) should be completed for each property acquired to be eligible for Landowner Liability Protections (LLPs)
Water Quality	Negligible to minor, short-term, localized impacts during construction activities	All impacts will be mitigated through Best Management Practices (BMPs), including improvements to drainage and stormwater management
Wetlands	▪ No impact to wetlands in most areas of the corridor and minor temporary and permanent impacts to jurisdictional wetland resource areas in a few discrete areas of the corridor. ▪ The Bedford/Manchester Airport station has several wetlands and watercourses located at the site. ▪ North of Ray Wieczorek Drive, the majority of the site is forested wetland ▪ South of Ray Wieczorek Drive, there are two small forested wetlands and one emergent/scrub-shrub wetland ▪ Minor temporary impacts may occur during construction activities	As more detail is developed in the project's next phase, these impacts will be defined in greater detail; any wetland impacts would be subject to state and federal permitting requirements
Threatened and Endangered Species	None	At this level of the project, neither state agency has ruled on whether the project would qualify as a "take" under the regulations (this will be confirmed in future analyses)
Floodplains	Minor to negligible impacts to floodplains	In locations where floodplain elevations will be altered, the project will provide compensatory floodplain storage; through mitigation, adverse impacts to floodplains will be kept to a minimum
Energy Resources	Beneficial impact: Diverting trips from vehicles to passenger rail will reduce the overall Vehicle Miles Travelled (VMT) and greenhouse emissions; during construction, the project would consume energy through the processing of materials and construction activities	All impacts during construction will be addressed in the next level of analysis
Visual Resources	For work associated with the rail line, no impacts; for work associated with the stations and layover facility, negligible impacts	All mitigation measures associated with visual resource impacts will be addressed in the next level of analysis
Accessibility	None	None
Property Acquisition	Minor impacts: Station development would require acquisition of two privately held parcels	All mitigation measures associated with property acquisitions will be addressed in the next level of analysis
Land Use	Moderate beneficial impacts associated with increasing transit supportive development around stations, improving access to jobs, reducing the reliance on vehicles for trips, attracting employers to New Hampshire, retaining and attracting employers from New Hampshire to Boston, and improving residency location choice in New Hampshire for commuters to Boston or regional jobs	None

Resource	Impact	Mitigation
Environmental Justice (EJ)	Major beneficial impacts for those EJ populations within proximity to proposed stations in Manchester and Nashua, as the project provides increased access to transportation options within the corridor	None
Public Safety	Beneficial impact through mitigation and upgraded safety features	A number of mitigation measures are recommended to improve the safety of the 21 at grade crossings: the Centralized Traffic Control (CTC) signal system would be renewed and upgraded for the new passenger service; all new equipment for the Automatic Highway Warning Devices (AHWD) will be installed; it is assumed that Positive Train Control (PTC) will be in-place by the time this route is operational
Cultural Resources	No impact on Historic Architectural Resources; minor to negligible impacts to Archeological Resources	As the archeological potential of the area is generally high, precautions will be put in-place to mitigate adverse impacts on the resources
Park and Recreations	Unknown impact on Section 4(f) Resources in the corridor	To be determined in the next level of analysis
Socioeconomics	Beneficial impact on New Hampshire economics by potentially generating the following: ▪ 3,600[2] new residential units ▪ 1,898,000 square feet of commercial space ▪ 5,600 new station area jobs in 2030 and beyond ▪ 230 new jobs over the construction period (2019-2022) and 3,390 jobs related to new real estate development between 2021 and 2030 ▪ Real estate development would add $750 million to the state's output between 2021 and 2030	None
Transportation	Beneficial impact on rail options and mobility in the corridor by increasing transportation options	None
Indirect Effects and Cumulative Impacts	▪ Indirect Effects: Beneficial long-term effects due to induced growth and development around station locations ▪ Cumulative Impacts: Incremental beneficial impact on the environment through greater access to transportation options and reduction in VMT within US Route 3 and I-93 corridors	

Public Involvement Objectives

The Capitol Corridor Study developed a robust public involvement program designed to solicit input from a broad, diverse range of players that have a stake in the future of passenger rail in the State of New Hampshire. The main objectives of the public and stakeholder outreach activities for the Capitol Corridor project are as follows:

- Build support for the AA and service development planning process among different stakeholder groups
- Encourage stakeholders to engage in the development process

[2] Rounded to the nearest 100th

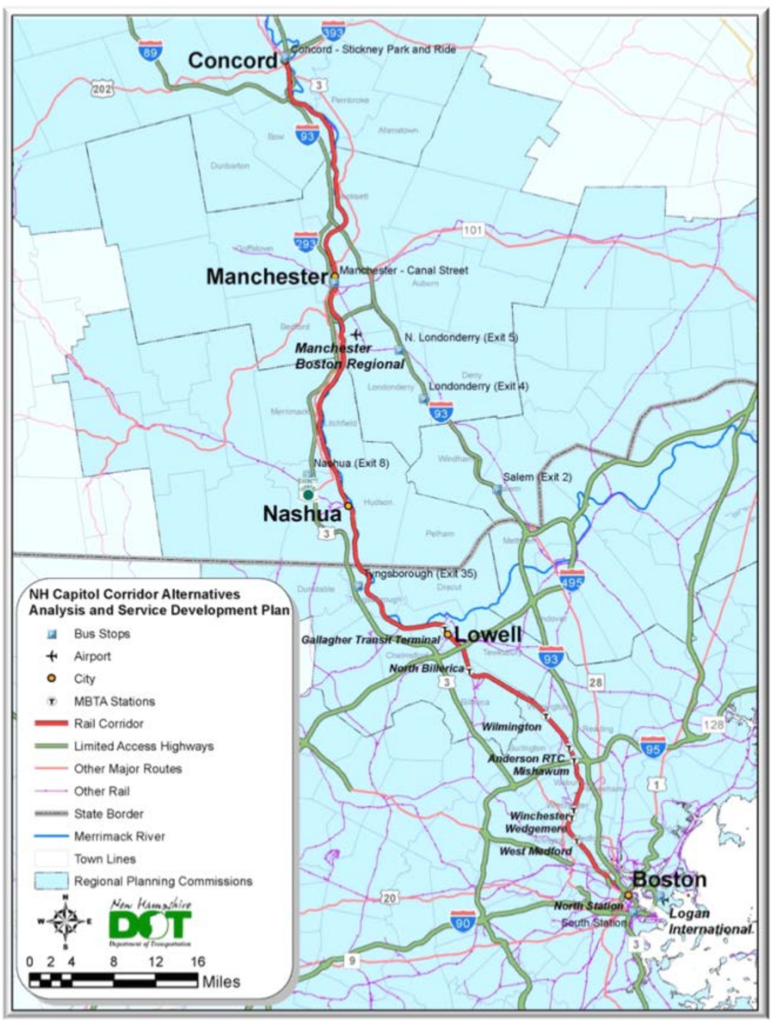
- Provide clear and understandable information at each step of the process
- Document public and stakeholder opinion as part of the decision-making process

The project team conducted 91 stakeholder meetings, three Project Advisory Committee (PAC) meetings, and three public meetings (Concord, Manchester, and Nashua) during the AA Study. This stakeholder engagement effort was designed to solicit input from a broad, diverse range of players that all have a stake in the future of passenger rail in New Hampshire. Input received from stakeholders focused on implementation of passenger rail service with very little emphasis on potential environmental impacts.

1 Introduction

The NHDOT, through a funding grant from the FTA, has prepared this EA consistent with the National Environmental Policy Act of 1969 (NEPA), as amended, 42 U.S.C. §§ 4321 et. seq. and its implementing regulation, 40 Code of Federal Regulations (CFR) 1500-1508. The EA is also prepared in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as revised in 36 CFR Part 800 (August 5, 2004).

Figure 1.1: Capitol Corridor



The Capitol Corridor extends 73 miles from Boston, Massachusetts to Concord, New Hampshire. The geographic area of the corridor encompasses the existing track alignment that runs north from Boston, through Lowell, Nashua, and Manchester to Concord. The portion of the alignment within Massachusetts is owned by the MBTA and the portion within New Hampshire is owned by PAR. The corridor also includes the US Route 3 and I-93 highway corridors, as well as Boston Logan International Airport and Manchester Airport (Figure 1.1). The corridor connects Boston with the three largest cities in New Hampshire: Concord, Manchester, and Nashua. These cities, as well as the other communities on the corridor, represent nearly 39 percent of the population and just over 41 percent of the employment in the entire State of New Hampshire. Manchester is the largest city in the Northeast currently without passenger rail service.

1.1 Corridor History

The first passenger train in New Hampshire pulled into Nashua from Lowell, Massachusetts in October 1838.[3] Passenger rail service along this alignment was soon extended to Manchester and Concord with further extensions into the White Mountains and westerly to Hanover and White River Junction. The New Hampshire Main Line (NHML) was a principal artery of the Boston and Maine Railroad (B&M), and remains a vital portion of the PAR's network. Consequently, the line functions as a key economic link between New Hampshire and the national economy. NHML passenger service ran for almost 130 years until it was abandoned in 1967. Passenger service was briefly restored in 1980, but abandoned again when federal funding expired. Freight service has been operating continuously for 175 years.

In 2006, the Community Advisory Committee to the NHDOT Commissioner recommended expanded passenger rail as one of the five "initial action items" in its final report, a component of the state's long-range transportation plan.[4] In 2007, the New Hampshire legislature created the New Hampshire Rail Transit Authority (NHRTA) to establish passenger rail service in New Hampshire. In 2009, the New Hampshire Climate Action Plan, prepared by the New Hampshire Climate Change Policy Task Force, recommended expanded passenger service as part of a balanced transportation system. These are examples of recent state-level recognition of the need for the Capitol Corridor Study.

1.1.1 Previous Corridor Planning

In 2003, the state departments of transportation from New Hampshire, Vermont, and Massachusetts commissioned a feasibility study for the Boston-to-Montreal rail corridor: *Boston to Montreal High-Speed Rail Planning and Feasibility Study Phase I: Final Report*. The study describes existing conditions, including those within the Boston, Massachusetts to Concord, New Hampshire portion of the study corridor, as well as a ridership analysis of stations in the corridor. The study found that "further study of associated operational, engineering, and cost/revenue factors is warranted," a recommendation that supports the Capitol Corridor Study.

In 2004, NHDOT developed a draft EA, *Lowell, MA to Nashua, NH Commuter Rail Extension Project Environmental Assessment (2004)*, for the corridor segment from Lowell, Massachusetts to Nashua, New Hampshire in anticipation of extending MBTA commuter rail service to New Hampshire. Because the study focuses on a segment of the Capitol Corridor Study area, its environmental analysis was used to support the Capitol Corridor Study.

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[3] Crowninshield-Bradlee, Francis Boardman; *The Boston And Lowell Railroad, The Nashua And Lowell Railroad, And The Salem And Lowell Railroad (1918);* Kessinger Publishing; 2009
[4] The report of the Community Advisory Committee to the Commissioner of the New Hampshire Department of Transportation; June 9, 2006; http://www.nhcf.org/document.doc?id=34

The 2010 *New Hampshire Capitol Corridor Project Overview,* based on a white paper prepared for Amtrak,[5] details this corridor's state of readiness to function as part of the federal High-Speed Intercity Passenger Rail (HSIPR) program. The overview includes many elements of the Capitol Corridor Study, including proposed service, ridership forecast, capital costs, and economic impacts.

Also in 2010, NHRTA commissioned the *Economic Impact of Passenger Rail Expansion along the New Hampshire Capitol Corridor.*[6] The report assessed the economic impacts of restoring intercity passenger rail service between Boston, Massachusetts and Concord, New Hampshire. The study supports the case that the implementation of passenger rail along this corridor is a net economic benefit for New Hampshire.

In 2011, a poll was conducted by the University of New Hampshire Survey Center of New Hampshire residents to assess attitudes about the extension of commuter rail service through the New Hampshire Capitol Corridor, for NHRTA. Findings suggest a majority of residents strongly favor extending passenger rail service in New Hampshire, and using federal funding to study the issue.

1.1.2 Other Related Planning

A number of other planning studies reference the Capitol Corridor, and are relevant to the current Study.

- The *Ten Year Transportation Improvement Plan (2013-2022)* includes a provision that requires legislative approval for capital and operating budgets associated with passenger rail service prior to expenditure.
- The *Massachusetts Department of Transportation Rail Plan (2010)* and the *New Hampshire State Rail Plan (2012)* both identify the corridor as a potential for passenger service, and the New Hampshire plan recommendations include "implement recommendations of studies of the New Hampshire Capitol Corridor."
- The *I-93 Corridor Multi-Modal Transit Investment Study (2009)* does not focus on studying the New Hampshire Capitol Corridor, but recognizes it as a viable candidate for passenger rail service.

1.2 Corridor Existing Conditions

The Capitol Corridor's robust transportation network includes roadways, highways, transit services, intercity passenger rail service, freight railroads, airport, and pedestrian and bicyclist facilities. Despite the dense, multi-modal nature of this transportation network, demand is exceeding capacity (particularly within the highway network) and there are opportunities to improve connectivity between the current modes.

- **Highway Facilities**: The limited access highways that connect New Hampshire's major population centers to metropolitan Boston are I-93, US Route 3/Everett Turnpike, Route 128/I-95, I-293, and, I-495. Under current conditions, there is severe traffic congestion inbound

[5] http://www.cometolowell.com/pdfs/NHCCorridorOverview.pdf
[6] http://www.edrgroup.com/pdf/NH-PassRail-Economic-Impact-Memo.pdf

towards Boston during the weekday morning peak hour. I-93 between Route 128/I-95 and I-495 is generally over-capacity with level of service (LOS) E and F conditions. This LOS represents roadway conditions with bumper-to-bumper or completely stopped traffic. Route 128/I-95 between US Route 3 and I-93 is generally over-capacity with traffic congestion. I-495 is over capacity closer to US Route 3. Near I-93, I-495 is close to and above capacity. US Route 3 operates near capacity during the weekday morning peak hour and has LOS E and F conditions between Route 128 and I-495, with congestion focused in the vicinity of the US Route 3 and I-495 interchange and the Lowell Connector. US Route 3 is close to capacity in the vicinity of North Chelmsford (Massachusetts), Tyngsborough (Massachusetts), and Nashua (New Hampshire). US Route 3 and I-93 are close to capacity in the vicinity of Manchester (New Hampshire) and Concord (New Hampshire).

- **Bus Service**: Seven regional and four local bus operators provide service within New Hampshire and intercity service to Boston and beyond. A partnership between NHDOT and Concord Coach (BX) operates roughly 50 daily bus round trips within the corridor between New Hampshire and Boston; this service typically carries 1,800 passengers per day. Existing traffic congestion along I-93 significantly impacts BX's scheduled travel times. The level of recurring daily congestion delays are built-in to the schedules. For instance, the 6:30 am southbound departure from Londonderry (Exit 4) on the I-93 service is scheduled for a one hour trip to Boston South Station. Meanwhile, the 9:50 am southbound departure is scheduled for a two hour and 20-minute trip, which is a built-in or induced delay of one hour and 20 minutes.
- **Commuter Rail**: On a typical weekday Lowell is served by 44 MBTA revenue trains to and from Boston's North Station. The 25-mile trip serving up to seven intermediate station stops takes 44 to 49 minutes. Typical weekday MBTA ridership on the entire line is 17,500 passenger trips including both northbound and southbound travel. Lowell is the busiest passenger station on the line with 4,280 weekday boardings and alightings.
- **Freight Rail**: The NHML was a principal artery of the B&M's (now PAR's) network and remains a key economic link between New Hampshire and the national economy. While the freight received is quite diverse, traffic flow is dominated by coal for electric generation shipped to the Bow Power Plant.
- **Airports:** Boston's Logan International Airport is currently New England's largest transportation center and ranks 20th in the nation in passenger volume. Manchester Airport ranks 140th in the nation and handled 2.814 million passengers in 2010 and remains New England's fourth largest airport by passenger volume, behind Boston Logan, Bradley International in Connecticut, and T. F. Green in Rhode Island. It contributes over $1 billion annually to the region's economy and accounts for more than 3,500 jobs in the three-county region contiguous to the airport.[7]

[7] *Manchester-Boston Regional Airport Economic Impact Study,* 2008-2009. Jacobs Consultancy

Once a busy main line railway, the NHML was originally double-tracked to Concord and beyond. However, today the railway is largely single tracked north of Chelmsford with some passing sidings, yards in Nashua and Manchester, and numerous turnouts to freight customer sidings. The following provides an overview of the existing conditions of the existing rail line along this corridor.

- **Ownership:** In Massachusetts, the southernmost 34.5 miles of the line was acquired by the MBTA in the 1960s. In New Hampshire, the NHML is the property of PAR. PAR has conveyed trackage rights for the operation of passenger trains on the NHML northward into New Hampshire between the state line and Concord to the MBTA.
- **Railway Signal System and Traffic Regulation:** The train control signal system for the route supports Northeast Operating Rules Advisory Committee (NORAC) Rule 261 between North Station and Manchester. Rule 261 allows for bi-directional operation with automatic wayside block signals on all main line tracks. North of Manchester, there are no wayside signals and operations are governed by Data Communication System (DCS) rules, wherein a Form D train order issued over the radio by the railroad dispatcher in Billerica, Massachusetts is necessary to move a train.
- **Track Class and Speed:** Within the southern 25 miles of the NHML between Boston and Lowell, most of the trackage is rated for 60 mph passenger operations, with some segments maintained to a 70 mph speed standard, due to MBTA operations. North from Lowell is a three-mile section of track to North Chelmsford that experiences heavy freight traffic, which is maintained for a maximum freight speed of 40 mph (Class 3). North of Chelmsford the track is maintained for 40 and 30 mph freight speeds on predominately Class 3 track north to Bow and with Class 2 track north to Concord with 25 mph freight speeds.
- **Track Condition:** The track conditions along the route are consistent with the Federal Railroad Administration (FRA) Track Class and maximum speeds.
    - *Boston to Lowell*: The entire rail is welded with the latest major tie renewal completed in 1992. The oldest rail on this segment was manufactured in 1980. Much of the track uses 132-pound (per yard) rail but approximately 20 of the 51 track miles between Boston and Lowell uses 115-pound rail.
    - *Lowell to Chelmsford:* The track is jointed here and the northbound track is primarily constructed with 100-pound rail manufactured in 1927. The southbound track is mostly constructed with 112-pound relay rail from 1965.
    - *North of Chelmsford*: Similar to the southern portion, the rail is almost all jointed. There are approximately two miles of welded rail just north of downtown Manchester. Nearly the entire rail is 112-pound manufactured during the first half of the 1940s.
- **Alignment:** The NHML track north of Lowell to Manchester runs along the Merrimack River. This alignment has mostly gentle grades, with none steeper than 0.35 percent. The horizontal alignment curves to follow the river with few tangent (straight) segments more than one-mile long. Many of the curves are sufficiently tight to impact maximum train speeds.

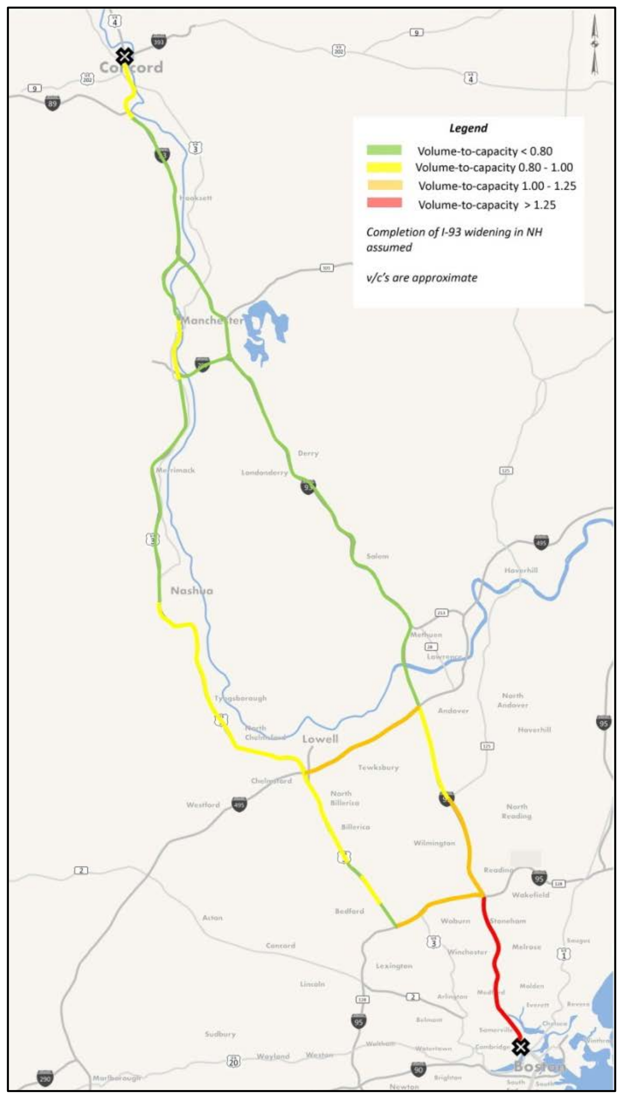
- **Bridges**: The bridges along the NHML between Lowell and Manchester are rated generally fair to good, with one bridge noted in poor condition in Tyngsborough, Massachusetts. The two longest bridges crossing the Merrimack River are not rated and should be inspected before passenger service is restored.
- **Highway Grade Crossings**: There are 21 locations identified between Lowell and Manchester where roadways or pedestrian paths cross the railway at grade. Federal safety regulations require trains to sound their horns at all grade crossings. The density of 21 crossings along the 48-mile route is relatively low for a suburban railway. Of the 21 grade crossings, 10 are public roads, 10 are private driveways, and one is an informal community crossing.

2 Purpose and Need

2.1 Purpose

The purpose of the Capitol Corridor AA Study is to identify and implement the transit investment strategy that will best leverage the existing transportation infrastructure to improve connectivity to and from Boston, the region's largest economic hub; diversify options and reduce the primarily single-mode reliance on roadways for the movement of people and goods; support mobility options that match emerging demographic trends and preferences in the corridor; and maintain the region's high quality-of-life through strategic infrastructure investments.

Figure 2.1: Existing Volume-to-Capacity Ratio during the Inbound Morning Peak



2.2 Need

Projected population growth will result in increased roadway congestion. As population density increases over the coming years, an increased number of multi-modal transportation options to Boston, the region's largest employment center, will be critical to mitigate corresponding increases in roadway congestion, particularly along I-93 and Route 3, as shown in Figure 2.1.

New Hampshire's existing transportation network does not effectively connect existing modes. Increased levels of corridor transit investment will improve local and regional mobility by linking travelers to the network of existing transportation modes: roadway, buses, commuter rail, heavy rail, light rail, bicycles, and airplanes. These increased linkages will improve ridership and usage across all of the modes, while promoting sustainable mobility.

Regional economy suffers from predominantly singular dependency on roads for movement of goods and passengers. Investing in transportation infrastructure that provides an alternative to roadway transport will link New Hampshire's businesses, industries, and residents to the national and New England transportation network.

Improved transportation options will attract employers to New Hampshire and improve employment options for New Hampshire residents. A mismatch between locations of residence and employment forces many in New Hampshire to spend comparatively long periods of time commuting to work. Investing in more efficient transportation modes will not only improve connectivity between existing centers of residence and employment, but increased levels of multi-modal access may catalyze additional business investment within New Hampshire.

New Hampshire is experiencing a young professional "brain drain." While the region's overall population is projected to grow in the coming decades, young professionals are choosing to leave southern New Hampshire to be closer to the employment, cultural, and social opportunities associated with larger urban centers. Improved transit connectivity will support the attraction and retention of young professionals within the Capitol Corridor Study area.

New Hampshire is getting older. New Hampshire's senior population continues to grow. Additional shared transportation accommodations that support "car-light" mobility will be required to accommodate these emerging demographic and lifestyle trends, and will continue to make New Hampshire attractive to residents from childhood through retirement.

Residential development patterns resulting from population growth may negatively impact the region's existing quality-of-life. Population growth, if not guided through strategic infrastructure investments that promote efficiency, will result in uncoordinated development patterns and sprawl that will diminish the region's high quality-of-life and negatively impact its unique character.

The existing transportation network cannot accommodate increased levels of demand without negative environmental consequences. The expansion of existing roadways and construction of new roadways will not be sufficient to sustainably accommodate the projected growth in travel demand, causing negative environmental consequences associated with an increased number of VMT and corresponding congestion.

2.3 Goals and Objectives

To determine how well transit and/or intercity passenger rail investment within the Capitol Corridor will address regional and corridor needs, a set of goals and objectives have been developed. Goals and objectives, outlined in Table 2.1, build on the work that has been completed or is ongoing within the corridor and region. Each goal reflects an understanding of the role that integrated transportation and land use planning can play in supporting an economically, environmentally, and socially sustainable community. Transit investment will be a major step in implementing this integrated planning approach within the Capitol Corridor.

Table 2.1: Capitol Corridor Goals and Objectives

Goals	Objectives
Transportation and Mobility Leverage the existing transportation network to improve access and mobility within the corridor and throughout the region	▪ Provide alternatives to address congestion within the Study corridor ▪ Expand the transit network capacity ▪ Increase transit ridership and mode share by expanding the existing rider base and attracting new riders ▪ Provide travel time savings ▪ Improve the efficiency, convenience, and reliability
System Integration Invest in transportation improvements that complement the existing multi-modal transportation network	▪ Increase corridor modal connectivity ▪ Provide connections to other corridors within the region ▪ Increase access to the Manchester Airport through additional transit service ▪ Balance system capacity (MBTA, BX, Concord Coach) ▪ Ensure operating efficiency
Economic Development and Land Use Support the vision for growth laid out in local/regional development plans	▪ Improve access to higher-paying jobs in greater Boston ▪ Support development patterns/lifestyle choices that attract younger, highly educated professionals to New Hampshire ▪ Leverage younger, highly educated employee base to attract new businesses/grow existing ones ▪ Promote transit-oriented development (TOD) to mitigate sprawl development patterns ▪ Improve the potential for additional freight rail business through infrastructure upgrades
Sustainability Support transportation investments that contribute to an environmentally, economically, and socially sustainable community	▪ Leverage existing transportation infrastructure to qualify for federal transportation investment dollars ▪ Mitigate potential adverse environmental impacts resulting from anticipated development ▪ Support growth patterns that attract and retain residents from childhood through retirement ▪ Improve access to other tourism, recreation, and cultural attractions in greater Boston and NH

3 Alternatives' Evaluation

The AA for this Study was performed in conjunction with FTA grant funding, wherein a full range of intercity, commuter rail and bus alternatives were developed to satisfy the Study's purpose and need. Including the No Build alternative, 12 alternatives were initially screened by the Study team, with input from project stakeholders (see Appendix 4 to the Capitol Corridor AA Final Report). Three alternatives were specific to intercity passenger rail service, and of the three, one alternative was carried forward into the detailed analysis (see Appendices 8 and 9 to the AA Final Report). In addition to the Service-level alternatives analysis, the Study team performed a layover facility alternatives analysis and a passenger station location alternatives analysis.

3.1 Screening of Alternatives

The Study team developed preliminary estimates of ridership, operating costs, and capital costs along with land use, economic development, and environmental impacts of the nine rail and three bus alternatives to screen the alternatives to a more manageable number for final evaluation (see Appendix 5 to the AA Final Report). The team's recommendations were reviewed with all stakeholders, including the FTA and the FRA, as well as the general public, before being finalized. Table 3.1 shows the basic performance metrics calculated for each alternative.

Table 3.1: Preliminary Estimates of Basic Economic Performance Metrics for Preliminary Alternatives

	Typical Weekday NH Passengers	Required Capital Expenditure (In Millions)	Annual Operating Cost (In Millions)	Annual Incremental Passenger Revenue (In Millions)	Net Operating Cost (In Millions)
Intercity 8	1,460	$162	$7.7	$3.5	$4.2
Intercity 12	1,720	$174	$11.6	$4.1	$7.45
Intercity 16	2,040	$174	$17.3	$4.9	$12.4
Concord Regional	2,700	$226	$11.1	$6.1	$5.0
Concord Commuter	3,020	$206	$13.3	$7.1	$6.1
Manchester Regional Commuter Rail	3,120	$164	$9.7	$7.2	$2.5
Manchester Commuter	3,060	$164	$9.9	$7.1	$2.8
Nashua Commuter	2,040	$124	$6.8	$4.2	$2.6
Nashua Minimum Commuter Rail	1,480	$124	$5.2	$2.7	$2.4
Expanded Base	346	$6	$3.0	$0.8	$2.2
Bus on Shoulder	692	$7	$0.0	$1.7	$0.0
Expanded Bus on Shoulder	1,038	$14	$3.0	$2.5	$0.5

After extensive consultation primarily focusing on the fiscal constraints faced by the State of New Hampshire, seven intermediate alternatives (three rail, three bus, and a No Build option) were selected for more detailed evaluation (see Table 3.2). The two commuter rail options with the lowest potential net operating cost, the one intercity rail option with the lowest preliminary net operating cost, and the three low-cost bus alternatives were recommended for refinement and detailed evaluation, as was the No Build option.

Table 3.2: Intermediate Service Options Selected for Detailed Evaluation

Service Option	Required Capital Expenditure (In Millions, 2014$)	Net Operating Cost (In Millions, 2012$)
Manchester Regional Commuter Rail	$164	$2.5
Nashua Minimum Commuter Rail	$124	$2.4
Intercity 8	$162	$3.6
Expanded Base	$6	$2.2
Bus on Shoulder	$7	$0.0
Expanded Bus on Shoulder	$14	$0.5

The Intercity 8 alternative was selected from the three intercity rail service options because of its low net operating cost and reasonable mobility benefit perspectives. As shown in Table 3.3, the number of additional riders attracted by more frequent service with Intercity 12 and 18 did not keep pace with the additional forecasted capital and operations costs.

Table 3.3: Intercity Service Riders Versus Cost

	Typical Weekday NH Passengers	Net Operating Cost (In Millions, 2012$)
Intercity 8	1,460	$3.6
Intercity 12	1,720	$6.9
Intercity 18	2,040	$11.8

Each of the rail options that were evaluated during the screening of intermediate alternatives exhibited a range of costs and benefits that were further refined for consideration by stakeholders and decision-makers. The Expanded Base and Expanded Bus on Shoulder options were eliminated from further evaluation. The Expanded Base option would result in the highest net operating cost and would attract the fewest new passengers of the three bus options. The Expanded Bus on Shoulder options would generate the greatest mobility benefits of the three bus options, but would do so at more than twice the capital cost of the Bus on Shoulder option.

From this information the Study team was able to make a more detailed and accurate estimates of costs for each rail and bus service option. Another round of ridership forecasts was prepared using more sophisticated forecasting techniques. Separate models were used for the intercity rail, commuter rail, and express bus options. Amtrak's ridership forecasting team prepared the patronage forecasts for the Intercity 8 option. Each key economic performance metrics and assumptions are described in Table 3.4 and final estimates of cost and demand are summarized in Table 3.5.

Table 3.4: Key Economic Performance Metrics and Assumptions

Economic Performance Metric	Evaluation Assumptions
New NH Transit Passenger Trips	Includes all new transit trips originating in New Hampshire including rail trips diverted from Lowell to Nashua and any changes in BX ridership
New Corridor Transit Passenger Miles	Includes all transit trip miles made by passenger rail and BX; reflects downward adjustments in BX passenger miles for options where BX service is reduced or eliminated
Total Project Value (In Millions, 2014$)	Includes cost of all necessary infrastructure investment (e.g., railroad improvements, stations, rail yards, and bus shoulder lanes), the value of any necessary rolling stock (buses or trains), and the prorated value of MBTA's 37-mile Nashua to Concord trackage rights based on the option's length in New Hampshire; Intercity 8 would use Amtrak's statutory trackage right, not rights acquired by MBTA
NH Costs after Federal Grants and MA Contributions (Conservative Case)	Assumes that MBTA contributes rolling stock and trackage rights to the project, but does not contribute to the cost of infrastructure improvements north of Lowell; also assumes FTA does not consider MBTA contribution of rolling stock or trackage rights as contributing to eligible project value; consequently, the 50% FTA grant would cover half of the infrastructure investment; also assumes that FRA would fund half of the overall project value for Intercity 8 and that no federal capital funding would be available for the bus options
Annual Operating Cost (In Millions, 2012$)	Updated preliminary cost estimates for commuter rail options; final estimates for intercity and bus options; assumes weekday-only operation for commuter rail and bus services; intercity service would operate 365 days per year
Net Operating Cost (In Millions, 2012$)	Annual operating costs minus forecast passenger revenue and federal formula funds; FTA fixed-guideway formula funding is distributed for commuter rail service, but not for bus or intercity rail programs
Annual NH Debt Service	Assumes that NH share of project cost would be retired with 20-year bonds at 5% annual interest
NH Annual Total Cost	Sum of net operating cost and annual debt service
NH Annual Cost Per New Passenger Mile	Shows NH annual cost divided by new annual transit passenger miles
NH Annual Cost per New NH Rider	Shows NH annual cost divided by new annual NH transit passengers

Table 3.5: Forecasts for Passenger Demand, Capital Cost, Operating Cost (In Millions), and Economic Metrics

Metrics	Intercity 8	Manchester Regional Commuter Rail	Nashua Minimum Commuter Rail	Bus on Shoulder
New NH Transit Passenger Trips	946	2,568	670	48
New Corridor Transit Passenger Miles	48,853	90,506	5,542	2,112
Forecast Capital Cost (In Millions, 2014$)	$256	$246	$120	$7
NH Costs after Federal Grants and MA Contributions (Pessimistic Case)	$128	$97	$49	$1
Annual Operating Cost (In Millions, 2012$)	$7.7	$11	$4	$0
Net Operating Cost (In Millions, 2012$)	$5	$2	$2	$0
Annual NH Debt Service (In Millions, 2012$)	$10	$8	$4	$1
NH Annual Total Cost (Debt Service and Operating Deficit) (In Millions, 2012$)	$15	$9	$6	$1
NH Annual Cost Per New Passenger Mile	$1.19	$0.41	$3.89	$1.11
NH Annual Cost per New NH Rider	$61	$14	$32	$49

Review of the forecast performance indicates that the Manchester Regional Commuter Rail, while expensive from a capital and operating cost perspective, would generate the greatest mobility benefits and the lowest unit costs per passenger mile and per passenger. The Bus on Shoulder option would be relatively inexpensive, but would generate limited mobility benefits with resulting medium-to-high unit costs per passenger and per passenger mile. Intercity 8 would be slightly more expensive to construct than the Manchester Regional Commuter Rail; it would also attract fewer passengers and fewer passenger miles, resulting in a reduced operating efficiency. Nashua Minimum Commuter Rail would be half as expensive as the other rail options, but would attract fewer passengers, resulting in relatively unattractive measures of efficiency.

3.2 No Build Alternative

The No Build alternative is required to be evaluated under NEPA as a baseline for comparing the impacts of the build alternatives. Under the No Build alternative, the existing condition of the rail corridor would remain unchanged. Freight traffic would continue to serve the existing customers located on the NHML, and intercity bus service would continue to serve passengers between Concord, Manchester, Nashua, and Boston. It is assumed that population growth in the region and the demand for jobs in the greater Boston market would further negatively impact corridor traffic conditions.

The No Build alternative does not satisfy the project's purpose and need because it fails to improve connectivity to and from Boston, the region's largest economic hub; it maintains single-mode reliance on roadways for the movement of people and goods; it does not increase mobility options that match emerging demographic trends and preferences in the corridor; and the region's high quality-of-life may deteriorate without strategic infrastructure investments.

3.3 Manchester Regional Commuter Rail Alternative

Of the six commuter rail alternatives considered during the Study's preliminary screening, the Manchester Regional Commuter Rail and Nashua Minimum Commuter Rail options were advanced into detailed analysis. Of the three rail intercity alternatives considered during preliminary screening, the Intercity 8 alternative was carried forward into detailed analysis. This alternative analysis is detailed in Appendix 10a, *Federal Railroad Administration Environmental Assessment,* to the AA Final Report. Of the three intercity commuter bus options considered during preliminary screening, the Bus on Shoulder alternative was advanced into detailed analysis.

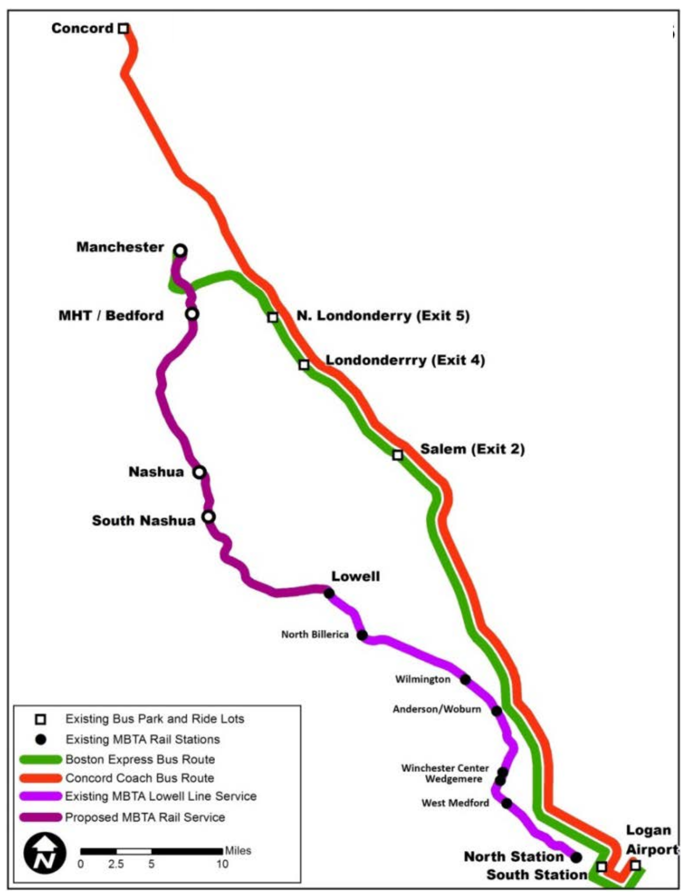
This EA focuses on the Manchester Regional Commuter Rail. The environmental impacts examined in the EA for the Manchester Regional Commuter Rail cover each of the other alternatives presented (Nashua Minimum Commuter Rail and Bus on Shoulder). No preferred alternative was selected in the Study, and the three options noted above (plus the No Build) were recommended for further debate and discussion. The focus in the EA on the Manchester Regional Commuter Rail is for analytical purposes only, and that alternative should not be seen as the preferred investment, a decision on which will be made after extended debate and discussion.

3.3.1 Manchester Regional Commuter Rail Service

The Manchester Regional Commuter Rail service option (Figure 3.1) would provide a mix of commuter train service for Nashua with a lower frequency regional service provided north to Manchester. MBTA service would be extended 30 miles to downtown Manchester, with intermediate stops at South Nashua, Nashua Crown Street and Bedford/Manchester Airport. The service adds four new stations to the line with 16 weekday trains for Manchester and 34 for Nashua. All existing MBTA Lowell Line deadhead trains would be eliminated. A layover facility for four train sets would be constructed in the vicinity of Manchester.

Up to 12 coaches and one locomotive would be added to the MBTA's weekday line up of equipment. Six MBTA trains would be marginally adjusted with most changes required on light ridership reverse peak trains.

Figure 3.1: Manchester Regional Commuter Rail Alignment



Ridership response to this service initiative is anticipated to include new riders attracted to rail service provided to the proposed New Hampshire stations. It is assumed that some current MBTA rail passengers living in New Hampshire would shift to these new stations from the existing MBTA Lowell, Massachusetts and North Billerica Stations, Massachusetts. It is also anticipated that many or most passengers from the discontinued BX Route 3 service would shift to the commuter railroad. Ridership impacts on the BX I-93 main line services to Londonderry, North Londonderry, and Salem would likely be negligible.

3.3.2 Manchester Regional Commuter Rail Stations and Layover Facility

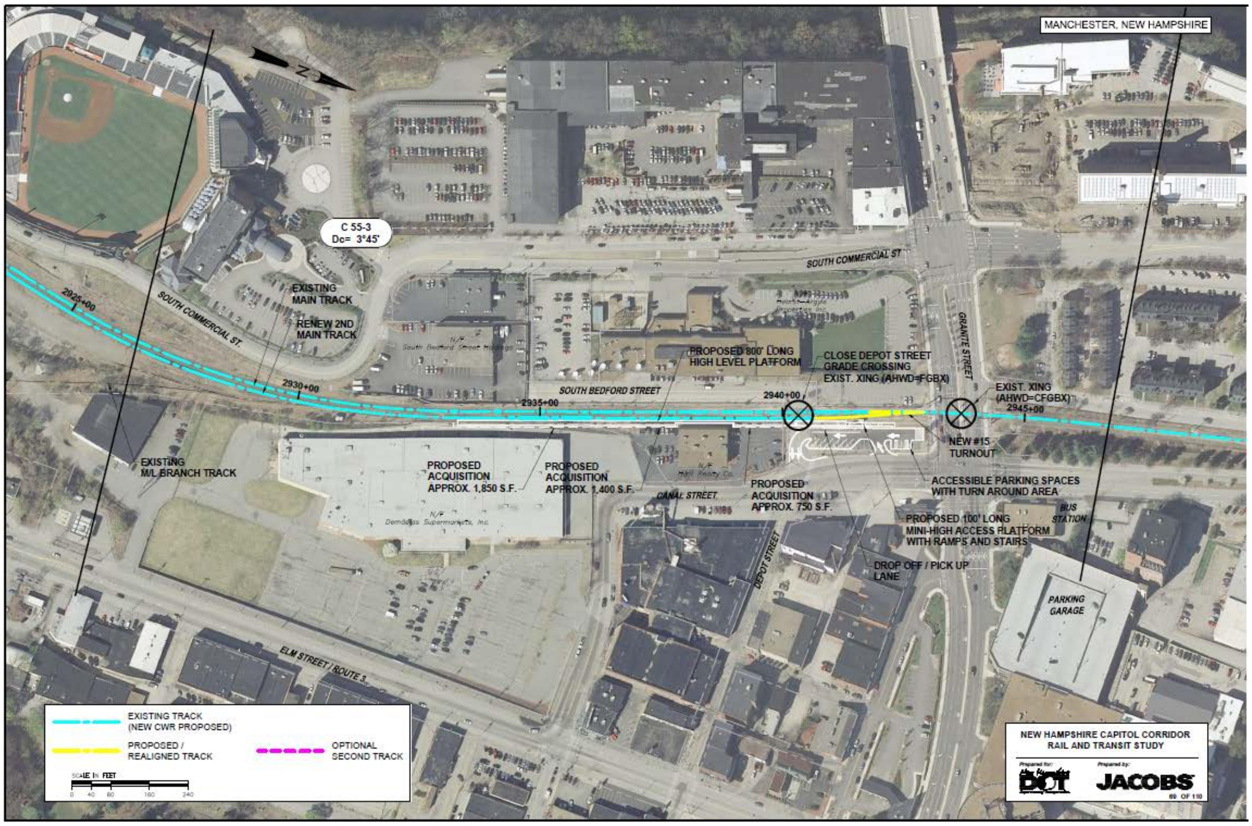
The Manchester Regional Commuter Rail Alternative would make four stops in New Hampshire. The four newly constructed passenger stations would be a mix of high-level platforms and low-level platforms with "mini-high" platforms based on MBTA design standards for handicapped accessibility. High-level platforms would be at most locations. A low-level with mini-high platform approach would be employed where PAR freight trains need to use the platform track.

The station alternatives analysis considered a wide range of station alternatives at each location. The station alternatives were determined based on field inspections, interviews with local officials, and review of previous studies. The locations were then chosen through coordination with local officials and through a screening process that took into account standard criteria for each alternative. The following provides a summary of the station locations.

Manchester – Granite Street

Manchester's main passenger rail station stood for many decades on the south side of Granite Street before the building was demolished and the site redeveloped. The site is proximate to the center of Manchester's densest urban development, across the street from the intercity bus terminal and a short walk to the Manchester Transit Authority's downtown hub at Veteran's Park, see Figure 3.2. The recommended station design would close the Depot Street crossing and develop the city-owned parcel on the corner of Granite and Canal Streets that is presently used for public parking. A two-track station option has been developed with a single low-level and mini-high platform serving the east track. This would enable the efficient operation of a terminal station and allow for unimpeded freight traffic to and from the north.

Figure 3.2: Proposed Manchester Station



Bedford/Manchester Airport

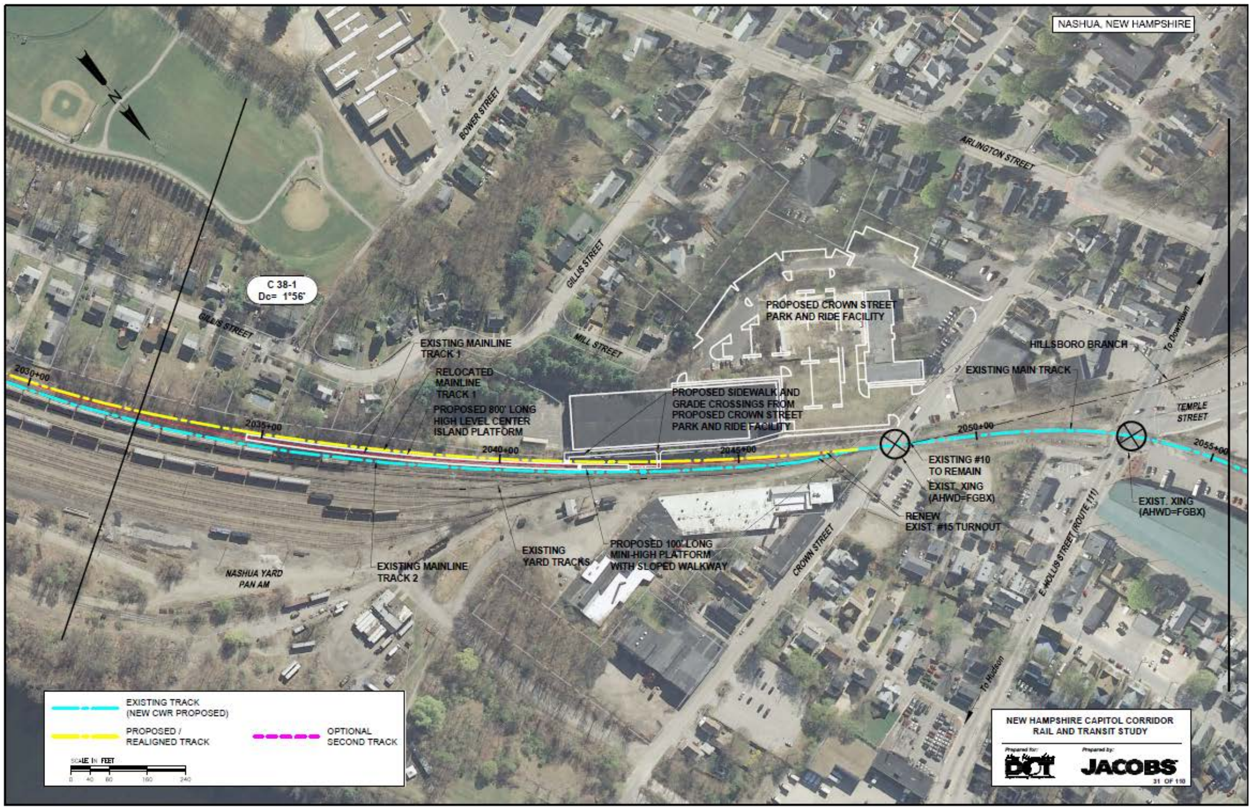
The proposed Manchester Airport station in Bedford would provide a location for air-rail passenger interchange and also serve as a regional park-and-ride for northern Hillsborough and southern Merrimack counties. The site is located under the Ray Wieczorek Drive/Pearl Harbor Memorial Bridge that provides a direct connection between Route 3 and Manchester Airport. This site has also been proposed as a development node within the Town of Bedford. A proposed shuttle bus would provide connecting service, meeting all trains, along the 2.8-mile (six minute) route between the airport passenger terminal and the proposed station, see Figure 3.3. Similar air-rail shuttle connections are used at airports in Baltimore, Boston, and Milwaukee. The station parking lot would be managed to prohibit overnight parking, avoid use by air passengers, and keep spaces available for rail commuters from Manchester, Bedford, and other nearby communities.

Figure 3.3: Proposed Bedford/Manchester Airport Station

Nashua – Crown Street

This site is located south of the Crown Street site and north and west of the PAR rail yard, as shown on Figure 3.4. It is the approximate location of Nashua's historic main line train station and is the only viable site near downtown that can accommodate platform requirements. The proposed 800-foot long center-island high-level station platform would be located adjacent to the Triangle Pacific building, which is a potential redevelopment site. The city and state recently cooperated to acquire the site with the intention of developing a park-and-ride lot independent of the proposed rail service. City plans call for 255 parking spaces and reuse of existing industrial buildings. Additional parking supply would be constrained by the size of the parcel. Since this location would rely on pedestrian and bicycle accessibility, a new sidewalk would be necessary on the south side of Crown Street and east of Arlington Street to ensure safe access to the site. A pedestrian/bicycle connection off Harvard Street would provide improved accessibility from the surrounding neighborhoods.

Figure 3.4: Proposed Nashua Station



South Nashua

Two locations in New Hampshire were considered for a potential South Nashua Station site. One location would site a station at the Pheasant Lane Mall and the other would be at the east end of Spit Brook Road adjacent to the Merrimack River. The exact location and configuration of these potential station sites have yet to be determined.

Based on the Study team's preliminary timetables for the Manchester service a single-track South Nashua station would be sufficient to support the Manchester Regional Commuter Rail service option as meets between southbound and northbound trains would occur at other locations along the route.

Massachusetts Stations

The Manchester Regional Commuter Rail Alternative would stop at each of the following stations in Massachusetts:

- Gallagher Intermodal Transit Center located in Lowell; this station is the current terminus of the MBTA Lowell Commuter Line, and also has connections to local bus serve and intercity bus service.
- North Billerica Station in Billerica
- Wilmington Station in Wilmington

- Anderson Regional Transportation Center located in Woburn; this station services the MBTA Lowell Commuter Line, the Amtrak *Downeaster*, as well as regional shuttle service
- Winchester Center Station in Winchester
- Wedgemere Station in Winchester
- West Medford Station in Medford
- North Station located in Boston; this station is the terminus for the Amtrak *Downeaster*, the four northern MBTA Commuter Rail Lines, and also provides connections to local buses and MBTA Subway service

3.3.3 Manchester Regional Commuter Rail Train Operating Speeds

The maximum speed of a train is dependent on the existing track characteristics, and the amount of investment required to increase the speeds in the corridor. The maximum historic passenger speed along the NHML was 70 mph. The NHML track profile or vertical alignment north of Lowell to Manchester runs along the banks of the Merrimack River. Many of the curves are sufficiently tight to impact maximum train speeds. The engineering required to achieve trains speeds of 80 mph or higher is substantially more challenging with sharp curves. As such, the service would operate at maximum speeds up to 60 mph between Manchester Airport and Nashua.

3.3.4 Manchester Regional Commuter Rail Major Infrastructure Components

Historically the NHML had two tracks along the entire length between Boston and Manchester. Today, aside from sidings, the rail line is single-tracked north of Chelmsford. To balance the need to achieve maximum allowable speed with an acceptable level of capital and operating expense, it was decided that the existing rail would be upgraded, and enough second track would be provided to accommodate both passenger rail and freight on the same line. As such, double-track would not need to be installed throughout the corridor.

No improvements south of MBTA's Lowell Gallagher Terminal would be required. North of Lowell the railroad would be upgraded to permit safe, reliable operation of eight daily passenger trains at speeds of up to 60 mph. Recommended upgrades to track, bridges, crossings, and signals are summarized below.

- **Track:** All of the existing 70-plus-year-old 112-pound main line rail between Lowell and Manchester would be upgraded with new continuous welded rail (CWR) of a similar weight. Along segments where the rail is renewed with CWR, approximately one-third of the existing ties would be replaced. No double-track would be required between North Chelmsford (MP 28.5) and the southern end of the Tyngsborough Curve (MP 32). Industrial sidings would be created at three key areas of freight activity in Nashua and Merrimack to eliminate conflicts between local freight deliveries and through passenger trains. At these locations the existing main line track would be retained as an industrial siding with an entirely new parallel main line track constructed in the same alignment for use by through trains. Adding a second track would not be difficult as the railway was once entirely double-tracked with the double-track bed still largely intact.

- **Bridges:** The service expansion would use existing bridges over watercourses or roadways. Most of the bridges are rated as having sufficient strength to accommodate the proposed additional traffic. One bridge in Tyngsborough is a candidate for complete replacement. The large steel (circa 1930) structure spanning the Merrimack River between Manchester and Bedford is subject to more detailed inspection. The other bridges should receive a renewal of worn and weakened components when the rails crossing them are replaced.
- **Grade Crossings:** With double-tracking and increased frequency of faster trains, most of the 21 roadway grade crossings between Manchester and downtown Lowell would need upgrades in their AHWD.
- **Other:** Upgrades to the train control and signal systems would also be required as well as some new switches and reconfigurations of track.

3.4 Alternatives for Further Discussion

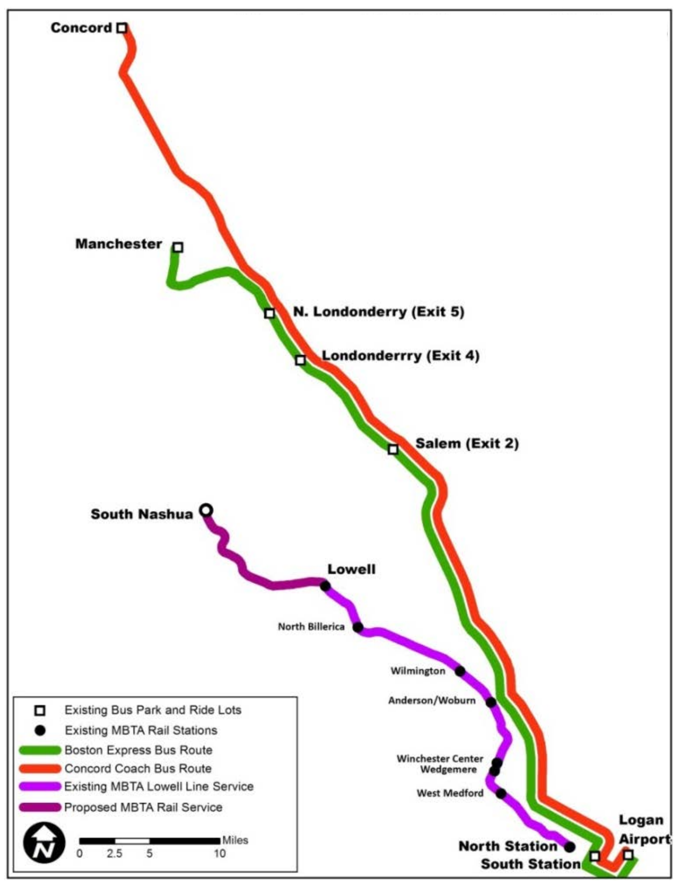
While this EA focuses on the Manchester Regional Commuter Rail Alternative, there are three other options that will require further discussion to determine a recommended strategy for the corridor. The following section describes the two additional commuter rail and one bus alternative still under consideration. Specific economic and social impacts of these alternatives can be found in the Task Report 7: Detailed Evaluation of Alternatives and Task 8 Report: Identification of the Recommended Strategy (Appendices 7 and 8 to the AA Final Report, respectively).

3.4.1 Nashua Minimum Commuter Rail Service

The Nashua Minimum Commuter Rail service option would provide a minimal peak-only commuter rail service to and from South Nashua with no rail service beyond Nashua to Manchester or Concord. It is specifically designed to minimize the MBTA operating cost of extending service to Nashua. It could be developed and operated as an interim service coordinated with bus service while markets and finances for more New Hampshire alternatives were given time to develop.

MBTA commuter rail service would be extended 9.7 miles to the South Nashua station located at or immediately across the New Hampshire state line, as shown in Figure 3.5. The service adds

Figure 3.5: Nashua Minimum Commuter Rail Alignment



one new station to the line with 16 weekday trains for Nashua. A layover facility for four train sets would be constructed in the vicinity of South Nashua. Similar to the previous options, up to 13 coaches and one locomotive would be added to the MBTA's weekday line up of equipment.

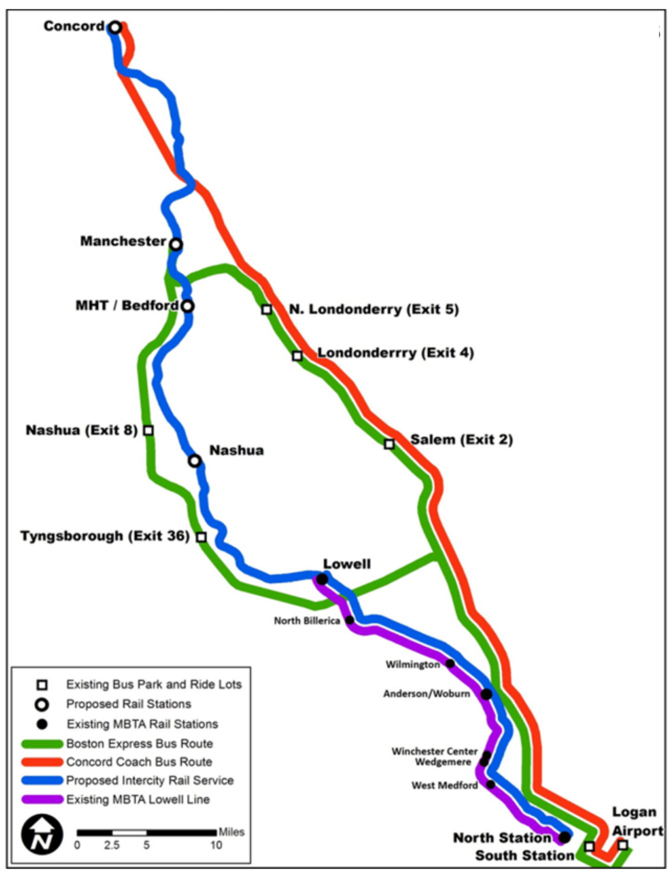
The rail service could potentially be supplemented by a schedule of feeder buses that would extend the reach of off-peak trains north to South Nashua to ensure that adequate mid-day mobility and travel options are available to daily commuters. Six inbound and six outbound buses could be provided throughout the day and could be operated with a single vehicle.

To schedule the feeder service with a single bus, the Study team decided to prioritize travel time for southbound passengers. Southbound trips are scheduled to provide five minutes for the transfer from bus to rail. This would require that the bus portion of the trip is operated reliably to ensure that the connection to the train is made on time. The northbound trips would depart using the same bus and passengers would therefore wait approximately 15 minutes for the transfer from rail to bus. This is due to the time required for crews to turn the train in Lowell. This longer transfer time built in to the schedules would allow for any delays on outbound rail trips from Boston and ensure that transferring passengers are not left at the station in Lowell.

3.4.2 Intercity 8 Rail Service

The Intercity 8 rail service option would operate eight trips per day between Boston North Station and Concord, as shown in Figure 3.6. The four daily round trips over the 73-mile route would stop at five intermediate stations (Manchester, Bedford/Manchester Airport, Nashua Crown Street, Lowell, and Woburn). The end-to-end trip time would be approximately 96 minutes. The service could be extended with possible connections to private bus services for North Country destinations. No changes are proposed to express bus service for commuting to Boston via I-93 or Route 3. Local bus service to the intercity rail stations could be offered but would not be integral to the service design. A BX/Concord Coach/rail fare integration scheme similar to that employed by the *Downeaster* at Portland, Maine could be employed at the Concord and Manchester stations that would be shared by both intercity rail and coach bus services.

Figure 3.6: Intercity 8 Alignment



Anticipated ridership responses to the service initiative would include new riders attracted to the intercity rail service. It is assumed that few current MBTA passengers living in New Hampshire would shift from using the MBTA Lowell and North Billerica Stations to the new intercity rail service. Some BX and Concord Coach customers might shift to intercity rail service from Nashua, Manchester, and Concord. The overall increase in the quality and frequency of transit options to Manchester and Concord may also stimulate bus ridership as has seemed to be the case at the shared terminal in Portland, Maine. Ridership figures show that Concord Coach served 216,000 passengers in Portland in 2003 while the *Downeaster* carried 250,000 passengers. In 2008, those numbers had increased to 400,000 passengers on Concord Coach and 320,000 passengers on the *Downeaster*.

3.4.3 Bus on Shoulder Service

The Bus on Shoulder option aims to provide faster peak-period service by utilizing Bus on Shoulder operations. The option would not add any additional trips, but would provide faster, more reliable travel times between New Hampshire and Boston South Station. The proposed timetables maintain the existing arrival and departure times at South Station and modify the departure and arrival times at New Hampshire park-and-ride lots based on the estimated travel time savings that would be possible from Bus on Shoulder operation. The service would not require any additional vehicles to operate the proposed schedule. It could potentially reduce vehicle requirements by allowing vehicles to operate more reliably so that they could provide multiple peak period round trips.

This option could potentially be combined with a viable passenger rail option or advanced as a Transportation Systems Management (TSM) approach or be implemented as a companion to a potential rail service improvement. A TSM is a FTA designation for an option that would contain a collection of low-cost transportation improvements to mitigate congestion or enhance the operational capacity of the existing transportation network.

Highway shoulders, generally used as an emergency breakdown lane and for emergency response vehicles can be easily adapted for bus use. The key design requirements are a minimum lane width of 10 feet (12 feet preferred), adequate shoulder pavement strength, drainage inlets level with roadway, and signage. Conflicts with pavement edge rumble strips and lateral obstructions adjacent to shoulders sometimes need to be addressed. The costs for these upgrades vary widely, but are modest compared with most highway widening and interchange reconstruction costs.[8]

Bus use of highway shoulders has been an operational practice in North America for over 20 years. This growing practice allows professional bus drivers the discretionary authority to drive within highway shoulders to reduce travel times and increase the reliability of transit service. The long-standing history of Bus on Shoulder operations and the increasing number of communities pursuing such projects point to the success of this practice in terms of both passenger and institutional benefits, and automobile

[8] Martin, Peter C. (2006). *TCRP Synthesis 64: Bus Use of Shoulders, A Synthesis of Transit Practice,* Transportation Research Board, National Research Council, Washington D.C. 2006, 100 pp

driver acceptance. Many agencies have demonstrated that Bus on Shoulder can safely and cost-effectively improve transit service on congested roadways. The Merrimack Valley Planning Commission and Massachusetts DOT (MassDOT) are evaluating Bus on Shoulder operations for I-93 in Massachusetts. That study assumes that Bus on Shoulder service along I-93 would follow the Minnesota operating model of 35 mph maximum speeds between I-495 and the Leonard P. Zakim-Bunker Hill Bridge in Boston.

4 Affected Environments and Environmental Impacts

This chapter describes the potential impacts resulting from the Manchester Regional Commuter Rail Alternative for the following resources: Air Quality, Noise and Vibration, Hazardous Waste Sites, Water Quality, Wetlands, Threatened and Endangered Species, Floodplains, Energy Resources, Visual Resources, Accessibility, Property Acquisition, Land Use, Environmental Justice, Public Safety, Cultural Resources, Parks and Recreation, Socioeconomics, Transportation, and Indirect Effects and Cumulative Impacts. Impacts were identified and assessed with regard to the anticipated level of intensity based on a review of scientific literature, previously prepared documentation, and the professional judgment of resource specialists.

Potential impacts are described in terms of the following:

- **Type**: Beneficial impact (a positive change in condition of the resource) or adverse impact (a change that reduces or degrades the condition of the resource)
- **Context**: Local, regional, global, or any combination
- **Duration**: Short- or long-term

4.1 Air Quality

The Capitol Corridor Air Quality and Global Climate Change Study and related analyses looked at the following pollutants: ozone (O_3), particulate matter (PM), including PM10, (10 micrometers or less in diameter and PM 2.5, 2.5 micrometers or less in diameter), carbon monoxide (CO), nitrogen oxide (NO_x), sulfur dioxide (SO_2), lead, asbestos, and mobile source air toxics (MSAT). In addition, greenhouse gases (GHGs), including carbon dioxide (CO_2), methane, nitrous oxide, and synthetic GHGs, were analyzed for climate change impacts.

40 CFR Part 51, Subpart W, applies in states where the state has an approved State Implementation Plan (SIP) revision adopting General Conformity regulations. 40 CFR Part 93, Subpart B, applies in states where the state does not have an approved SIP revision adopting General Conformity regulations. The project is subject to the general conformity regulations but not the transportation conformity guidelines in 40 CFR Part 93.109 and 93.119.

On a local scale, the potential effect of Manchester Regional Commuter Rail Alternative on air quality is limited to increases in locomotive emissions, and both increases and decreases in on-road emissions. Decreases in on-road emissions could have a beneficial impact on local air quality if large numbers of vehicle trips are shifted to rail, occurring along roadways where those trips would otherwise occur. Since the details of that shift are not clearly known at this time, this potential benefit has not been analyzed; however, a more meaningful analysis of the region-wide benefits of this mode shift is included in the regional analysis.

For local impacts, CO hotspot and PM hotspot analysis would be performed during the next phase of the project, but locomotive emissions factors were obtained from "2009 Technical Highlights for Locomotive Emissions" by the United States Environmental Protection Agency (USEPA). The total emissions were distributed to each state (Massachusetts and New Hampshire) and by attainment areas. For regional impact, the locomotive emission factors used are the same as for the local impact. An on-road vehicle emission analysis was conducted using average daily VMT estimates and associated average daily speed estimates for each of the affected areas. The criteria pollutants emissions for the vehicles were obtained from USEPA Motor Vehicle Emission Simulator (MOVES) model (national level allocated to the Hillsborough and Merrimack counties in New Hampshire). Total VMT were obtained from the project traffic study. The analysis was conducted for the modeling year 2020. To determine overall pollutant burdens generated by on-road vehicles, estimated VMT increases or decreases were multiplied by applicable pollutants' emission factors, which are based on national default speeds and vehicle speciation data, and using a 2020 analysis year.

Based on the Federal Highway Administration (FHWA) guidance, the Manchester Regional Commuter Rail Alternative does not require a detailed quantitative analysis for MSAT. In addition, the detailed project level MSAT and GHG emission factors for vehicles and locomotives are not available in the current version of MOVES. Therefore, the hazardous air pollutant and GHG emissions were estimated by scaling either NO_x emissions from the MOVES model, SO_2 emissions from locomotive engines, or NO_x emissions from USEPA's 2011 National Emissions Inventory data. The Air Quality Technical Memorandum in Appendix A has the detailed methodology and the results.

4.1.1 Affected Environment

Ambient air quality standards have been set by both the federal government and state agencies. Both New Hampshire and Massachusetts do not designate areas as state attainment or nonattainment with these standards. USEPA, in response to the federal Clean Air Act (CAA) of 1970, established the National Ambient Air Quality Standards (NAAQS) in Title 40 CFR Part 50. The NAAQS include both primary and secondary standards for six "criteria pollutants." These criteria pollutants are O_3, CO, nitrogen NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. Primary standards were established to protect human health, and secondary standards were designed to protect property and natural ecosystems from the effects of air pollution. The NAAQS and related requirements can be found in the Air Quality Technical Memorandum in Appendix A.

The Study area is classified as attainment with respect to the NAAQS for O_3, NO_2, PM_{10}, $PM_{2.5}$, SO_2, and CO, except for some areas in Massachusetts that are maintenance areas for CO (1971 standard) and nonattainment areas for O_3 (1997 standard). Some areas in New Hampshire are nonattainment areas for SO_2 (2010 standard) and maintenance areas for CO (1997 standard).

NO_x and SO_2 are regulated as PM_{10} precursors, and NO_x and volatile organic compounds (VOCs) as O_3 precursors. Table 4.1 provides the area, pollutant, attainment status, and the General Conformity applicable *de minimis* emission levels for the Study area.

Table 4.1: Air Pollutants and NAAQS Attainment Status

Area	Pollutant	Attainment Status	General Conformity applicable de minimis emission levels tons per year (tpy)
MA – Boston and Lowell	CO (1971 standard)	Maintenance	100
MA – Boston-Lawrence-Worcester	O_3 (1997 standard)	Nonattainment - Moderate	100 (NO_x and VOC)
NH – Hillsborough County	CO (1971 standard)	Maintenance	100
NH – Central New Hampshire	SO_2 (2010 standard)	Nonattainment	100
NH – Boston-Manchester-Portsmouth	O_3 (1997 standard)	Maintenance	100 (NO_x and VOC)

The ambient air quality in the project area is monitored at a number of permanent air quality monitoring stations operated by USEPA, Massachusetts Department of Environmental Protection (MassDEP), and New Hampshire Department of Environmental Serves (NHDES). The monitoring stations within Massachusetts that are closest to the project area are in Chelmsford, Lawrence, and Boston (Charlestown, North End, Kenmore Square, and Roxbury). In New Hampshire, the monitoring stations nearest to the Study area are in Nashua (Gilson Road and Crown Street), Concord, Peterborough, and Manchester. For each pollutant, the maximum concentration from these stations was selected as a conservative background. These numbers can be found in the Air Quality Technical Memorandum in Appendix A.

Hazardous Air Pollutant Emissions: The federal CAA Amendments of 1990 listed 188 Hazardous Air Pollutants (HAPs) and addressed the need to control toxic emissions from transportation. USEPA's 2007 MSAT rule identified a subset of seven HAPs as having significant contributions from mobile sources: benzene, 1,3-butadiene, formaldehyde, acrolein, naphthalene, polycyclic organic matter (POM), and diesel particulate matter (DPM).

Greenhouse Gas Emissions: Climate change and GHG emission reductions are a concern at the federal level. Laws and regulations, as well as plans and policies, address global climate change issues. This section summarizes key federal regulations relevant to the project.

In Massachusetts v. U.S. Environmental Protection Agency, et al., 549 U.S. 497 (2007), the United States Supreme Court ruled that GHG does fit within the CAA definition of a pollutant and that USEPA has the authority to regulate GHG.

On February 18, 2010, the White House Council on Environmental Quality (CEQ) released draft guidance regarding the consideration of GHG in NEPA documents for federal actions. The draft guidelines include a presumptive threshold of 25,000 metric tons of carbon dioxide equivalent (CO_2e)[9] emissions from a proposed action to trigger a quantitative analysis. CEQ has not established when GHG emissions are significant for NEPA purposes (CEQ 2010); therefore, there is no standard for GHG emissions to compare for this project.

4.1.2 Manchester Regional Commuter Rail Alternative

The mobile source dispersion models and hotspot analyses are not required for this project, as the results of the local scale emissions for the project are below the federal general conformity *de minimis* levels for all applicable criteria pollutants in every nonattainment or maintenance area in New Hampshire and Massachusetts. Therefore, the local air quality impact is not significant due to the project operation.

For the regional context, the emission increases presented in Table 4.2 show the Manchester Regional Commuter Rail Alternative would not only be below the federal general conformity *de minimis* levels, but would also even create net emission reduction benefits by saving vehicle trips for some pollutants (CO and SO_2). Therefore, the project is presumed to conform to the applicable SIPs and would not require a full conformity analysis and conformity determination. The detailed analysis can be found in the Air Quality Technical Memorandum in Appendix A.

Table 4.2: Air Quality Impact for Manchester Regional Commuter Rail Alternative – Criteria Pollutants

Emissions Increases (ton/year)	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
Personal Vehicles	-47.65281	-3.12784	-0.15408	-0.13639	-0.05561	-1.12602
BX Buses	-6.20233	-202.09959	-9.22918	-8.49050	-0.38755	-12.51834
Locomotive	5.89738	39.62302	1.47434	1.43011	0.02080	2.32873
Net Emissions Increases	-47.95776	-165.60441	-7.90892	-7.19678	-0.42237	-11.31563
Applicable General Conformity Emission de minimis level (to each nonattainment or maintenance area)	100	100	NA	NA	100	100
Exceed de minimis level?	No	No	NA	NA	No	No

Note: NA = Not Applicable

The estimated annual operational emissions increases in MSAT (HAPs) and GHG emissions associated with the Manchester Regional Commuter Rail Alternative are presented in Table 4.3 and Table 4.4, respectively. The Manchester Regional Commuter Rail Alternative is expected to create less emissions in

[9] A universal unit of measurement that allows the global warming potential of different GHGs to be compared

GHG through the saving of vehicle trips and, therefore, it would have less environmental and global climate change impact and be more beneficial to the environment.

The New Hampshire 10-year State Energy Strategy from the New Hampshire Office of Energy and Planning Department in September 2014 also supported rail service as one of the major energy-saving strategies for the state. It recommended the State of New Hampshire should continue supporting efforts to maintain and to expand rail service.

Table 4.3: Air Quality Impact for Manchester Regional Commuter Rail Alternative – Hazardous Air Pollutants

Emissions Increases (ton/year)	1,3-Butadiene	Acrolein	Formaldehyde	Benzene	Naphthalene	POM	DPM	Lead
Net Emissions Increases	-0.79326	-0.0773	-1.74318	-4.6265	-0.30853	NA	-7.2	-0.0003

Note: NA = Not Applicable

Table 4.4: Air Quality Impact for Manchester Regional Commuter Rail Alternative – Greenhouse Gases

Emissions Increases (metric ton/year)	Greenhouse Gases in CO_2e
Personal Vehicles	-1,140.13
BX Buses	-73,667.47
Locomotive	2,263.13
Net Emissions Increases	-72,544.48

Since global climate change is caused cumulatively by world-wide activity, the impact of a specific program on climate change cannot be determined. Therefore, the approach applied here for evaluating the potential impact of the project is to identify the project's potential GHG emissions, and to evaluate whether it incorporates cost-effective energy efficiency and renewable energy measures into its design, construction, and operation to the maximum extent practicable, consistent with social, economic, and other essential considerations. By doing so, the project would demonstrate consistency with state and local policies.

The details of design, construction, and operation are not yet fully available. Therefore, this section identifies potential measures for inclusion, which would reduce the project's energy and GHG footprint if implemented. These measures will be further investigated, and if found to be practicable, incorporated in the project's design and operation.

Operational

Shift Locomotives Engines to Higher Tier 1s or to Change the Fuel to Biodiesel Fuel: Options to use biodiesel for the locomotives could be investigated, including blends of B20 and B100 (20 percent biodiesel with 80 percent standard diesel, or pure biodiesel). B20 can be used with current technology while B100 may require some adjustments or new engines. The use of B20 would reduce GHG emissions by 10 percent, and B100 would reduce GHG emissions by 70 percent, reducing operational emissions by 2,300 to 3,000 metric tons CO_2e annually (varies by alternative).

Electrification: The benefits of shifting rail operations along the entire line to electricity have not been quantified at this time. Benefits would increase over the years as the New Hampshire grid shifts to increasingly higher fractions of renewable power sources (the New Hampshire grid currently includes relatively large fractions of nuclear and hydro power, which result in very little GHG emissions). It is noted that the cost of electrification is not included in the Manchester Regional Commuter Rail Alternative.

Sustainable Station Design and Construction: Although station energy use was not included in this analysis, new stations could be designed in accordance with the new requirements from the state.

Construction

Use of Local, Renewable, Recycled Materials: 75 percent of the construction emissions were estimated to come from the extraction, production, transport, and disposal of construction materials. Although precise details are not known at this time, the reduction in these emissions can be substantial if local, renewable, and recycled materials are used. The largest contributors are cement and steel. If emissions associated with material can be cut in half (existing strategies demonstrate that this is possible), the emissions payback period could be reduced by nearly 40 percent.

Biodiesel for Construction Engines: Biodiesel blends would be used in construction engines to the extent practicable.

Replanting Trees: Although not quantified in this analysis, any trees that need to be removed for construction could be replaced with a larger number of trees, replacing the trees in kind or more on a tree-mass basis.

Future Analysis: If the Manchester Regional Commuter Rail Alternative progresses, additional analysis would include the potential air quality implications of local traffic to and from stations, locomotives, and other sources operating in rail yards and other locations. Potential construction impacts would also be analyzed. If the project is not included in the SIP, an applicability analysis would be performed to determine if a general conformity analysis is required. In addition, because line-haul operations change substantially, micro-scale, line-haul, and meso-scale emissions likely would be investigated. All the emission estimations for criteria pollutants, HAPs, and GHG would need to be refined. The detailed GHG reduction measures may be reviewed and evaluated for applicability and practicability, and incorporated into the project as appropriate. In addition, beneficial measures would be quantified, if practicable. If substantial changes in design occur, the overall GHG emissions analysis would be reevaluated as well, and further refined if possible.

4.2 Noise and Vibration

The noise and vibration limits chosen for the analysis satisfy the federal guidelines of the FTA for train and rail facility operations.[10] The noise-sensitive receptors for the analysis include relevant receptors that are defined by FTA criteria. The number of receptors potentially impacted have been determined using FTA's general assessment guidelines, including comparing existing with future noise levels and rating impacts. The vibration impact assessment uses the FTA general assessment procedure of determining if absolute vibration limits will exceed specified thresholds at vibration-sensitive receptors. Additional detail can be found in the Noise and Vibration Technical Memorandum in Appendix B.

4.2.1 Affected Environment

The region for this analysis includes areas and communities within Middlesex County in Massachusetts and Hillsborough County in New Hampshire. These areas are mixed in terms of rural, residential, commercial, and industrial with isolated residential clusters considered to be suburban in nature, except for the downtown urban areas of Lowell, Nashua, and Manchester.

In general, freight trains without horns would generate 67 decibels (dBA) day-night average noise levels (L_{dn}) at 50 feet from the rail tracks. The noise level would drop off at a rate of 4.5 dBA per doubling of distance, per the FTA Guidance Manual. The warning horn noise level would be 74 dBA L_{dn} at 50 feet from the rail centerline within one-fourth mile of each grade crossing.

Warning horns would be the dominant noise sources when receptors are near grade crossings. When receptors are not near grade crossings, the dominant noise sources would be passing freight trains, passenger trains, or vehicular traffic.

4.2.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative was analyzed for impacts to noise and vibration related to operations, stations, traffic, and construction.

Operations Noise Impacts: The Manchester Regional Commuter Rail Alternative would have predicted unmitigated noise impacts due exclusively to the added warning horns. Table 4.5 provides a summary of the unmitigated noise impact results. Hillsborough County, New Hampshire has the most parcels with severe noise impacts with 468 single-family residential units and 57 multi-family residential units impacted. Installation of stationary wayside horns at the grade crossings where severe, unmitigated noise impacts exist for the Manchester Regional Commuter Rail Alternative would mitigate noise and result in no adverse noise impact on the surrounding communities.

[10] *FTA. Transit Noise and Vibration Impact Assessment*. USDOT Report Number FTA-VA-90-1003-06, May 2006

Table 4.5: Summary of Unmitigated Noise Impact Results

County	Number of Severe Impact Parcels				Number of Moderate Impact Parcels			
	Residential Single-Family	Residential Multi-Family	Institutional	Recreational	Residential Single-Family	Residential Multi-Family	Institutional	Recreational
Middlesex (MA)	53	50	1	1	85	63	0	3
Hillsborough (NH)	468	57	0	0	273	25	2	2
Merrimack (NH)	0	0	0	0	0	0	0	0

Source: URS Corporation, 2014

Operations Vibrations Impacts: Due to the distance between the rail activities and the closest vibration-sensitive locations, no vibration-related impacts are anticipated with the Manchester Regional Commuter Rail Alternative. None of the residential buildings in the Study area would experience levels exceeding the FTA limits of 80 Vibration Velocity Level (VdB) for ground borne vibration and 43 dBA for ground borne noise. Likewise, no institutional buildings in the Study area would experience levels exceeding the FTA limits of 83 VdB and 48 dBA.

Station Noise Impacts: The dominant noise source near each station would be the warning horn. When a train slows down near a station, train pass-by noise would be reduced. However, the warning horn would be used when a train approaches each station regardless of the train speed. There are no noise- or vibration-sensitive parcels within 500 feet of any of the proposed station sites to be impacted by the station noise, including horn soundings. Therefore, station noise is considered negligible and not included in the impact calculation.

Traffic Noise Impacts: While traffic conditions would change for the roadways around the proposed stations, there are no new major roadways or roadway expansions anticipated for the Manchester Regional Commuter Rail Alternative. Because the proposed stations are located in the developed areas of Nashua, Bedford, and Manchester the existing traffic volumes around the station sites are already high. Traffic noise produced by the Manchester Regional Commuter Rail Alternative is not anticipated to cause significant impacts due to the already existing high-ambient noise environment and lack of sensitive receptors in the impact range of the Manchester Regional Commuter Rail Alternative.

Construction Noise Impacts: Only four potential daytime impacts and up to 309 potential nighttime impacts have been identified as a result of the analysis. However, any such impact would be addressed through committed mitigation measures. Because the construction noise mitigation measures would be followed during construction, no noise impacts would result from the implementation of the Manchester Regional Commuter Rail Alternative. Table 4.6 provides a summary of the unmitigated construction noise impact results.

Table 4.6: Summary of Unmitigated Construction Noise Impact Results

County	Potential Daytime Impacts				Potential Nighttime Impacts			
	Residential Single-Family	Residential Multi-Family	Institutional	Recreational	Residential Single-Family	Residential Multi-Family	Institutional	Recreational
Middlesex (MA)	0	1	0	0	27	43	2	2
Hillsborough (NH)	3	0	0	0	205	29	0	1
Merrimack (NH)	0	0	0	0	11	2	1	1

Source: URS Corporation, 2014

Construction Vibration Impacts: The Manchester Regional Commuter Rail Alternative is not expected to result in impacts exceeding FTA limits for residential buildings or for institutional buildings in the Study area. There are no significant vibration impacts expected from construction of the Manchester Regional Commuter Rail Alternative. Some equipment may cause perceptible ground-borne vibrations. For example, construction equipment can produce vibration levels at 25 feet that range from 58 VdB for a small bulldozer to 112 VdB for heavier equipment. Any potential impacts will be mitigated during construction.

4.3 Hazardous Waste Sites

The NHDES OneStop Geographic Information System (GIS) website was used to identify contaminated sites within the 1,000-foot search distance. The website includes NHDES project sites with administrative tracking records, such as underground storage tanks (USTs) and hazardous waste generators, as well as contaminated sites with documented discharges or suspected discharges of petroleum or hazardous materials. In reviewing the corridor through the OneStop GIS website, three basic assumptions were applied: 1) the Merrimack River is considered to be a contaminant migration barrier; soil and groundwater contamination are assumed to not cross the river, 2) groundwater flow within 1,000 feet of the Merrimack River is generally toward the river, and 3) sites with a status of Closed or Inactive are assumed, in the absence of other mitigating factors or information, to be in compliance with state and federal requirements with respect to soil and groundwater.

A database report was commissioned from Environmental Data Resources, Inc. (EDR) for each of the properties proposed for construction of new facilities (Target Properties). The EDR report includes a summary of environmentally-related sites identified in state and federal environmental databases (database sites). These sources include databases that track controlled facilities and/or activities, e.g., hazardous waste generators and regulated USTs with no identified violations, as well as sites with known contamination such as discharges of petroleum and/or hazardous waste, remediation activities, institutional controls as the result of discharges, and ongoing environmental monitoring due to discharges. The search radius of the database report for each Target Property conforms to American

Society for Testing Materials (ASTM) 1527-13, Section 8.2.1, and is based on the approximate property or construction boundaries.

Additional details are in the Contamination Inventory Memorandum in Appendix C.

4.3.1 Affected Environment

Along the existing railroad track bed, there is a high probability of the presence of contaminated soils or debris. Contaminants commonly found associated with railroad corridors include railroad ties (wood treating chemicals), spilled or leaked fluids (oil, cleaning solvents), herbicides, transformer fluids [Polychlorinated biphenyl (PCBs)], fossil fuel combustion products [Polycyclic aromatic hydrocarbons (PAHs)], asbestos, and metals such as arsenic and mercury. Also, existing steel bridge overpasses along the corridor were likely painted with lead-based paint prior to 1970, which may or may not have been removed or sealed.

Full Corridor: Of the contaminated sites within 1,000 feet of the corridor, 81 were identified as having the potential to impact the corridor.

Manchester – Granite Street: The EDR database report did not identify the Target Property as a contaminated site. The property is depicted on historical Sanborn maps dated 1885 and 1891 as rail tracks and a freight depot. An 1897 map depicts tracks only. The 1915 through 1954 maps depict rail tracks and a rail station and associated facilities. The 1971 and 1983 maps depict rail tracks and parking; the 1985 and 1989 maps depict rail tracks and a commercial building on the southern portion and parking. The building is currently occupied by Hampshire First Bank with an address of 80 Canal Street.

Bedford/Manchester Airport: The EDR database report did not identify the Target Property as a contaminated site. The Target Property is not depicted on historical Sanborn fire insurance maps. Historical aerial photographs appear to depict the Target Property as undeveloped from 1947 through 1998. No contaminated sites requiring further review were identified.

Nashua – Crown Street: The Target Property and vicinity has been developed for industrial use since prior to circa 1885, as documented by historical Sanborn fire insurance maps. Documented property usage nearby has included machine shops, a steam boiler works, and rail. The OneStop database indicates that the site is a Leaking Underground Storage Tank (LUST), Unsolicited Site Assessment, and Brownfields site. A Phase I/II report has been completed for the property on behalf of the City of Nashua.

South Nashua: The Target Property (Pheasant Lane Mall) is not depicted on historical Sanborn fire insurance maps. Aerial photographs show undeveloped agricultural land until 1985. Three spill response and two LUST projects are associated with the site; all five projects have a status of Closed. These projects are not directly associated with the portion of the property proposed for construction. The Closed status indicates that appropriate investigations and/or remedial actions have been completed and no further risk to human health and the environment is anticipated relative to the issue identified. These NHDES projects are unlikely to require additional management during construction in the defined area.

4.3.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative may have short-term adverse impacts during construction of the rail and station sites due to the potential for movement of contaminated soils or material. The Manchester Regional Commuter Rail Alternative would also likely have a long-term beneficial impact on the corridor as construction activities would provide final solutions for some contaminated sites, lowering potential exposure in the future.

Phase I ESAs should be completed for each property that would be acquired in order to be eligible for LLPs. If Recognized Environmental Conditions (RECs) are identified during the Phase I ESA process, the RECs should be addressed through clean-up or further investigation through a Phase II assessment. Based on the development histories of the properties and surrounding areas, it is advisable that the Nashua (Crown Street and South Nashua) and Manchester (Granite Street) properties be assessed for the presence of petroleum or hazardous substances that might require management or disposal, regardless of the findings of a Phase I ESA. Given the history and settings of these properties, assessment of subsurface conditions for the presence of VOCs, PAHs, PCBs, and Resource Conservation and Recovery Act (RCRA) 8 metals in soils is advisable. Assessment for asbestos should be considered for the Nashua – Crown Street property.

4.4 Water Quality

Surface water quality is regulated statewide by the NHDES under rules found at Env-Wq 1700, in Massachusetts, under regulations 314 CMR 4.00 and nationally by the USEPA under the Clean Water Act (CWA). Surface water bodies were identified using available mapping, such as National Wetland Inventory Maps, the New Hampshire Wetlands Base Map, Massachusetts Geographic Information System (MassGIS), U.S. Geologic Survey (USGS) topographic maps, and aerial photographs. Additional detail can be found in the Natural Resources Technical Report in Appendix D.

4.4.1 Affected Environment

The dominant surface water feature within the project corridor is the Merrimack River, which flows from north to south through the entire corridor from Manchester to Nashua to Lowell. The existing rail line parallels the Merrimack River crossing it once from the City of Manchester to the Town of Bedford. Based upon a review of USGS topographic maps and the NHDES Watershed Report Cards, the existing rail corridor crosses 13 other rivers or streams between the Massachusetts border and the end of the corridor in Manchester. Two crossings (Baker Brook and Spit Brook) occur in urban areas of Manchester and Nashua, respectively, and flow through culverts instead of natural channels. In addition, numerous wetlands are also located within 100 feet of the existing rail line.

The Capitol Corridor is not located near any Outstanding Resource Waters, as designated by the Massachusetts Surface Water Quality Standards (314 CMR 4.00) and NHDES Regulation Env-Wq 1708.05.

4.4.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative would not adversely impact water quality within the corridor as it is an existing rail line and improvements to drainage and stormwater management would be part of the project. The upgrade to culverts and associated stormwater BMPs along the entire length of the corridor, as well as at potential station locations, would have a net beneficial impact to water quality. The site design for each station, where new parking is being proposed, would be designed to meet applicable state stormwater standards and guidelines for the areas they are proposed. In addition, the existing corridor currently supports freight rail traffic, which does not contribute to the impairments of the Total Maximum Daily Loads (TMDLs) that have been developed for the impaired water bodies in the corridor. It is not anticipated, based on the operating characteristics of the passenger rail that the four round trips per day would contribute to the existing impairments in the corridor.

There would be, however, negligible to minor, short-term, localized impacts during construction activities in the corridor. The relatively short and temporary duration of these activities, combined with appropriate sediment containment and construction BMPs, would ensure that any impacts are minor to negligible.

4.5 Wetlands

Wetlands are federally protected under the CWA and activities resulting in impacts to them require a permit from the U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA. Wetlands are also protected under State of New Hampshire statutes, with permits obtained through the NHDES Wetlands Bureau. Wetlands are also regulated at the state level by the Massachusetts Wetlands Protection Act (WPA), which is administered by the municipal conservation commissions, with overview by the MassDEP.

Wetlands along the project corridor were not field-delineated, but were identified using available mapping, including National Wetland Inventory Maps, the New Hampshire Wetlands Base Map, MassGIS, USGS topographic maps, and aerial photographs. Field reviews of the proposed station and layover facilities were conducted in order to obtain more accurate information on wetland resources. Approximate wetland boundaries within and adjacent to the proposed facilities were mapped using Global Positioning System (GPS), but wetland delineation flags were not placed in the field and surveyed. Additional detail can be found in the Natural Resources Technical Report in Appendix D.

To more accurately evaluate wetland impacts and to apply for ACOE and NHDES permits, a formal wetland delineation within the entire project corridor and the station and layover facilities will need to be conducted during the project's preliminary design phase.

4.5.1 Affected Environment

Wetland resources within the project corridor include palustrine and riverine systems that feed into the Merrimack River. Since the proposed rail corridor follows an existing railroad embankment, wetland, and stream crossings have bridges or culverts. As a result, the wetland systems that are crossed by the rail embankment have already been impacted by the placement of fill and culverts. Table 4.7 provides a summary of the large wetland systems that are located along the project corridor.

Prime wetlands within the project corridor are located in the municipalities of Hooksett and Nashua. Prime wetlands are identified in Table 4.7 (Large Wetland Systems). Within the City of Nashua, the Merrimack River, the Nashua River, and Salmon Brook are also considered prime wetlands. None of the prime wetlands within the Study corridor have a 100-foot buffer zone.

Table 4.7: Major New Hampshire Wetlands in Corridor

Town	Federal Classification	Prime Wetlands	Description
Merrimack	L1UBH, PSS1E, PSS1C	No	Horseshoe Pond and associated wetlands; also includes Naticook Brook
Merrimack	PFO1E, PFO4E, PEM1Eb	No	Located near Mast Road, between Route 3 and Merrimack River
Nashua	R5UBHx, PUB/SS1Fh, PFO1E	Yes	Wetland system associated with Salmon Brook

In Massachusetts, corridor wetland and water resources include the following:

- Unnamed tributary to the Merrimack River and adjacent wetlands: Located north of Parlee Farms in Tyngsborough
- Bridge Meadow Brook: Located north of the Route 3A bridge over the Merrimack River in Tyngsborough
- Unnamed tributary to the Merrimack River (flows from Uptons Pond):Llocated in Tyngsborough near intersection of Route 3A and Westford Road
- Deep Brook and adjacent wetlands: Located in Chelmsford near Wotton Street
- Stony Brook and adjacent wetlands: Located in Chelmsford near Church Street
- Black Brook: Located in Lowell near the intersection of Middlesex Street and Pawtucket Street and appears to be piped under the Study corridor and the surrounding urban area
- Pawtucket Canal: Located in Lowell and is crossed twice by the project corridor
- River Meadow Brook: Located in Lowell near the Lowell Connector and the southern end of the Study corridor

4.5.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative would have no impact in most areas of the corridor and minor temporary and permanent impacts to jurisdictional wetland resource areas in a few discrete areas of the corridor. Minor temporary impacts may occur during construction activities, such as replacing or rehabilitating bridges or culverts, relocating utilities for track work, and grading work associated with station construction. These impacts would be mitigated during design and restored after construction has been completed. Minor permanent impacts may occur during these same activities in cases where temporary impacts cannot be restored in-place. In these cases, compensatory mitigation would be identified at the appropriate ratio for replication. As more detail is developed in the next phase of the project, these impacts will be defined in greater detail. Any wetland impacts would be subject to state and federal permitting requirements.

The following station sites are located in previously developed areas and no wetlands or watercourses are located within or adjacent to the site: Manchester – Granite Street, Nashua – Crown Street, and South Nashua; the Bedford/Manchester Airport station has several wetlands and watercourses located at the site; north of Ray Wieczorek Drive, the majority of the site is forested wetland; south of Ray Wieczorek Drive, there are two small forested wetlands and one emergent/scrub-shrub wetland. These three wetlands drain to Sebbins Brook, which flows into the Merrimack River. As currently designed, this station would impact less than 1,000 square feet of wetland at this site.

4.6 Threatened and Endangered Species

Endangered species are provided protection on both federal and state levels. The Federal Endangered Species Act of 1973 (16 USC 1531-1543, Sec. 2A) is the federal legislation that provides protection, while the State of New Hampshire protects species through the Native Plant Protection Act of 1987 and the New Hampshire Endangered Species Conservation Act of 1979. The State of Massachusetts protects species through the Massachusetts Endangered Species Act (M.G.L. c.131A). The Massachusetts Natural Heritage and Endangered Species Program (NHESP) is the state agency responsible for the protection of plant and animal species that are listed as threatened, endangered, and of special concern in Massachusetts.

Information on important wildlife habitat and recorded occurrences of rare, threatened, and endangered species was obtained from the New Hampshire Natural Heritage Bureau (NHB), the Massachusetts NHESP and MassGIS website. Additional detail can be found in the Natural Resources Technical Report in Appendix D.

4.6.1 Affected Environment

NHB identified the following species of concern in the project corridor: bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), eastern hognose snake (*Heterodon platirhinos*), New England cottontail (*Sylvilagus transitionalis*), and grasshopper sparrow (*Ammodramus savannarum*). NHESP identified three species of concern within the project corridor, including bald eagle, riverine clubtail (*Stylurus amnicola*), and cobra clubtail (*Gomphus vastus*). A full listing of threatened and endangered species can be found in the *Natural Resources Technical Report* in Appendix D.

NHB also listed exemplary natural communities in the corridor, including Acidic Riverside Seep, Dry Appalachian Oak Forest, Pitch Pine – Scrub Oak Woodland, Semi-Rich Oak – Sugar Maple Forest, and Sugar Maple – Silver Maple – White Ash Floodplain Forest.

4.6.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative would not adversely impact federal and state regulated wildlife habitats. At this level of the Study, neither state agency has ruled on whether the project would qualify as a “take” under the regulations (this will be confirmed during the next NEPA documentation); however, based on preliminary conversations over design aspects of the project, it is not anticipated that the Manchester Regional Commuter Rail Alternative would adversely impact threatened or endangered species. The major concern is over destruction of habitat, and as currently designed, the project would require limited vegetation removal as stations are located in previously developed areas, and the existing rail right-of-way has been maintained to control vegetation in the past.

More details on the existing rail line, the proposed improvements, and vegetation clearing will need to be provided to New Hampshire Fish and Game, NHB, and NHESP as the project design progresses. The project will need to be reviewed under the Massachusetts Endangered Species Act (MESA) and an application will need to be filed with NHESP. It is recommended that continued coordination with these agencies occur during the design phases of the project to obtain feedback and to determine the need for any field surveys.

4.7 Floodplains

The Digital Flood Insurance Rate Maps (DFIRMs) available on the New Hampshire Geographically Referenced Analysis and Information Transfer System (NH GRANIT) GIS website and MassGIS website were reviewed to determine the locations of flood hazard areas within the project corridor. Since the rail corridor is located along the Merrimack River, a large portion of the project is located within or adjacent to areas that are mapped as 100-year floodplains. Additional detail can be found in the Natural Resources Technical Report in Appendix D.

4.7.1 Affected Environment

Most of the proposed station and layover facility sites in New Hampshire are located within or adjacent to floodplain areas. These areas are generally mapped as either “Zone AE” (100-year floodplain or 1 percent annual chance of flood) or “0.2 percent annual chance of flood hazard” (500-year floodplain). Portions of the downtown Nashua site are mapped as “Zone X, Protected by Levee.”

The Study corridor crosses through the 100-year floodplain (Zones A and AE) in several locations in Massachusetts. These floodplains are associated with the Merrimack River and its larger tributaries (Deep Brook, Stony Brook, Pawtucket Canal, and River Meadow Brook). The largest Zone A floodplain area is located in Chelmsford, where approximately one mile of proposed new rail (double-track on the existing embankment) is located within an area mapped as Zone A floodplain.

4.7.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative would have minor to negligible impacts to floodplains in the project corridor. As the existing rail right-of-way runs adjacent to the Merrimack River and in many cases is less than 250 feet from the river bank, impacts to floodplains would be unavoidable in certain discrete sections of the corridor. However, within the existing right-of-way, the project corridor historically carried two tracks along its entire length, and the Manchester Regional Commuter Rail Alternative calls for restoring that second track on the existing embankment in certain locations. To the extent practicable, the Study team has located station elements outside of floodplains. In locations where floodplain elevations would be altered, the project would provide compensatory floodplain storage. Through mitigation, adverse impacts to floodplains would be kept to a minimum.

4.8 Energy Resources

Energy resources are measured over time and related to energy consumption and GHG emissions from the construction and the operation of the project (see Section 4.1 Air Quality and Greenhouse Gas Emissions). New Hampshire's transportation sector accounted for 35 percent of New Hampshire's energy consumption in 2011[11] and ranked 41st nationally in VMT with over 12,894 million miles (2012)[12]. This project would help reduce the state's VMT and overall energy consumption by offering a new passenger rail service and reducing the number of vehicles on the state's roadways.

4.8.1 Affected Environment

The project would impact energy sources during the construction of the project and during operation of the new passenger rail service. Energy resources would be required to build the station facilities, operate the trains and other project facilities. The operation of the service would also require energy.

4.8.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative would introduce passenger rail operations, which currently do not exist in the corridor. This service is expected to divert trips from vehicles to passenger rail, reducing the overall VMT and GHG emissions. However, the Manchester Regional Commuter Rail Alternative could potentially have a minor adverse impact on traffic operations around certain station locations. As described in the Air Quality Section (Section 4.1), emission increases related to traffic for the Manchester Regional Commuter Rail Alternative are below the minimum threshold for a conformity determination. The Manchester Regional Commuter Rail Alternative would create a net emission reduction benefit from the saving of vehicle trips for some pollutants (CO and SO_2).

During construction, the project would consume energy through the processing of materials and construction activities. All impacts, during construction will be addressed in the next level of analysis.

4.9 Visual Resources

Visual resources in the Study corridor were analyzed as part of the historic architecture work that was developed for the project. A field survey conducted in the corridor was supplemented with map research and historic documentation. In addition to historic buildings and districts identified for this area, other items identified included significant features, parks, and significant natural resources.

[11] U.S. Energy Information Administration. www.eia.gov/state/?sid=NH
[12] U.S. Energy Information Administration. http://www.eia.gov/state/print.cfm?sid=NH

4.9.1 Affected Environment

The most significant natural resource in the corridor is the Merrimack River, which runs adjacent to the rail right-of-way for its entire length, and in some cases is less than 250 feet away. In addition to the river, there is one wetland system that is classified as "prime" wetlands in Nashua. The rail right-of-way also abuts several parks/recreation areas along the route.

As documented in greater detail in the Cultural Resources Section 4.15, there are a number of aboveground historic properties and historic districts that are adjacent to the rail right-of-way. In addition to historic build resources, the corridor is highly developed, urban landscape in Lowell, Nashua, and Manchester and a less developed, rural landscape in the those towns between the major urban areas. Generally, the significant natural resources are located outside of the urban areas, and the historic built resources are located within the urban areas.

4.9.2 Manchester Regional Commuter Rail Alternative

For work associated with the rail line, including infrastructure associated with upgrading the existing rail and adding double-track, the Manchester Regional Commuter Rail Alternative would have no impact on visual resources as the rail right-of-way historically accommodated double-tracking throughout the length of the corridor. For the work associated with the stations and layover facility, the Manchester Regional Commuter Rail Alternative would have negligible impacts to visual resources as the stations would be built in underutilized, previously developed land and none of the new stations would be built in an existing historic district. In addition, the stations would consist of mini-high platforms, which do not require building large pedestrian crossovers at each station.

4.10 Accessibility

The Americans with Disabilities Act (ADA) of 1990 requires that persons with disabilities be accommodated for all public facilities including transportation. All stations and transportation facilities must meet the ADA design standards and applicable state and local codes.

4.10.1 Affected Environment

The accessibility evaluation focused on how the alternatives impacted accessibility for patrons with disabilities. The Manchester Regional Commuter Rail Alternative would make four stops in New Hampshire (Manchester, Bedford, and Nashua [Crown Street and South Nashua]), in addition to three existing Massachusetts commuter rail stops (Lowell, Woburn, and Boston) in Massachusetts. The four new stations would provide a mix of high-level platforms and low-level platforms with "mini-high" platforms based on MBTA design standards for handicapped accessibility. High-level platforms would be preferred at all locations.

4.10.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative would have a beneficial impact on accessibility as it would meet all ADA design standards and applicable state and local codes. The station design would include level boarding between the platform and train. Ramps would be included from the parking lots to the raised station platforms. The proposed park-and-ride lots would provide handicap accessible parking spaces. All station facilities would be ADA accessible.

4.11 Property Acquisition

Property acquisition requirements were determined based on the selection of station locations in the corridor and through research of assessor's databases in the affected towns. The existing rail right-of-way is of sufficient width to accommodate the proposed track work for the project. The focus of this section is on station development.

4.11.1 Affected Environment

Four station locations were developed through research on previous planning studies in the corridor, workshops with local stakeholders in each of the communities, and the Study Team's professional judgment. In Manchester, the station location would require coordination with the City of Manchester, as the proposed platform and parking is located at an existing municipally-owned parking lot. At Manchester Airport, the majority of land in the vicinity of this location has been previously acquired by the state during the construction of the Ray Wieczorek Drive Bridge. There is one parcel still in private ownership that is leased to a natural gas company, which would be impacted by the project. In Nashua, the Crown Street station location would require coordination with the City of Nashua, as the parcel for the platform and parking is located on a municipally-owned lot. For South Nashua (either Spit Brook or Pheasant Lane Mall) private property would be impacted.

4.11.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative would have minor impacts on privately-held property in the corridor, as the station development would only require acquisition of two privately-held parcels. The remaining land for development is owned by the state or by the municipality. These properties are generally underdeveloped/underutilized and would see substantial benefit with the development of stations at these locations (see Section 4.17 Socioeconomics). The one parcel with the most impact is located at the Manchester Airport site, as it is currently developed and utilized as a natural gas storage location.

4.12 Land Use

The land use and zoning evaluation focused on whether the proposed stations would support transit, mixed use development, and park-and-ride lots. Data was gathered through field visits and focus groups in Manchester and Nashua (additional information in Appendix H, Public Involvement). The purpose of the focus groups was to hear participants' perceptions of TOD, impacts of the proposed project and preferences for implementation. The project established a set of sustainable land use goals that are supported by the purpose and need:

- Environmental Goals:
  - Catalyze more compact, infill rail-supportive land use and development patterns, thereby reducing the need for additional infrastructure (sewer, water, power) to support new development, and supporting maintenance of existing open/rural space
  - Reduces reliance on cars for trips/errands
- Social Goals:
  - Expand mobility and transportation choice for all age cohorts
  - Support low-income households through increased access to jobs
- Economic Goals:
  - Attract employers to New Hampshire
  - Attract and retain regional employers to New Hampshire and Boston
  - Provide improved residency location choice in New Hampshire for commuters to Boston or regional jobs

4.12.1 Affected Environment

The Study team evaluated each proposed station through a qualitative rating system based on five criteria as defined by the FTA for TOD: economic climate for development, capacity of land in station areas, existing plans and policies, urban design and connectivity, and TOD potential. The first four criteria consider attributes of the proposed station areas, defined as half-mile radius around potential rail stations; the fifth criterion evaluates TOD potential based on the mode and service characteristics of the various alternatives.

Manchester – Granite Street: Manchester downtown north of Granite Street has a high economic climate for development as well as appropriate urban design and connectivity. There are plans and policies in-place that support TOD. This area has a limited amount of developable land surrounding the station area. South of Granite Street the economic climate for development is not as high as north of Granite Street. There is more land available around the stations and there are plans and policies in-place that support TOD. The urban design and connectivity is suitable for TOD.

Bedford/Manchester Airport: The Bedford/Manchester Airport station has less of an economic climate for development. It has a very limited amount of developable land surrounding the station and there are no plans and policies in-place that support TOD. There is also little pedestrian-scale urban design and connectivity in the vicinity of the station.

Nashua – Crown Street: Nashua Crown Street Station has some economic climate for development. There is a fair amount of capacity of land around the station areas. Some plans and policies are in-place that support TOD. The urban design of the areas surrounding the station is not as walkable as some of the other stations.

South Nashua: The proposed station location, local real estate conditions, accessibility and urban design, and service schedule suggest some positive potential for TOD.

4.12.2 Manchester Regional Commuter Rail Alternative

Based on a qualitative assessment, it is anticipated that the Manchester Regional Commuter Rail Alternative would have moderate impact on the sustainable land use goals identified for this project. The Manchester Regional Commuter Rail Alternative would have a low-to-medium impact on catalyzing more compact, infill transit-supported land use and development patterns around the stations and would reduce reliance on vehicles for trips and errands. The Manchester Regional Commuter Rail Alternative also has a low-to-medium impact on expanding mobility and transportation choices for all ages and supporting low income communities with access to jobs. The Manchester Regional Commuter Rail Alternative would have a medium impact on attracting employers to New Hampshire, retaining and attracting employers from New Hampshire to Boston, and would improve residency location choice in New Hampshire for commuters to Boston or regional jobs.

4.13 Environmental Justice

Equitable access to transit investments – and the mobility benefits that these investments provide riders – is an important consideration when assessing the transit alternative developed for the Capitol Corridor. Public transit investment supports broad improvements in mobility, but is a particularly critical tool in increasing the mobility of transit-reliant or -dependent populations, including households below the poverty line, minorities, and households in affordable housing units.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, issued in 1994, states that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

DOT Order 5610.2(a), *Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs federal agencies to address environmental and human health conditions in minority and low-income communities. EJ areas are defined as census block groups that represent neighborhoods of high-minority, low-income, non-English speaking and foreign-born populations.

4.13.1 Affected Environment

U.S. Census data was used to calculate statistics related to income, race, and housing for households and individuals in Census tracts within a half-mile of the Manchester Regional Commuter Rail Alternative. Data was collected for the States of New Hampshire and Massachusetts, and the U.S. for overall comparison. The Equity Analysis Report is found in Appendix F.

Income is an important element of the equity analysis because the costs associated with car ownership are relatively fixed, and can consume a comparatively larger percentage of lower-income household budgets. Access to transit allows households to maintain mobility and access while reducing the household expenditures on transportation, which then increases the amount of discretionary budget available to the household. Table 4.8 shows the median income of households in Census tracts within a half-mile of the Manchester Regional Commuter Rail Alternative stations, as well as the percent of the population within a half-mile whose household income falls below the federal poverty line. While median household income within the Capitol Corridor is comparatively high, median household income declines in the urban areas. The poverty levels are comparatively higher in the central areas of Manchester and Nashua. The poverty level in these downtowns ranges from five to 30 percent. Transit investments that directly serve these urban households living below the poverty line would promote equity through increased access to comparatively lower-cost transportation options.

Minority populations represent between five and 26 percent of the population in Census tracts within a half-mile of the transit stations, as shown in Table 4.8. Though this range is higher than the minority population found within New Hampshire (six percent), most station areas have a lower percent of minority population than Massachusetts (19 percent) and the U.S. (26 percent).

Manchester and Nashua each have affordable housing developments within a half-mile radius of the potential rail station locations. These affordable residences coupled with lower-cost transportation alternatives can help to reduce the share of household income spent on transportation costs.

Table 4.8: Equity Metrics in Corridor

Station Area (Half-Mile Buffer)	Proposed Rail Station	Equity Metrics			
		Average Median Income	Population Below Poverty	Minority Population	Affordable Housing Units
Manchester, NH	X	$30,300	29.5%	26.1%	675
Bedford/MHT	X	$65,500	4.5%	5.2%	0
Nashua, NH: Crown Street	X	$52,500	14.9%	12.2%	28
Nashua, NH: South Nashua	X	$76,900	4.8%	11.3%	0

4.13.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative would have a major beneficial impact for EJ populations within proximity to proposed stations in Manchester and Nashua, as the project provides increased access to transportation options within the corridor. Potentially minor adverse impacts to certain populations associated with the noise impacts of horns within certain communities. The noise impacts and mitigation are addressed under the Noise and Vibration, Section 4.2 of this report.

4.14 Public Safety

Increasing rail traffic in the corridor would increase the likelihood of conflicts between rail operations, traffic operations, and pedestrian movements. The existing safety features of the existing railroad were evaluated with the owner, PAR, and through field reconnaissance and GIS mapping. Of particular concern were interlockings, block signals, and at-grade crossing.

4.14.1 Affected Environment

The train control signal system for the route supports NORAC Rule 261 between North Station and Manchester. Rule 261 allows for bi-directional train operation with automatic wayside block signals on all main line tracks.

There are 21 locations identified between Lowell's Gallagher Terminal and Granite Street in Manchester where roadways or pedestrian paths cross the railway at grade. Grade crossings are of particular concern as they present the greatest accident hazard on the railway due to the potential for vehicle/pedestrian conflicts with trains. Grade crossings would require sensitive treatment should substantially greater volumes of trains be reintroduced along the route. Federal safety regulations require trains to sound their horns at all grade crossings. A federally sanctioned "quiet zone" may be established cooperatively with the local community working with the railroad to make substantial investments that reduce the likelihood of accidents.

The density of 21 crossings along the 30.8-mile route is relatively low for a transit system. The railroad generally follows the banks of the Merrimack River and only several of the streets are heavily travelled. Most of the grade crossings lead to relatively small riverfront residential enclaves or industrial sites. Of the 21 grade crossings, 10 are public roads, 10 are private driveways, and one is an informal community crossing.

Public grade crossings are roadways that are under the jurisdiction of and maintained by a public authority. Private grade crossings are on privately-owned roadways such as those leading into an apartment complex, housing estate or commercial/industrial development. A private crossing is not intended for public use and is not maintained by a public road authority.

4.14.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative would have a beneficial impact in the project corridor through mitigation and upgraded safety features. The existing railroad (NHML) has a fully functioning CTC signal system in-place between Lowell and Manchester that would be renewed and upgraded for the new passenger service. Existing block signals were identified by reference to PAR documentation. New and renewed interlockings were identified in the track configuration planning process. In addition, the project includes installing all new equipment for the AHWD. It is also assumed that the rail line would operate with PTC, which is in the process of being incorporated in PAR, Amtrak, and MBTA facilities around New England, and would be in-place by the time this route is operational.

4.15 Cultural Resources

A Phase IA survey was conducted for the proposed construction area of potential effect (APE) from Lowell, Massachusetts up to Manchester, New Hampshire, for the section of the corridor that would be under construction. The proposed APE was examined to establish the archeological potential of the Study corridor as well as determine the impact of the proposed construction on extant historic structures. This effort combined a review of the known prehistoric and historic sites as well as a survey of historic maps of the region from which were synthesized a determination of archeological potential. In addition, a historic architecture survey of the proposed construction APE consisted of an inventory of previously identified historic properties recorded within or adjacent to the proposed APE as well as a windshield survey of the project APE. The Cultural Resources Technical Report can be found in Appendix G. The State Historic Preservation Offices (SHPOs) of Massachusetts and New Hampshire have been coordinated with for this project.

4.15.1 Affected Environment

Historic Architecture: In New Hampshire, there is a previously identified historic property within the direct APE: the Amoskeag Millyard Historic District, as well as eight previously identified historic properties within the indirect APE. Background research and the field visit also found that there are 10 resources over 50 years of age within the direct APE that have not been previously surveyed, including the rail line itself, and a bridge that carries the rail line over the Merrimack River.

In Massachusetts, background research gathered from Massachusetts Cultural Resource Information System (MACRIS), a Massachusetts Historical Commission (MHC) visit, and other online sources determined that there are four National Register of Historic Places (NRHP)-listed resources in the APE. One of those resources, the Lowell Locks and Canals Historic District is also a National Historic Landmark (NHL). The other three are the Lowell Historic Preservation District, the Lowell National Historic Park, and Middlesex Canal Historic and Archeological District. In addition, background research and the field visit determined that there are two previously unidentified properties that may be 50 years of age or older within the direct APE. This includes the rail line itself, and one of the bridges that carries the rail line over the Pawtucket Canal.

Archeology: In New Hampshire, overall, the prehistoric potential for the Study areas remained consistently high, owing in large part to the proximity of the construction APE to the Merrimack River. The historical archeological sensitivity was also determined to be high given the density of historic settlement within the Study area. The archeological sensitivity for historic archeological resources was subdivided into site types. Analysis of these site types revealed that sites of an industrial- or transportation-related association were the most likely form of historic archeological material to be encountered. Both of these site types were frequently situated along the river and its tributaries from which they derived operational power and transportation. As the extant rail bed follows the course of the Merrimack River, the likelihood of encountering industry/transportation-related resources is therefore high. For a full listing of archeological sites and potential in New Hampshire, see Appendix G.

In Massachusetts, the Lowell Study Area contains a total of 33 identified archeological sites. Within the Lowell Study Area, 21 sites are classified as historic sites, and 12 sites are classified as prehistoric. Of the 33 previously identified archeological sites contained within the Lowell Study area, no site occurs within the extant railroad bed which forms the project APE; however, several sites do occur in close proximity namely the Railroad Site (19-MD-0570)[13] and the B&M Roundhouse Site (LOW-HA-31)[14] both of which are immediately adjacent to the current main line.

4.15.2 Manchester Regional Commuter Rail Alternative

Historic Architecture: The Manchester Regional Commuter Rail Alternative would have no impact on Historic Architectural Resources. Historically, this line contained a double-track, but sometime in the 20th century, the second track was abandoned except for the section from Lowell to Stony Brook and selected sidings north to Manchester. Since the project would be limited to the existing right-of-way and would only consist of replacing the second track in selected locations that existed historically, there is very little possibility for physical impacts and no possibility for visual impacts. As a result, no additional work is recommended.

Although no impact is projected for this resource, based on the information currently available, it is recommended that an intensive-level historic architectural survey be conducted to determine whether or not the 10 resources in the direct APE that have not previously been surveyed are eligible for listing in the NRHP.

Archeology: The Manchester Regional Commuter Rail Alternative would have minor to negligible impacts to Archeological Resources. The majority of work proposed for this project would be located in previously disturbed track bed or in highly developed areas. However, as the archeological potential of the area is generally high, precautions would be put in-place to mitigate adverse impacts to the resources.

Any activity associated with the construction effort – including but not limited to: the establishment of access roads, drainage, removal of existing railroad bed or other soil caps, or the establishment of new sections of rail bed – will all need to be monitored by a qualified archeologist or subjected to an intensive Phase 1b field survey prior to commencement of the work to ensure that there are no cultural resources present that might be adversely effected by that action. Additionally, the placement of any support/maintenance facilities or construction staging areas will require Phase 1b testing prior to their construction or usage to ensure that no cultural resources are negatively impacted.

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[13] Massachusetts site from the SHPO
[14] Massachusetts site from the SHPO

4.16 Section 4(f)

The U.S. Department of Transportation Act of 1966, Section 4(f) requires Department of Transportation agencies to avoid if feasible certain resources when implementing transportation improvements. These resources, collectively referred to as Section 4(f) resources, include publicly owned parks, recreation areas, wildlife or waterfowl refuges, or public or private historic properties of national, state, or local significance. These resources were identified using GIS mapping and field reconnaissance surveys to identify potential resources.

4.16.1 Affected Environment

There are a number of publicly-owned parks and recreation areas that are adjacent to the existing rail right-of-way, though none of them would be impacted by the project, and, as such, do not qualify as Section 4(f) resources. The work associated with the rail would take place within existing right-of-way, and the stations would be located on either private or publicly owned parcels that are not set aside as either park land or recreation land.

There are a number of NRHP-eligible resources within the corridor (see Section 4.15 Cultural Resources). Based on the level of detail included in the preliminary rail design, there is not yet enough information to determine whether any of the resources would be directly impacted by the project and therefore classified as a Section 4(f) resource. As the project design progresses, further coordination will occur with the appropriate agencies to make this determination and conduct a full Section 4(f) evaluation if necessary.

4.16.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative would have an unknown impact on Section 4(f) Resources in the corridor. As further detail is developed on the project, these impacts will be defined and evaluated as part of the NEPA process.

4.17 Socioeconomics

Economic benefits of transit investment were developed through examining the literature and findings from recent studies of similar regional transit enhancement projects. Numerous studies have identified a net positive benefit of transit investment to the regional economy, as a result of travel time savings and congestion reduction, expanded access to jobs and workforce, and new development attracted to station areas. Studies have also found a positive impact of transit on property values in station areas. While only a few studies have specifically examined commuter rail, evidence from other rail system expansions in the greater Boston region similarly suggests that transit investment would have a positive effect on the communities it serves.

Interviews were conducted with local stakeholders to gather information on the impact the different transit alternatives could have in bringing about new development over the next 20 years. The Study team also assembled data on land use and zoning to evaluate the potential impact of the Capitol

Corridor alternatives on development and redevelopment. This potential was measured in terms of commercial square footage (office and retail) and housing units for the different alternatives.

Lastly, the economic modeling tool IMPLAN was used to estimate the economic benefits to the southern New Hampshire region of each Capitol Corridor rail alternative. The following economic benefits were evaluated:

- Short-term benefits as a result of spending on construction of rail improvements in New Hampshire
- Long-term benefits as a result of the attraction of more residents and jobs to southern New Hampshire; these include benefits from construction of new real estate, as well as ongoing benefits from new worker earnings reinvested in the local economy

4.17.1 Affected Environment

There is little vacant land within the Manchester – Granite Street station area. Due to the transit supportive zoning, however, there are many underutilized parcels that could potentially redevelop in conjunction with the proposed rail service enhancements. Parcels considered likely to redevelop are predominantly located within the Central Business Performance (CBP) district with some intensification possible in the residential district. This area is also considered suitable for TOD due to its high-density residential and commercial allowances under zoning.

Given the relatively low residential and commercial densities proximate to the proposed station area for the Bedford/Manchester Airport, this site has the least amount of development potential; however, there was a general consensus among interview participants that rail connectivity to the airport was critical for regional economic development.

The predominant zoning for the Nashua – Crown Street station area is multi-family residential and general industrial. This analysis assumed development would be predominantly residential with a small amount of commercial use. A mixed-use or TOD supportive overlay in this area would boost development potential, given the amount of vacant land suitable for development.

4.17.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative would have a beneficial impact on the economics of the State of New Hampshire. This alternative, with 16 trains per day serving South Nashua, Nashua and Manchester, could potentially generate about 3,600[15] new residential units and 1,898,000 square feet of commercial space supporting 5,600 new jobs by the year 2030, as shown in Table 4.9. It has the potential to generate 230 new jobs over the construction period (2019-2022), 3,390 jobs related to new real estate development between 2021 and 2030; and 1,140 new jobs annually in 2030 and beyond (with benefits beginning to accrue after 2021) due to reinvested worker earnings, see Table 4.10. Real

[15] Rounded to the nearest 100th

estate development would add $750 million to the state's output between 2021 and 2030, with reinvested earnings adding $140 million per year beyond 2030.

Table 4.9: Development Potential at Each Station

Alternative	Commercial (Square Feet)	Residential (Units)	Jobs
Manchester – Granite Street	567,000	1,360	1,970
Bedford/MHT	245,000	0	720
Nashua – Crown Street	155,000	1,110	410
South Nashua	930,000	1,120	2,480

Table 4.10: Impacts on Employment and Output

Manchester Regional Commuter Rail	Project Construction (2019-2022)	Real Estate Development (2021-2030)	Reinvested New Resident Earnings (Annual, 2030+)
Impact on Employment (Jobs)	230	3,390	1,730
Impacts on Output (Gross Regional Product In Millions of 2014$)	$70	$1,200	$220

4.18 Transportation

Rail operations for the Manchester Regional Commuter Rail Alternative were modeled using stringline diagrams (also referred to as time-distance diagrams) that plan the flow of traffic on the railroad and designed to overlay on top of the existing MBTA and Amtrak operations that would share trackage south of Lowell (MBTA) and south of Woburn (Amtrak). Stations were designed to provide direct access from major routes or take advantage of dense areas of development that would most likely utilize the system. Ridership numbers at each station were used to estimate parking requirements. Accessibility at each station is driven by existing guidelines developed by Amtrak.

4.18.1 Affected Environment

As described in Section 1.2 Corridor Existing Conditions, the existing rail corridor is owned by PAR and utilized exclusively for freight rail traffic, with no passenger rail operations. See Section 1.2 for additional details.

4.18.2 Manchester Regional Commuter Rail Alternative

The Manchester Regional Commuter Rail Alternative would have a beneficial impact on rail options and mobility in the corridor by increasing transportation options. The service would introduce passenger rail operations, which currently do not exist in the corridor. The Manchester Regional Commuter Rail Alternative could potentially have a minor adverse impact on traffic operations around certain station locations. As more detail is developed for the station alternatives and designs, traffic operations would be modeled in and around the proposed stations. Due to the daily commuter train schedules, traffic in and around stations usually does not coincide with rush hour traffic. As a secondary impact to station design, development in and around stations would likely have a beneficial impact on accessibility and walkability in and around stations.

4.19 Indirect Effects and Cumulative Impacts

Indirect effects are defined in the CEQ regulations (40 CFR 1508.8) as those effects "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." Cumulative impacts are defined in 40 CFR 1508.7 as the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions."

4.19.1 Indirect Effects

The indirect effects associated with the Manchester Regional Commuter Rail Alternative have been documented in the previous sections of this chapter. The Manchester Regional Commuter Rail Alternative would have beneficial long-term effects due to induced growth and development around station locations. While the Manchester Airport station is designed to specifically be a park-and-ride style station, the Town of Bedford has planning documents that include mixed use TOD-style development around this location if a station were built there. The remaining stations are each designed with TOD in mind, which would likely foster denser development and more walkable communities. This type of growth is generally favored over sprawl-type growth, and helps to protect the natural resources of the state. In addition, as described in Section 4.17 Socioeconomics, the Manchester Regional Commuter Rail Alternative is expected to increase Gross Regional Product and jobs both during construction and during future operations.

4.19.2 Cumulative Impacts

There are a number of past, present, and future projects identified in the planning documentation for the region that can be taken into account when analyzing the cumulative impact scenario. The I-93 widening project is currently underway and serves as a major transportation connection within the same corridor. Exit 36, located on US Route 3 in Massachusetts, was recently the subject of a planning study by the Southern New Hampshire Regional Planning Commission to evaluate the impact of redesigning the interchange to allow southbound traffic to exit at this location (it currently only supports exiting from the northbound direction). Lastly, it is assumed that there would be development patterns affected by these transportation improvements if they are implemented.

Under the cumulative impact scenario, the Manchester Regional Commuter Rail Alternative would have an incremental beneficial impact on the environment. The project would provide greater access to transportation options for people in the corridor, and reduce VMT within the US Route 3 and I-93 travel corridors. In addition, the project is consistent with all local and regional plans and has been coordinated directly and transparently with the communities who would see the greatest impact from the project.

4.20 Construction Period Impacts

Construction period impacts are temporary during the implementation of the project and will vary depending on the type of construction and the location. Impacts are minimal and can be mitigated with construction best practices.

4.20.1 Affected Environment

The NHML previously accommodated two tracks along the entire length between Boston and Manchester; however, aside from sidings, the rail line today is only single-tracked north of the wye at Stony Brook in Chelmsford. To accommodate new passenger rail, the existing rail has to be upgraded, and enough second track needs to be provided to accommodate both passenger rail and freight on the same line. No improvements south of MBTA's Lowell Gallagher Terminal would be required. North of Lowell the railroad would be upgraded to permit safe, reliable operation of 16 daily passenger trains at speeds of up to 60 mph. Upgrades would be provided to track, bridges, crossings, and signals, which are summarized in the Major Infrastructure Components, Section 3.3.4.

4.20.2 Manchester Regional Commuter Rail Alternative

Minor temporary impacts may occur during construction activities, such as replacing or rehabilitating bridges or culverts, relocating utilities for track work and grading work associated with station construction. Noise associated with the construction of the project is expected to have four potential daytime impacts and up to 309 potential nighttime impacts have been identified as a result of the analysis. These impacts would be mitigated during design and restored after construction has been completed. Minor permanent impacts may occur during these same activities in cases where temporary impacts cannot be restored in-place. In these cases, compensatory mitigation would be identified at the appropriate ratio for replication. As more detail is developed in the next phase of the project, these impacts will be defined in greater detail.

5 Agency Coordination and Public Involvement

A Public and Stakeholder Involvement Plan (PSIP) was developed that outlines how the NHDOT – in cooperation with FRA, FTA, and the Study team – would both educate and seek input from private entities, public agencies, communities, residents, and the traveling public. The PSIP's purpose was to describe how stakeholder and public input would be sought to inform the completion of key project milestones, including the definition of the Study Purpose and Need, the development of alternatives, the evaluation of alternatives, the selection of a recommended strategy, and the methods by which clear and understandable information would be developed and disseminated at the conclusion of each Study milestone. Activities described in this plan would educate key stakeholders and the public about the technical analyses that fed into the decision-making process and to receive input for that process.

A variety of approaches were used to inform stakeholders of Study activities and there were numerous opportunities for discussion and comment. Public opinion and comments were documented and considered throughout the process. The main objectives of the public and stakeholder outreach activities for the Capitol Corridor AA Study are as follows:

- Build support for the AA Study and service development planning process among different stakeholder groups
- Encourage stakeholders to engage in the development process
- Provide clear and understandable information at each step of the process
- Document public and stakeholder opinion as part of the decision-making process
- Create a high-level of transparency regarding how the project is conducted

Because the Study included rail transit service as an alternative in the State of New Hampshire, the Study attracted significant interest from public and private stakeholders throughout the region, as well as members of the general public. Public and stakeholder outreach began at Study initiation and was proactive, consistent, and timely to fully engage the public and key stakeholders in the process. Federal, state, and local agencies with regulatory authority were contacted throughout the process to provide input and comment. In addition, NHDOT identified quasi- and non-governmental stakeholders, and solicited comments through public information meetings, PAC meetings, a project website, and other activities.

5.1 Agency and Stakeholder Coordination

The Study team and NHDOT conducted 91 stakeholder meetings, three PAC meetings, and three public meetings (in Concord, Manchester, and Nashua) over the Study's 21-month lifecycle. The initial phase of stakeholder engagement was designed to solicit input from a broad, diverse range of players who all have a stake in the future of passenger rail in New Hampshire.

5.2 Project Advisory Committee

The PAC provided input to the Study, including the vetting of early, preliminary alternatives. Throughout the Study, the PAC held meetings (including ongoing Study progress discussions) that coincided with the conclusion of major Study milestones and phases. The Study team coordinated the PAC's efforts. In addition, the Governor's Office, Congressional Delegation Offices, Executive Councilors, and State Senators and State Representatives from communities along the Capitol Corridor were notified of all meetings (public meetings and PAC meetings). Information on the PAC meetings is provided in Appendix H.

The following organizations were PAC members:

- Amtrak
- Central New Hampshire Regional Planning Commission
- City of Concord, New Hampshire
- City of Manchester, New Hampshire
- City of Nashua, New Hampshire/Nashua Transit System

- Conservation Law Foundation of New Hampshire
- The Greater Concord Chamber of Commerce
- The Greater Nashua Chamber of Commerce
- Lowell Regional Transit Authority
- Manchester Transit Authority
- Manchester-Boston Regional Airport
- Massachusetts Bay Transportation Authority
- Massachusetts Department of Transportation
- Merrimack Valley Planning Commission
- Nashua Regional Planning Commission
- New Hampshire Rail Transit Authority
- Northern Middlesex Council of Governments
- Pan Am Railways
- Rockingham Planning Commission
- Southern New Hampshire Planning Commission

5.3 Other Stakeholders

One-on-one interviews and group briefings were held early in the Study with representatives of stakeholder groups identified by the Study team in consultation with NHDOT. These sessions allowed NHDOT and the Study team to convey information about the Study' scope and process and gain an understanding of stakeholders' perceptions of the Study, sensitivities associated with the project, and how local communities might react to the project. Stakeholders also provided information on other individuals and organizations that might have a particular interest in or provide support for the project.

Following is a list of stakeholders and a brief description of each.

- Anagnost Companies: Manchester developer
- C&J Trailways: Regional bus service provider in the Study area
- Central New Hampshire Regional Planning Commission (RPC): Planning commission serving 20 communities in Central New Hampshire, including the City of Concord
- City of Concord, New Hampshire
- City of Dover, New Hampshire
- City of Manchester, New Hampshire – Board of Aldermen: Legislative body of the City of Manchester
- City of Manchester, New Hampshire – Mayor's Office: Executive Office of the City of Manchester
- City of Nashua, New Hampshire/Nashua Transit System: Second largest city in New Hampshire; both Route 3 and existing rail line runs through the city

- Concord Area Transit: Public transit provider in the City of Concord
- Greater Concord Chamber of Commerce: Business advocacy organization representing businesses in the Central New Hampshire region
- Concord Coach/Dartmouth Coach/Boston Express: Regional bus service providers in the Study area
- Conservation Law Foundation: Non-profit focusing on environmental issues in New England
- FRA: Grantee for the portion of the Study to develop a Service Development Plan and related documents for intercity passenger rail service in the corridor between Boston and Concord
- FTA: Grantee for the portion of the Study to provide an AA for transit service in the Concord-Boston corridor
- Mount Washington College, Manchester, New Hampshire
- Lowell Regional Transit Authority: Public transit provider in the greater Lowell region
- Greater Manchester Chamber of Commerce: Business advocacy organization representing businesses in the Manchester region
- Manchester Community College, Manchester, New Hampshire
- Manchester Transit Authority: Public transit provider in the greater Manchester region
- Manchester-Boston Regional Airport (Manchester Airport): Public airport located in Manchester, New Hampshire
- Massachusetts Department of Transportation (MassDOT)/Massachusetts Bay Transportation Authority (MBTA): MassDOT is the state agency that coordinates, plans, and funds all public transportation infrastructure within the Commonwealth; MassDOT oversees the MBTA, which is responsible for providing public transit service to 176 cities and towns in Massachusetts
- Massachusetts Historical Commission: Established in 1963 to identify, evaluate, and protect important historical and archeological assets of the Commonwealth
- Merrimack Chamber of Commerce: Business advocacy organization representing businesses in the Merrimack region
- Merrimack Valley Planning Commission: Regional planning agency serving 15 communities in the northeast region of Massachusetts
- Greater Nashua Chamber of Commerce: Business advocacy organization representing businesses in the Southern New Hampshire region
- Nashua RPC: Planning commission serving 13 communities in Southern New Hampshire, including the City of Nashua
- National Railroad Passenger Corporation (Amtrak): Publicly-supported service that operates intercity passenger rail service throughout the U.S.
- New Hampshire Rail Transit Authority (NHRTA): Established by the legislature in 2007 for the general purpose of developing and providing commuter rail or other similar forms of passenger rail service; the authority is administratively attached to NHDOT
- New Hampshire Technical Institute, Concord, New Hampshire

- New Hampshire Congressional Delegates: Senators Jeanne Shaheen and Kelly Ayotte; Representatives Carol Shea-Porter and Annie Kuster
- New Hampshire Department of Environmental Services (NHDES): state agency concerned with the protection and wise management of New Hampshire's environment
- New Hampshire Department of Resources and Economic Development (NHDRED): State agency concerned with economic development in the State of New Hampshire
- New Hampshire Division of Historical Resources: Established as the State Historic Preservation Office in 1974 to preserve the historical, archeological, architectural, and cultural resources of New Hampshire
- Northern New England Passenger Rail Authority/*Downeaster*: Amtrak's rail service from Massachusetts to Maine
- PAR: Operator of more than 2,000 route miles of railroad in the Northeast, including the track included in the Study corridor
- Public Service of New Hampshire (PSNH): New Hampshire's largest electric utility and owner/operator of the coal-fired Merrimack Station in Bow, New Hampshire
- Rivier University, Nashua, New Hampshire
- Rockingham Planning Commission: Planning commission serving the southernmost corridor communities
- Southern New Hampshire University, Manchester, New Hampshire
- Southern New Hampshire Planning Commission: Planning commission serving 13 communities in Southern New Hampshire, including the City of Manchester
- The Duprey Companies: Concord, New Hampshire Developer
- The Northern Middlesex Council of Governments: Regional planning agency serving nine communities in the Northeast region of Massachusetts
- Town of Bedford, New Hampshire
- Town of Bow, New Hampshire
- Town of Durham, New Hampshire
- Town of Exeter, New Hampshire
- Town of Hooksett, New Hampshire
- Town of Hudson, New Hampshire
- Town of Litchfield, New Hampshire
- Town of Merrimack, New Hampshire
- University of New Hampshire

Notes and details of stakeholder meetings can be found in Appendix H.

5.4 Public Involvement

The Study team held three public meetings at key Study milestones, one of which was a scoping meeting to satisfy FRA requirements:

- Study Initiation Public Meeting, Manchester, New Hampshire – June 5, 2013
- Public Scoping Meeting, Concord, New Hampshire – March 5, 2014
- Final Alternatives Meeting, Nashua, New Hampshire – November 20, 2014

Public meeting documentation can be found in Appendix H. Table 5.1 is a summary stakeholder outreach activities.

Table 5.11: Stakeholder Outreach Summary

Date	Stakeholder
3/11/2013	Central New Hampshire RPC
3/12/2013	NHRTA
3/12/2013	City of Nashua, New Hampshire
3/12/2013	Nashua Chamber of Commerce
3/12/2013	Concord Area Transit
3/12/2013	Concord Coach/Dartmouth Coach/Boston Express
3/13/2013	FRA
3/13/2013	FTA
3/13/2013	Nashua RPC
3/13/2013	Southern New Hampshire RPC
3/13/2013	Manchester Chamber of Commerce
3/13/2013	Manchester Airport
3/14/2013	Manchester Transit Authority
4/2/2013	Mayor of the City of Manchester, New Hampshire
4/2/2013	Conservation Law Foundation
4/3/2013	MBTA
4/3/2013	MassDOT
4/3/2013	Northern New England Passenger Rail Authority
4/3/2013	Town of Durham, New Hampshire
4/3/2013	University of New Hampshire
4/16/2013	Senator Shaheen District Office
4/16/2013	Southern New Hampshire RPC
4/16/2013	City of Manchester – Board of Alderman
4/17/2013	City of Concord, New Hampshire
4/17/2013	Rockingham Planning Commission
4/17/2013	Town of Exeter, New Hampshire
4/17/2013	C&J Trailways
4/18/2013	Nashua RPC
4/18/2013	Town of Merrimack, New Hampshire
4/18/2013	Merrimack Chamber of Commerce
5/14/2013	Concord Chamber of Commerce
5/14/2013	NHDES

Date	Stakeholder
5/14/2013	PAC Meeting – Concord, New Hampshire
5/15/2013	Congresswoman Shea-Porter District Office
5/16/2013	FRA/FTA Conference Call
5/16/2013	Congresswoman Kuster District Office
5/16/2013	Manchester Chamber of Commerce
5/16/2013	Merrimack Valley Planning Commission
5/16/2013	Anagnost Companies
5/28/2013	Northern Middlesex Council of Governments
5/28/2013	PAR
5/30/2013	City of Dover, New Hampshire
6/5/2013	Public Meeting – Manchester, New Hampshire
6/28/2013	FTA
7/17/2013	MBTA
7/19/2013	Briefing for NHDOT Commissioner Clement
7/19/2013	PAR
7/23/2013	Land Use Workshop – Nashua, New Hampshire
7/23/2013	Land Use Workshop – Concord, New Hampshire
7/25/2013	Land Use Workshop – Manchester, New Hampshire
7/29/2013	EPA
8/19/2013	Congresswomen's Kuster and Shea-Porter's Staff Project Briefing/ Senator Shaheen's Staff Project Briefing/FRA Project Briefing – Washington, DC
11/20/2013	FTA/FRA – Washington, DC
12/17/2013	Central New Hampshire RPC
12/17/2013	City of Concord, New Hampshire
12/17/2013	City of Nashua, New Hampshire
12/17/2013	Nashua RPC
12/18/2013	City of Manchester, New Hampshire
12/18/2013	Southern New Hampshire Planning Commission
12/20/2013	FRA & FTA
1/21/2014	PAC Meeting – Concord, New Hampshire
1/31/2014	MassDOT/MBTA
2/06/2014	Boston Express
2/06/2014	MassDOT/NHDOT
3/03/2014	Commissioner Clement; Governor's staff
3/04/2014	Harry Blunt, Mark Sanborn; NHDOT Project Management
3/05/2014	Congresswoman Niki Tsongas' staff
3/05/2014	Public Scoping Meeting at NHDOT, Concord, New Hampshire
3/25/2014	FRA Conference call
3/26/2014	Manchester Board of Advisors Meeting
4/03/2014	Meeting with Amtrak Regarding Ridership Forecasting
4/15/2014	John D. (Jody) Ray (MBTA) and Chris Clement (NHDOT)
4/16/2014	NHDOT Natural Resource Coordination Meeting
4/17/2014	FTA – Cambridge, Massachusetts
4/22/2014	FRA Conference Call
4/25/2014	City of Nashua, New Hampshire – Tom Galligani, Economic Development Director

Date	Stakeholder
5/07/2014	NHDOT Commissioner and NHDOT Management
5/08/2014	Montagne Communications (NHRTA Public Relations firm)
6/04/2014	Meeting on Bow-Concord Project with NHDOT
5/14/2014	1st Hy-Rail trip with PAR
6/13/2014	FTA Meeting – Washington, DC
7/14/2014	Nashua RPC – Exit 36 SB Planning Study
7/1&28/2014	FRA Conference Calls
7/30/2014	2nd Hy-Rail Trip with PAR
8/06/2014	Mayor of the City of Nashua, New Hampshire
8/6/2014	Meeting with Chris Clement, selection of locally preferred alternative and state decision-making
8/6/2014	Meeting with Dan Kelly, development at Spit Brook Road
8/14/2014	FRA call, comments on deliverables
10/21/2014	FRA call with NHDOT Project Management
10/23/2014	Chris Kennedy, Governor's Transport Assistant
10/23/2014	FTA – Cambridge, Massachusetts
11/18/2014	PAC Meeting – Concord, New Hampshire
11/20/2014	Montagne Communications – EJ Powers
11/20/2014	Manchester Union Leader – Michael Cousineau
11/20/2014	Public Meeting – Nashua, New Hampshire
11/21/2014	Congresswoman Annie Kuster
11/21/2014	NHRTA

As a result of agency and stakeholder input, the following is a compilation of the most frequent comments and concerns:

- New Hampshire would benefit from a transportation system that provides multiple transit options, is less focused on single occupancy vehicles, and provides an increase in options that have the potential to ease traffic congestion and save commuting time.
- The Manchester-Boston Regional Airport is an important cog in the New Hampshire economy and a rail connection to the airport should be part of the Study.
- The state needs to work to attract and retain young professionals, who are now leaving New Hampshire at a faster rate than they are moving to the state.
- It is important to demonstrate the impacts and benefits of passenger rail to the state (economic, social, and environmental).
- The project needs to have a solid financial plan.
- State demographics are changing (the population is getting older), and the transportation system needs to address the needs of this changing demographic.
- The location of potential rail stations is important to many of the communities, and they would like to be part of the discussion in identifying appropriate locations.
- System safety needs to be analyzed.

- The fare structure for any system needs to be competitive with other forms of transportation.
- The frequency of operation needs to be competitive with other forms of transportation.
- The Study has many implications for development in New Hampshire, which needs to be quantified.
- Freight rail along the corridor is important, and the Study needs to examine the benefits to freight that could be realized by a passenger rail project.
- The project needs to quantify environmental impacts, including emissions, air quality, noise/vibration, etc.
- An increase in transit options has the potential to ease traffic congestion or slow the increase in traffic congestion in the state.
- Parking issues associated with potential rail stations is a concern in many communities.
- Any transportation study needs to include connections between rail/bus and other parts of the state, i.e., local transit systems.
- There is a concern among stakeholders that any proposed train service would negate the need for existing bus routes, which have been successful to date.
- A transparent process for the Study is important with a high-level of stakeholder and public engagement.
- Many stakeholders are interested in how passenger rail would impact the state's economy.

5.5 Website

A Study-specific website, http://www.nhcapitolcorridor.com, was developed to both disseminate and receive information about the Capitol Corridor AA Study.

5.6 Media Outreach

In cooperation with the NHDOT Public Information Office, notices of upcoming meetings were sent to the following local news media outlets:

- Print Media
  - Concord Monitor
  - Manchester Union Leader
  - Nashua Telegraph
  - Lawrence Eagle Tribune
- Broadcast Television
  - WBIN, Concord
  - WMUR, Manchester
  - TV 23, Manchester
  - TV 16, Nashua
- Radio
  - WEVO 89.1 FM, Concord
  - WGIR 610 AM, Manchester

5.7 Project Electronic Mailing List

A project electronic mailing list was developed with input from NHDOT, and maintained and used throughout the Study. Some individuals/organizations requested they be added to the list during public open houses, project briefings, or on the project website.

The mailing list is provided in Appendix H.

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7 Distribution List

The following agencies, organizations, and persons received a copy of the EA:

Table 7.1: Distribution List

U.S. Agencies/Officials	▪ **Federal Transit Administration** Noah Berger ▪ **Federal Railroad Administration** Trevor Gibson ▪ Fed**eral Highway Administration – New Hampshire Division** Jamie Sikora, Environmental Program Manager ▪ **United States Army Corps of Engineers New England District** Michael Hicks ▪ **United States Environmental Protection Agency, New England** Mark Kern Rosemary K. Monahan, PhD, Smart Growth Coordinator
State Agencies/ Officials	▪ **Massachusetts Executive Office of Energy and Environmental Affairs, MEPA Office** Deirdre Buckley, Director ▪ **Massachusetts Department of Environmental Protection** Stephen Johnson, Deputy Regional Director ▪ **Massachusetts Department of Transportation** John D. Ray, Deputy Director – Rail and Transit Division Ronald Morgan, MBTA Planning and Development Office ▪ **Massachusetts Historical Commission** Brona Simon ▪ **New Hampshire Department of Environmental Services** Timothy Drew, Public Information & Permit Administration Gino E. Infascelli, Water Pollution Division Lori Summer ▪ **New Hampshire Department of Transportation** Christine Perron, Senior Environmental Manager ▪ **New Hampshire Division of Historic Resources** Elizabeth Muzzey, Director ▪ **New Hampshire Fish and Game Department** Carol Henderson, Environmental Review Coordinator ▪ **New Hampshire Natural Heritage Bureau** Melissa Coppola, Environmental Information Specialist ▪ **MBTA** John D. Ray
Elected Officials	▪ **Massachusetts** Governor Deval Patrick Governor Elect Charles Baker Congresswoman, Niki Tsongas, Massachusetts 3rd Congressional District Senator Edward Markey ▪ **New Hampshire** Governor Maggie Hassan Senator Jeanne Shaheen Senator Kelly Ayotte Congresswoman Carol Shea Porter Congresswoman Annie Kuster

Regional Planning Commissioners	▪ **Boston Regional Metropolitan Planning Organization** Karl Quackenbush, Executive Director ▪ **Central New Hampshire Planning Commission** Michael Tardiff, Executive Director ▪ **Merrimack Valley Planning Commission** Joe Cosgrove, Environmental Program Manager Anthony Komornick, Transportation Program Manager ▪ **Nashua Regional Planning Commission** Kerry Diers, Executive Director Tim Roache, Assistant Director ▪ **Northern Middlesex Council of Governments** Beverly A. Woods, Executive Director ▪ **Rockingham Planning Commission** Cliff Sinnott, Executive Director ▪ **Southern New Hampshire Planning Commission** David Preece, Executive Director
City and Town Officials	▪ **City of Concord** Mayor Jim Bouley Carlos P. Baia, Deputy City Manager ▪ **City of Manchester** Mayor Ted Gatsas William Craig, Director of Economic Development ▪ **City of Nashua** Mayor Donnalee Lozeau Thomas Galligani, Economic Development Division Director
City Agencies	▪ **Greater Concord Chamber of Commerce** Timothy G. Sink, CCE President ▪ **Greater Manchester Chamber of Commerce** Michael J. Skelton, President & CEO ▪ **Greater Nashua Chamber of Commerce** Christopher Williams ▪ **Manchester-Boston Regional Airport** Mark P. Brewer, A.A.E Director
Interest Groups	▪ **Appalachian Mountain Club** John Judge, President ▪ **Boston Express/Concord Coach** Ben Blount ▪ **Conservation Law Foundation** Tom Irwin, Vice President ▪ **New Hampshire Sierra Club** Catherine Corkey, Director ▪ **Society of the Protection of New Hampshire Forests** Jane A. Difley, President/Forester

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Appendices

APPENDIX A

Draft Technical Report Tier 1 Air Quality and Greenhouse Gases Impact Analyses

New Hampshire DOT
Department of Transportation

TECHNICAL REPORT
AIR QUALITY AND GREENHOUSE GASES IMPACT ANALYSES

NEW HAMPSHIRE CAPITAL CORRIDOR RAIL & TRANSIT ALTERNATIVES

Prepared for

New Hampshire Department of Transportation
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URS Project No. 10161320 and 10161321

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Acronym

ADT	average daily traffic
CAA	Clean Air Act
CAFÉ	Corporate Average Fuel Economy
CEQ	Council on Environmental Quality
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
DPM	diesel particulate matter
GHG	greenhouse gasses
GWP	global warming potential
HAPs	hazardous air pollutants
HFCs	hydrofluorocarbons
LOS	level of service
MA	Massachusetts
MassDEP	Massachusetts Department of Environmental Protection
MMT	million metric tons
MSAT	mobile source air toxic
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NH	New Hampshire
NHDES	New Hampshire Department of Environmental Services
NHTSA	National Highway Traffic Safety Administration
N_2O	nitrous oxide
NOA	naturally occurring asbestos
NAAQS	National Ambien Air Quality Standards
NO_x	nitrogen oxides
O_3	ozone
Pb	lead
PFCs	perfluorocarbons
PM_{10}	particulate matter up to 10 micrometers in diameter
$PM_{2.5}$	particulate matter up to 2.5 micrometers in diameter
POM	polycyclic organic matter
ppm	parts per million
RAQS	regional air quality strategy
SF_6	sulfur hexafluoride
SIP	state implementation plan
SO_2	sulfur dioxide

TAC	toxic air contaminant
TSP	total suspended particulate
USEPA	United States Environmental Protection Agency
VMT	Vehicle miles traveled
VOC	volatile organic compound

SECTION 1 REGULATORY CONTEXT

1.1 POLLUTANTS

Ozone. Ozone (O_3) occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. Here, ground level O_3 is an air pollutant that damages human health, vegetation, and many common materials. It is a key ingredient of urban smog. The troposphere extends to a level about 10 miles up, where it meets the second layer, the stratosphere. In contrast, the beneficial or stratospheric O_3 layer extends upward from about 10 to 30 miles and protects life on earth from the sun's harmful ultraviolet rays.

Ground level O_3 is what is known as a photochemical pollutant. Significant O_3 formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight for the photochemical reaction to take place.

Ozone is a regional air pollutant. It is generated over a large area and is transported and spread by wind. O_3, the primary constituent of smog, is the most complex, difficult to control, and the most pervasive of the criteria pollutants. Unlike other pollutants, O_3 is not emitted directly into the air by specific sources. O_3 is created by sunlight acting on precursors pollutants, specifically nitrogen oxides (NO_x) and volatile organic compounds (VOCs). Sources of precursor gases to the photochemical reaction that form O_3 number in the thousands. Common sources include consumer products, gasoline vapors, chemical solvents, and combustion products of various fuels. Originating from gas stations, motor vehicles, large industrial facilities, and small businesses such as bakeries and dry cleaners, the O_3 forming chemical reactions often take place in another location, catalyzed by sunlight and heat. High O_3 concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins.

Particulates. Particulates in the air are caused by a combination of: 1) windblown fugitive dust or road dust; 2) particles emitted directly from combustion sources; and 3) organic, sulfate, ammonium, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, ammonia, and nitrogen oxides. Respirable particulate matter is referred to as PM_{10}, which has a diameter of 10 micrometers or less. It can contribute to increased respiratory disease, lung damage, cancer, premature death, as well as reduced visibility and surface soiling. In 1987, the United States Environmental Protection Agency (USEPA) adopted standards for PM_{10} and phased out the previous standards for total suspended particulate (TSP) that had been in effect.

Fine particulates result from fuel combustion in motor vehicles and industrial sources, residential and agricultural burning, and from atmospheric reactions involving NO_X, SO_X, and organics. Fine particulates are referred to as $PM_{2.5}$ and have a diameter equal to or less than 2.5 micrometers. The potential health effects of $PM_{2.5}$ are considered potentially more serious than those of PM_{10}. In 1997, USEPA established the first annual and 24-hour National Ambient Air

Quality Standards (NAAQS) for $PM_{2.5}$. The standard regulating the 3-year average of the 98th percentile of 24-hour PM_{10} concentrations, or the monitored design value (35μg/m^3), became effective on December 17, 2006.

Carbon Monoxide. CO is a product of incomplete combustion of fuels that contain carbon, principally from automobiles and other mobile sources of pollution, but also from stationary combustion sources. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. These emissions can result in high concentrations of CO, particularly in local areas with heavy traffic congestion. CO emissions from wood-burning stoves and fireplaces can also be important sources of this pollutant. Health effects resulting from exposure to high CO levels can include chest pain in heart patients, headaches, and reduced mental alertness.

Nitrogen Dioxide. Nitrogen oxide emissions are primarily generated from the combustion of fuels in air. Nitrogen oxides include NO and NO_2. Because NO reacts to form NO_2 in the atmosphere over time and NO_2 has been demonstrated to cause the more adverse health effects such as lung irritation and damage, NO_2 is the listed criteria pollutant. The control of NO_2 is also important because it contributes to the atmospheric formation of ozone, the principal component of smog, and the formation of nitrates which contribute to fine particle formation.

Sulfur Dioxide. SO_2 is produced when any sulfur-containing fuel is burned. It is also emitted by chemical plants that treat or refine sulfur or sulfur-containing chemicals. Natural gas contains trace quantities of sulfur, while fuel oils contain much larger amounts. SO_2 can increase lung disease and breathing problems for asthmatics. It reacts in the atmosphere to form acid rain, which is destructive to crops and vegetation, as well as to buildings, materials, and works of art. It also contributes to the formation of fine particulate sulfates.

Lead (Pb). Lead exposure can occur through multiple pathways, including inhalation of air and ingestion of lead in food caused by water, soil, or dust contamination. Excessive exposure to lead can trigger seizures, mental retardation or behavioral disorders, and other central nervous system damage. Lead gasoline additives, nonferrous smelters, and battery manufacturing plants were the most significant contributors to atmospheric lead emissions. Legislation in the early 1970s required gradual reduction of the lead content of gasoline over a period of time, which has dramatically reduced lead emissions from mobile and other combustion sources. These controls have essentially eliminated violations of the lead standard for ambient air in urban areas.

Asbestos. Asbestos deposits from brake wear may be present on surfaces and in the ambient air along the corridor alignment. In addition, asbestos-containing materials may have been used in constructing buildings that will be demolished. Chronic inhalation exposure to asbestos in humans can lead to a lung disease called asbestosis, which is a diffuse fibrous scarring of the lungs. Symptoms of asbestosis include shortness of breath, difficulty in breathing, and coughing. Asbestosis is a progressive disease (i.e., the severity of symptoms tends to increase with time, even after the exposure has stopped). In severe cases, this disease can lead to death due to impairment of respiratory function. A large number of occupational studies have reported that exposure to asbestos by inhalation can cause lung cancer and mesothelioma, which is a rare cancer of the membranes lining the abdominal cavity and surrounding internal organs. USEPA considers asbestos to be a human carcinogen.

Mobile Source Air Toxics (MSAT) **–** USEPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants (HAPs), also known as air toxics, from Mobile Sources and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System. The MSAT rules are intended to reduce HAPs emitted by cars and trucks. USEPA identified seven compounds with significant contributions from mobile sources that are among the national- and regional-scale cancer risk drivers from its National Air Toxics Assessment (USEPA 1999). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter (DPM) plus diesel exhaust organic gases, formaldehyde, naphthalene, and polycyclic organic matter (POM). This list, however, is subject to change and may be adjusted in consideration of future USEPA rules.

Greenhouse Gases and Climate Change. Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs). This layer of gases functions much the same as glass in a greenhouse (i.e., both prevent the escape of heat), which is why this phenomenon is known as the "greenhouse effect." The greenhouse effect helps to regulate the temperature of the Earth and is essential for life and other natural processes. The greenhouse effect is the result of heat absorption by GHGs and downward re-radiation of some of that heat. The concern is not with the fact that we have a greenhouse effect, but whether human activities are leading to an enhancement of the greenhouse effect by the emission of GHGs through fossil fuel combustion and reduced uptake of GHGs through deforestation. A large body of evidence, accumulated over several decades from hundreds of studies, supports the conclusion that human activity is the primary driver of recent warming (National Climatic Data Center, 2012).

Some GHGs such as carbon dioxide (CO_2) occur naturally and are emitted to the atmosphere through natural processes such as volcanoes, forest fires, and biological processes. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities. The principal GHGs that enter the atmosphere because of human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The sources of these emissions associated with human activities are:

Carbon Dioxide – Carbon dioxide can enter the atmosphere through the burning of fossil fuels, solid waste, trees and wood products, and as a result of other chemical reactions (e.g., manufacture of cement).

Methane – Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

Nitrous Oxide – Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

Synthetic GHGs – Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes. For example, sulfur hexafluoride is used in magnesium processing, semiconductor manufacturing, and electrical transmission equipment (circuit breakers), as well as a tracer gas for leak detection. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (e.g., CFCs, HCFCs, and halons). These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as high Global Warming Potential gases.

The Global Warming Potential (GWP) of each GHG is the ability of that gas to trap heat in the atmosphere relative to CO_2. Total GHG emissions are expressed as carbon dioxide equivalent (CO_2e) and are the sum of the GWP-weighted emissions of each GHG.

Climate change refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. Climate change may result from natural processes and human activities that change the composition of the atmosphere and alter the surface and features of the land. Significant changes in global climate patterns have recently been associated with global warming, a worldwide average increase in the temperature of the atmosphere near the Earth's surface, attributed to accumulation of GHG emissions in the atmosphere.

1.2 NAAQS AND STATE STANDARDS

USEPA, in response to the federal Clean Air Act (CAA) of 1970, established National Ambient Air Quality Standards (NAAQS) in Title 40 CFR Part 50. The NAAQS include both primary and secondary standards for six "criteria pollutants." These criteria pollutants are O_3, CO, NO_2, SO_2, particulate matter, and lead. Primary standards were established to protect human health, and secondary standards were designed to protect property and natural ecosystems from the effects of air pollution.

The 1990 CAA Amendments established attainment deadlines for all designated areas that were not in attainment with the NAAQS. In addition to the NAAQS described above, a new federal standard for $PM_{2.5}$ and a revised O_3 standard were promulgated in July 1997. The new federal standards were challenged in a court case during 1998. The court required revisions in both standards before USEPA can enforce them. The U.S. Supreme Court upheld an appeal of the District Court decision in February 2001. These issues were resolved and the 1-hour O_3 standard revoked in 2005, while the revised $PM_{2.5}$ standard was made effective in 2006. In 2010 a new 1-hour SO_2 standard was implemented and the SO_2 24-hour and annual standards were revoked. The 3-hour secondary standard for SO_2 remains unchanged. The NAAQS relevant to the Project are summarized in Table 1.

TABLE 1
NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 μg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]		primary	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	Annual	53 ppb (2)	Annual Mean
Ozone [73 FR 16436, Mar 27, 2008]		primary and secondary	8-hour	0.075 ppm (3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution Dec 14, 2012	$PM_{2.5}$	primary	Annual	12 μg/m^3	annual mean, averaged over 3 years
		secondary	Annual	15 μg/m^3	annual mean, averaged over 3 years
		primary and secondary	24-hour	35 μg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24-hour	150 μg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]		primary	1-hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Notes:
(1) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
(2) The official level of the annual NO2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.
(3) Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, USEPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.
(4) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.
ppm – parts per million (unit of measure for gases only)
ppb – parts per billion (unit of measure for gases only)
µg/m^3 – micrograms per cubic meter (unit of measure for gases and particles, including lead)

USEPA, Massachusetts Department of Environmental Protection (MassDEP), and New Hampshire Department of Environmental Services (NHDES) determine air quality attainment status by comparing local ambient air quality measurements from the state or local ambient air monitoring stations with the NAAQS. Those areas that meet ambient air quality standards are classified as "attainment" areas; areas that do not meet the standards are classified as "non-attainment" areas. Areas that have insufficient air quality data may be identified as unclassifiable areas. These attainment designations are determined on a pollutant-by-pollutant basis. The Project area is classified as attainment with respect to the NAAQS for O_3, NO_2, PM_{10}, $PM_{2.5}$, SO_2, and CO, except for some areas in Massachusetts are maintenance areas for CO (1971 standard) and nonattainment area for ozone (1997 standard) and some areas in New Hampshire are nonattainment area for SO_2 (2010 standard) and maintenance area for CO (1997 standard). Nitrogen dioxide (NO_2) and SO_2 are regulated as PM_{10} precursors, and NO_2 and VOCs as O_3 precursors. Table 2 presents the attainment status for Massachusetts and New Hampshire.

TABLE 2
ATTAINMENT STATUS IN MASSACHUSETTS AND NEW HAMPSHIRE

Area	Pollutant	Attainment Status
MA – Boston and Lowell	CO (1971 standard)	Maintenance
MA – Boston-Lawrence-Worcester	Ozone (1997 standard)	Nonattainment - Moderate
NH – Hillsborough County	CO (1971 standard)	Maintenance
NH – Central New Hampshire	Sulfur Dioxide (2010 standard)	Nonattainment
NH – Boston-Manchester-Portsmouth	Ozone (1997 standard)	Maintenance

Notes: The NH and MA areas that are not listed here are all in attainment for all pollutants.
NH = New Hampshire
MA = Massachusetts

1.3 FEDERAL CONFORMITY RULES

Pursuant to CAA Section 176(c) requirements, USEPA promulgated Title 40 of the Code of Federal Regulations Part 51 (40 Code of Federal Regulations [CFR] 51) Subpart W and 40 CFR Part 93, Subpart B, ―Determining Conformity of General Federal Actions to State or Federal Implementation Plans (see 58 Fed. Reg. 63214 [November 30, 1993], as amended, 75 Fed. Reg. 17253 [April 5, 2010]). These regulations, commonly referred to as the General Conformity Rule, apply to all federal actions including those by Federal Railroad Administration (FRA), except for those federal actions which are excluded from review (e.g., stationary source emissions) or related to transportation plans, programs, and projects under Title 23 U.S. Code or the Federal Transit Act, which are subject to Transportation Conformity.

40 CFR Part 51, Subpart W, applies in states where the state has an approved state implementation plan (SIP) revision adopting General Conformity regulations; 40 CFR Part 93, Subpart B, applies in states where the state does not have an approved SIP revision adopting General Conformity regulations.

The General Conformity Rule is used to determine if federal actions meet the requirements of the CAA and the applicable SIP by ensuring that air emissions related to the action do not:

- Cause or contribute to new violations of a NAAQS
- Increase the frequency or severity of any existing violation of a NAAQS
- Delay timely attainment of a NAAQS or interim emission reduction

A conformity determination under the General Conformity Rule is required if the federal agency determines that the action will occur in a nonattainment or maintenance area; one or more specific exemptions do not apply to the action; the action is not included in the federal agency's ―presumed to conform list; the emissions from the proposed action are not within the approved emissions budget for an applicable facility; and the total direct and indirect emissions of a pollutant (or its precursors), are at or above the *de minimis* levels established in the General Conformity regulations (75 Fed. Reg. 17255). Table 3 presents the applicable *de minimis* emissions levels for this Project.

TABLE 3
GENERAL CONFORMITY *de minimis* LEVELS

Pollutant	Federal Attainment Status	Threshold Values (tpy)
Ozone	Nonattainment – Moderate Maintenance	100 for each precursor (NO_x and VOC)
SO_2	Nonattainment	100
CO	Maintenance	100

Notes:
typ = ton per year

Conformity regulatory criteria are listed in 40 CFR 93.158. An action will be required to conform to the applicable SIP if, for each pollutant that exceeds the *de minimis* emissions level in 40 CFR 93.153(b) or otherwise requires a conformity determination due to the total of direct and indirect emissions from the action, the action meets the requirements of 40 CFR 93.158(c).

In addition, federal activities may not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emissions reductions toward attainment. The proposed project is subject to review under the USEPA General Conformity Rule.

1.4 GHG REGULATIONS/STANDARDS

Climate change and greenhouse gas (GHG) emission reductions are a concern at the federal level. Laws and regulations, as well as plans and policies, address global climate change issues. This section summarizes key federal regulations relevant to the project.

In Massachusetts v. U.S. Environmental Protection Agency, et al., 549 U.S. 497 (2007), the United States Supreme Court ruled that GHG does fit within the CAA definition of a pollutant and that USEPA has the authority to regulate GHG.

On September 22, 2009, USEPA published the final rule that requires mandatory reporting of GHG emissions from large sources in the United States. The rule amends CAA Regulations under 40 CFR Parts 86, 87, 89 90 and 94 and provides a new section, Part 98. USEPA uses the reports to collect accurate and comprehensive emissions data that can inform future policy decisions. Facilities that emit 25,000 metric tons or more per year of GHG emissions must submit annual reports to USEPA under Subpart C of the final rule. GHGs covered by the final rule are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and other fluorinated gases including nitrogen trifluoride (NF3) and hydrofluorinated ethers (HFEs). This is not a transportation-related regulation. However, the methodology developed as part of this regulation is helpful in identifying potential GHG emissions.

On October 5, 2009, President Obama signed Executive Order (E.O.) 13514; Federal Leadership in Environmental, Energy, and Economic Performance. E.O. 13514 requires Federal agencies to set a 2020 GHG emission-reduction target within 90 days, increase energy efficiency, reduce fleet petroleum consumption, conserve water, reduce waste, support sustainable communities, and leverage federal purchasing power to promote environmentally responsible products and technologies.

On December 7, 2009, the Final Endangerment and Cause or Contribute Findings for Greenhouse Gases (endangerment finding), under Section 202(a) of the CAA, went into effect. The endangerment finding states that current and projected concentrations of the six key well-mixed GHGs in the atmosphere (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) threaten the public health and welfare of current and future generations. Furthermore, it states that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution, which threatens public health and welfare (USEPA 2010a).

Based on the endangerment finding, USEPA is revising vehicle emission standards under the CAA. USEPA and National Highway Traffic Safety Administration (NHTSA) updated the Corporate Average Fuel Economy (CAFE) fuel standards on May 7, 2010 (75 Fed. Reg. 25324), requiring substantial improvements in fuel economy for all vehicles sold in the Unites States. The new standards apply to new passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The USEPA GHG standards require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile in the model year 2016, which would be the equivalent to 35.5 miles per gallon if the automotive industry were to meet this CO_2 level solely through fuel economy improvements.

On September 15, 2011, USEPA and NHTSA issued a Final Rule of Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles (76 Fed. Reg. 57107). This final rule is tailored to each of the three regulatory categories of heavy-duty vehicles: combination tractors, heavy-duty pickup trucks and cars, and vocational vehicles. USEPA and NHTSA estimated that the new standards in this rule will reduce CO_2 emissions by approximately 270 million metric tons (MMT) and save 530 million barrels of oil over the life of vehicles sold during the 2014 through 2018 model years.

On February 18, 2010, the White House Council on Environmental Quality (CEQ) released draft guidance regarding the consideration of GHG in National Environmental Policy Act (NEPA) documents for federal actions. The draft guidelines include a presumptive threshold of 25,000 metric tons of carbon dioxide equivalent (CO2e) emissions from a proposed action to trigger a quantitative analysis. CEQ has not established when GHG emissions are ―significant for NEPA purposes; rather, it poses the question to the public (CEQ 2010).

SECTION 2 METHODOLOGY

2.1 LOCAL IMPACT (MICRO-SCALE ANALYSIS)

On a local scale, the potential effect of the Project on air quality is limited to increases in locomotive emissions, and both increases and decreases in on-road emissions. Decreases in on-road emissions could have a beneficial impact on local air quality if large numbers of vehicle trips are shifted to rail, occurring along roadways where those trips would otherwise occur. Since the details of that shift are not clearly known at this time, this potential benefit has not been analyzed; however, a more meaningful analysis of the region-wide benefits of this mode shift is included in the regional analysis.

Mobile source dispersion models are the basic analytical tools used to estimate hotspot concentrations expected under given traffic, roadway geometry, and meteorological conditions. However, quantitative CO hotspot and PM hotspot analyses for this project are not required in this Service-Level impact analysis report because the project is located in either federal attainment or federal maintenance areas for those pollutants. Therefore, dispersion modeling was not used for the project. The project is subject to the general conformity guidelines but not the transportation conformity guidelines. Therefore, the micro-scale analysis focuses on the potential local effect associated with increases in locomotive emissions.

Locomotive emissions factors were obtained from USEPA 2009 technical highlights for locomotive emissions. The total emissions were distributed to each State and by attainment areas.

2.2 REGIONAL IMPACT (MESO-SCALE ANALYSIS)

2.2.1 Criteria Pollutants

The regional impact (meso-scale emissions analysis) estimates the net change in emissions associated with the entire project, including the change in both on-road and locomotive emissions for the two project alternatives, Manchester Regional Commuter Rail and Intercity 8. The locomotive emission factors used are described in the local impact (micro-scale analysis) section above. An on-road vehicle emission analysis was also conducted using average daily vehicle miles traveled (VMT) estimates and associated average daily speed estimates for each affected area. The criteria pollutant emission factors for on-road vehicles were obtained using the USEPA MOVES emissions model. For the Service Level analysis, the MOVES model was ran at the national scale with national input data allocated to Hillsborough and Merrimack counties in New Hampshire. Total vehicle miles-traveled (VMT) were obtained from the project traffic study. The analysis was conducted for the modeling year 2020.

To determine overall pollutant burdens generated by on-road vehicles, estimated VMT increases or decreases were multiplied by applicable pollutant's emission factors, which are based on national default speeds and vehicle speciation data, and using a 2020 analysis year.

2.2.2 Hazardous Air Pollutants, Greenhouse Gases, and Other Pollutants

The federal Clean Air Act (CAA) Amendments of 1990 listed 188 Hazardous Air Pollutants (HAPs) and addressed the need to control toxic emissions from transportation. USEPA's 2007 Mobile Source Air Toxics (MSAT) rule identified a subset of seven HAPs as having significant contributions from mobile sources: benzene, 1,3-butadiene, formaldehyde, acrolein, naphthalene, polycyclic organic matter (POM), and diesel particulate matter (DPM).

Based on the FHWA guidance, the proposed alternatives do not require a detailed quantitative analysis. In addition, the detailed project level MSAT and GHG emission factors for vehicles and locomotives were not available. Therefore, the hazardous air pollutant and the greenhouse gases emissions were estimated by scaling either NO_x emissions from the MOVES model, SO_2 emissions from locomotive engines, or NO_x emissions from USEPA's 2011 National Emissions Inventory data.

Asbestos minerals occur in rocks and soil as the result of natural geologic processes. Naturally occurring asbestos (NOA) takes the form of long, thin, flexible, separable fibers. Natural weathering or human disturbance can break NOA down to microscopic fibers, easily suspended in air. When inhaled, these thin fibers irritate tissues and resist the body's natural defenses. In addition, asbestos-containing materials may have been used in constructing buildings that would be demolished. The demolition of asbestos-containing materials is subject to the limitations of the National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations and would require an asbestos inspection. The asbestos survey would be conducted before any construction activity starts.

SECTION 3 EXISTING CONDITIONS

Ambient air quality standards have been set by both the federal government and the Commonwealth of Massachusetts to protect public health and welfare with an adequate margin of safety. However, according to the MassDEP, the state does not designate areas as attainment or nonattainment with these standards. Pollutants for which NAAQS have been established are often referred to as “criteria” air pollutants. This term is derived from the comprehensive health and damage effects review that culminates in pollutant-specific air quality criteria documents, which precede the establishment of NAAQS. These standards are reviewed on a legally prescribed frequency and revised as warranted by new health and welfare effects data. Each NAAQS is based on a specific averaging time over which the concentration is measured. Different averaging times are based upon protection against short-term, high-dosage effects or longer-term, low-dosage effects. Most NAAQS may be exceeded no more than once per year. A listing of the current NAAQS is provided in Section 1.2, NAAQS and State Standards.

The ambient air quality in the project area is monitored at a number of permanent air quality monitoring stations operated by USEPA, MassDEP, and NHDES. The monitoring stations within Massachusetts that are closest to the Project area are in Chelmsford, Lawrence, and Boston (Charlestown, North End, Kenmore Square, and Roxbury). In New Hampshire the monitoring stations nearest to the Project area are in Nashua (Gilson Road and Crown Street), Concord, Peterborough, and Manchester. For each pollutant, the maximum concentration from these stations was selected as a conservative background concentration level. Background concentration data is presented in Tables 4 to Table 9.

TABLE 4
CONCENTRATION DATA SUMMARY FOR OZONE

State	Year	Highest Concentration for O_3 (ppm)		Number of Days Exceeding Standards	
		1-hour	8-hour	1-hr	8-hr
Massachusetts	2011	0.103	0.086	0	1
	2012	0.113	0.089	0	1
	2013	0.082	0.071	0	0
New Hampshire	2011	0.108	0.09	0	1
	2012	0.112	0.085	0	2
	2013	0.081	0.07	0	0

Notes:
ppm = parts per million
MA data from the Chelmsford monitor.
NH data from the Nashua (Gilson Road) monitor.

TABLE 5
CONCENTRATION DATA SUMMARY FOR NITROGEN DIOXIDE

State	Year	Highest 1-hour Concentration for NO_2 (ppm)	98th Percentile 1-hour Concentration for NO_2 (ppm)	Number of Days Exceeding Standards (days)
Massachusetts	2011	75	53	0
	2012	61	49	0
	2013	56	48	0
New Hampshire	2011	0.012	0.01	0
	2012	0.011	0.01	0
	2013	0.009	0.009	0

Notes:
MA data from the Boston (Kenmore Square) monitor.
NH data from the Nashua (Gilson Road) monitor.

TABLE 6
CONCENTRATION DATA SUMMARY FOR SULFUR DIOXIDE

State	Year	Highest Concentration for SO_2 (ppm)		99^{th} Percentile Concentration for SO_2 (ppm)	Number of Days Exceeding Standards (days)	
		1-hour	24-hour	1-hour	1-hour	24-hour
Massachusetts	2011	49	12	19	0	0
	2012	16	6	13	0	0
	2013	30	7	12	0	0
New Hampshire	2011	0.153	0.028	0.078	5	0
	2012	0.036	0.006	0.008	0	0
	2013	0.014	0.007	0.009	0	0

Notes:

MA data from the Boston (Kenmore Square) monitor.

NH data from the Concord (Hazen Drive) monitor.

TABLE 7
CONCENTRATION DATA SUMMARY FOR CARBON MONOXIDE

State	Year	Highest Concentration for CO (ppm)		Number of Days Exceeding Standards (days)	
		1-hour	8-hour	1-hour	8-hour
Massachusetts	2011	2.4	1.9	0	0
	2012	2.2	1.9	0	0
	2013	2	1.3	0	0
New Hampshire	2011	4.4	2.5	0	0
	2012	2.4	1.7	0	0
	2013	0.4	0.4	0	0

Notes:

MA data from the Boston (Roxbury/Harrison Ave) monitor.

NH: 2011-2012 data from the Manchester (Pearl Street) monitor.

NH: 2013 data from the Peterborough monitor, because it was unavailable at the Manchester monitor.

TABLE 8
CONCENTRATION DATA SUMMARY FOR $PM_{2.5}$

State	Year	Highest 24-hour Concentration for $PM_{2.5}$ (µg/m³)	98th Percentile Concentration for $PM_{2.5}$ (µg/m³)	Annual Arithmetic Mean for $PM_{2.5}$ (µg/m³)
Massachusetts	2011	38.9	24	10.3
	2012	27.9	21	9.5
	2013	26.2	20	8.8
New Hampshire	2011	19.5	18	7.4
	2012	24	23	8.2
	2013	15.8	14	7.5

Notes:

MA data from the Boston (North End) monitor.

NH data from the Nashua (Crown Street) monitor.

TABLE 9
CONCENTRATION DATA SUMMARY FOR PM_{10}

State	Year	Highest 24-hour Concentration for PM_{10} (µg/m³)	Number of Days Exceeding Standards (days)
Massachusetts	2011	42	0
	2012	72	0
	2013	39	0
New Hampshire	2011	28	0
	2012	21	0
	2013	22	0

Notes:

MA data from the Boston (Roxbury/Harrison Ave) monitor.

NH data from the Peterborough monitor.

SECTION 4 ENVIRONMENTAL CONSEQUENCES

4.1 LOCAL ANALYSIS RESULTS

The results of the micro-scale analysis are presented in Table 10 and Table 11. The results represent the local impact from locomotive emissions along the track and at stations for both Manchester Regional Commuter Rail and Intercity 8 alternatives.

TABLE 10
LOCAL AIR QUALITY IMPACT FROM LOCOMOTIVES
(MANCHESTER REGIONAL COMMUTER RAIL ALTERNATIVE)

Annual Emissions (tons/year)	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
MA total	1.78	11.93	0.44	0.43	0.01	0.70
Boston and Lowell 1997 Ozone Nonattainment area and 1971 CO Maintenance area	1.05	7.05	0.26	0.25	0.00	0.41
NH - Service to Nashua only	2.49	16.76	0.62	0.60	0.01	0.98
NH - Service from Nashua to Manchester	1.58	10.65	0.40	0.38	0.01	0.63
NH total - includes Central NH SO2 NAA, 1971 CO maintenance area, and 1997 Ozone maintenance area	4.08	27.40	1.02	0.99	0.01	1.61
Idling emissions	0.04	0.29	0.01	0.01	0.00	0.02
Applicable General Conformity Emission *de minimis* level (to each nonattainment or maintenance area)	100	100	NA	NA	100	100
Exceed *de minimis* level?	No	No	NA	NA	No	No

Notes:
NA = Not Applicable
NAA = nonattainment area
NH = New Hampshire
MA = Massachusetts

TABLE 11
LOCAL AIR QUALITY IMPACT FROM LOCOMOTIVES (INTERCITY 8 ALTERNATIVE)

Annual Emissions (tons/year)	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
MA total	3.22	21.67	0.81	0.78	0.01	1.27
Boston and Lowell 1997 Ozone Nonattainment area and 1971 CO Maintenance area	0.77	5.21	0.19	0.19	0.00	0.31
NH total - includes Central NH SO2 NAA, 1971 CO maintenance area, and 1997 Ozone maintenance area	3.87	26.03	0.97	0.94	0.01	1.53
Idling emissions	0.03	0.19	0.01	0.01	0.00	0.01
Applicable General Conformity Emission *de minimis* level (to each nonattainment or maintenance area)	100	100	NA	NA	100	100
Exceed *de minimis* level?	No	No	NA	NA	No	No

Notes:
NA = Not Applicable
NAA = nonattainment area
NH = New Hampshire
MA = Massachusetts

Since mobile source dispersion modeling and hotspot analyses are not required for this Service Level analysis project, the results of the micro-scale emissions presented in Table 10 and Table 11 show that project emissions are below the federal general conformity *de minimis* levels for all applicable criteria pollutants in each nonattainment or maintenance area in New Hampshire and Massachusetts. Therefore, the local air quality impact is not significant due to Project operations.

4.2 REGIONAL ANALYSIS RESULTS

4.2.1 Criteria Pollutant Results

The total net change in criteria pollutant emissions in the project's affected region from the Manchester Regional Commuter Rail Alternative and Intercity 8 Alternative are presented in Table 12 and 13, respectively. There will be emissions reductions for all criteria pollutants in both alternatives except for PM_{10}, $PM_{2.5}$, NO_x, and VOC in Intercity 8 Alternative. However, the net emissions increases for those pollutants in Intercity 8 Alternative are definitely below the federal general conformity *de minimis* levels since there are some emissions reductions from the saving of vehicle trips. Therefore, in either alternative the project is presumed to conform to the applicable SIPs and would not require a full conformity analysis and conformity determination.

TABLE 12
REGIONAL AIR QUALITY IMPACT – CRITERIA POLLUTANTS
(MANCHESTER REGIONAL COMMUTER RAIL ALTERNATIVE)

Emissions Increases (ton/year)	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
Personal Vehicles	-47.65281	-3.12784	-0.15408	-0.13639	-0.05561	-1.12602
Boston Express Buses	-6.20233	-202.09959	-9.22918	-8.49050	-0.38755	-12.51834
Locomotive	5.89738	39.62302	1.47434	1.43011	0.02080	2.32873
Net Emissions Increases	-47.95776	-165.60441	-7.90892	-7.19678	-0.42237	-11.31563
Applicable General Conformity Emission de minimis level (to each nonattainment or maintenance area)	100	100	NA	NA	100	100
Exceed de minimis level?	No	No	NA	NA	No	No

Notes:
NA = Not Applicable

TABLE 13
REGIONAL AIR QUALITY IMPACT – CRITERIA POLLUTANTS
(INTERCITY 8 ALTERNATIVE)

Emissions Increases (ton/year)	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
Personal Vehicles	-29.23197	-1.91873	-0.09452	-0.08367	-0.03412	-0.69074
Boston Express Buses	-3.80473	-13.77503	-0.62906	-0.57871	-0.02642	-0.85324
Locomotive	7.12735	47.88687	1.78184	1.72838	0.02513	2.81441
Net Emissions Increases	-25.90935	32.19311	1.05826	1.06600	-0.03540	1.27043
Applicable General Conformity Emission de minimis level (to each nonattainment or maintenance area)	100	100	NA	NA	100	100
Exceed de minimis level?	No	No	NA	NA	No	No

Notes:
NA = Not Applicable

4.2.2 Hazardous Pollutant Emissions Results

The total net change in HAPs emissions in the project's affected region from the Manchester Regional Commuter Rail Alternative and Intercity 8 Alternative are presented in Table 14 and Table 15, respectively. Lead emissions were also estimated using light-duty vehicle emissions. DPM emissions are conservatively assumed to be the same as the $PM_{2.5}$ emissions in Table 12 and Table 13.

USEPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades in three ways: (1) by lowering the benzene content in gasoline; (2) by reducing exhaust emissions from passenger vehicles operated at cold temperatures; and (3) by reducing emissions that evaporate from, and permeate through, portable fuel containers. Federal regulations are also severely reducing the diesel emissions from both on-road and non-road vehicles, and diesel PM is therefore also expected to diminish over time. In general, the impacts are expected to be much lower than those presented in Table 12 and Table 13.

TABLE 14
REGIONAL AIR QUALITY IMPACT – HAZERDOUS AIR POLLUTANTS
(MANCHESTER REGIONAL COMMUTER RAIL ALTERNATIVE)

Emissions Increases (ton/year)	1,3-Butadiene	Acrolein	Formaldehyde	Benzene	Naphthalene	Polycyclic organic matter (POM)	DPM	Lead
Net Emissions Increases	-0.79326	-0.0773	-1.74318	-4.6265	-0.30853	NA	-7.2	-0.0003

Notes:
NA = Not Applicable

TABLE 15
REGIONAL AIR QUALITY IMPACT – HAZERDOUS AIR POLLUTANTS
(INTERCITY 8 ALTERNATIVE)

Emissions Increases (ton/year)	1,3-Butadiene	Acrolein	Formaldehyde	Benzene	Naphthalene	Polycyclic organic matter (POM)	DPM	Lead
Net Emissions Increases	0.15421	0.01502	0.33887	0.89938	0.05998	NA	1.07	0.00007

Notes:
NA = Not Applicable

4.2.3 Greenhouse Gas Results

The estimated annual operational emissions increases in GHG emissions associated with the Manchester Regional Commuter Rail and Intercity 8 alternatives are presented in Table 16 and Table 17, respectively. Manchester Regional Commuter Rail Alternative has much greater emission reductions in total potential greenhouse gases and climate change impact than the Intercity 8 Alternative.

The New Hampshire 10-year State Energy Strategy from the New Hampshire Office of Energy & Planning Department in September 2014 also supported to use rail as one of the major energy saving strategies for the State. It recommended to maintain and to expand rail use instead of all freight option.

TABLE 16
REGIONAL AIR QUALITY IMPACT – GREENHOUSE GASES
(MANCHESTER REGIONAL COMMUTER RAIL ALTERNATIVE)

Emissions Increases (metric ton/year)	CO_2e
Personal Vehicles	-1,140.13
Boston Express Buses	-73,667.47
Locomotive	2,263.13
Net Emissions Increases	-72,544.48

TABLE 17
REGIONAL AIR QUALITY IMPACT – GREENHOUSE GASES
(INTERCITY 8 ALTERNATIVE)

Emissions Increases (metric ton/year)	CO_2e
Personal Vehicles	-699.40
Boston Express Buses	-5,021.15
Locomotive	2,735.13
Net Emissions Increases	-2,985.41

SECTION 5 POTENTIAL MITIGATION STRATEGIES

Since global climate change is caused cumulatively by world-wide activity, the impact of a specific program on climate change cannot be determined. Therefore, the approach applied here for evaluating the potential impact of the program is to identify the program's potential GHG emissions, and to evaluate whether it incorporates cost-effective energy efficiency and renewable energy measures into its design, construction, and operation to the maximum extent practicable, consistent with social, economic and other essential considerations. By doing so, the program would demonstrate consistency with state and local policies.

Since this is a Service-Level impact analysis, the details of design, construction, and operation are not yet fully available. Therefore, this section identifies potential measures for inclusion, which would reduce the program's energy and GHG footprint if implemented. These measures will be further investigated, and if found to be practicable, incorporated in the program's design and operation.

Operational

Shift Locomotives Engines to Higher Tier 1's or to Change the Fuel to Biodiesel Fuel—Options to use biodiesel for the locomotives will be investigated, including blends of B20 and B100 (20 percent biodiesel with 80 percent standard diesel, or pure biodiesel). B20 can be used with current technology while B100 may require some adjustments or new engines. The use of B20 would reduce GHG emissions by 10 percent, and B100 would reduce GHG emissions by 70 percent, reducing operational emissions by 2,300 to 3,000 metric tons CO_2e annually (varies by alternative).

Electrification—The benefits of shifting rail operations along the entire line to electricity have not been quantified at this time. Benefits would increase over the years as the New Hampshire grid shifts to increasingly higher fractions of renewable power sources (the New Hampshire grid currently includes relatively large fractions of nuclear and hydro power, which result in very little GHG emissions).

Sustainable Station Design and Construction—Although station energy use was not included in this analysis, new stations would be designed in accordance with the new requirements from the State.

Construction:

Use of Local, Renewable, Recycled Materials—75 percent of the construction emissions were estimated to come from the extraction, production, transport, and disposal of construction materials. Although precise details are not known at this time, the reduction in these emissions can be substantial if local, renewable, and recycled materials are used. The largest contributors are cement and steel. If emissions associated with material can be cut in half (existing strategies demonstrate that this is possible), the emissions payback period could be reduced by nearly 40 percent.

Biodiesel for Construction Engines—Biodiesel blends would be used in construction engines to the extent practicable.

Replanting Trees— Although not quantified in this analysis, any trees that need to be removed for construction would be replaced with a larger number of trees, replacing the trees in kind or more on a tree-mass basis.

SECTION 6 FUTURE ANALYSIS

The next level analysis will include the potential air quality implications of local traffic to and from stations, and of locomotives and other sources operating in rail yards and other locations other than the line-haul analyzed for Service-level. Potential construction impacts will also be analyzed. If the project is not included in the State Implementation Plan, an applicability analysis will be performed to determine if a general conformity analysis is required. In addition, should in line-haul operations change substantially, micro-scale line-haul and meso-scale emissions likely would be investigated. The detailed GHG reduction measures may be reviewed and evaluated for applicability and practicability, and incorporated into the program as appropriate. In addition, beneficial measures will be quantified, if practicable. If substantial changes in design occur, the overall GHG emissions analysis will be reevaluated as well, and further refined if possible.

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APPENDIX B

Technical Report Noise and Vibration Impact Analyses

New Hampshire DOT Department of Transportation

TECHNICAL REPORT
NOISE AND VIBRATION ANALYSES

NEW HAMPSHIRE CAPITAL CORRIDOR RAIL & TRANSIT ALTERNATIVES

Prepared for

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URS Project No. 10161320 and 10161321

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Acronym

dBA	Decibels
EA	Environmental Assessment
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
L_{dn}	Day-night average noise levels
NHDOT	New Hampshire Department of Transportation
RMS	root-mean-square
VdB	vibration velocity level

SECTION 1 NOISE AND VIBRATION

The noise and vibration limits chosen for construction and operation of the recommended project alternatives satisfy the federal guidelines of the Federal Transit Administration (FTA)[1] for train and rail facility operations.

1.1 METHODS FOR EVALUATION OF IMPACTS

The analysis of noise and vibration impacts used design information for the proposed alignment of the recommended project alternatives and regional rail traffic data. The FTA Guidance Manual provides guidelines for establishing the extent of the study area to be used for the noise and vibration impact analyses. It also provides guidance for identifying noise-sensitive locations where increased annoyance can occur from train pass-bys. The methodology followed by the noise and vibration analysts is described below.

1.2 NOISE- AND VIBRATION-SENSITIVE RECEPTORS

The noise-sensitive receptors for the analysis of all alternatives considered within the Environmental Assessment (EA) include relevant receptors that are defined by FTA criteria. The number of receptors potentially impacted have been determined using FTA's general assessment guidelines, including comparing existing with future noise levels and rating impacts. The vibration impact assessment uses the FTA general assessment procedure of determining if absolute vibration limits will exceed specified thresholds at vibration-sensitive receptors.

1.3 OPERATIONS NOISE

The descriptors and criteria for assessing noise impacts vary according to land use categories adjacent to the track. For land uses where people live and sleep (e.g., residential neighborhoods, hospitals, and hotels), L_{dn} is the assessment parameter. L_{dn} is the day-night average level, which is the energy-averaged sound level for a continuous 24-hour period with 10 decibels (dBA) added to all levels occurring between 10:00 pm and 7:00 am (to account for the added sensitivity to sounds during normal sleeping hours). For other land use types where there are noise-sensitive uses (e.g., outdoor concert areas, schools, and libraries), the equivalent (energy-averaged) noise level for an hour of noise sensitivity ($L_{eq}(_h)$) that coincides with train activity is the assessment parameter. Table 1 summarizes the three land use categories.

The noise impact criteria used by the FTA are ambient-based; the increase in future noise (future noise levels with the recommended project alternatives added to existing noise levels) is assessed rather than the noise caused by each passing train. The criteria specify a consideration of future project noise with existing levels because this analysis with an existing condition considers annoyance due to the change in the noise environment caused by the recommended project alternatives. Figure 1 shows the FTA noise impact criteria for human annoyance. Depending on the magnitude of the cumulative noise increases, FTA categorizes impacts as (1) no impact; (2) moderate impact; or (3) severe impact. Severe impact is

[1] FTA. *Transit Noise and Vibration Impact Assessment*. USDOT Report Number FTA-VA-90-1003-06, May 2006

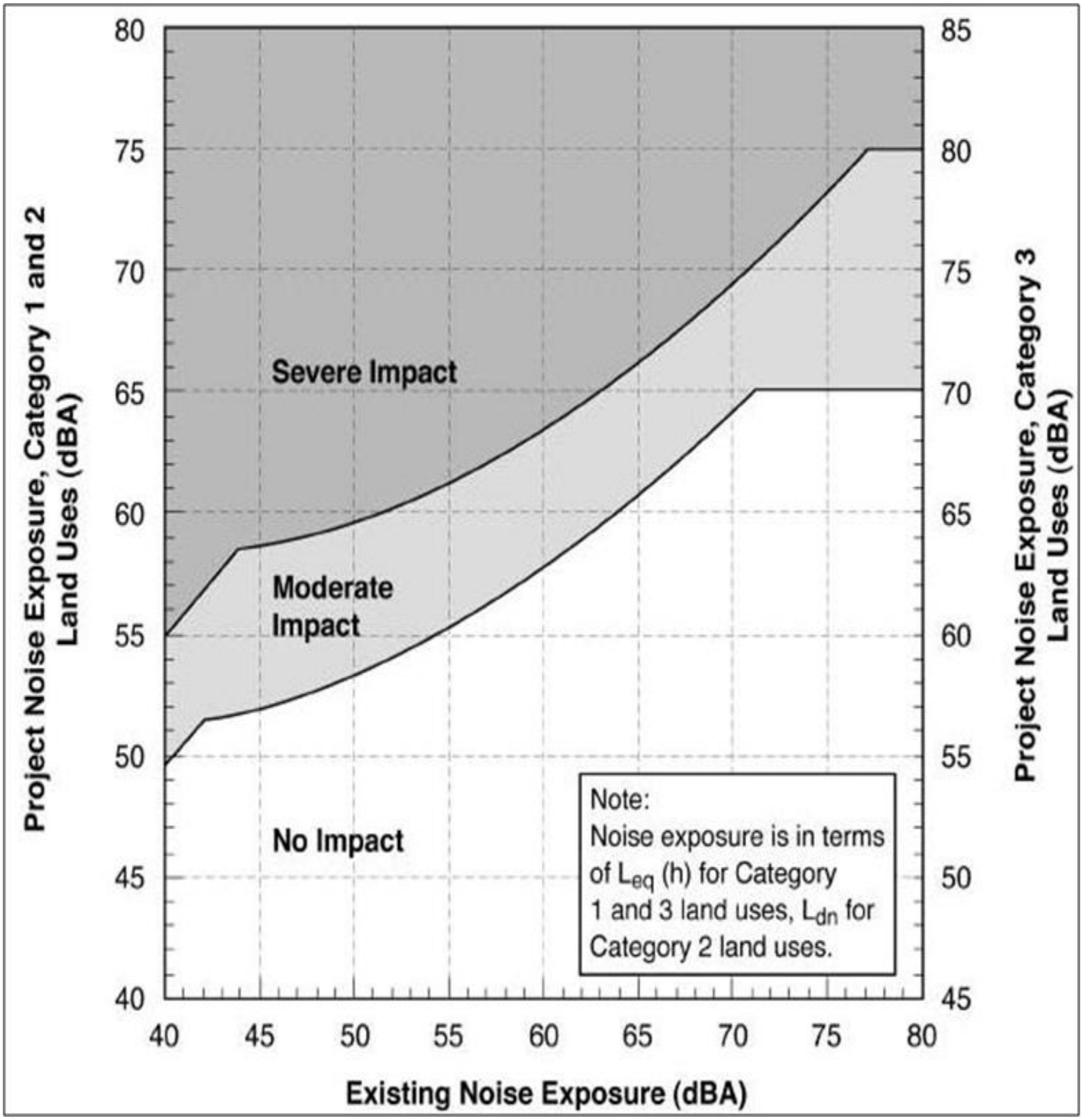
where a significant percentage of people would be highly annoyed by the project's noise. Moderate impact is where the change in cumulative noise levels would be noticeable to most people, but may not be sufficient to generate strong, adverse reactions.

Table 1
FTA Noise-Sensitive Land Uses

Land Use Category	Noise Metric, dBA	Land Use Category
1	Outdoor $L_{eq(h)}$[(a)]	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, such as outdoor amphitheaters, concert pavilions, and National Historic Landmarks with significant outdoor use.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes and hospitals, where nighttime sensitivity to noise is of utmost importance.
3	Outdoor $L_{eq(h)}$[(a)]	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches, where it is important to avoid interference with such activities as speech, meditation, and concentration. Buildings with interior spaces where quiet is important, such as medical offices, conference rooms, recording studios, and concert halls fall into this category, as well as places for meditation or study associated with cemeteries, monuments, and museums. Certain historical sites, parks, and recreational facilities are also included.

Source: FTA 2006
(a)L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.

Figure 1
FTA Noise Impact Criteria



Source: FTA 2006

In addition to monitored existing background noise levels, the following assumptions and methodologies were used to establish existing noise levels along the alignment for all alternatives:

- Freight Train Noise – Calculations were based on the FTA Guidance Manual for train operations including warning horns, and the freight operation condition assumptions based on 2012 operations:

    - Operations – 3 through-freight trains per day (2 trains during daytime hours [7:00 am to 10:00 pm] and 1 train during nighttime hours [10:00 pm to 7:00 am]).

    - Speeds – 40 mph.

    - Length – 2 locomotives and 130 freight cars per train (1 train each during daytime and nighttime hours) and 1 locomotive and 30 freight cars per train (1 train during daytime hours); length of each locomotive of 89 feet; length of each freight car of 79 feet; total train set length of approximately 10,448 feet for 2 locomotives and 130 freight cars and 2,460 feet for 1 locomotive and 30 freight cars.

    - Horns – ¼-mile from each crossing affected by warning horns.

- Freight Train Crossing Signal Noise – The crossing signal noise would be more than 10 dBA less than the warning horn noise at the same receiver. According to the FTA guidelines, horns generate sound exposure levels of 110 dBA at 50 feet while a 2-minute crossing signal generates a sound exposure level of 94 dBA at 50 feet. Therefore, the crossing signal noise was considered negligible and it was not included in the existing noise calculation.

In addition, the following assumptions were used for the operational noise assessment for the inclusion of passenger train service, based on the design characteristics of the recommended project alternatives:

- Passenger Train Noise – Calculations were based on the FTA Guidance Manual for train operations including warning horns, and the following assumptions:

    Nashua Minimum Rail Service

    - Operations – 7 roundtrips per day between Lowell and South Nashua.

    - Speeds – 60 mph maximum.

    - Length – 1 locomotive per train; length of each locomotive of 89 feet; 9 passenger cars per train; length of each passenger car of 85 feet; total train set length of approximately 854 feet.

    - Horns – ¼-mile from each grade-crossing affected by warning horns, with 10 grade-crossings along the corridor.

    These assumptions result in predicted levels of 59 dBA L_{dn} at 50 feet between Lowell and Nashua for the passenger trains without horns.

- Crossing Signal Noise – For the reasons referenced above, the crossing signal noise would be negligible when compared to warning horn noise. Therefore, it was excluded from the noise calculations.

- Crossover Noise – The noise level would be greater with a train passing by at full speed compared with that for a train slowing down and traversing crossovers. Crossovers are switches that allow a train to move from one track to an adjacent track. There is noise generated by the train's steel wheels passing through these comparatively rough sections of track. Also, crossovers will be used infrequently by the passenger trains. Therefore, the worst-case scenario was taken into account and crossover noise was excluded from the noise calculations.

  Further, it was assumed that the rail track will be a combination of ballast and slab track with continuous welded rail, consistent with the assumptions in the FTA Guidance Manual and that there will be no change to the location of any of the existing at-grade-crossings and, therefore, no change to locations where the freight and passenger trains will sound their horns.

Manchester Regional Commuter Rail Service

- Operations – 17 roundtrips per day between Lowell and Nashua, 8 roundtrips per day between Nashua and Manchester.
- Speeds – 70 mph maximum.
- Length – 1 locomotive per train; length of each locomotive of 89 feet; 9 passenger cars per train; length of each passenger car of 85 feet; total train set length of approximately 854 feet.
- Horns – ¼-mile from each grade-crossing affected by warning horns, with 26 grade-crossings along the corridor.

These assumptions result in predicted levels of 65 dBA L_{dn} at 50 feet between Lowell and Nashua and 64 dBA L_{dn} at 50 feet between Nashua and Manchester for the passenger trains without horns.

Intercity 8 Rail Service

- Operations – 4 roundtrips per day between Lowell and Concord.
- Speeds – 70 mph maximum.
- Length – 1 locomotive per train; length of each locomotive of 89 feet; 9 passenger cars per train; length of each passenger car of 85 feet; total train set length of approximately 854 feet.
- Horns – ¼-mile from each grade-crossing affected by warning horns, with 48 grade-crossings along the corridor.

These assumptions result in predicted levels of 57 dBA L_{dn} at 50 feet between Lowell and Manchester and 59 dBA L_{dn} at 50 feet from Manchester to Concord for the passenger trains without horns. Although there is one set of 4 roundtrips over the entire corridor for this alternative, the L_{dn} is higher between Manchester and Concord because there are nighttime (10:00 pm to 7:00 am) operations that transition to daytime (7:00 am to 10:00 pm) operations between Lowell and Manchester since the operations begin at 6:30 am each day in Concord.

1.4 OPERATIONS VIBRATION

Ground-borne vibration impacts from new rail operations inside vibration-sensitive buildings are defined by the vibration velocity level, expressed in terms of VdB, and the number of vibration events per day of the same kind of source. Table 2 summarizes vibration sensitivity in terms of the three land use categories and the criteria for acceptable ground-borne vibrations and acceptable ground-borne noise. Ground-borne noise is a low-frequency rumbling sound inside buildings, caused by vibrations of floors, walls, and ceilings. Ground-borne noise is generally not a problem for buildings near railroad tracks at- or above-grade, because the airborne noise from trains typically overshadows the effects of ground-borne noise. Ground-borne noise becomes an issue in cases where airborne noise cannot be heard, such as for buildings near tunnels.

The FTA provides guidelines to assess the human response to different levels of ground-borne vibration, as shown in Table 2. These levels represent the maximum vibration level of an individual train pass-by. A vibration event occurs each time a train passes the building or property and causes discernible vibration. “Frequent Events” are more than 70 vibration events per day, and “Infrequent Events” are fewer than 30 vibration events per day.

Table 2 includes separate FTA criteria for ground-borne noise (the "rumble" that radiates from the motion of room surfaces in buildings from ground-borne vibration). Although the criteria are expressed in dBA, which emphasizes the more audible middle and high frequencies, the criteria are significantly lower than airborne noise criteria to account for the annoying low-frequency character of ground-borne noise.

Table 2
FTA Ground-Borne Vibration and Ground-Borne Noise Operations Impact Criteria

Land Use Category	Ground-Borne Vibration Impact Criteria (VdB relative to 1 µin/sec[e])			Ground-Borne Noise Impact Criteria (dB re 20 µPa[f])		
	Frequent Events[a]	Occasional Events	Infrequent Events[b]	Frequent Events[a]	Occasional Events	Infrequent Events[b]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB[c]	65 VdB[c]	65 VdB[c]	NA[d]	NA[d]	NA[d]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Source: FTA 2006
(a) Frequent Events is defined as more than 70 vibration events per day.
(b) Infrequent Events is defined as fewer than 30 vibration events per day.
(c) This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the heating, ventilating and air conditioning systems, and stiffened floors.
(d) Vibration-sensitive equipment is not sensitive to ground-borne noise.
NA = Not Applicable
(e) micro inches per second, which is the FTA standard vibration velocity unit for vibration assessment
(f) standard reference for decibels in sound pressure level (the threshold pressure of human hearing) - 20 micro Pascals. Micro is 10 to the (-6) power

Because airborne noise often masks ground-borne noise for above-ground (i.e., at-grade or viaduct) trains, ground-borne noise criteria apply primarily to operations in a tunnel, where airborne noise is not a factor. The recommended project alternatives within the rail corridor from Lowell to Concord are planned to be at-grade only. As a result, ground-borne noise criteria are not expected to be issues for the recommended project alternatives. Further, for the recommended project alternatives, the impact criteria are based on "Infrequent Events" since they would not exceed 70 train events per day.

Rail operation noise and vibration levels were projected using current New Hampshire Department of Transportation (NHDOT) operation and plans for growth and the prediction models provided in the FTA Guidance Manual. Potential noise and vibration impacts were also evaluated in accordance with the FTA Guidance Manual. The assumptions for train operations are listed above (Section 1.3).

Analysts tabulated projected noise and existing ambient noise exposures at the identified receptors or clusters of receptors. The analysts determined the levels of impact (no impact, moderate impact, or severe impact) by comparing the existing and projected noise exposure based on the impact criteria shown in Figure 1.

1.5 STATION NOISE

A total of four new stations along the Project alignment are planned in the cities of Concord, Manchester, Bedford (Manchester-Boston Regional Airport), and Nashua. For each city, the recommended project alternatives were analyzed. Noise from each station would include train idling, warning horns, and auxiliary equipment. In addition, the speed of each train would be reduced around each station when compared with that of a train pass-by.

When a train slows down near a station, train pass-by noise levels will be reduced. However, the use of warning horns needs to be taken into account when trains approach (within ¼-mile of) each grade-crossing or station regardless of the train speed. Other station noise sources are considered negligible in the locations of the recommended project alternatives for Concord, Manchester, and Nashua, each of which being situated in highly-developed, urban areas with elevated ambient sound levels already existing, as well as in Bedford, New Hampshire, since that station is near the Manchester Boston Regional Airport. Other noise sources are less than horn noise at all locations by more than 10 dBA, in accordance with reference source noise levels in the FTA manual.

1.6 TRAFFIC NOISE

The criteria for highway noise impacts (relevant to the extent the recommended project alternatives cause changes in traffic patterns) are from the Federal Highway Administration (FHWA) Procedures for Abatement of Highway Traffic Noise and Construction Noise, as provided in 23 CFR Part 772. A Type 1 project is defined in 23 CFR Part 772 as a proposed federal or federal-aid highway project for the construction of a highway at a new location or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes. FHWA requires identifying highway traffic noise impacts and examining potential abatement measures for all Type 1 projects receiving federal funds.

The recommended project alternatives will involve traffic increases to local roads, mainly around new stations, without any major changes to the existing roadway designs anticipated, so this would not be classified as a Type 1 project. Therefore, the traffic noise criteria for the recommended project alternatives would be the same as the FTA criteria presented in Figure 1.

1.7 CONSTRUCTION NOISE

Table 3 shows the FTA general assessment criteria for construction noise. The general assessment criteria for construction noise prescribe different levels for daytime and nighttime construction. Daytime is defined as 7:00 am to 10:00 pm and nighttime is defined as 10:00 pm to 7:00 am. For the purpose of this analysis, construction noise impacts and distances to the 90 dBA and 80 dBA 1-hour L_{eq} noise contours were calculated for construction activities, including train corridors and stations. The construction noise limits are normally assessed at the noise-sensitive receiver property line.

Table 3
General Assessment Criteria for Construction Noise

Land Use	One-Hour L_{eq} (dBA)	
	Daytime	Nighttime
Residential	90	80
Commercial	100	100
Industrial	100	100

Source: FTA 2006

The construction noise impact assessment used the general assessment methodology described in the FTA Guidance Manual. For this analysis, construction equipment for the rail corridor and stations are based on general assumptions for railroad construction. The construction noise methodology includes the following:

- Noise emissions from equipment expected to be used by contractors for corridor and station construction.
- Typical railroad construction equipment expected to be used by contractors.
- Two of the noisiest pieces of construction equipment per construction phase for corridor and station construction.
- Relationship of the construction operations to nearby noise-sensitive receptors.

Table 3 lists FTA criteria for the maximum acceptable 1-hour noise levels (L_{eq}) for daytime and nighttime.

1.8 CONSTRUCTION VIBRATION

The FTA Guidance Manual provides the basis for the construction vibration assessment.

FTA provides construction vibration criteria designed primarily to prevent building damage, and to assess whether vibration might interfere with vibration-sensitive building activities or temporarily annoy building occupants during the construction period. The FTA criteria include two ways to express vibration levels – (1) root-mean-square (RMS) VdB (L_v) for annoyance and activity interference; and (2) peak particle velocity (PPV), which is the maximum instantaneous peak of a vibration signal used for assessments of damage potential.

Table 4 shows the FTA building damage criteria for construction activity; the table lists PPV limits for four building categories. These limits are used to estimate potential problems that should be addressed during final design.

The FTA Guidance Manual provides the methodology for the assessment of construction vibration impact. Typical construction equipment included in the FTA Guidance Manual was used to conduct a quantitative construction vibration assessment where vibration-sensitive receptors were within the study area. Criteria for annoyance (see Table 2) and damage (see Table 4) were applied to determine construction vibration impacts.

Table 4
Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate L_v (VdB)
I. Reinforced concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: FTA 2006

SECTION 2 AFFECTED ENVIRONMENT

The affected environment follows the recommended project alternatives from Lowell, MA to Concord, NH within the existing freight rail corridor, as well as the recommended project alternatives for the stations in Nashua, Bedford, Manchester, and Concord. This region includes areas and communities within Middlesex County in Massachusetts and Hillsborough and Merrimack Counties in New Hampshire. These areas are mixed in terms of rural, residential, commercial, and industrial with isolated residential clusters considered to be suburban in nature, except for the downtown urban areas of Lowell, Nashua, Manchester, and Concord.

The recommended project alternative for each proposed station location falls within the urban areas of the cities of Lowell, Nashua, Manchester, and Concord. There are no applicable plans or policies for the region as a whole pertaining to noise and vibration within the rail corridor.

2.1 EXISTING NOISE LEVELS

Background noise monitoring was performed at 10 representative residential locations closest to the proposed Capitol Corridor rail line between Lowell, MA and Concord, NH. Each of the monitoring locations was in a concentrated residential community adjacent to the existing tracks. Roughly 24 hours of continuous data were recorded at each monitoring location, although the monitoring sessions were cut short to 22 hours for half of the sites due to steady rainfall occurring at the end of the those sessions.

Monitoring was performed between November 20 and 22, 2013 at the ten representative locations. Figure 2 shows these locations on a map of the entire study area. Each of these locations provides background sound levels representative of the closest residential communities to the project alignment. These locations were on residential properties adjacent to the rail line, all with a line-of-site to the rail line. These locations are:

1. 44 Elgin Street, Nashua, NH
2. 76 Gillis Street, Nashua, NH
3. 101 Atherton Avenue, Nashua, NH
4. 21 Cassandra Lane, Nashua, NH
5. 23 Caldwell Lane, Merrimack, NH
6. 13 Monadnock Lane, Merrimack, NH
7. 45 Bourne Drive, Bedford, NH
8. Colonial Village Apartments, behind building 145 (at southern end of parking lot closest to the rail), West River Road, Manchester, NH
9. 11 Lafond Avenue, Hooksett, NH

10. Williamsburg II development off Wellman Avenue, behind Unit 897, Chelmsford, MA

The weather conditions during the entire monitoring period were favorable for the sound level measurements with no precipitation, light winds (less than 10 miles per hour), and temperatures in the mid-20s at night to the mid- to upper-30s during daylight hours, all in degrees Fahrenheit until the morning of November 22, when it rained. Five sound monitors were used for these sessions – three Larson Davis Model 820 Type 1 (re ANSI S1.4-1983) sound level meters (serial numbers 1651, 1652, and 1655), a Larson Davis Model 720 Type 2 sound level meter (serial number 0395), and a Larson Davis Model 712 Type 2 sound level meter (serial number 0418). All meters were field-calibrated before and after the sessions with a Larson Davis Model CAL200 calibrator (serial number 5789). All instruments had been factory-calibrated within 12 months of their use and copies of their calibration certificates are in the project files. All measurement procedures were in accordance with standard industry-accepted practices. Photographs of the noise monitoring equipment were taken at each monitoring location. These photographs, showing the sound level meters with respect to the project site and nearby residential properties, are included in the Appendix to this report. Monitoring datasheets and instrument calibration certificates are available in the project files.

Day-night average noise levels (L_{dn}) measured at each of these sites are listed in Table 5.

Table 5
Monitored L_{dn} at Noise Monitoring Locations

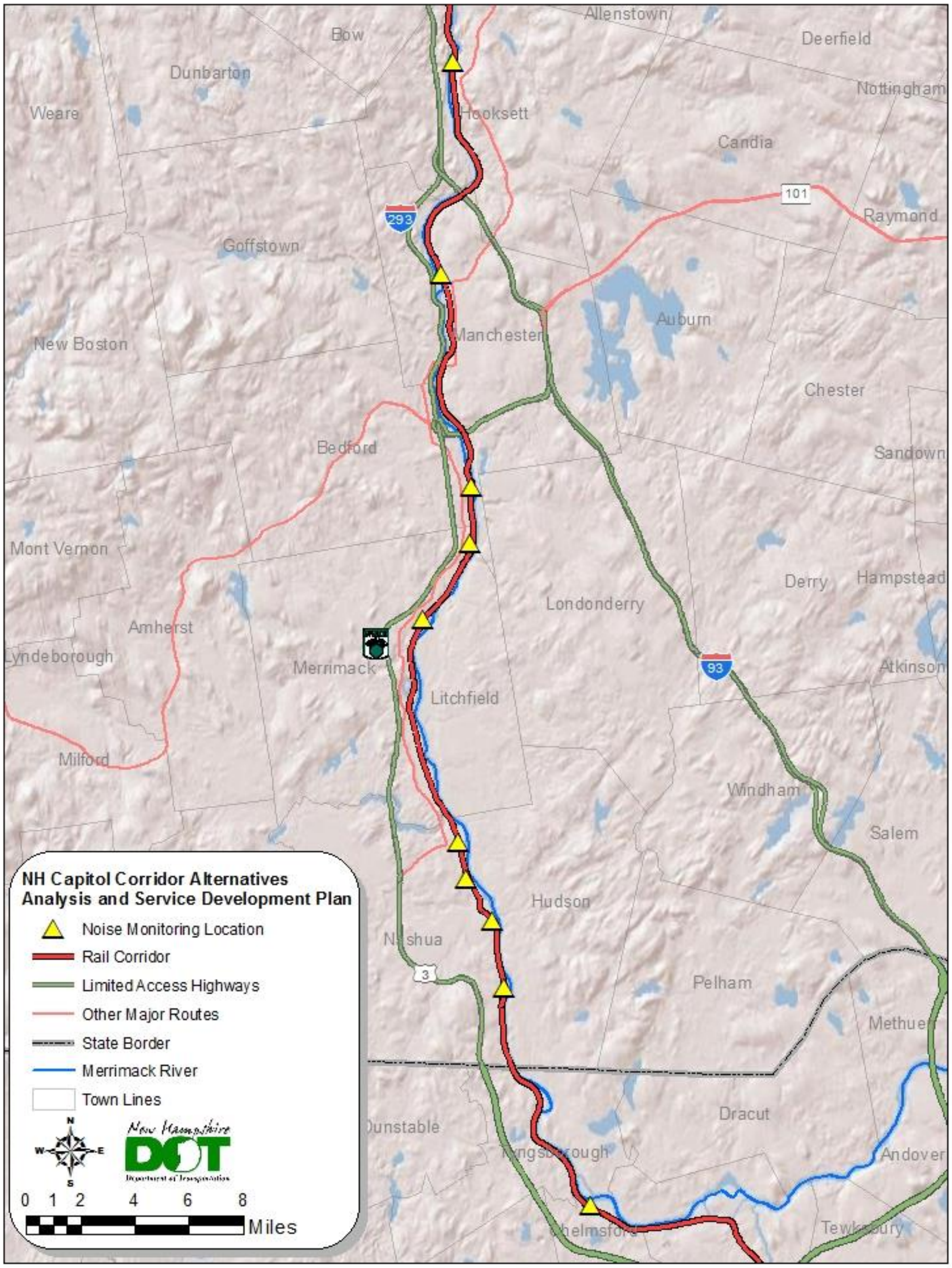
Noise Monitoring Location	Monitored L_{dn} (dBA)
1 – Elgin Street, Nashua	67*
2 – Gillis Street, Nashua	59
3 – Atherton Avenue, Nashua	50
4 – Cassandra Lane, Nashua	53
5 – Caldwell Lane, Merrimack	53
6 – Monadnock Lane, Merrimack	54
7 – Bourne Drive, Bedford	61**
8 – Colonial Apts., Manchester	59
9 – Lafond Avenue, Hooksett	56
10 – Williamsburg II, Chelmsford	59

*** - level elevated due to nighttime train operations**
**** - level elevated due to aircraft flyovers from Manchester airport**

In general, freight trains would generate 67 dBA L_{dn} at 50 feet from the rail tracks without horns. The noise level would drop off at a rate of 4.5 dBA per doubling of distance, per the FTA Guidance Manual. The warning horn noise level would be 74 dBA L_{dn} at 50 feet from the rail centerline within ¼-mile of each grade-crossing.

Warning horns would be the dominant noise sources when receptors are near grade-crossings. When receptors are not near grade-crossings, the dominant noise sources would be passing freight trains, passenger trains, or vehicular traffic.

Figure 2
Project Study Area with Noise Monitoring Locations



2.2 EXISTING VIBRATION LEVELS

Unlike the FTA noise impact assessment method, train-related vibration impact thresholds are not dependent upon existing ground-borne vibration levels, so the documentation of existing ground-borne vibration levels is not an issue as it is for noise levels.

As a reference, the existing freight trains generate 82 VdB at 50 feet when they operate at 40 mph. This reference is based on the methodology described in the FTA Guidance Manual.

SECTION 3 ENVIRONMENTAL CONSEQUENCES

3.1 OPERATIONS NOISE IMPACTS

No noise impacts would result from the No-Build Alternative in that this scenario maintains freight operations within the corridor with no projected and planned annual growth.

For the recommended project alternatives, analysts assessed noise impacts for noise-sensitive land uses based on a consideration of existing (2013) noise levels as measured at representative locations along the corridor, together with calculated future levels per the FTA Guidance Manual, which requires that impacts be considered based on the future project-generated levels resulting from the implementation of the recommended project alternatives. For this analysis, the recommended alternatives being considered are the Nashua Minimum Commuter Rail Service (with passenger service between Lowell and South Nashua), the Manchester Regional Commuter Rail Service (with passenger service between Lowell and Manchester), and the Intercity 8 Rail Service (with passenger service between Lowell and Concord).

Table 6 summarizes potential noise impacts related to the Nashua Minimum Commuter Rail Service Alternative by county, without mitigation, during the build-out year (2023).

Table 6
Summary of Unmitigated Noise Impact Results
Nashua Minimum Commuter Rail Service Alternative

County	Number of Severe Impact Parcels					Number of Moderate Impact Parcels				
	Residential Single Family	Residential Multi Family		Institutional	Recreational	Residential Single Family	Residential Multi Family		Institutional	Recreational
Middlesex (MA)	29	39		0	0	43	16		1	1
Hillsborough (NH)	0	0		0	0	0	0		0	0
Merrimack (NH)	0	0		0	0	0	0		0	0

Source: URS Corporation, 2014

Table 7 summarizes potential noise impacts related to the Manchester Regional Commuter Rail Service Alternative by county, without mitigation, during the build-out year (2023).

Table 7
Summary of Unmitigated Noise Impact Results
Manchester Regional Commuter Rail Service Alternative

County	Number of Severe Impact Parcels					Number of Moderate Impact Parcels				
	Residential Single Family	Residential Multi Family		Institutional	Recreational	Residential Single Family	Residential Multi Family		Institutional	Recreational
Middlesex (MA)	**53**	**50**		**1**	**1**	**85**	**63**		**0**	**3**
Hillsborough (NH)	**468**	**57**		**0**	**0**	**273**	**25**		**2**	**2**
Merrimack (NH)	**0**	**0**		**0**	**0**	**0**	**0**		**0**	**0**

Source: URS Corporation, 2014

Table 8 summarizes potential noise impacts related to the Intercity 8 Service Alternative by county, without mitigation, during the build-out year (2023).

Table 8
Summary of Unmitigated Noise Impact Results
Intercity 8 Service Alternative

County	Number of Severe Impact Parcels					Number of Moderate Impact Parcels				
	Residential Single Family	Residential Multi Family		Institutional	Recreational	Residential Single Family	Residential Multi Family		Institutional	Recreational
Middlesex (MA)	**2**	**0**		**0**	**0**	**47**	**50**		**1**	**1**
Hillsborough (NH)	**58**	**13**		**0**	**0**	**503**	**46**		**0**	**0**
Merrimack (NH)	**2**	**0**		**0**	**0**	**54**	**5**		**0**	**0**

Source: URS Corporation, 2014

All of the predicted impacts under all three alternatives take into account the effects of horn soundings from the trains within ¼-mile of each grade-crossing approach. As explained in the Mitigation Section (Section 4), however, the impacts of such horns could be eliminated through the introduction of stationary wayside horns at affected grade-crossings as a committed mitigation measure for severe and unmitigated impacts under all of the recommended project alternatives.

3.2 OPERATIONS VIBRATION IMPACTS

A vibration impact general assessment was conducted based on information in the FTA Guidance Manual. The factors considered in a general assessment include train speed, train-set, track system/support, track structure, propagation characteristics, coupling-to-building foundation, and type of building/receiver location in a building. Because any impacts would be relatively close to the tracks, a general soil type assumption was used and is appropriate for the level of detail of this analysis.

For the operation of the recommended project alternatives, none of the residential buildings in the study area would experience levels exceeding the FTA limits of 80 VdB for ground borne vibration and 43 dBA for ground borne noise. Likewise, no institutional buildings in the study area would experience levels exceeding the FTA limits of 83 VdB and 48 dBA (see Table 2). However, since there are planned to be more than 30 (but less than 70) operations in the segment of the Manchester Regional Commuter Rail Service Alternative between Lowell and South Nashua, the limit would be lowered from 80 VdB to 75 VdB in that area. This results in 77 single family residences and 42 multifamily residences being within the annoyance impact limit (see Table 2). These impacts could be eliminated by removing two round trips from the schedule for that alternative. In that case, as the above analysis indicates, none of the alternatives considered would be expected to result in operational vibration impacts.

3.3 STATION NOISE IMPACTS

A total of four proposed stations along the Project alignment are planned in the cities of Nashua, Bedford (at the MHT airport), Manchester, and Concord, New Hampshire as part of the recommended project alternatives**.** Each station location is in a highly developed urban area with predicted existing noise levels in the 65 to 70 dBA L_{dn} range at the closest residences. Noise from each station would include train idling, warning horns, and auxiliary equipment. In addition, the speed of each train would be reduced around the stations when compared to that for a train pass-by.

The dominant noise source near each station will be the warning horn. When a train slows down near a station, train pass-by noise will be reduced. However, the warning horn will be used when a train approaches each station regardless of the train speed. There are no noise- or vibration-sensitive parcels within 500 feet of any of the proposed station sites to be impacted by the station noise, including horn soundings. Therefore, station noise is considered negligible and not included in the impact calculation.

As the above analysis indicates, the recommended project alternatives would not be expected to result in noise or vibration impacts at or around the recommended station alternatives.

3.4 TRAFFIC NOISE IMPACTS

While traffic conditions will change for the roadways around the proposed stations, there are no new major roadways or roadway expansions anticipated for any of the recommended project alternatives. Because the proposed stations are located in busy downtown areas of Nashua, Bedford (at the MHT airport), Manchester, and Concord, the existing traffic volumes around the station sites are already high.

Based on the analysis completed for all alternatives considered, no traffic noise impacts are expected to be caused by traffic increases around the proposed stations.

3.5 CONSTRUCTION NOISE IMPACTS

Based on the construction noise impact criteria described in Table 3, the threshold noise levels would be 90 dBA L_{eq} for daytime hours (7:00 am to 10:00 pm) and 80 dBA L_{eq} for nighttime hours (10:00 pm to 7:00 am) for residential communities. Noise-sensitive receptors within 45 feet of construction activities would be potentially impacted during daytime hours and those within 145 feet would be potentially impacted during nighttime hours. Table 9 summarizes these impacts.

Table 9
Summary of Unmitigated Construction Noise Impact Results

County	Potential Daytime Impacts					Potential Nighttime Impacts				
	Residential Single Family	Residential Multi Family		Institutional	Recreational	Residential Single Family	Residential Multi Family		Institutional	Recreational
Middlesex (MA)	**0**	**1**		**0**	**0**	**27**	**43**		**2**	**2**
Hillsborough (NH)	**3**	**0**		**0**	**0**	**205**	**29**		**0**	**1**
Merrimack (NH)	**0**	**0**		**0**	**0**	**11**	**2**		**1**	**1**

Source: URS Corporation, 2014

Only 4 potential daytime impacts but up to 324 potential nighttime impacts have been identified as a result of the analysis conducted pursuant to the FTA guidelines. As explained in the Mitigation Section (Section 4), however, any such impact will be addressed through the introduction of committed mitigation measures under the recommended project alternative such that no significant impact would result.

3.6 CONSTRUCTION VIBRATION IMPACTS

During construction, some equipment may cause perceptible ground-borne vibrations, most notably pile driving equipment. If pile driving is used for the recommended project alternatives, it would only be for station construction. Construction equipment can produce vibration levels at 25 feet that range from 58 VdB for a small bulldozer to 112 VdB for a pile driver. Because there are receptors within the screening distances identified for construction vibration impact criteria in the FTA guidelines, the potential for vibration impacts during construction exists. These potential impacts would mostly depend on the locations of pile driving equipment (if used) associated with station construction. As explained in the Mitigation Section (Section 4), such an impact (if any) would be addressed through the introduction of committed mitigation measures under the recommended project alternative such that no significant impact would result.

SECTION 4 MITIGATION MEASURES

FTA guidance requires the consideration of mitigation measures for all severe impacts. The FTA 2006 impact assessment guide has guidelines that will be followed during construction. The following mitigation measures will be followed to address impacts that cannot be minimized or avoided by other means.

4.1 OPERATIONS NOISE

Warning horns on the trains have been calculated to generate impacts resulting from the all of the recommended project alternatives, as summarized in Tables 6, 7, and 8. If these impacts are not mitigated by separate action (such as efforts that may be undertaken independently by others), the project could mitigate these impacts with the installation of stationary wayside horns at the required grade-crossings where severe, unmitigated impacts exist. This measure would eliminate all severe noise impacts from occurring for all three of the recommended alternatives analyzed.

4.2 CONSTRUCTION NOISE

As shown on Table 9, four potential daytime impacts and 324 nighttime impacts have been identified as a result of the analysis conducted pursuant to the FTA guidelines. Construction noise will be monitored to verify compliance with the relevant noise limits. The contractor will have the flexibility to meet the FTA construction noise limits in the most efficient and cost-effective manner. In that regard, the contractor will have the flexibility of either prohibiting certain noise-generating activities during nighttime hours or by providing additional noise control measures to meet the noise limits.

To meet required noise limits, the following noise control mitigation measures will be implemented, as necessary, for nighttime and daytime:

- Install a temporary construction site sound barrier near a noise source.
- Avoid nighttime construction in residential neighborhoods.
- Locate stationary construction equipment as far as possible from noise-sensitive sites.
- Re-route construction-related truck traffic along roadways that will cause the least disturbance to residents.
- Monitor and maintain equipment to meet noise limits.
- Minimize the use of generators to power equipment.
- Limit the use of public address systems.
- Limit or avoid certain noisy activities during nighttime hours such as above-ground jackhammering and impact pile driving.

To mitigate noise related to pile driving (if needed), the use of an auger to install the piles instead of a pile driver would reduce noise levels substantially. Further, if pile driving is necessary for station construction, the time of day that the activity can occur will be limited.

Through the foregoing proposed measures, the limited and temporary construction noise impacts from the recommended project alternatives would be significantly reduced, and largely eliminated.

4.3 CONSTRUCTION VIBRATION

Because there are receptors within the screening distances identified for construction vibration impact criteria in the FTA guidelines, the potential for vibration impacts during construction exists. However, building damage from construction vibration is only anticipated from impact pile driving at very close distances to buildings. If piling occurs more than 25 to 50 feet from buildings, or if alternative methods such as push piling or auger piling can be used, impacts or damage from construction vibration is not expected to occur. Other sources of construction vibration do not generate high enough vibration levels for impacts or damage to occur. In any event, once a construction scenario has been established, preconstruction surveys are conducted at locations within 50 feet of piling to document the existing condition of buildings in case damage is reported during or after construction.

In light of the foregoing proposal to engage in alternative methods such as push piling or auger piling if and to the extent that piling must occur within 25 to 50 feet from existing buildings, impacts or damage from construction vibration are not expected to occur from the recommended project alternatives.

4.4 ADDITIONAL NOISE AND VIBRATION ANALYSIS FOLLOWING FINAL DESIGN

If final design or final specifications result in changes to the assumptions underlying the noise or vibration analyses, the Study team will reassess noise and/or vibration impacts and consider recommendations for mitigation, and provide supplemental environmental documentation, as required by FTA.

SECTION 5 SUMMARY OF POTENTIAL PROJECT IMPACTS

5.1 OPERATIONS NOISE IMPACTS

With the proposed recommended project alternatives, noise impacts are identified pursuant to the FTA guidelines. The predicted unmitigated noise impacts are due exclusively to the added warning horns from the recommended project alternatives.

With the institution of stationary wayside horns at the grade-crossings where severe, unmitigated noise impacts exist, the recommended project alternatives will have no adverse noise impact on the surrounding communities. In summary, with the institution of stationary wayside horns at the grade-crossings where severe, unmitigated impacts exist, the recommended project alternatives will have no adverse noise impact on the surrounding communities.

5.2 OPERATIONS VIBRATION IMPACTS

Due to the distance between the rail activities and the closest vibration-sensitive locations, no vibration-related impacts are anticipated with the recommended project alternatives, except for the segment between Lowell and South Nashua with the Manchester Regional Commuter Rail Service Alternative. These impacts could be mitigated by operational schedule changes.

5.3 STATION NOISE IMACTS

As the above analysis indicates, the recommended project alternatives would not be expected to result in noise or vibration impacts at or around the recommended project alternatives.

5.4 TRAFFIC NOISE IMPACTS

As outlined above, traffic noise produced by recommended project alternatives is not anticipated to cause significant impacts due to the already existing high ambient noise environment and lack of sensitive receptors in the impact range in the study area of the recommended project alternatives. There are, therefore, no significant traffic noise impacts anticipated under the recommended project alternatives.

5.5 CONSTRUCTION NOISE IMPACTS

Because the construction noise mitigation measures found above will be followed for the construction of the recommended project alternative, no noise impacts will result from the implementation of the recommended project alternative.

5.6 CONSTRUCTION VIBRATION IMPACTS

In light of the foregoing analysis showing that the construction of the recommended project alternatives is not expected to result in impacts exceeding FTA limits for residential buildings in the study area or for institutional buildings in the Project Area, there are no significant vibration impacts expected from construction of any of the recommended project alternatives.

APPENDIX

Noise Monitoring Locations

New Hampshire DOT
Department of Transportation

Site 1 – Back yard of 44 Elgin Street, view toward house from microphone

Site 1 – Back yard of 44 Elgin Street, view toward rail from microphone

Site 2 – Back yard of 76 Gillis Street, view toward house from microphone

Site 2 – Back yard of 76 Gillis Street, view toward rail from microphone

Site 3 – Back yard of 101 Atherton Avenue, view toward house from microphone

Site 3 – Back yard of 101 Atherton Avenue, view toward rail from microphone

Site 4 – Back yard of 21 Cassandra Lane, view toward house from microphone

Site 4 – Back yard of 21 Cassandra Lane, view toward rail from microphone

Site 5 – Back yard of 23 Caldwell Lane, view toward house from microphone

Site 5 – Back yard of 23 Caldwell Lane, view toward rail from microphone

Site 6 – Back yard of 13 Monadnock Lane, view toward house from microphone

Site 6 – Back yard of 13 Monadnock Lane, view toward rail from microphone

Site 7 – Back yard of 45 Bourne Drive, view toward house from microphone

Site 7 – Back yard of 45 Bourne Drive, view toward rail from microphone

Site 8 – Back lot of Colonial Village Apartments, view toward units from microphone

Site 8 – Back lot of Colonial Village Apartments, view toward rail from microphone

Site 9 – Back yard of 11 Lafond Avenue, view toward house from microphone

Site 9 – Back yard of 11 Lafond Avenue, view toward rail from microphone

Site 10 – Back yard of Williamsburg II Unit 897, view toward units from microphone

Site 10 – Back yard of Williamsburg II Unit 897, view toward rail from microphone

APPENDIX C

New Hampshire Capitol Corridor Rail and Transit Alternatives Analysis – Contamination Inventory (Nobis File No. 87290.00)

New Hampshire DOT
Department of Transportation

Memorandum

To: Carl Chamberlin, Environmental Planner, URS Corp.

From: Stan Bonis, P.G., Project Geologist; Michael Summerlin, P.E., Project Manager

Subject: N.H. Capitol Corridor Rail and Transit Alternatives Analysis – Contamination Inventory (Nobis File No. 87290.00)

Date: July 24, 2014

1.0 Introduction

Nobis Engineering, Inc. has prepared this Technical Memorandum to identify and describe environmental concerns with the potential to impact the proposed rail corridor.

1.1 Project Description

URS Corporation (URS), under contract with New Hampshire Department of Transportation (NHDOT), is preparing an Environmental Assessment (EA) for the Locally Preferred Alternative (LPA) in cooperation with the Federal Transit Administration (FTA), Federal Railroad Administration (FRA), and other relevant resource agencies. There will be one document produced by URS that:

- Updates previous work done for the FTA on service from Lowell to south Nashua;
- Assesses environmental impacts for transit alternatives from south Nashua to downtown Manchester; and
- Assesses environmental impacts for potential inter-city rail service from Boston to Concord for the FRA.

The EA will provide for scoping, public outreach, agency coordination, and preparation of required National Environmental Policy Act (NEPA) documentation for submission by the NHDOT. Data collection and impact analysis for the EA will be performed at a screening level or "high-level", with overall air and noise effects from train operations considered. If a project emerges from this study, a site-specific impact analysis and field work would be performed in the future for a Project Level NEPA document (as described in the next section). The EA will be designed to meet the following objectives:

- Determine which aspects of the proposed action have potential for social, economic, or environmental impact;

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- Identify alternatives and measures which might avoid, minimize, and/or mitigate adverse environmental impacts;

- Identify other environmental review and consultation requirements which should be performed concurrently with the EA; and

- Summarize public involvement and the results of agency coordination.

1.2 Task Objective

Nobis' task is to contribute to the environmental review and consultation requirements with respect to a review of documented environmental concerns proximal to the existing rail corridor and for ten properties proposed for construction of platforms or other support facilities. To support this objective, Nobis performed an initial environmental review of the LPA of the proposed transportation corridor from the Massachusetts border in Nashua, New Hampshire to the northern-most proposed facility in Concord, New Hampshire. The entire corridor received high-level screening of known contamination sites (Section 2.0 of this Technical Memorandum). Known and potentially contaminated sites with the potential to impact 11 proposed station stop, park and ride, and layover locations, as provided by URS, were reviewed in depth (Section 3.0 of this Technical Memorandum). It is noted that out of the 11 potential construction locations reviewed, 5 station locations and 1 layover location will ultimately be selected.

1.3 Contract Reference

This work was performed in accordance with a Master Subcontract for Services Between URS Corporation – New York and Nobis Engineering, Inc., effective January 23, 2012, and Work Authorizations NOB-2012-03, NOB-2012-04, NOB-2012-05, and NOB 2012-06 dated July 11, 2013.

2.0 High-Level Corridor Review

2.1 Description of Approach

The high-level review of the corridor provides an initial listing of the contaminated sites within 1,000 feet of the existing right-of-way. If intrusive activities are required in the right-of-way, *e.g.*, excavations that might encounter known groundwater and/or soil contamination, additional assessment of the contaminated site may be required to manage potential exposure to petroleum or hazardous substances. The NHDES OneStop Global Information System (GIS) website was used to identify contaminated sites within the 1,000-foot search distance. The website includes NHDES project sites with administrative tracking records, such as underground storage tanks (USTs) and hazardous waste generators, as well as contaminated sites with documented discharges or suspected discharges of petroleum or hazardous materials. These contaminated sites are shown on the Asbestos Disposal Sites (ADSs) and Remediation Sites GIS layers. Due to the limitations of the OneStop GIS website for this application, a conservative approach was used where interpretation of the 1,000-foot search distance was required, *i.e.*, some NHDES project sites reviewed may be greater than 1,000 feet in map distance from the existing right-of-way.

In reviewing the corridor through the OneStop GIS website, three basic assumptions were applied: 1) the Merrimack River is considered to be a contaminant migration barrier; soil and groundwater contamination are assumed to not cross the river, 2) groundwater flow within 1,000 feet of the Merrimack River is generally toward the river, and 3) sites with a status of Closed or Inactive are assumed, in the absence of other mitigating factors or information, to be in compliance with state and federal requirements with respect to soil and groundwater. It is noted that, although regulators may not require additional action, Inactive ADSs may require special management if disturbed.

Given these assumptions, the corridor was reviewed relative to the following:

Is the NHDES project site shown on the Asbestos Disposal Site or Remediation Sites GIS layers?

> If No – Not considered a contaminated site and no further review performed.
>
> If Yes – Is the contaminated site within approximately 1,000 feet of the existing rail line, as depicted in GIS?
>
> > If No – No further review.
> >
> > If Yes – Is the contaminated site on the same side of the Merrimack River as the rail right-of-way?
> >
> > > If No – No further review.
> > >
> > > If Yes – listed in Table 1; is the site status other than Closed or Inactive?
> > >
> > > > If No – No further review.
> > > >
> > > > If Yes – For contaminated sites with ongoing investigations or ongoing monitoring under a Groundwater Management Permit (GMP), is the site hydrologically upgradient of the rail right-of-way?
> > > >
> > > > > If No – No further review.
> > > > >
> > > > > If Yes – refer to discussion in Section 2.3.

2.2 List of Contaminated Sites

The contaminated sites within the 1,000-foot search radius identified in accordance with the criteria above are listed in Table 1 in Attachment A.

2.3 Summary of Concerns and Recommendations

A contaminated site with an Activity and Use Restriction (AUR) may require additional assessment to understand the extent and limitations of the AUR if intrusive activities are required in close proximity to the AUR site. Reviewing NHDES and county records to determine the location of the AUR relative to the corridor may be all that is required. If an AUR includes or abuts the right-of-way, the AUR limitations should be reviewed to determine any restrictions on disturbances and material management requirements.

Contaminated sites that are hydrologically upgradient of the corridor and are monitored under a GMP may require additional assessment if intrusive activities have the potential to encounter contaminated groundwater. The assessment may consist of as little as a review of NHDES reports available online to determine the general depth to groundwater. If excavations are anticipated that have the potential to encounter contaminated groundwater, then additional assessment of existing records may be required to determine any precautions to limit worker exposure and manage contaminated water.

Inactive ADSs do not require ongoing monitoring and generally do not have administrative limitations. In light of the asbestos disposal history in the greater Nashua area and the industrial history of the properties adjoining the rail right-of-way, appropriate precautions are advisable for any activities requiring surficial disturbance. These precautions may include the need for ADS-certified workers and consultations with NHDES and City of Nashua personnel to determine the likely presence of asbestos waste. If encountered, waste containing asbestos will require management in accordance with State and Federal requirements.

Of the contaminated sites within 1,000 feet of the corridor, 81 were identified as having the potential to impact the corridor. Table 1 includes comments regarding these 81 contaminated sites.

3.0 Constructed Facility Location Review

3.1 Description of Approach

Nobis commissioned a database report from Environmental Date Resources, Inc. (EDR) for each of the properties proposed for construction of new facilities (Target Properties), based on the coordinates and figures provided by URS. The EDR report includes a summary of environmentally-related sites identified in State and Federal environmental databases (database sites). These sources include databases that track controlled facilities and/or activities, *e.g.*, hazardous waste generators and regulated USTs with no identified violations, as well as sites with known contamination such as discharges of petroleum and/or hazardous waste, remediation activities, institutional controls as the result of discharges, and ongoing environmental monitoring due to discharges. The search radius of the database report for each Target Property conforms to ASTM 1527-13, Section 8.2.1, and is based on the approximate property or construction boundaries, as provided by URS.

For each Target Property, the detail map included in the EDR report was reviewed for indications of likely groundwater flow direction. Given the proximity of the rail corridor to the Merrimack River at all points, the groundwater flow was generally inferred to be toward the river, while recognizing that a component of groundwater flow may be in the southerly surficial flow direction of the river. This assumption of groundwater flow toward the Merrimack River was generally supported where reports or other data with interpreted flow direction were available; a southerly component is generally suggested in available reports as the distance from the river increases. Based on these assumptions, a generalized flow direction was inferred, and hydrologically upgradient and downgradient areas relative to the Target Property were defined. A portion of the detail map was then defined as the “area of potential impact” relative to the Target Property, based on applying professional experience with a variety of contaminated sites, the inferred groundwater flow direction, and the proximity of the database sites to the Target Property. This first-order review based on basic hydrogeologic principals and professional experience is considered appropriate for the purpose of this contaminated sites inventory. Recommendations for more rigorous review and assessment, based on preliminary findings and concerns, are included after the discussion of contaminated sites. For the MHT Airport / Wieczorek Drive property, defining an area of potential impact was unnecessary due to the small number of database sites identified. The EDR detail maps with the defined area of potential impact and inferred groundwater flow direction are included in Attachment A.

The database sites identified within the area of potential impact were then reviewed for the potential to be contaminated sites. For the purposes of this Technical Memo, Nobis defined contaminated sites as properties or facilities with known contamination, *e.g.*, leaking UST (LUST) sites, hazardous waste (haz waste) sites, or documentation suggesting a reasonable expectation of contamination, *i.e.*, spill sites, underground injection control (UIC) sites, disposal sites, and similar projects. Facilities tracked for administrative purpose, such as hazardous waste generators, were not considered contaminated in the absence of documentation of a discharge or unresolved violations. The exceptions to this are properties identified in the EDR Historical Cleaners database. This EDR database provides a listing of properties where dry cleaning business have been located that is based on non-environmental records, such as city directories. The halogenated volatile organic compounds associated with dry cleaning are dense, non-aqueous phase liquids (DNAPL) that have the potential for greater vertical distribution compared to petroleum products that are less dense than water. In addition to the potential for greater distribution, the potential for a Vapor Intrusion (VI) hazard to occupied buildings is generally greater for halogenated compounds. Given these factors, historical dry cleaning facilities in the defined area of potential impact were also considered for review, to the extent possible from existing records, without documentation of a discharge. It is noted that the lack of a documented discharge at a historical dry cleaning facility may be the only method of assessment for potential impact to the Target Property, *i.e.*, if a dry cleaning facility is not on record as having a discharge, it is assumed that an impact to the Target Property is unlikely.

The contaminated sites within the defined area of potential impact for each Target Property are summarized in Table 2. Contaminated sites with New Hampshire Department of Environmental Services (NHDES) identifiers were reviewed for current status on the NHDES OneStop online database. Where possible and applicable, contaminated sites with United States Environmental Protection Agency (US EPA) identifiers were reviewed via the EPA Integrated Data for Enforcement Analysis (IDEA) website. Contaminated sites other than the Target Property listed as “Closed” were assumed, in the absence of other mitigating factors or information, to be in compliance with state and federal requirements with respect to soil, groundwater, and indoor air quality and, therefore, unlikely to impact the Target Property. Based on the above, contaminated sites other than the Target Property with a status of Closed, or Inactive for ADS, were not reviewed further. Likewise, contaminated sites hydrologically downgradient of the Target Property generally are assumed not to impact the Target Property but were reviewed for factors that might contradict that assumption. The available reports and other documentation for active sites were reviewed to establish the project work phase, *i.e.,* ongoing investigation, GMP, and/or AUR.

An AUR, as defined in Code of New Hampshire Administrative Rules Chapter Env-Or 600, Part 602, Section 602.01 Activity and Use Restrictions, generally applies to sites where a contaminant source cannot be removed due limitations to access, such as a source beneath a structure, or other logistics. The AUR acknowledges that a contaminant source remains that is not an overt contact hazard under controlled conditions and establishes a defined area with limitations and restrictions to usage and activities within the AUR area. The AUR generally defines the conditions that must be met to disturb the contaminant source and how the disturbance must be managed. The AUR is recorded in the chain-of-title for the property. If an impact to groundwater has been documented relative to the source, a GMP is likely to be associated.

A GMP is effectively an AUR with respect to groundwater only. A NHDES GMP defines a Groundwater Management Zone (GMZ) for a site with groundwater contamination exceeding the limits established in Section Env-Or 603.03 Ambient Groundwater Quality Standards (AGQS). Section Env-Or 602.13 defines a GMZ as “*the subsurface volume in which the groundwater contamination associated with a discharge is contained*”. By definition, a GMP for a site confirms that the limits of groundwater contamination originating from the site, *i.e.*, the GMZ, have been identified. The GMP controls the use of groundwater within the GMZ as a drinking water source and establishes a monitoring program to track the progress of the selected remedial method, often a passive method such as natural attenuation, and confirm compliance with the GMZ with respect to the limits of contamination. The GMP may specify additional requirements such as indoor air monitoring where a VI hazard related to contaminant concentrations in groundwater has been identified. Notification of the existence of the GMP is recorded in the chain-of-title for all properties within the GMZ. It is noted that, as per NHDES policy, GMZs cannot overlap; a property cannot be in more than one GMZ. A GMP is issued for a period of five years, with renewal required every five years, and remains in effect until AGQS are met.

The GMP sites within the area of potential impact of the Target Property were reviewed to confirm that the Target Property is not within the GMZ for a site and determine if further review for a VI hazard with respect the Target Property was necessary. Likewise, other contaminated sites not categorized as Closed or Inactive were reviewed for potential impacts to the Target Properties. Comments regarding the contaminated sites are included in Table 2 and the sites identified for additional review and discussion are noted. Target Properties identified as contaminated sites and other contaminated sites identified for additional review are discussed below.

3.2 Pheasant Lane Mall Property, Nashua

3.2.1 Contaminated Sites

Refer to Table 2, Page 1, for a list of contaminated sites in the area of potential impact for the Pheasant Lane Mall Property, and the identifiers, category, and status of the contaminated sites. The assumptions discussed above and the comments in Table 2 address the necessity of further review.

3.2.2 In-Depth Review of Contaminated Sites

Pheasant Lane Mall (Target Property)

The Target Property is not depicted on historical Sanborn fire insurance maps. Aerial photographs depict undeveloped agricultural land until circa 1985. The Pheasant Lane Mall is identified as NHDES Site No. 198404009. Three spill response and two LUST projects are associated with the site; all five projects have a status of Closed. These projects are not directly associated with the portion of the property proposed for construction. The Closed status indicates that appropriate investigations and/or remedial actions have been completed and no further risk to human health and the environment is anticipated relative to the issue identified. These NHDES projects are unlikely to require additional management during construction in the defined area.

Non-Target Property Sites

No other contaminated sites were identified in the area of potential impact.

3.2.3 Summary of Potential Concerns

Based on the information available for review, no potential concerns are identified.

3.2.4 Recommended Further Action

As with any commercial transaction, the potential purchaser should complete a Phase I Environmental Site Assessment (ESA) in accordance with the practice set forth in ASTM E1527-

13 to fulfill the requirements of the EPA "all appropriate inquiries" (AAI) rule to be eligible for limitations on Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability, referred to as "landowner liability protections" (LLPs). The Phase I ESA must identify all parties relying on the assessment for eligibility for LLPs as *Users*, as defined in ASTM E1527-13, 3.2.98, and the *Users* must fulfill the *User's Responsibilities* specified in ASTM E1527-13, 6.

3.3 Hampshire Chemical Property, Nashua

3.3.1 Contaminated Sites

Refer to Table 2, Pages 1 and 2, for a list of contaminated sites in the area of potential impact for the Hampshire Chemical Target Property, and the identifiers, category, and status of the contaminated sites. The assumptions discussed above and the comments in Table 2 address the necessity of further review.

3.3.2 In-Depth Review of Contaminated Sites

<u>Hampshire Chemical Corporation (Target Property)</u>

The Hampshire Chemical Corp. property at 2 East Spit Brook Drive, formerly identified as Hampshire Chemical Co. and W.R. Grace and Co., is identified in the OneStop database as a haz waste, UIC, and LUST site. Previous reports indicate that Hampshire Chemical Co. and its successors likely operated from circa 1959 through at least circa 1990. Prior to development as Hampshire Chemical Co., the property was apparently a field and possibly an airfield.

The UIC project was Closed in 1996.

Two LUST projects are established for the site with a status of Closed for both as of 1998 and 2006. According to NHDES records, ten USTs were formerly located on the property comprising one apparently unused tank, one containing diesel fuel, one containing No. 6 fuel oil, one containing No. 2 fuel oil, one containing waste oil and five listed as containing hazardous substances.

The haz waste project has a long history of investigation and assessment dating to the late 1980s that is too voluminous to summarize in depth in this Memo. The Target Property is currently the subject of GMP GWP-198704027-N-004 issued October 31, 2012. The GMP established a GMZ comprising the Target Property and the eastern-abutting Boston and Maine Corp. property; the eastern boundary of the GMZ is the Merrimack River (see Attachment B). An array of eight groundwater monitoring wells and three locations on the banks of the Merrimack River are monitored on a biennial basis with selected samples analyzed for VOCs, 1,4-dioxane, available cyanide, ammonia, formaldehyde, and sulfate. The submittal documenting the April 2013 monitoring reported concentrations of 1,4-dioxane, formaldehyde, and sulfate exceeding the applicable AGQS and elevated concentrations of ammonia.

Site-specific VI criteria were established for the site to address ammonia and cyanide in soil and hydrogen sulfide in groundwater. The criteria were applied to the development of an AUR that includes a ±10.9-acre portion of the ±41.3-acre property. The AUR is on the northeastern portion of the property and includes ±1,708.1 linear-feet of the ±2,859.4 linear-foot eastern boundary shared with the rail right-of-way to the east. The AUR outlines permitted activities and uses, restricted activities and uses, obligations and conditions, emergency procedures, and procedures needed to change the activities and uses and to terminate the AUR. It is noted that a vapor mitigation system is required for any occupied building on the property. The AUR is recorded at the Hillsborough Registry of Deeds in Book 8119 beginning on Page 380. The AUR, including a figure depicting the restricted area, is included in Attachment B.

Non-Target Property Sites

The contaminated sites in the area of potential impact are not considered to be significant concerns relative to the Target Property.

3.3.3 Summary of Potential Concerns

The documented contamination on the Target Property, including soil and groundwater exceeding applicable standards and a VI hazard, are the primary concerns. Redevelopment of the property will require vapor mitigation for occupied structures, and likely will involve management of contaminated soil and possibly contaminated groundwater.

3.3.4 Recommended Further Action

In considering the acquisition of the Hampshire Chemical property for further redevelopment as a commuter rail platform/station, the environmental history of the property and the implications of the AUR relative to design and construction should be fully understood. Based on the extensive documentation for this site, Nobis recommends that the potential purchaser commission an environmental report to summarize the work completed to date and identify potential data gaps that might require further investigation prior to redevelopment of the property. As with any commercial transaction, the potential purchaser should complete a Phase I ESA in accordance with the practice set forth in ASTM E1527-13 to fulfill the requirements of the EPA AAI rule to be eligible for limitations on CERCLA liability, referred to as LLPs. The Phase I ESA must identify all parties relying on the assessment for eligibility for LLPs as Users, as defined in ASTM E1527-13, 3.2.98, and the Users must fulfill the User's Responsibilities specified in ASTM E1527-13, 6.

3.4 Crown Street Property, Nashua

3.4.1 Contaminated Sites

Refer to Table 2, Pages 2 and 3, for a list of contaminated sites in the area of potential impact for the Crown Street Target Property, and the identifiers, category, and status of the contaminated sites. The assumptions discussed above and the comments in Table 2 address the necessity of further review.

3.4.2 In-Depth Review of Contaminated Sites

Crown Street Property (Target Property)

The 25 Crown Street property is identified in the EDR database report as Triangle Pacific Corp. The OneStop database indicates that it is a LUST, Unsolicited Site Assessment, and Brownfields site. A Phase I/II ESA completed in March 2013 by GZA GeoEnvironmental Corp. (GZA) on behalf of the City of Nashua indicates that Armstrong Cabinet Products operated on the property at the time of the assessment. GZA reported that the property was developed circa 1870 for manufacturing of doors, windows, and similar building supplies. Similar usage continued into the 1990s. As of the date of the GZA assessment, the property was used for offices, showroom, and warehousing. NHDES records indicate that the City of Nashua subsequently acquired the Target Property. NHDES reviewed the Phase I/II ESA and concurred with the conclusion that further investigation was not warranted relative to the information gathered for the assessment.

NHDES records indicate that five USTs were formerly located on the property consisting of one No. 6 heating oil tank, one diesel tank, and three hazardous materials tanks. The LUST project appears have originated in response to the closure report for the No. 6 heating oil UST. The LUST project was closed in early 2006. As part of the Phase I/II ESA, GZA completed six soil borings with five monitoring well installations in the former UST areas. Analytical results for soil samples did not exceed applicable NHDES standards for VOCs, total petroleum hydrocarbons, polynuclear aromatic hydrocarbons, or the eight Resource Conservation and Recovery Act (RCRA 8) metals arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Analytical results for groundwater samples did not exceed applicable NHDES standards for VOCs, semi-VOCs (SVOCs), and RCRA 8 metals.

GZA's Phase I/II ESA identified Recognized Environmental Conditions (RECs), as defined in the then-current E1527-05 Section 3.2.74. The RECs included a small stockpile of suspected transite (asbestos) roofing material, fill material derived from a demolished site building with the potential to contain asbestos, a basement room of unknown historical use that was posited to potentially have contained a storage tank or oil-containing machinery, and four 55-gallon drums of unknown provenance, the presence of which was apparently unknown to site personnel.

The EDR report cites a record of inspection No. 19891120NH007 1 in the FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) / TSCA (Toxic Substances Control Act) Tracking System (FTTS). The system tracks regulatory inspections in regions and states with cooperative agreements, enforcement actions, and settlements. The record apparently references a Section 6 PCB State-conducted PCB (polychlorinated biphenyl) inspection on November 20, 1989. The record notes a violation. No other records were identified in the NHDES database referencing inspection No. 19891120NH007 1. A corresponding reference (with no indication of a violation) was identified in an EPA Facility Registry Service (FRS) Facility Detail Report available online. No additional details were available on the EPA website. Given the database and the lack of any additional records pertaining to this inspection, it is likely that it refers to an administrative violation such as labeling or record keeping. No other records pertaining to PCBs on the Target Property were identified. While the presence of PCBs in fluorescent light ballasts and older transformers is common, no information has been identified to suggest other PCB usage on the Target Property.

No further information regarding the Brownfields designation or determination of eligibility was identified in the records reviewed.

<u>Non-Target Property Sites</u>

The contaminated sites in the area of potential impact are not considered to be significant concerns relative to the Target Property.

3.4.3 Summary of Potential Concerns

The Target Property and vicinity has been developed for industrial use since prior to circa 1885, as documented by historical Sanborn fire insurance maps. Documented property usage nearby has included machine shops, a steam boiler works, and rail.

There is no documentation of current soil and groundwater contamination exceeding applicable standards, although it is noted that the halogenated compound trichloroethene (TCE) was detected in two groundwater samples at concentrations of 3.3 parts per billion (ppb) and 2.9 ppb; the NHDES AGQS for TCE is 5 ppb. The TCE was detected in a groundwater sample from a monitoring well sidegradient to the historical dry cleaner at 18 Arlington Street. Additionally, although the existing analytical data for soil do not exceed applicable standards, it is likely that redevelopment activities may expose soil requiring assessment and management. Based on the industrial development history of the site and general vicinity, the presence of petroleum and halogenated VOCs, PAHs related to coal use in the past, PCBs, and elevated metals concentrations is possible. The greater Nashua area has a history of asbestos disposal activities and the presence of as-yet unidentified fill containing asbestos is possible. It is further noted that GZA's Phase II activities were limited to assessing the former UST areas.

3.4.4 Recommended Further Action

The RECs identified in the Phase I/II ESA should be addressed either through additional assessment or clean-up, if they have not already been resolved. Given the industrial history of the Target Property and vicinity, additional Phase II investigation focused on assessing the property for potential materials management and/or clean-up during redevelopment appears to be prudent. As with any commercial transaction, the potential purchaser should complete a Phase I ESA in accordance with the practice set forth in ASTM E1527-13 to fulfill the requirements of the EPA AAI rule to be eligible for limitations on CERCLA liability, referred to as LLPs. The

Phase I ESA must identify all parties relying on the assessment for eligibility for LLPs as Users, as defined in ASTM E1527-13, 3.2.98, and the Users must fulfill the User's Responsibilities specified in ASTM E1527-13, 6.

3.5 MHT Airport / Wieczorek Drive Property, Bedford

3.5.1 Contaminated Sites

Refer to Table 2, Page 3, for a list of contaminated sites in the area of potential impact for the MHT / Wieczorek Drive Target Property, and the identifiers, category, and status of the contaminated sites. The assumptions discussed above and the comments in Table 2 address the necessity of further review.

3.5.2 In-Depth Review of Contaminated Sites

The EDR database report did not identify the Target Property as a contaminated site. The Target Property is not depicted on historical Sanborn fire insurance maps. Historical aerial photographs appear to depict the Target Property as undeveloped from 1947 through 1998. No contaminated sites requiring further review were identified.

3.5.3 Summary of Potential Concerns

No concerns relative to the Target Property were identified.

3.5.4 Recommended Further Action

As with any commercial transaction, the potential purchaser should complete a Phase I ESA in accordance with the practice set forth in ASTM E1527-13 to fulfill the requirements of the EPA AAI rule to be eligible for limitations on CERCLA liability, referred to as LLPs. The Phase I ESA must identify all parties relying on the assessment for eligibility for LLPs as Users, as defined in ASTM E1527-13, 3.2.98, and the Users must fulfill the User's Responsibilities specified in ASTM E1527-13, 6.

3.6 Manchester Wastewater Treatment Facility Property, Manchester

3.6.1 Contaminated Sites

Refer to Table 2, Page 3, for a list of contaminated sites in the area of potential impact for the Manchester Wastewater Treatment Facility Property, and the identifiers, category, and status of the contaminated sites. The assumptions discussed above and the comments in Table 2 address the necessity of further review.

3.6.2 In-Depth Review of Contaminated Sites

Manchester Wastewater Treatment Facility (Target Property)

The Target Property is not depicted on historical Sanborn fire insurance maps. Aerial photographs indicate that the property was undeveloped until circa 1965. The Manchester Wastewater Treatment Facility is identified as NHDES Site No. 198509000. Four NHDES Projects are associated with the site. Three pertain to petroleum releases and one is associated with a sodium hypochlorite release. The sodium hypochlorite release is also the subject of Federal identifier DOT I-2010040279 as the result of a release to the ground surface during a delivery transfer. All NHDES Projects have a status of Closed except LUST Project 976.

A GMP is in effect for LUST Project 976; the GMZ established under the permit comprises the entire property. The available documentation indicates that the impacted area is inferred to be hydrologically downgradient relative to the rail right-of-way. The former location of the UST where the release occurred is also downgradient.

Non-Target Property Sites

The Fairpoint Communications site, NHDES Site No. 198806101, is LUST Project No. 16640 with petroleum contamination in groundwater that is monitored under a GMP. This site abuts the Target Property to the west and is inferred, in the context of the hydrogeologic setting, to be upgradient. It is noted that monitoring and investigation reports available in the NHDES OneStop database indicate a southeasterly groundwater flow direction that is inconsistent with the inferred westerly flow that is based on the proximity to the Merrimack River. Historical analytical results for groundwater samples collected from a monitoring well situated between the impacted area and the Target Property have indicated minor intermittent concentrations of petroleum compounds exceeding applicable NHDES standards. The well is no longer included in the GMP monitoring program.

3.6.3 Summary of Potential Concerns

The documented contamination on the Target Property does not appear likely to impact the proposed construction area.

In general, a GMZ implies that the limits of contamination are understood and are tracked through the GMP monitoring program. With respect to eastern-abutting Fairpoint site, the flow direction presented in historical reports appears to be inconsistent with the hydrogeologic setting. The information available for review in the OneStop database is insufficient to resolve the apparent contradiction between the inferred groundwater flow and the interpretation based on field data. If the documented flow direction is accurate, the site is unlikely to impact the Target Property. A conservative conclusion based only on the hydrogeologic setting is that construction on the Target Property has the potential to encounter groundwater contaminated with petroleum compounds at concentrations exceeding applicable NHDES standards. It is noted that NHDES appears to be in agreement with the data interpretation historically presented for the Fairpoint site, which would suggest that an impact to the Target Property is unlikely.

3.6.4 Recommended Further Action

As with any commercial transaction, the potential purchaser should complete a Phase I ESA in accordance with the practice set forth in ASTM E1527-13 to fulfill the requirements of the EPA AAI rule to be eligible for limitations on CERCLA liability, referred to as LLPs. The Phase I ESA must identify all parties relying on the assessment for eligibility for LLPs as Users, as defined in ASTM E1527-13, 3.2.98, and the Users must fulfill the User's Responsibilities specified in ASTM E1527-13, 6.

If additional records review during the Phase I ESA cannot confirm that groundwater contamination at the Fairpoint site is unlikely to be migrating onto the Target Property, the conservative approach would be to complete a Phase II ESA that would include installation of one or more monitoring wells near the Target Property / Fairpoint property boundary. Alternately, provisions for managing contaminated groundwater, if encountered during construction, could be included in construction plans.

3.7 Pine Grove Cemetery Property, Manchester

3.7.1 Contaminated Sites

Refer to Table 2, Page 3, for a list of contaminated sites in the area of potential impact for the Pine Grove Cemetery Property, and the identifiers, category, and status of the contaminated sites. The assumptions discussed above and the comments in Table 2 address the necessity of further review.

3.7.2 In-Depth Review of Contaminated Sites

Pine Grove Cemetery (Target Property)

The proposed construction area is an undeveloped portion of a larger property. The Target Property is not depicted on historical Sanborn fire insurance maps. Aerial photographs from 1952 through 2012 confirm that the proposed construction area has not been developed. The Pine Grove Cemetery is identified as NHDES site No. 199504003. LUST Project No. 5699 and On-Premises Use Facility (OPUF) Project No. 20091 both have a status of Closed. Both are related to UST installations more than one-quarter mile from the proposed construction area. Neither of these projects is likely to impact the proposed construction area.

Non-Target Property Sites

One contaminated site in the area of potential impact has a status of Closed and is not considered to be a significant concern relative to the Target Property.

3.7.3 Summary of Potential Concerns

The historical contamination on the Target Property was not near the proposed construction area and no concerns are related to the previous releases.

3.7.4 Recommended Further Action

As with any commercial transaction, the potential purchaser should complete a Phase I ESA in accordance with the practice set forth in ASTM E1527-13 to fulfill the requirements of the EPA AAI rule to be eligible for limitations on CERCLA liability, referred to as LLPs. The Phase I ESA must identify all parties relying on the assessment for eligibility for LLPs as Users, as defined in ASTM E1527-13, 3.2.98, and the Users must fulfill the User's Responsibilities specified in ASTM E1527-13, 6.

3.8 Hancock Street Property, Manchester

3.8.1 Contaminated Sites

Refer to Table 2, Page 3, for a list of contaminated sites in the area of potential impact for the Hancock Street Property, and the identifiers, category, and status of the contaminated sites. The assumptions discussed above and the comments in Table 2 address the necessity of further review.

3.8.2 In-Depth Review of Contaminated Sites

<u>Hancock Street Property (Target Property)</u>

The EDR database report did not identify the Target Property as a contaminated site. An historical Sanborn fire insurance map dated 1915 depicts the Manchester Rendering Co. on the northern portion of the Target Property adjacent to the western terminus of Hancock Street. Of note on the map is a portion of the building labeled "oil storage", presumably referencing animal byproducts, not petroleum. The notation "oleo factory" is shown in the same building area. Railroad tracks are depicted along the eastern property boundary and are depicted on all later maps. The W.H. McElwain Company "Central Plant" is depicted on the southern portion of the Target Property. Although structures are described, no buildings are depicted. It appears to be a manufacturing facility but the nature of the operations is not clear from the description on the map. The same description is included on the 1950 map with the name International Shoe Company "Central Plant". This 1950 labeling appears to be overwritten by an additional structure added to the Manchester Rendering Co., suggesting that maps are missing between 1915 and 1950. The 1954 map depicts the Manchester Rendering Co. and the notations related the "Central Plant" are not present. The maps from 1971, 1973, 1975, 1983, 1895, and 1989 depict M.R. Co., presumably referencing Manchester Rendering Co., and the buildings are either not depicted or are overwritten. Also depicted on maps from 1950 through 1989 is the Granite State Packing Co. adjoining the railroad tracks to the east. Historical aerial photographs appear to depict the Target Property as undeveloped from 1947 and 1952, however, the resolution is poor. The building on the northern portion can be seen in the 1952 image. The 1965, 1977, 1985, and 1992 images appear to depict the Target Property as vacant with the Granite State Packing Co. building adjoining to the east. A building is present on the Target Property in the 1998 image and it appears to be connected to the packing plant to the east by a structure that bridges the railroad tracks. The 2006 and 2008 images similarly depict the connected buildings. The 2009 image depicts the building on the Target Property and adjoining (and connected) building to the east is gone. The 2011 and 2012 images appear to depict the building on the Target Property gone and a new structure to the east. The aerial images appear to be generally consistent with the historical maps. The Target Property is not identified in the EDR report as a contaminated site.

Non-Target Property Sites

Three contaminated sites in the area of potential impact has the status of Closed and are not considered to be a significant concern relative to the Target Property.

3.8.3 Summary of Potential Concerns

Although the Target Property and surrounding area have been developed for industrial use since prior to 1915, the available documentation does not suggest that significant concerns have been identified.

3.8.4 Recommended Further Action

As with any commercial transaction, the potential purchaser should complete a Phase I ESA in accordance with the practice set forth in ASTM E1527-13 to fulfill the requirements of the EPA AAI rule to be eligible for limitations on CERCLA liability, referred to as LLPs. The Phase I ESA must identify all parties relying on the assessment for eligibility for LLPs as Users, as defined in ASTM E1527-13, 3.2.98, and the Users must fulfill the User’s Responsibilities specified in ASTM E1527-13, 6.

3.9 Riverwalk Way and South Commercial Street Property, Manchester

3.9.1 Contaminated Sites

Refer to Table 2, Page 4, for a list of contaminated sites in the area of potential impact for the Riverwalk Way and South Commercial Street, and the identifiers, category, and status of the contaminated sites. The assumptions discussed above and the comments in Table 2 address the necessity of further review.

3.9.2 In-Depth Review of Contaminated Sites

Riverwalk Way and South Commercial Street (Target Property)

The EDR database report did not identify the Target Property as a contaminated site. Historical Sanborn fire insurance maps from 1885 and 1891 depict railroad tracks and an engine house at the proposed construction area. Maps from 1915 through 1950 depict tracks. Maps from 1954 through 1989 depict rail facilities to the east but do not depict the proposed construction area.

Non-Target Property Sites

The historical maps generally depict the area to the east of the Target Property as commercial and industrial development. The contaminated sites identified in the database do not appear likely to impact the Target Property.

3.9.3 Summary of Potential Concerns

The Target Property was developed for rail use prior to 1885 and the general area has been developed for rail and industrial use since at least that same time period. Experience with numerous sites in the greater Manchester area generally finds urban fill containing ash in the subsurface. Numerous properties in the areas of Manchester with long industrial/commercial development histories have also been impacted by halogenated VOCs. Additionally, ash is commonly identified on properties historically used for rail facilities. While there are no overt indications of activities in the vicinity that would impact the target property, the development history suggests a potential for the presence of petroleum or hazardous substances in the subsurface.

3.9.4 Recommended Further Action

Given the development history of the Target Property and vicinity, an investigation focused on assessing the property for potential materials management and/or clean-up during redevelopment is prudent. As with any commercial transaction, the potential purchaser should complete a Phase I ESA in accordance with the practice set forth in ASTM E1527-13 to fulfill the requirements of the EPA AAI rule to be eligible for limitations on CERCLA liability, referred to as LLPs. The Phase I ESA must identify all parties relying on the assessment for eligibility for LLPs as Users, as defined in ASTM E1527-13, 3.2.98, and the Users must fulfill the User's Responsibilities specified in ASTM E1527-13, 6.

3.10 Granite Street and Canal Street Property, Manchester

3.10.1 Contaminated Sites

Refer to Table 2, Pages 4 and 5, for a list of contaminated sites in the area of potential impact for the Granite and Canal Street Target Property, and the identifiers, category, and status of the contaminated sites. The assumptions discussed above and the comments in Table 2 address the necessity of further review.

3.10.2 In-Depth Review of Contaminated Sites

Granite and Canal Streets (Target Property)

The EDR database report did not identify the Target Property as a contaminated site. The property is depicted on historical Sanborn maps dated 1885 and 1891 as rail tracks and a freight depot. An 1897 map depicts tracks only. The 1915 through 1954 maps depict rail tracks and a rail station and associated facilities. The 1971 and 1983 maps depict rail tracks and parking; the 1985 and 1989 maps depict rail tracks and a commercial building on the southern portion and parking. The building is currently occupied by Hampshire First Bank with an address of 80 Canal Street.

Non-Target Property Sites

The historical maps generally depict the area surrounding the Target Property as commercial and industrial development to the west and commercial development to the east. The contaminated sites identified in the database do not appear likely to impact the Target Property.

3.10.3 Summary of Potential Concerns

The Target Property was developed for rail use prior to 1885 and the general area has been developed for commercial and industrial use since at least that same time period. Experience with numerous sites in the greater Manchester area generally finds urban fill containing ash in the subsurface. Numerous properties in the areas of Manchester with long industrial/commercial development histories have also been impacted by halogenated VOCs. Additionally, ash is commonly identified on properties historically used for rail facilities. While there are no overt indications of activities in the vicinity that would impact the target property, the development history suggests a potential for the presence of petroleum or hazardous substances in the subsurface.

3.10.4 Recommended Further Action

Given the development history of the Target Property and vicinity, an investigation focused on assessing the property for potential materials management and/or clean-up during redevelopment is prudent. As with any commercial transaction, the potential purchaser should complete a Phase I ESA in accordance with the practice set forth in ASTM E1527-13 to fulfill the requirements of the EPA AAI rule to be eligible for limitations on CERCLA liability, referred to as LLPs. The Phase I ESA must identify all parties relying on the assessment for eligibility for LLPs as Users, as defined in ASTM E1527-13, 3.2.98, and the Users must fulfill the User's Responsibilities specified in ASTM E1527-13, 6.

3.11 Spring Street and Canal Street Property, Manchester

3.11.1 Contaminated Sites

Refer to Table 2, Page 5, for a list of contaminated sites in the area of potential impact for the Spring Street and Canal Street Property, and the identifiers, category, and status of the contaminated sites. The assumptions discussed above and the comments in Table 2 address the necessity of further review.

3.11.2 In-Depth Review of Contaminated Sites

<u>Spring Street and Canal Street (Target Property)</u>

The EDR database report did not identify the Target Property as a contaminated site. Historical Sanborn fire insurance maps from 1897 through 1975 depict an industrial canal. Maps from 1983 through 1989 depict rail tracks only. Historical aerial photographs are generally consistent with the conditions depicted on the Sanborn maps.

<u>Non-Target Property Sites</u>

The historical maps generally depict the area surrounding the Target Property as commercial and industrial development to the west and commercial development to the east. The contaminated sites identified in the database do not appear likely to impact the Target Property.

3.11.3 Summary of Potential Concerns

The Target Property was developed as an industrial canal prior to 1887 and the general area has been developed for commercial and industrial use since at least that same time period. Industrial canals have the potential to be used for inappropriate disposal of wastes. Experience with numerous sites in the greater Manchester area generally finds urban fill containing ash in the subsurface. Numerous properties in the areas of Manchester with long industrial/commercial development histories have also been impacted by halogenated VOCs. While there are no overt indications of activities in the vicinity that would impact the target property, the development history suggests a potential for the presence of petroleum or hazardous substances in the subsurface.

3.11.4 Recommended Further Action

Given the development history of the Target Property and vicinity, an investigation focused on assessing the property for potential materials management and/or clean-up during redevelopment is prudent. As with any commercial transaction, the potential purchaser should complete a Phase

I ESA in accordance with the practice set forth in ASTM E1527-13 to fulfill the requirements of the EPA AAI rule to be eligible for limitations on CERCLA liability, referred to as LLPs. The Phase I ESA must identify all parties relying on the assessment for eligibility for LLPs as Users, as defined in ASTM E1527-13, 3.2.98, and the Users must fulfill the User's Responsibilities specified in ASTM E1527-13, 6.

3.12 Stickney Avenue Property, Concord

3.12.1 Contaminated Sites

Refer to Table 2, Pages 6 and 7, for a list of contaminated sites in the area of potential impact for the Stickney Avenue Target Property, and the identifiers, category, and status of the contaminated sites. The assumptions discussed above and the comments in Table 2 address the necessity of further review.

3.12.2 In-Depth Review of Contaminated Sites

<u>Stickney Avenue Property (Target Property)</u>

The Target Property is identified as the former NHDOT facility located at 11 Stickney Avenue. The property has been a NHDOT garage, maintenance facility, and materials research facility. An historical Sanborn map dated 1928 depicts a New Hampshire State Highway Department facility constructed circa 1926. A garage, woodworking shop, auto repair shop, machine shop, and storage areas are identified on the map. The development prior to 1926 is unclear; the Sanborn maps prior to 1928 do not appear to depict the Target Property. Groundwater Technology, Inc. completed a Site Investigation (SI) Report dated January 18, 1996 that detailed current and previous activities on the property. The documented activities include warehousing, heavy and light vehicle maintenance, a sign painting shop, welding and machine shop, carpentry, materials research, and vehicle painting. A Supplemental SI completed by Nobis Engineering, Inc. in 2001 detailed storage of heating oils in 16 aboveground storage tanks (ASTs) that have existed on the property as well as motor oil and solvents contained in various sizes of drums. The SSI documented a 2,000-gallon oil-water separator and a hazardous waste storage area primarily used for waste solvents and paint shop waste including lead-based paints. A commercial truck and equipment painting operation appears to currently operate on the property.

NHDES files indicate two UIC projects that were closed as of 2007 and 2004.

A NHDES Initial Response Spill project was closed in 2000.

A NHDES OPUF project was closed in 2001.

NHDES records available for review online indicate that no USTs remain on the site. The available documentation indicates that 14 diesel and gasoline USTs have existed on the site in the past.

NHDES haz waste and LUST projects are monitored under GMP No. GWP-199004021-C-003 issued October 21, 2010. The GMP defines the GMZ as the property boundary and requires annual monitoring with samples collected from two monitoring wells analyzed for VOCs. The most recent monitoring data indicate the presence of petroleum and halogenated VOCs; only the gasoline additive methyl tertiary-butyl ether (MtBE) remains at concentrations exceeding AGQS. No VI hazard is identified.

Non-Target Property Sites

The contaminated sites in the area of potential impact are not considered to be significant concerns relative to the Target Property.

3.12.3 Summary of Potential Concerns

The Target Property has a history as a vehicle repair and machine shop facility since at least circa 1926. Sign and vehicle painting has been conducted on the property during the prior NHDOT usage and vehicle painting continues currently as a commercial operation. Based on the development history, the presence of petroleum and halogenated VOCs, PAHs related to coal use in the past, hazardous materials related to painting and solvent usage, and elevated metals concentrations in the subsurface is possible.

3.12.4 Recommended Further Action

Given the development history of the Target Property and vicinity, an investigation focused on assessing the property for potential materials management and/or clean-up during redevelopment appears to be prudent. Existing historical records should be reviewed to identify the locations of past activities that included petroleum and hazardous materials, and to determine if these areas have been assessed to date. As with any commercial transaction, the potential purchaser should complete a Phase I ESA in accordance with the practice set forth in ASTM E1527-13 to fulfill the requirements of the EPA AAI rule to be eligible for limitations on CERCLA liability, referred to as LLPs. The Phase I ESA must identify all parties relying on the assessment for eligibility for LLPs as Users, as defined in ASTM E1527-13, 3.2.98, and the Users must fulfill the User's Responsibilities specified in ASTM E1527-13, 6.

4.0 Summary and Conclusion

Of the contaminated sites identified within 1,000 feet of the corridor during the high-level review, 81 sites were identified as having the potential to impact the corridor. A contaminated site with an AUR may require additional assessment to understand the extent and limitations of the AUR if intrusive activities are required in close proximity to the AUR site. Contaminated sites that are hydrologically upgradient of the corridor and are monitored under a GMP may require additional assessment if intrusive activities have the potential to encounter contaminated groundwater. Inactive ADSs do not require ongoing monitoring and generally do not have administrative limitations. In light of the asbestos disposal history in the greater Nashua area and the industrial history of the properties adjoining the rail right-of-way, appropriate precautions are advisable for any activities requiring surficial disturbance. The need for further review and assessment of contaminated sites with the potential to impact the corridor that were identified during the high-level review is contingent on the nature of repairs and/or upgrades to the existing right-of-way.

Areas of potential impact were established for e Target Properties and Federal and State environmental databases were reviewed for sites within the defined area with a history of discharges of petroleum and hazardous substances. Where identified, these contaminated sites were assessed for the potential to impact the Target Property.

The MHT Airport / Wieczorek Drive property has no identified history of industrial or commercial development. The proposed construction area of the Pine Grove Cemetery does not appear to have been developed although the cemetery has existed since at least 1952. The Hancock Street property, the Riverwalk Way and South Commercial Street property, the Granite and Canal Street property, and the Spring Street and Canal Street Property have not been investigated relative to a documented or potential discharge, although all are in areas with historical commercial and/or industrial development. Of the Target Properties where investigations have been conducted, the Pheasant Lane Mall Property, the Crown Street property, and the Pine Grove Cemetery property are not currently monitored under institutional controls. The Manchester Wastewater Treatment Facility is monitored under a GMP. The Hampshire Chemical property is the subject of an AUR that limits activity and development. The property is also the subject of a GMP that controls groundwater usage and requires ongoing monitoring within the GMZ. The Stickney Avenue property is the subject of a GMP that controls groundwater usage and requires ongoing monitoring within the GMZ.

Of the developed properties, the Hampshire Chemical property is the most impacted. Approximately one-quarter of the property is under an AUR due to the concentrations of ammonia and cyanide in soil and hydrogen sulfide in groundwater. It is noted that some restrictions of the AUR apply to the entire property, not just the defined AUR area. The concentrations of 1,4-dioxane, formaldehyde, and sulfate in groundwater exceed applicable NHDES standards. Although NHDES does not establish a groundwater standard for ammonia, the concentrations in groundwater are elevated to the degree that a risk-based site-specific standard was defined for the Hampshire Chemical site. Site-specific VI criteria were established for the property and the AUR includes vapor mitigation requirements for construction.

The identified groundwater contamination at the Stickney Avenue property is currently limited to MtBE. Other petroleum and halogenated VOCs have been present but the concentrations are currently below applicable standards.

The Manchester Wastewater Treatment Facility is monitored as the result of a petroleum release from a UST. The impacted area appears to be hydrologically downgradient of the proposed construction area, however; the abutting, apparently hydrologically upgradient, property is also the subject of a GMP as the result of a petroleum release from a UST. There is ambiguity with respect to the groundwater flow direction inferred from the hydrologic setting and the direction interpreted from data collected at the abutting property.

Soil and groundwater assessment completed to date at the Crown Street property focused on former USTs. The analytical data available do not indicate concentrations of VOCs exceeding applicable standards. A Phase I/II ESA cited RECs identified on the property. It is noted that a REC is not necessarily a confirmation of a discharge or release but an indication of the potential for a discharge or release based on records, observations, or other information gathered during the Phase I process. The current status of the RECs is unknown. The property and vicinity have been developed for industrial/commercial use since prior to 1885.

No records of investigation or assessment of soil and groundwater at the Hancock Street, Riverwalk Way and South Commercial Street, Granite and Canal Street, and Spring and Canal Street properties have been identified. The properties and the properties nearby have been developed for industrial/commercial use since prior to 1885.

While the Pheasant Lane Mall property is heavily developed, the proposed construction area is generally south and east of the development. Likewise, the Pine Grove Cemetery property is developed, but the proposed construction area is not.

The MHT Airport / Wieczorek Drive property appears to have been undeveloped prior to the construction of Wieczorek Drive.

None of the non-Target Property contaminated sites appear to have overt potential to impact the Target Properties with the exception of the Fairpoint Communications site to the east of the Manchester Wastewater Treatment Facility. As discussed previously, the reported hydrologic gradient at this site is inconsistent with the setting. As a result, the potential for an impact to the Target Property seems to be unclear. It is noted that NHDES apparently accepts the interpretations presented in investigation and monitoring reports for the Fairpoint site and believes the extent of groundwater contamination to be defined.

As discussed in Section 3, Phase I ESAs should be completed for each property that will be acquired in order to be eligible for LLPs. If RECs are identified during the Phase I ESA process, the RECs should be addressed through clean-up or further investigation through a Phase II assessment. If a Phase I ESA does not identify data clarifying the groundwater flow direction at the Manchester Wastewater Treatment Facility property and the eastern abutting property, additional investigations, or contingencies for managing petroleum contaminated groundwater during construction, should be considered. Based on the development histories of the properties and surrounding areas, it is advisable that the Crown Street, Riverwalk Way and South Commercial Street, Granite and Canal Street, Spring and Canal Street, and Stickney Avenue properties be assessed for the presence of petroleum or hazardous substances that might require management or disposal, regardless of the findings of a Phase I ESA. Given the history and settings of these properties, assessment of subsurface conditions for the presence of VOCs, PAHs, PCBs, and RCRA 8 metals in soils is advisable. Assessment for asbestos should be considered for the Crown Street property.

Based on the extensive investigations and other activities completed at the Hampshire Chemicals property, the nature and distribution of contamination appears to be documented. A summary of the investigations completed to date should be compiled and any data gaps identified, relative to planned redevelopment. The limitations and requirements of the AUR should be considered relative to redevelopment plans. If data gaps are identified, additional investigations may be warranted.

TABLES

TABLE 1

Summary of Contaminated Sites - BLNMC Corridor

N.H. Capitol Corridor Rail and Transit Alternatives

Site Name	Site Address	State Identifiers	Site Type	Status	Comments	Additional Action/Assessment needed?
Pheasant Lane Mall	310 Daniel Webster Highway, Nashua	198404009, Project 31020	Initial Response Spill Site	Closed		no
Pheasant Lane Mall	310 Daniel Webster Highway, Nashua	198404009, Project 30532	Initial Response Spill Site	Closed		no
Pheasant Lane Mall	310 Daniel Webster Highway, Nashua	198404009, Project 9753	Initial Response Spill Site	Closed		no
Pheasant Lane Mall	310 Daniel Webster Highway, Nashua	198404009, Project 1974	LUST	Closed		no
Pheasant Lane Mall	310 Daniel Webster Highway, Nashua	198404009, Project 4125	LUST	Closed		no
Cumberland Farms 2844	308 Daniel Webster Highway, Nashua	199012002, Project 11044	UIC	Closed		no
Cumberland Farms 2532	308 Daniel Webster Highway, Nashua	199012002, Project 11044	LUST	Closed		no
Cumberland Farms 2532	308 Daniel Webster Highway, Nashua	199012002, Project 6270	Oil Spills/Releases	Closed		no
Blue Line Express (Webster Square)	260 Daniel Webster Highway, Nashua	198904055, Project 28192	ADS	Inactive		possible - refer to Section 2.3
Blue Line Express (Webster Square)	260 Daniel Webster Highway, Nashua	198904055, Project 1227	LUST	Closed		no
Blue Line Express (Webster Square)	260 Daniel Webster Highway, Nashua	198904055, Project 774	Municipal/Commercial Stump or Demo Dump	GMP	upgradient	yes
UPACO Industries, Inc.	3 East Spit Brook Drive, Nashua	198709009, Project 371	Haz Waste	Closed		no
Exxon Div. of CFI 70115	242 Daniel Webster Highway, Nashua	199307020, Project 25242	Haz Waste	unknown	monitored under Project 25242	yes - refer Section 2.3
Exxon Div. of CFI 70115	242 Daniel Webster Highway, Nashua	199307020, Project 4401	LUST	GMP	upgradient	yes - refer Section 2.3
U-Haul 79055	286 Daniel Webster Highway, Nashua	199305016, Project 4306	LUST	Closed		no
Hampshire Chemical Corporation	2 East Spit Brook Drive, Nashua	198704027, Project 142	Haz Waste	GMP, AUR	upgradient, GMZ includes rail RoW	yes (see Section 3)
Hampshire Chemical Corporation	2 East Spit Brook Drive, Nashua	198704027, Project 6129	UIC	Closed		no
Hampshire Chemical Corporation	2 East Spit Brook Drive, Nashua	198704027, Project 3318	LUST	Closed		no
Hampshire Chemical Corporation	2 East Spit Brook Drive, Nashua	198704027, Project 15065	LUST	Closed		no
Taggart Ice, Inc.	8 Taggart Drive, Nashua	199709025, Project 7267	LUST	Closed		no
Lovering Volvo	180 Daniel Webster Highway, Nashua	198906051, Project 818	Unsolicited Site Assessment	Closed		no
Nashua Waste Water Treatment Facility	1 Sawmill Road, Nashua	200104018, Project 14483	Haz Waste	Closed		no
GL & V Pulp Group, Inc.	150 Burke Street, Nashua	198904062, Project 14000	ADS	Inactive		possible - refer to Section 2.3
GL & V Pulp Group, Inc.	150 Burke Street, Nashua	198904062, Project 4324	UIC	Closed		no
GL & V Pulp Group, Inc.	150 Burke Street, Nashua	198904062, Project 11411	Initial Response Spill Site	Closed		no
GL & V Pulp Group, Inc.	150 Burke Street, Nashua	198904062, Project 3792	Haz Waste	GMP	upgradient	yes - refer Section 2.3
GL & V Pulp Group, Inc.	150 Burke Street, Nashua	198904062, Project 781	LUST	GMP. monitored under Project 3792		yes - refer Section 2.3
Roussell Park	Haines Street, Nashua	200202018, Project 14004	ADS	Inactive		possible - refer to Section 2.3
Roussell Park	Haines Street, Nashua	200202018, Project 11739	Existing Landfill or Landfill Closure	GMP	upgradient	yes - refer Section 2.3
McElligott Residence	83 Gillis Street, Nashua	200906008, Project 21767	Meth Lab with Contamination / waste from illegal lab	unclear	upgradient	no
Gardiner Memorial Field	Bowers Street, Nashua	200502039, Project 14426	ADS	Inactive		possible - refer to Section 2.3
128 Bowers Street	128 Bowers Street, Nashua	200410094, Project 14013	ADS	Inactive		possible - refer to Section 2.3

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Summary of Contaminated Sites - BLNMC Corridor

N.H. Capitol Corridor Rail and Transit Alternatives

Site Name	Site Address	State Identifiers	Site Type	Status	Comments	Additional Action/Assessment needed?
Robert Voyer	26 Arlington Street, Nashua	199507013, Project 5854	OPUF	Closed		no
49 Gillis Street	49 Gillis Street, Nashua	200410086, Project 14005	ADS	Inactive		possible - refer to Section 2.3
51 Gillis Street	51 Gillis Street, Nashua	200410088, Project 14007	ADS	Inactive		possible - refer to Section 2.3
55 Gillis Street	55 Gillis Street, Nashua	200410087, Project 14006	ADS	Inactive		possible - refer to Section 2.3
Former Coating System Inc.	55 Crown Street, Nashua	198403097, Project 56	Haz Waste	AUR	downgradient	yes - refer Section 2.3
Triangle Pacific Corp.	25 Crown Street, Nashua	199402011, Project 4718	LUST	Closed		no
Triangle Pacific Corp.	25 Crown Street, Nashua	199402011, Project 30404	Unsolicited Site Assessment	RECs	upgradient, GZA Phase I & II ESA identified RECs, no action required	yes (see Section 3)
Triangle Pacific Corp.	25 Crown Street, Nashua	199402011	Brownfields			no
55, 59, & 65 Crown Street	55, 59, & 65 Crown Street, Nashua	200410089, Project 14008	ADS	Inactive	downgradient	possible - refer to Section 2.3
Shell Service Station	119 East Hollis Street, Nashua	200006009, Project 10056	Haz Waste	Closed		no
8 Crown Street	8 Crown Street, Nashua	200410098, Project 14017	ADS	Inactive		possible - refer to Section 2.3
Bowers Street	Bowers Street, Nashua	200410097, Project 14016	ADS	Inactive		possible - refer to Section 2.3
Leonard and France LeMoine	25 Harvard Street, Nashua	199704009, Project 6970	OPUF	Closed		no
110 Allds Street	110 Allds Street, Nashua	200502082, Project 14459	ADS	Inactive		possible - refer to Section 2.3
140 East Hollis Street	140 East Hollis Street, Nashua	200410100, Project 14019	ADS	Inactive		possible - refer to Section 2.3
134 Allds Street	134 Allds Street, Nashua	200502038, Project 14425	ADS	Inactive		possible - refer to Section 2.3
134 Allds Street	134 Allds Street, Nashua	200502038, Project 26759	Unsolicited Site Assessment	pending	upgradient, contaminated soil, additional information requested	yes - refer Section 2.3
Circle K / Hess	79 East Hollis Street, Nashua	198905020, Project 31060	Initial Response Spill Site	Closed		no
Circle K / Hess	79 East Hollis Street, Nashua	198905020, Project 28232	Initial Response Spill Site	Closed		no
Circle K / Hess	79 East Hollis Street, Nashua	198905020, Project 28232	Haz Waste	Closed		no
Circle K / Hess	79 East Hollis Street, Nashua	198905020, Project 786	LUST	GMP	upgradient	yes - refer Section 2.3
10 Crown Street	10 Crown Street, Nashua	200410099, Project 14018	ADS	Inactive		possible - refer to Section 2.3
Henry Hangers Company	110 East Hollis Street, Nashua	198906013, Project 10307	Haz Waste	GMP	monitored under Project 1231	yes - refer Section 2.3
Henry Hangers Company	110 East Hollis Street, Nashua	198906013, Project 1231	LUST	GMP	upgradient	yes - refer Section 2.3
120 East Hollis Street	120 East Hollis Street, Nashua	200410122, Project 14043	ADS	Inactive		possible - refer to Section 2.3
Diesel Parts and Service	177 East Hollis Street, Nashua	200502040, Project 14427	ADS	Inactive		possible - refer to Section 2.3
WBMR/North of Bridge Street	WBMR/North of Bridge Street, Nashua	200410124, Project 14045	ADS	Inactive		possible - refer to Section 2.3
Maine Manufacturing	46 Bridge Street, Nashua	198806017, Project 14041	ADS	Inactive		possible - refer to Section 2.3
Maine Manufacturing	46 Bridge Street, Nashua	198806017, Project 580	Unsolicited Site Assessment	Closed		no
41- 43 Bridge Street	41- 43 Bridge Street, Nashua	200502033, Project 14419	ADS	Inactive		possible - refer to Section 2.3
Former Manville Manufacturing Plant	40 Bridge Street, Nashua	198603081, Project 14042	ADS	Inactive		possible - refer to Section 2.3
Former Johns Manville Site	Sanders Street, Nashua	199902001, Project 8834	Haz Waste	Closed		no

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Summary of Contaminated Sites - BLNMC Corridor

N.H. Capitol Corridor Rail and Transit Alternatives

Site Name	Site Address	State Identifiers	Site Type	Status	Comments	Additional Action/Assessment needed?
Lock Street Substation	Map 41, Lot 10, Nashua	200410220, Project 14142	ADS	Inactive		possible - refer to Section 2.3
Rainbow Race and Auto	5 Havelin Avenue, Nashua	200104025, Project 11011	UIC	Closed		no
6 1/2 Bridge Street	6 1/2 Bridge Street, Nashua	200410225, Project 14147	ADS	Inactive		possible - refer to Section 2.3
10 Sanders Street	10 Sanders Street, Nashua	200410125, Project 14046	ADS	Inactive		possible - refer to Section 2.3
Energy North	38 Bridge Street, Nashua	199810022, Project 28281	ADS	Inactive		possible - refer to Section 2.3
Energy North	38 Bridge Street, Nashua	199810022, Project 8323	Haz Waste	GMP pending	upgradient, Remedial Action Plan pending	yes - refer Section 2.3
46-50 Bridge Street	46-50 Bridge Street, Nashua	200410126, Project 14047	ADS	Inactive		possible - refer to Section 2.3
119 Lock Street	119 Lock Street, Nashua	200410135, Project 14056	ADS	Inactive		possible - refer to Section 2.3
118 Lock Street	119 Lock Street, Nashua	200502031, Project 14417	ADS	Inactive		possible - refer to Section 2.3
Atherton Street Park	Atherton Street, Nashua	200410139, Project 14061	ADS	Inactive		possible - refer to Section 2.3
Lock Street Substation	Tax Map 41, Lot 24, Nashua	200410140, Project 14062	ADS	Inactive		possible - refer to Section 2.3
115 Lock Street	115 Lock Street, Nashua	200410134, Project 14055	ADS	Inactive		possible - refer to Section 2.3
Formerly Rouchambeau, Inc.	105 Lock Street, Nashua	199504030. Project 14057	ADS	Inactive		possible - refer to Section 2.3
Formerly Rouchambeau, Inc.	105 Lock Street, Nashua	199504030. Project 5735	OPUF	Closed		no
Atherton Park	Atherton Avenue, , Nashua	200206014, Project 12033	Haz Waste	Closed		no
Thoreau's Landing	Waldon Drive, Behind Unit 62, Nashua	200410127, Project 14049	ADS	Inactive		possible - refer to Section 2.3
Thoreau's Landing	Waldon Drive, Behind Unit 62, Nashua	200410127, Project 14420	ADS	Inactive		possible - refer to Section 2.3
Tom and Jill Monahan	28 Swart Terrace, Nashua	200210051, Project 12357	OPUF	Closed		no
Greeley Park	100 Concord Street, Nashua	199711008, Project 10425	Oil Spills/Releases	Closed		no
32 Damon Avenue	32 Damon Avenue, Nashua	199607004, Project 6413	Oil Spills/Releases	unknown	upgradient, last activity 2003	no
Beazer East, Inc.	Hills Fry Road, Nashua	198708017, Project 346	Haz Waste	GMP	upgradient	yes - refer Section 2.3
Jerry's Auto Body	48 Daniel Webster Highway, Merrimack	199509002, Project 5935	Haz Waste	Closed		no
Nashua Corp/ Nashua A Cenveo Co.	59 Daniel Webster Highway, Merrimack	198711006, Project 8622	Initial Response Spill Site	Closed		no
Nashua Corp/ Nashua A Cenveo Co.	59 Daniel Webster Highway, Merrimack	198711006, Project 423	Haz Waste	GMP	upgradient	yes - refer Section 2.3
Nashua Corp/ Nashua A Cenveo Co.	59 Daniel Webster Highway, Merrimack	198711006, Project 561	LUST	Closed		no
Anheuser-Busch, LLC	221 Daniel Webster Highway, Merrimack	198406031, Project 1904	UIC	Closed		no
Anheuser-Busch, LLC	221 Daniel Webster Highway, Merrimack	198406031, Project 24306	Drinking Water Treatment System Waste Water	Closed		no
Anheuser-Busch, LLC	221 Daniel Webster Highway, Merrimack	198406031, Project 3940	Haz Waste	Closed		no
Anheuser-Busch, LLC	221 Daniel Webster Highway, Merrimack	198406031, Project 9956	Oil Spills/Releases	Closed		no
Fairpoint Communications	237 Daniel Webster Highway. Merrimack	200108064, Project 30757	Haz Waste	RAP	upgradient, ongoing investigation	yes - refer Section 2.3
Fairpoint Communications	237 Daniel Webster Highway. Merrimack	200108064, Project 12468	Oil Spills/Releases	Closed		no
Fairpoint Communications	237 Daniel Webster Highway. Merrimack	200108064, Project 26741	Oil Spills/Releases	Closed		no

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N.H. Capitol Corridor Rail and Transit Alternatives

Site Name	Site Address	State Identifiers	Site Type	Status	Comments	Additional Action/Assessment needed?
Tom Beauregard	20 Star Drive, Merrimack	200707065, Project 16934	Oil Spills/Releases	Closed		no
Colt Refining Co,	12A Star Drive. Merrimack	199911007, Project 9566	Haz Waste	Closed		no
Joseph Nissem	14 Star Drive, Merrimack	200101031, Project 10731	Haz Waste	Closed		no
Joseph Nissem	14 Star Drive, Merrimack	200101031, Project 11029	OPUF	Closed		no
Agway, Inc. Surplus Property	101 Herrick Street, Merrimack	199805030, Project 7954	Haz Waste	Closed		no
Gas Producers Realty, Inc.	22 Wright Avenue	199806006, Project 7980	UIC	Closed		no
New England Pole	26 Wright Avenue	198711004, Project 421	Haz Waste	GMP	upgradient	yes - refer Section 2.3
N.H. Plating Co.	Wright Avenue, Merrimack	198406030, Project 1951	Superfund	ongoing monitoring	downgradient	no
N.H. Plating Co.	Wright Avenue, Merrimack	198406030, Project 2297	LUST	Closed		no
Quality Lube and Wash	386 Daniel Webster Highway, Merrimack	200512028, Project 18074	UIC	Closed		no
Louis/Chung Property	396 Daniel Webster Highway, Merrimack	199107035, Project 3573	Haz Waste	Closed		no
Jones Chemical, Inc.	40 Railroad Avenue, Merrimack	201006034, Project 16761	Actual/Potential Discahrge of Hazardous Materials	Closed		no
Jones Chemical, Inc.	40 Railroad Avenue, Merrimack	201006034, Project 24386	Actual/Potential Discahrge of Hazardous Materials	Closed		no
Merrimack Village Mall	416 Daniel Webster Highway	199509008, Project 5943	Unsolicited Site Assessment	Closed		no
Combat corp.	24 Wright Avenue, Merrimack	198407002, Project 1952	UIC	Closed		no
Combat corp.	24 Wright Avenue, Merrimack	198407002, Project 116	Haz Waste	Closed		no
Holiday Cleaners	2 Railroad Avenue, Merrimack	199604003, Project 6238	UIC	Registered		no
Holiday Cleaners	2 Railroad Avenue, Merrimack	199604003, Project 11277	Haz Waste	GMP	upgradient	yes - refer Section 2.3
Al Prime Energy	426 Daniel Webster Highway, Merrimack	199201018, Project 3396	UIC	Closed		no
Harcros Chemical co.	441 Daniel Webster Highway, Merrimack	198901022, Project 12524	UIC	Closed		no
Harcros Chemical co.	441 Daniel Webster Highway, Merrimack	198901022, Project 719	Haz Waste	GMP	upgradient	yes - refer Section 2.3
Longo Sand and Gravel Pit	17 Twin Bridge Road, Merrimack	198403080, Project 14156	ADS	Inactive		yes - refer Section 2.3
Longo Sand and Gravel Pit	17 Twin Bridge Road, Merrimack	198403080, Project 428	Old Non-Landfill Open Dump Site	Closed		no
Longo Sand and Gravel Pit	17 Twin Bridge Road, Merrimack	198403080, Project 15088	Unsolicited Site Assessment	Closed		no
Longo Sand and Gravel Pit	17 Twin Bridge Road, Merrimack	198403080, Project 29690	Unsolicited Site Assessment	Closed		no
Merrimack District Water Well 4	Front Street, Merrimack	199812109, Project 13934	UIC	Registered		no
Merrimack District Water Well 4	Front Street, Merrimack	199812109, Project 86559	Drinking Water Treatment System Waste Water	Closed		no
Yield House, Inc.	33 Elm Street, Merrimack	199403020, Project 4755	LUST	Closed		no
Yield House, Inc.	33 Elm Street, Merrimack	199403020, Project 12141	Oil Spills/Releases	unknown	upgradient	no
Green Valley 55244	605 Daniel Webster Highway, Merrimack	198406032, Project 1212	LUST	GMP	upgradient	yes - refer Section 2.3
Phyllis Brunetto Residence	15 Pinewood Drive, Merrimack	199709043, Project 7289	OPUF	Closed		no
Saint-Gobian Performance Plastics	701 Daniel Webster Highway, Merrimack	199712055, Project 12732	UIC	Closed		no

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Summary of Contaminated Sites - BLNMC Corridor

N.H. Capitol Corridor Rail and Transit Alternatives

Site Name	Site Address	State Identifiers	Site Type	Status	Comments	Additional Action/Assessment needed?
Saint-Gobian Performance Plastics	701 Daniel Webster Highway, Merrimack	199712055, Project 26456	Initial Response Spill Site	Closed		no
Martels Garage	742 Daniel Webster Highway, Merrimack	198506000, Project 1211	LUST	Closed		no
NHDOT Dist. 5 Patrol Shed 511 / Bridge Maint. Crew 14 Yard	6 Sommerville Road, Bedford	199702062, Project 29443	Non Domestic Wastewater	Registration		no
NHDOT Dist. 5 Patrol Shed 511 / Bridge Maint. Crew 14 Yard	6 Sommerville Road, Bedford	199702062, Project 6854	UIC	Closed		no
NHDOT Dist. 5 Patrol Shed 511 / Bridge Maint. Crew 14 Yard	6 Sommerville Road, Bedford	199702062, Project 25621	LUST	Closed		no
West Bank Merrimack River	1/3 mile north of Wieczorek Drive, Bedford	201202006, Project 27710	Initial Response Spill Site	Closed		no
Willian Bohle	358 South River Road, Bedford	199602041, Project 6228	OPUF	Closed		no
Schonland Foods	21 Commerce Park, Bedford	199407040, Project 4953	LUST	Closed		no
Fairpoint Communications	100 Gay Street, Manchester	198806101, Project 13592	UIC	Closed		no
Fairpoint Communications	100 Gay Street, Manchester	198806101, Project 11640	LUST	GMP	upgradient	yes - refer Section 2.3
Federal Pipe and Steel	300 Gay Street, Manchester	199407067, Project 4998	LUST	Closed		no
City of Manchester Wastewater Treatment Plant	300 Winston Street	198509000, Project 13121	Non Domestic Wastewater	Closed		no
City of Manchester Wastewater Treatment Plant	300 Winston Street	198509000, Project 23913	Actual/Potential Discahrge of Hazardous Materials	Closed		no
City of Manchester Wastewater Treatment Plant	300 Winston Street	198509000, Project 4582	LUST	Closed		no
City of Manchester Wastewater Treatment Plant	300 Winston Street	198509000, Project 976	LUST	GMP	downgradient	no
City of Manchester Wastewater Treatment Plant	300 Winston Street	198509000, Project 16797	OPUF	Closed		no
RR Donnelley Co.	2060 Brown Avenue, Manchester	198403058, Project 14986	UIC	Closed		no
RR Donnelley Co.	2060 Brown Avenue, Manchester	198403058, Project 48	Haz Waste	GMP	upgradient	yes - refer Section 2.3
RR Donnelley Co.	2060 Brown Avenue, Manchester	198403058, Project 28885	OPUF	Closed		no
RR Donnelley Co.	2060 Brown Avenue, Manchester	198403058, Project 5727	OPUF	Closed		no
Pine Grove Cemetery	765 Brown Avenue, Manchester	199504003, Project 5699	LUST	Closed		no
Pine Grove Cemetery	765 Brown Avenue, Manchester	199504003, Project 20091	OPUF	Closed		no
Velcro USA, Inc.	406 Brown Avenue, Manchester	199801046, Project 24478	Initial Response Spill Site	Closed		no
Velcro USA, Inc.	406 Brown Avenue, Manchester	199801046, Project 28731	Initial Response Spill Site	Closed		no
Velcro USA, Inc.	406 Brown Avenue, Manchester	199801046, Project 24121	Initial Response Spill Site	Closed		no
Velcro USA, Inc.	406 Brown Avenue, Manchester	199801046, Project 7529	Initial Response Spill Site	Closed		no
Velcro USA, Inc.	406 Brown Avenue, Manchester	199801046, Project 9786	LUST	Closed		no
Velcro USA, Inc.	406 Brown Avenue, Manchester	199801046, Project 9687	OPUF	Closed		no
Neon Communications	1 Sundial Avenue, Manchester	198903057, Project 1147	Haz Waste	Closed		no
Nylon Corp. of America	333 Sundial Avenue, Manchester	199006017, Project 23849	Initial Response Spill Site	Closed		no
Nylon Corp. of America	333 Sundial Avenue, Manchester	199006017, Project 22704	Initial Response Spill Site	Closed		no
Nylon Corp. of America	333 Sundial Avenue, Manchester	199006017, Project 18973	Initial Response Spill Site	Closed		no

TABLE 1

Summary of Contaminated Sites - BLNMC Corridor

N.H. Capitol Corridor Rail and Transit Alternatives

Site Name	Site Address	State Identifiers	Site Type	Status	Comments	Additional Action/Assessment needed?
Nylon Corp. of America	333 Sundial Avenue, Manchester	199006017, Project 2121	Unsolicited Site Assessment	Closed		no
Nylon Corp. of America	333 Sundial Avenue, Manchester	199006017, Project 27950	Oil Spills/Releases	unknown	downgradient, no current investigation or monitoring	no
Manchester Transit Authority	110 Elm Street, Manchester	199712026, Project 8147	UIC	Closed		no
Manchester Transit Authority	110 Elm Street, Manchester	199712026, Project 11656	Haz Waste	GMP	upgradient	yes - refer Section 2.3
Manchester Transit Authority	110 Elm Street, Manchester	199712026, Project 7409	LUST	Closed		no
Rivers Edge II	50 Elm Street, Manchester	199608001, Project 6498	LUST	Closed		no
Rivers Edge II	50 Elm Street, Manchester	201003063, Project 23879	Unsolicited Site Assessment	no action requested		no
Energy North, Former Manufactured Gas Plant	130 Elm Street, Manchester	200003011, Project 9890	Haz Waste	GMP	upgradient	yes - refer Section 2.3
Paul's Executive Car Care	80 Elm Street, Manchester	199904019, Project 9021	Unsolicited Site Assessment	Closed		no
Dead River Co.	159 Elm Street, Manchester	199105030, Project 10275	Initial Response Spill Site	Closed		no
Dead River Co.	159 Elm Street, Manchester	199105030, Project 2950	Leaking Bulk Storage Containing Motor Fuel	GMP	upgradient	yes - refer Section 2.3
Former Keystone Battery	235 Elm Street, Manchester	199110032, Project 3207	Unsolicited Site Assessment	Closed		no
A L Prime Energy	276 Elm Street, Manchester	199103042, Project 2849	LUST	Closed		no
Merchants Motors	275 Elm Street, Manchester	199705017, Project 16154	UIC	Closed		no
Merchants Motors	275 Elm Street, Manchester	199705017, Project 7019	LUST	Closed		no
Import Connections	512 Willow Street, Manchester	200704033, Project 25732	UIC	Closed		no
Import Connections	512 Willow Street, Manchester	200704033, Project 17953	UIC	Closed		no
Import Connections	512 Willow Street, Manchester	200704033, Project 18126	Haz Waste	AUR	upgradient, Closed	yes - refer Section 2.3
Import Connections	512 Willow Street, Manchester	200704033, Project 16726	Leaking Motor Oil Storage	Closed		no
Firestone Tire and Service Center	300 Elm Street, Manchester	199410009, Project 5276	LUST	Closed		no
Goulet Supply co.	341 Elm Street, Manchester	199207013, Project 3828	LUST	Closed		no
Goulet Supply co.	409 Elm Street, Manchester	199506012, Project 5806	LUST	Closed		no
Rubenstein B & M Site	South Bedford Road, Manchester	198711001, Project 418	Haz Waste	Closed		no
Rubenstein B & M Site	South Bedford Road, Manchester	198711001, Project 10147	Leaking Bulk Storage Containing Motor Fuel	GMP	downgradient	no
Rubenstein B & M Site	South Bedford Road, Manchester	198711001, Project 8035	LUST	Closed		no
Singer Family Park	169 South Commercial Street, Manchester	200210018, Project 12336	Haz Waste	Closed		no
Hilton Garden Inn	South Commercioal Street, Manchester	200502058, Project 14508	Haz Waste	Closed		no
B & M Railroad/Danais Co.	South End of Canal Street	199109022, Project 3153	Haz Waste	GMP	downgradient	no
Auto City of Manchester	17 South Bedford Street, Manchester	199902043, Project 8890	Unsolicited Site Assessment	Closed		no
Avilite Corp.	55 South Commercial Street, Manchester	199403010, Project 4744	LUST	Closed		no
Former Jemma Building	186 Granite Street, Manchester	199411017, Project 5345	Haz Waste	Closed		no
Former Jemma Building	186 Granite Street, Manchester	199411017, Project 9774	OPUF	GMP	downgradient	no

TABLE 1

Summary of Contaminated Sites - BLNMC Corridor

N.H. Capitol Corridor Rail and Transit Alternatives

Site Name	Site Address	State Identifiers	Site Type	Status	Comments	Additional Action/Assessment needed?
Former Service Mechandise Building	100 South Commercial Street, Manchester	199109011, Project 3133	Haz Waste	Closed		no
Former Tri-State Amusement Co.	494 Elm Street, Manchester	200012008, Project 10573	OPUF	Closed		no
Manchester Civic Center	599 Elm Street, Manchester	200005022, Project 10015	Haz Waste	GMP	upgradient	yes - refer Section 2.3
Former Manchester Tire and Battery	570 Elm Street, Manchester	199002002, Project 14383	Haz Waste	GMP	upgradient, monitored under Project 1596	yes - refer Section 2.3
Former Manchester Tire and Battery	570 Elm Street, Manchester	199002002, Project 1596	LUST	GMP	upgradient	yes - refer Section 2.3
Queen City Taxi	560 Elm Street, Manchester	199507005, Project 5836	UIC	Closed		no
Manchester Tobacco Co.	64 Granite Street	198903058, Project 755	LUST	Closed		no
Pandora Factory Building	88 Commercial Street, Manchester	199203043, Project 3672	LUST	Closed		no
Radisson Hotel	700 Elm Street, Manchester	199408025, Project 5049	Unsolicited Site Assessment	AUR	upgradient, Closed	yes - refer Section 2.3
Fairpoint Communications, Inc.	770 Elm Street, Manchester	199712045, Project 7435	LUST	Closed		no
1848 Associates	100 Commercial Street, Manchester	200007008, Project 10123	LUST	Closed		no
1848 Associates	100 Commercial Street, Manchester	200007008, Project 14632	Unsolicited Site Assessment	Closed		no
1870 Associates	286 Commercial Street, Manchester	198403056, Project 1599	Unsolicited Site Assessment	Closed		no
Carpenter Center	323 Franklin Street, Manchester	200011035, Project 10528	OPUF	Closed		no
Grossman Companies, Inc.	18-72 Hanover Street, Manchester	200302042, Project 12616	OPUF	Closed		no
AW Sullivan	250 Commercial Street, Manchester	199111018, Project 3278	LUST	GMP	downgradient	no
300 Bedford Street	300 Bedford Street, Manchester	198605094, Project 15891	OPUF	Closed		no
Fairpoint Communications	25 Concord Street, Manchester	199602005, Project 6146	LUST	Closed		no
1037-1045 Elm Street	1037-1045 Elm Street, Manchester	199907059, Project 9291	OPUF	GMP	upgradient	yes - refer Section 2.3
University Center / Amoskeag Manchine	370-400 Commercial Street, Manchester	198403040, Project 1937	Haz Waste	GMP	downgradient	no
Anchor Electric	400 Bedford Street, Manchester	200205010, Project 11973	Haz Waste	GMP	downgradient	no
Manchester Place	1200 Elm Street, Manchester	199402007, Project 4712	Haz Waste	GMP	upgradient, not in compliance	yes - refer Section 2.3
Manchester Place	1200 Elm Street, Manchester	199402007, Poject 12491	Unsolicited Site Assessment	Closed		no
New England Telephone Co.	1228-1230 Elm Street, Manchester	199101023, Project 2621	LUST	Closed		no
Kyzen Corp.	540 North Commercial Street, Manchester	199307019, Project 23463	Haz Waste	GMP	downgradient	no
Kyzen Corp.	540 North Commercial Street, Manchester	199307019, Project 4397	LUST	Closed		no
PSNH Hydraulic Spill	40 Dow Street, Manchester	200601029, Project 15286	Initial Response Spill Site	Closed		no
Shaer Shoe	155 Dow Street, Manchester	199507022, Project 5866	OPUF	Closed		no
Getty Station 55201	1467 Elm Street, Manchester	199903018, Project 8944	UIC	Closed		no
Getty Station 55201	1467 Elm Street, Manchester	199903018, Project 16003	LUST	Investigation	ongoing	yes - refer Section 2.3
New Hampshire Food Bank	62 West Brook Street, Manchester	199503002, Project 25587	Initial Response Spill Site	Closed		no
New Hampshire Food Bank	62 West Brook Street, Manchester	199503002, Project 5623	LUST	Closed		no

TABLE 1

Summary of Contaminated Sites - BLNMC Corridor

N.H. Capitol Corridor Rail and Transit Alternatives

Site Name	Site Address	State Identifiers	Site Type	Status	Comments	Additional Action/Assessment needed?
PSNH Energy Park	780 North Commercial Street, Manchester	200308035, Project 13019	UIC	Registration		no
Manchester Steam Co.	780 North Commercial Street, Manchester	198403054, Project 1944	LUST	AUR	downgradient, Closed	yes - refer Section 2.3
PSNH	73 West Brook Street, Manchester	199908021, Project 14686	Initial Response Spill Site	Closed		no
PSNH	73 West Brook Street, Manchester	199908021, Project 9400	OPUF	AUR	upgradient, Closed	yes - refer Section 2.3
Cumberland Farms 2859	1595 Elm Street, Manchester	200108014, Project 11310	LUST	Closed		no
Budget Service Center	1631 Elm Street, Manchester	199008023, Project 2303	LUST	Closed		no
Klemms Mobil	1602 Elm Street, Manchester	198910045, Project 10195	Initial Response Spill Site	Closed		no
Klemms Mobil	1602 Elm Street, Manchester	198910045, Project 10194	Initial Response Spill Site	Closed		no
Klemms Mobil	1602 Elm Street, Manchester	198910045, Project 21050	LUST	GMP	upgradient	yes - refer Section 2.3
Klemms Mobil	1602 Elm Street, Manchester	198910045, Project 1177	LUST	Closed		no
American International/Servistar Hardware	1662 Elm Street, Manchester	199205001, Project 3725	LUST	Closed		no
NH Army National Guard	1059 Canal Street, Manchester	199202004, Project 28010	Initial Response Spill Site	Closed		no
NH Army National Guard	1059 Canal Street, Manchester	199202004, Project 3434	LUST	Closed		no
Manchester Shopping Center	317 Lincoln Street, Manchester	199103061, Project 13473	Haz Waste	Closed		no
Manchester Shopping Center	317 Lincoln Street, Manchester	199103061, Project 8569	OPUF	Closed		no
The Courville at Manchester	32 Webster Street, Manchester	199306017, Project 4338	OPUF	Closed		no
Colonial Village Apartments	River Road, Manchester	199111019, Project 3281	LUST	Closed		no
Notre Dame College Garage	608 River Road, Manchester	200206067, Project 12174	Unsolicited Site Assessment	Closed		no
NH Youth Development Center	1056 North River Road, Manchester	199305001, Project 15435	Initial Response Spill Site	Closed		no
NH Youth Development Center	1056 North River Road, Manchester	199305001, Project 10439	Initial Response Spill Site	Closed		no
NH Youth Development Center	1056 North River Road, Manchester	199305001, Project 4237	LUST	Closed		no
Southern NH University	2500 North River Road, Manchester	199002009, Projects 1443	LUST	Closed		no
Southern NH University	2500 North River Road, Manchester	199002009, Projects 8967	OPUF	Closed		no
Brox Industries, Inc.	1500 Hooksett Road, Hooksett	199406035, Project 14574	Initial Response Spill Site	Closed		no
Brox Industries, Inc.	1500 Hooksett Road, Hooksett	199406035, Project 10491	Oil Spills/Releases	Closed		no
Barrett Equipment	1582 Hooksett Road, Hooksett	199102046, Project 2775	Haz Waste	GMP	upgradient	yes - refer Section 2.3
Former Mount St. Mary Property	Route 3, Hooksett	200704057, Project 16775	OPUF	Closed		no
Roadside Spill	Route 3 near Morse Drive	201109077, Project 27083	Initial Response Spill Site	Closed		no
Brian Rousseau Residence	7 Beauchesne Drive, Hooksett	199603024, Project 6233	OPUF	Closed		no
Therrien Property	26 A&B Merrimack Street, Hooksett	201010050, Project 25196	OPUF	Closed		no
James Sprague	15 Rosedale Avenue, Hooksett	200205001, Project 11958	OPUF	Closed		no
Plourde Sand and Gravel	100 North Main Street, Hooksett	200009054, Project 10408	Initial Response Spill Site	Closed		no

TABLE 1

Summary of Contaminated Sites - BLNMC Corridor

N.H. Capitol Corridor Rail and Transit Alternatives

Site Name	Site Address	State Identifiers	Site Type	Status	Comments	Additional Action/Assessment needed?
PSNH	97 River Road, Bow	198400065, Project 11100	Non Domestic Wastewater	Registration		no
PSNH	97 River Road, Bow	198400065, Project 364	Unlined Wastewater Lagoon	Closed		no
PSNH	97 River Road, Bow	198400065, Project 27061	Initial Response Spill Site	Closed		no
PSNH	97 River Road, Bow	198400065, Project 24095	Initial Response Spill Site	Closed		no
PSNH	97 River Road, Bow	198400065, Project 20298	Initial Response Spill Site	Closed		no
PSNH	97 River Road, Bow	198400065, Project 24351	Initial Response Spill Site	Closed		no
PSNH	97 River Road, Bow	198400065, Project 20146	Initial Response Spill Site	Closed		no
PSNH	97 River Road, Bow	198400065, Project 20141	Initial Response Spill Site	Closed		no
PSNH	97 River Road, Bow	198400065, Project 20140	Initial Response Spill Site	Closed		no
PSNH	97 River Road, Bow	198400065, Project 20139	Initial Response Spill Site	Closed		no
PSNH	97 River Road, Bow	198400065, Project 15218	Initial Response Spill Site	Closed		no
PSNH	97 River Road, Bow	198400065, Project 13228	Initial Response Spill Site	Closed		no
PSNH	97 River Road, Bow	198400065, Project 22358	Actual/Potential Discahrge of Hazardous Materials	Closed		no
PSNH	97 River Road, Bow	198400065, Project 9	Lined Landfill	GMP	upgradient	yes - refer Section 2.3
PSNH	97 River Road, Bow	198400065, Project 23084	Oil Spills/Releases	unknown	continuing assessment	yes - refer Section 2.3
PSNH	97 River Road, Bow	198400065, Project 20481	Oil Spills/Releases	Closed		no
River Road Wells/Kalwall	River Road, Bow	198400063, Project 117	Haz Waste	Closed		no
Wikoff Color Corp.	River Road, Bow	199401001, Project 4643	Haz Waste	Closed		no
River Road Business Bay Condominium	29 River Road, Bow	199906043, Project 9180	UIC	Closed		no
Sara Lee Coffee and Tea Foodservice	560 Route 3, Bow	199606010, Project 6331	UIC	Registration		no
Ruggles III Office Building	553 Route 3A	200302028, Project 12602	UIC	Registration		no
G&N Realty	4 Garvin Falls Road, Bow	199403016, Project 4750	LUST	Closed		no
Grappone Toyota and Truck Center	574 Route 3A, Bow	199703048, Project 25545	UIC	Registration		no
Grappone Toyota and Truck Center	574 Route 3A, Bow	199703048, Project 6938	Ether Contaminated Site	Closed		no
Grappone Toyota and Truck Center	574 Route 3A, Bow	200905045, Project 21700	Initial Response Spill Site	Closed		no
Grappone Ford Complex	Route 3A, Bow	199702005, Project 14364	Ether Contaminated Site	Closed		no
Grappone Ford Complex	Route 3A, Bow	199702005, Project 15506	Unsolicited Site Assessment	Closed		no
Pitco Frialator	510 Boute 3A, Bow	199105025, Project 9674	UIC	Closed		no
Pitco Frialator	510 Boute 3A, Bow	199105025, Project 13610	Ether Contaminated Site	Closed		no
Pitco Frialator	510 Boute 3A, Bow	199105025, Project 29103	Unsolicited Site Assessment	Closed		no
Pitco Frialator	510 Boute 3A, Bow	199105025, Project 2944	Oil Spills/Releases	Closed		no
Former Grappone Honda	507 Route 3A, Bow	200304047, Project 15317	Ether Contaminated Site	unknown	upgradient, ongoing water supply treatment	yes - refer Section 2.3

TABLE 1

Summary of Contaminated Sites - BLNMC Corridor

N.H. Capitol Corridor Rail and Transit Alternatives

Site Name	Site Address	State Identifiers	Site Type	Status	Comments	Additional Action/Assessment needed?
Former Grappone Honda	507 Route 3A, Bow	200304047, Project 12799	Unsolicited Site Assessment	Closed		no
Former Grappone Honda	507 Route 3A, Bow	200304047, Project 8976	Oil Spills/Releases	Closed		no
Bow Irving	500 Route 3, Bow	200006023, Project 31520	Initial Response Spill Site	Closed		no
Bow Irving	500 Route 3, Bow	200006023, Project 30669	Initial Response Spill Site	Closed		no
Bow Irving	500 Route 3, Bow	200006023, Project 26038	Initial Response Spill Site	Closed		no
Bow Irving	500 Route 3, Bow	200006023, Project 14667	Initial Response Spill Site	Closed		no
Bow Irving	500 Route 3, Bow	200006023, Project 14637	Initial Response Spill Site	Closed		no
Bow Irving	500 Route 3, Bow	200006023, Project 13050	Initial Response Spill Site	Closed		no
Bow Irving	500 Route 3, Bow	200006023, Project 10641	Initial Response Spill Site	Closed		no
Bow Irving	500 Route 3, Bow	200006023, Project 10084	Initial Response Spill Site	Closed		no
Bow Irving	500 Route 3, Bow	200006023, Project 16015	LUST	GMP	upgradient	yes - refer Section 2.3
Conoco Phillips	417 South main Street, Concord	199208022, Project 3879	LUST	Closed		no
Max Cohen and Sons, Inc.	14 Poplar Avenue, Concord	200505038, Project 14664	Ether Contaminated Site	GMP	downgradient	no
ATCNH Realty Trust, LLC	12 Langdon Street, Concord	198812004, Project 690	Haz Waste	Closed		no
ATCNH Realty Trust, LLC	12 Langdon Street, Concord	198812004, Project 12293	OPUF	Closed		no
ATCNH Realty Trust, LLC	12 Langdon Street, Concord	198812004, Project 28141	Oil Spills/Releases	Investigation	upgradient	yes - refer Section 2.3
Former Channel 21 Studio	81 Hall Street, Concord	199501027, Project 5500	Haz Waste	Closed		no
71-75 Hall Street, Concord	71-75 Hall Street, Concord	198710006, Project 388	Haz Waste	Closed		no
Capitol Dodge	296 South Main Street, Concord	199404007, Project 4791	LUST	Closed		no
NHDRED	5 Langdon Street, Concord	199201032, Project 3416	LUST	GMP	upgradient	yes - refer Section 2.3
Edgecomb Metals	33 Langdon Street, Concord	198808032, Project 635	Haz Waste	Closed		no
Edgecomb Metals	33 Langdon Street, Concord	198808032, Project 4848	LUST	Closed		no
Concord Citgo	268 South Main Street, Concord	198705091, Project 1899	LUST	Closed		no
Capital Car Wash	22 Hall Street, Concord	198400099, Project 1373	LUST	Closed		no
Yankee Truck, LLC	24 Hall Street, Concord	199811022, Project 8463	LUST	Closed		no
Hess Corp. 29300	15 Hall Street, Concord	198612001, Project 12067	LUST	Closed		no
Hess Corp. 29300	15 Hall Street, Concord	198612001, Project 1764	LUST	Closed		no
Exit 13 Coal Tar Pond	Manchester Street Bridge Area, Concord	199212014, Project 4042	Haz Waste	GMP	downgradient	no
Former Gulf Station	21 Water Street, Concord	198908007, Project 1765	LUST	Closed		no
Lot 26-1-10	14-16 Water Street, Concord	199401020, Project 4673	Haz Waste	AUR	downgradient, Closed	yes - refer Section 2.3
Former NH Business Sales Office	10 Water Street, Concord	199304013, Project 4214	Haz Waste	Closed		no
Concord Coal Gas Site	Gas Street and South Main Street, Concord	198904063, Project 1479	Haz Waste	GMP pending	upgradient, RAP pending	yes - refer Section 2.3

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Summary of Contaminated Sites - BLNMC Corridor

N.H. Capitol Corridor Rail and Transit Alternatives

Site Name	Site Address	State Identifiers	Site Type	Status	Comments	Additional Action/Assessment needed?
Johnson and Dix Bulk Fuel Corp.	1 Gulf Street	199104009, Project 4363	UIC	Closed		no
Johnson and Dix Bulk Fuel Corp.	1 Gulf Street	199104009, Project 2876	Leaking Bulk Storage Containing Heating Fuel Oil	unknown	downgradient, monitored under Project 5180	no
Johnson and Dix Bulk Fuel Corp.	1 Gulf Street	199104009, Project 10087	Haz Waste	unknown	downgradient, monitored under Project 5180	no
Johnson and Dix Bulk Fuel Corp.	1 Gulf Street	199104009, Project 5845	LUST	Closed		no
Johnson and Dix Bulk Fuel Corp.	1 Gulf Street	199104009, Project 5180	LUST	GMP	downgradient	no
Johnson and Dix Bulk Fuel Corp.	1 Gulf Street	199104009, Project 6104	Oil Spills/Releases	Closed		no
Store 24	201 South Main Street, Concord	199007032, Project 2816	LUST	Closed		no
Econolodge	Gulf Street, Concord	198612000, Project 691	Haz Waste	Closed		no
Econolodge	Gulf Street, Concord	198612000, Project 5381	LUST	Closed		no
Mobil Station (01-367) 5D2	129 South Main Street, Concord	198904039, Project 14524	UIC	Closed		no
Mobil Station (01-367) 5D2	129 South Main Street, Concord	198904039, Project 13453	UIC	Registration		no
Mobil Station (01-367) 5D2	129 South Main Street, Concord	198904039, Project 1040	LUST	GMP	upgradient	yes - refer Section 2.3
Goodyear Auto Service Center	86 South Main Street, Concord	199406011, Project 4869	LUST	Closed		no
Sear Roebuck & Co.	80 South Main Street, Concord	200011034, Project 26674	UIC	Registration		no
Sear Roebuck & Co.	80 South Main Street, Concord	200011034, Project 11778	Initial Response Spill Site	Closed		no
Sear Roebuck & Co.	80 South Main Street, Concord	200011034, Project 10527	Haz Waste	GMP	upgradient	yes - refer Section 2.3
Targett-Williams Inc.	78 South Main Street, Concord	198605216, Project 13256	Unsolicited Site Assessment	Closed		no
Car Preservation Center	74-76 South Main Street, Concord	198705003, Project 202	LUST	Closed		no
Caillers South Main Gulf	89 South Main Street, Concord	199212021, Project 12693	Haz Waste	Closed		no
Caillers South Main Gulf	89 South Main Street, Concord	199212021, Project 4056	LUST	Closed		no
Penny Piou Travel	87 South Main Street, Concord	200102053, Project 12390	LUST	Closed		no
South Main Citgo	81 South Main Street, Concord	199302009, Project 4139	LUST	GMP	upgradient	yes - refer Section 2.3
Reynold Addario	45 South Main Street, Concord	199607001, Project 6392	LUST	Investigation	work pending	yes - refer Section 2.3
Jon Samaha	32 Chesley Street, Concord	200408038, Project 13754	OPUF	Closed		no
NH State of Employment Security	32 South Main Street, Concord	199003012, Project 1477	LUST	Closed		no
City of Concord	19 South Main Street, Concord	199806095, Project 15943	Initial Response Spill Site	Closed		no
Cobb Hill Construction	6-10 Pleasant Street, Concord	200508082, Project 14990	OPUF	Closed		no
City of Concord	Kennedy Lane, Concord	199601010, Project 6115	OPUF	Closed		no
Commercial Offices	36 North Main Street, Concord	199901005, Project 8768	OPUF	Closed		no
Fire House Parking Garage	Green Street, Concord	201107018, Project 26650	Initial Response Spill Site	Closed		no
Evans Building	23-29 School Street, Concord	199102016, Project 2722	LUST	Closed		no
Capitol Supply Asscociates	Ward and Dixon, Concord	199604005, Project 6244	LUST	Closed		no

TABLE 1

Summary of Contaminated Sites - BLNMC Corridor

N.H. Capitol Corridor Rail and Transit Alternatives

Site Name	Site Address	State Identifiers	Site Type	Status	Comments	Additional Action/Assessment needed?
Concord Steam Plant	16 Ward Avenue, Concord	199609018, Project 6580	LUST	Closed		no
NHDOT Mechanical Services	11 Stickney Avenue, Concord	199004021, Project 10311	UIC	Closed		no
NHDOT Mechanical Services	11 Stickney Avenue, Concord	199004021, Project 16899	UIC	Closed		no
NHDOT Mechanical Services	11 Stickney Avenue, Concord	199004021, Project 10764	Initial Response Spill Site	Closed		no
NHDOT Mechanical Services	11 Stickney Avenue, Concord	199004021, Project 6249	Haz Waste	GMP	downgradient, monitored under Project 1921	yes (see Section 3)
NHDOT Mechanical Services	11 Stickney Avenue, Concord	199004021, Project 10347	OPUF	Closed		no
NHDOT Mechanical Services	11 Stickney Avenue, Concord	199004021, Project 1921	LUST	GMP	downgradient	yes (see Section 3)
B&M Railroad Corp.	Storrs Street, Concord	198807001, Project 598	Haz Waste	Closed		no
SNP Parking Associates	Storrs Avenue, Concord	200110045, Project 11546	Oil Spills/Releases	Closed		no
Cumberland Farms 2890	165 North Main Street, Concord	199210026, Project 3979	LUST	Closed		no
Cumberland Farms 2890	165 North Main Street, Concord	199210026, Project 12817	LUST	GMP	upgradient	yes - refer Section 2.3
Exxon Division of CFI 2861	196 North Main Street, Concord	199007029, Project 12037	Initial Response Spill Site	Closed		no
Exxon Division of CFI 2861	196 North Main Street, Concord	199007029, Project 2239	LUST	Closed		no
Exxon Division of CFI 2861	196 North Main Street, Concord	199007029, Project 13294	LUST	GMP	upgradient	yes - refer Section 2.3
Prescott and Sons Oil	196 North Main Street-rear (Storrs Street Extention), Concord	199407068, Project 12362	LAST	GMP	upgradient, petroleum free product	yes - refer Section 2.3
Concord Center Trust	10 Ferry Street, Concord	199307012, Project 14150	ADS	Inactive		possible - refer to Section 2.3
Concord Center Trust	10 Ferry Street, Concord	199307012, Project 4388	Haz Waste	Closed		no
Concord Center Trust	10 Ferry Street, Concord	199307012, Project 5040	LUST	Closed		no
Hess Station 29500	175 North Main Street, Concord	199306008, Project 4319	LUST	GMP	upgradient	yes - refer Section 2.3
Hess Station 29500	175 North Main Street, Concord	199306008, Project 12767	Oil Spills/Releases	Closed		no
Lockwood Young Corp.	South Commercial Street, Concord	198805015, Project 2106	UIC	Closed		no
Lockwood Young Corp.	South Commercial Street, Concord	198805015, Project 549	LUST	Closed		no

Recommendations are relative to the criteria in Section 2; other factors may apply relative to Section 3.
Contaminated Sites: site where contamination is known to exist or has existed in the past
VOC: Volatile Organic Compounds, often petroleum or solvent (halogenated) related
AUR: Activity and Use Restriction
GMP: Groundwater Management Permit
RAP: Remedial Action Plan
Haz Waste: Hazardous Waste Discharge
LUST: Leaking Underground Storage Tank (petroleum)
OPUF: On-Premises-Use Facility
ADS: Asbestos Disposal Site
MOST: Motor Oil Storage Tank
ETHER: Ether contaminated site.
UIC: Underground Injection Control (commonly floor drains not related to septic or sewer systems)
LAST: Leaking Aboveground Storage Tank

TABLE 2

Summary of Contaminated Sites - Potential Construction Target Properties

N.H. Capitol Corridor Rail and Transit Alternatives

Target Property	Contaminated Sites								
	Site Name	EDR Detail Map Identifier	Site Address	Federal Identifiers	State Identifiers	Alternate Names	Site Type	Status	Comments
Pheasant Lane Mall	*Pheasant Lane Mall	A	310 Daniel Webster Highway		198404009, Project 31020	PSNH	Initial Response Spill Site	Closed	
	*Pheasant Lane Mall	A	310 Daniel Webster Highway		198404009, Project 30532	PSNH	Initial Response Spill Site	Closed	
	*Pheasant Lane Mall	A	310 Daniel Webster Highway		198404009, Project 9753	Pheasant Lane Realty Trust	Initial Response Spill Site	Closed	
	*Pheasant Lane Mall	A	310 Daniel Webster Highway		198404009, Project 1974	Pheasant Lane Realty Trust	LUST	Closed	
	*Pheasant Lane Mall	A	310 Daniel Webster Highway		198404009, Project 4125	Pheasant Lane Realty Trust	LUST	Closed	
	other sites are unlikely to impact the Target Property due to distance, nature of the release, and/or hydrologic setting								
Hampshire Chemical Corporation	*Hampshire Chemical Corporation	A	2 East Spit Brook Drive	NHD048724173	198704027, Project 142	W.R. Grace, and Co.; Hampshire Chemical Company	Haz Waste	GMP, AUR	Target Property is an active hazardous waste site with institutional controls, AUR is ±26% of property area and ±67% of abutting rail RoW frontage; contaminated soil, groundwater (monitored under GMP), and VI hazard
	*Hampshire Chemical Corporation	A	2 East Spit Brook Drive		198704027, Project 6129	W.R. Grace, and Co.; Hampshire Chemical Company	UIC	Closed	
	*Hampshire Chemical Corporation	A	2 East Spit Brook Drive		198704027, Project 3318	W.R. Grace, and Co.; Hampshire Chemical Company	LUST	Closed	
	*Hampshire Chemical Corporation	A	2 East Spit Brook Drive		198704027, Project 15065	W.R. Grace, and Co.; Hampshire Chemical Company	LUST	Closed	
	UPACO Industries, Inc.	B	3 East Spit Brook Drive		198709009, Project 371	UPACO Adhesives, Worthen Industries, Inc.	Haz Waste	Closed	downgradient
	Taggart Ice, Inc.	E	8 Taggart Drive		199709025, Project 7267		LUST	Closed	northwest of target property, side to downgradient
	Exxon Div. of CFI 70115	D	242 Daniel Webster Highway		199307020, Project 25242	Conoc Phillips, Cumberland Farms 70115	Haz Waste	unknown	apparently monitored under LUST project
	Exxon Div. of CFI 70115	D	242 Daniel Webster Highway		199307020, Project 4401	Conoc Phillips, Cumberland Farms 70115	LUST	GMP	side gradient, southwest, petroleum and holgenated VOCs, tetrachloroethene exceeds VI threshold in one location, approx. 480 ft. from Target Property boundary, Target Property not in site GMZ, unlikely to impact Target Property
	Cumberland Farms 70116	F	219 Daniel Webster Highway		199012031, Project 2572	Conoc Phillips, Exxon Div. of CFI, Nicks Exxon Service	LUST	Closed	

TABLE 2

Summary of Contaminated Sites - Potential Construction Target Properties

N.H. Capitol Corridor Rail and Transit Alternatives

Target Property	Contaminated Sites								
	Site Name	EDR Detail Map Identifier	Site Address	Federal Identifiers	State Identifiers	Alternate Names	Site Type	Status	Comments
Hampshire Chemical Corporation	Cumberland Farms 70116	F	219 Daniel Webster Highway		199012031, Project 2573	Conoc Phillips, Exxon Div. of CFI, Nicks Exxon Service	UIC	Closed	closed concurrent with Project 2572
	other sites are unlikely to impact the Target Property due to distance, nature of the release, and/or hydrologic setting								
Crown Street	*Triangle Pacific Corp.	A	25 Crown Street		19891120NH007 1	Armstrong Cabinet Products, 25 Crown Street	FIFRA/TSCA Tracking System (FTTS)	unknown	PCB-related violation noted during Nov. 1989 inspection, no further documentation identified
	*Triangle Pacific Corp.	A	25 Crown Street		199402011, Project 4718	Armstrong Cabinet Products, 25 Crown Street	LUST	Closed	
	*Triangle Pacific Corp.	A	25 Crown Street		199402011, Project 30404	Armstrong Cabinet Products, 25 Crown Street	Unsolicited Site Assessment	RECs	GZA Phase I & II ESA identified RECs
	*Triangle Pacific Corp.	A	25 Crown Street		199402011	Armstrong Cabinet Products, 25 Crown Street	Brownfields		
	49 Gillis Street	C	49 Gillis Street		200410086, Project 14005	Former ADS 193	ADS	Inactive	sidegradient
	51 Gillis Street	C	51 Gillis Street		200410088, Project 14007	Former ADS 195	ADS	Inactive	sidegradient, possibly adjoining
	55 Gillis Street	C17	55 Gillis Street		200410087, Project 14006	Former ADS 195	ADS	Inactive	sidegradient, possibly abutting
	10 Crown Street	D18	10 Crown Street		200410099, Project 14018	Former ADS 210	ADS	Inactive	upgradient
	Shell Service Station	E	119 East Hollis Street		200006009, Project 10056	Shell Service Station SAP 138286	Haz Waste	Closed	
	18 Arlington Street	16	18 Arlington Street		na		**EDR Historical Cleaners	na	former or current dry cleaning facility upgradient abuttor, not confirmed by other historical sources, Target Property Phase II ESA does not suggest release of halogenated compounds impacting subject property
	Robert Voyer	F	26 Arlington Street		199507013, Project 5854	Robert Voyer (Deceased), 26 Arlington Street	OPUF	Closed	
	120 East Hollis Street	G24	120 East Hollis Street		200410122, Project 14043	Former ADS 239	ADS	Inactive	
	James Lumpkin Property	G27	136 East Hollis Street		200305082, Project 12946	136 East Hollis Street	Initial Response Spill Site	Closed	
	Henry Hangers Company	E	110 East Hollis Street		198906013, Project 10307	Henry Hanger Company of America	Haz Waste	GMP	monitored under Project 1231
	Henry Hangers Company	E	110 East Hollis Street		198906013, Project 1231	Henry Hanger Company of America	LUST	GMP	sidegradient, Target Property not in GMZ, no impact to Target Property likely
	140 East Hollis Street	I30	140 East Hollis Street		200410100, Project 14019	Former ADS 212	ADS	Inactive	
	8 Crown Street	D31	8 Crown Street		200410098, Project 14017	Former ADS 209	ADS	Inactive	
	Former Coating System Inc.	H	55 Crown Street		198403097, Project 56	Coating System Inc., Soval Engineering	Haz Waste	AUR	downgradient

TABLE 2

Summary of Contaminated Sites - Potential Construction Target Properties

N.H. Capitol Corridor Rail and Transit Alternatives

Target Property	Contaminated Sites								
	Site Name	EDR Detail Map Identifier	Site Address	Federal Identifiers	State Identifiers	Alternate Names	Site Type	Status	Comments
Crown Street	Bell Auto Service	K	93 East Hollis Street		198605533, Project 25589	Bell Automotive	LMOST	Closed	upgradient
	other sites are unlikely to impact the Target Property due to distance, nature of the release, and/or hydrologic setting								
MHT Airport / Wieczorek Drive	Coastal Forest Products	A3	451 South River Road		200011039, Project 10536	Coastal Specialty Forest Products	Initial Response Spill Site	Closed	upgradient, minor diesel spill
	other sites are unlikely to impact the Target Property due to distance, nature of the release, and/or hydrologic setting								
Manchester Wastewater Treatment Facility	*Wastewater Treatment Facility	A7	300 Winston Street		198509000, Project 976		LUST	GMP	impacted area downgradient of rail RoW, VOCs and PAHs
	*Wastewater Treatment Facility	A7	300 Winston Street		198509000, Project 4582		LUST	Closed	
	*Wastewater Treatment Facility	A7	300 Winston Street		198509000, Project 23913		Actual/potential release of hazardous materials	Closed	
	*Wastewater Treatment Facility	A7	300 Winston Street		198509000, Project 23913		OPUF	Closed	
	*Wastewater Treatment Facility	A7	300 Winston Street	DOT I-2010040279			HMIRS	na	sodium hyprochlorite release during delivery, NHDES 198509000, Project 23913
	Federal Pipe & Steel	B15	300 Gay Street		199407067, Project 4998	Federal Steel Corp.	LUST	Closed	
	Fairpoint Communications	C22	100 Gay Street		198806101, Project 13592	Verizon New England, Former Verizon, Verizon	UIC	Closed	
	Fairpoint Communications	C22	100 Gay Street		198806101, Project 11640	Verizon New England, Former Verizon, Verizon	LUST	GMP	petroleum VOCs, upgradient abutting property
	Environmental Compliance, Inc.	D30	157 Gay Street		199710039, Project 7303	ECI	Initial Response Spill Site	Closed	
	Highland Goffes Falls Elementary School	47	2021 Goffes Falls Road		199208031, project 18272	City of Manchester, SAU 37 Highland-Goffe's Falls Elementary School	Initial Response Spill Site	Closed	
	Exxon Mobil Oil Corp. 18397	H55	2391 Brown Avenue		200109048, Project 21867	Mobil 18397, Mobil 2735	Initial Response Spill Site	Closed	
	Exxon Mobil Oil Corp. 18397	H55	2391 Brown Avenue		200109048, Project 15283	Mobil 18397, Mobil 2735	Initial Response Spill Site	Closed	
	George Campbell	H58	2361 Brown Avenue		199903041, Project 8978		Initial Response Spill Site	Closed	
	other sites are unlikely to impact the Target Property due to distance, nature of the release, and/or hydrologic setting								
Pine Grove Cemetery	*Pine Grove Cemetery	A	765 Brown Avenue		199504003, Project 5699		LUST	Closed	USTs associated with facilities >1/4 mile from the proposed construction area
	*Pine Grove Cemetery	A	765 Brown Avenue		199504003, Project 20091		OPUF	Closed	USTs associated with facilities >1/4 mile from the proposed construction area
	Joseph Curly	B3	7 Gold Street		200301041, 12670		OPUF	Closed	
	other sites are unlikely to impact the Target Property due to distance, nature of the release, and/or hydrologic setting								
Hancock Street	Neon Communications	A	1 Sundial Avenue		198903057, Project 1147	Level 3 Communications, Neon Optica, Inc. d/b/a Sidera	Haz Waste	Closed	
	Former Agway Gas	C12	209 Queen City Avenue		198406017, Project 328		LUST	Closed	
	Queen City Inn Property	E	140 Queen City Avenue		201202001, Project 27660	Easter Seals - Queen City Ave. Manchester	Unsolicited Site Assessment	Closed	
	other sites are unlikely to impact the Target Property due to distance, nature of the release, and/or hydrologic setting								

TABLE 2

Summary of Contaminated Sites - Potential Construction Target Properties

N.H. Capitol Corridor Rail and Transit Alternatives

Target Property	Contaminated Sites								
	Site Name	EDR Detail Map Identifier	Site Address	Federal Identifiers	State Identifiers	Alternate Names	Site Type	Status	Comments
Riverwalk Way and South Commercial Street	Firestone	A3	300 Elm Street		199410009, Project 5276	Firestone Tire and Service Center	LUST	Closed	
	Elm Street Citgo	A5	276 Elm Street		199103042, Project 2849	AL Prime Energy, The Southland Energy Corp., 276 Elm St. Energy	LUST	Closed	
	Former Keystone Battery	B7	235 Elm Street		199110032, Project 3207		Unsolicited Site Assessment	Closed	
	Merchant Motors Rent-A-Car	B9	275 Elm Street		199705017, Project 16154		UIC	Closed	
	Merchant Motors Rent-A-Car	B9	275 Elm Street		199705017, Project 7019		LUST	Closed	
	Dead River Company	E23	159 Elm Street		199105030, Project 10275		Initial Response Spill Site	Closed	
	Dead River Company	E23	159 Elm Street		199105030, Project 2950		Leaking Bulk Storage Containing Motor Fuel	GMP	upgradient, Target Property not in GMZ, no impact to Target Property likely
	Cotes Carpet Cleaning	E27	150 Elm Street				**EDR Historical Cleaners	na	former or current dry cleaning facility upgradient
	Import Connections	G34	512 Willow Street		200704033, Project 25732		UIC	Closed	
	Import Connections	G34	512 Willow Street		200704033, Project 17953		UIC	Closed	
	Import Connections	G34	512 Willow Street		200704033, Project 18126		Haz Waste	Closed	upgradient, AUR, no impact to Target Property likely
	Import Connections	G34	512 Willow Street		200704033, Project 16726		Leaking Motor Oil Storage Tank	Closed	
	Advanced Recycling, TS Schnitzer	K56	399 Willow Street		198606070, Project 15861	Amoskeag Bank, Prolerized New England Co.	UIC	Closed	
	Advanced Recycling, TS Schnitzer	K56	399 Willow Street		198606070, Project 15619	Amoskeag Bank, Prolerized New England Co.	Ether Contaminated Site	non-GMP monitoring	up to sidegradient, arsenic in one well, no impact to Target Property likely
	other sites are unlikely to impact the Target Property due to distance, nature of the release, and/or hydrologic setting								
Granite and Canal Streets	Former Jemma Building	A2	186 Granite Street		199411017, Project 5345		Haz Waste	Closed	downgradient
	Former Jemma Building	A2	186 Granite Street		199411017, Project 9774		OPUF	GMP	Target Property not in GMZ, downgradient
	Langer Place	B	55 South Commercial Street		199403010, Project 4744	Avilite Corp., Studio North	LUST	Closed	downgradient
	33 South Commercial Street	D	33 South Commercial Street		199801078, Project 7585	Manchester Knitted Fashion, A.W. Rose Construction	OPUF	Closed	downgradient
	33 South Commercial Street	D	33 South Commercial Street		na	E & R Cleaners	EDR Historical Cleaners	na	former or current dry cleaning facility downgradient
	Next Level Performance Building	D	31 South Commercial Street		200910035, Project 22572		Haz Waste	SI requested	downgradient, halogenated VOC VI hazard
	Manchester Tobacco Co.	E	64 Granite Street		198903058, Project 755		LUST	Closed	upgradient
	Hermsdorf Fixture Manufacturing Co.	E27	108 Franklin Street		199407080, Project 20532	Ultra, Gamache Enterprises	ETHER	non-permit monitoring	upgradient, VOC contamination below VI threshold
	Hermsdorf Fixture Manufacturing Co.	E27	108 Franklin Street		199407080, Project 20267	Ultra, Gamache Enterprises	Unsolicited Site Assessment	Closed	

TABLE 2

Summary of Contaminated Sites - Potential Construction Target Properties

N.H. Capitol Corridor Rail and Transit Alternatives

Target Property	Contaminated Sites								
	Site Name	EDR Detail Map Identifier	Site Address	Federal Identifiers	State Identifiers	Alternate Names	Site Type	Status	Comments
Granite and Canal Streets	Former Tri-State Amusement Co.	H40	494 Elm Street		200012008, Project 10573		OPUF	Closed	upgradient
	Former Rockwell Automation	H	460 Elm Street		200407074, Project 26023		Haz Waste	no monitoriing currently required	upgradient, halogenated VOC contamination in site groundwater orginating offsite upgradient, below VI threshold
	Former Rockwell Automation	H	460 Elm Street		200407074, Project 13722		Initial Response Spill Site	Closed	
	Queen City Taxi	I	560 Elm Street		199507005, Project 5836		UIC	Closed	
	Former Manchester Tire and Battery	I	570 Elm Street		199002002, Project 14383	Afshin Convenience, Inner City Auto Repair	Haz Waste	GMP	upgradient, monitored under Project 1596
	Former Manchester Tire and Battery	I	570 Elm Street		199002002, Project 1596	Afshin Convenience, Inner City Auto Repair	LUST	GMP	upgradient, petroleum VOCs below VI threshold, Target Property not in GMZ, unlikely to impact Target Property
	Manchester Civic Center	K	599 Elm Street		200005022, Project 10015		Haz Waste	GMP	upgradient, halogenated VOCs above VI threshold, approx. I,000 ft. from Targat property, Target Property not in GMZ, unlikely to impact Target Property
	other sites are unlikely to impact the Target Property due to distance, nature of the release, and/or hydrologic setting								
Spring and Canal Street	Service Master Site	D21	500 North Commercial Street		201003003, Project 23669		Initial Response Spill Site	Closed	downgradient
	JCM Management	E26	540 North Commercial Stret		199307019, Project 23463	Kyzen corp., 540 North Assoc., JCM, Inc., EPE Corp., Forty-Five North Assoc.	Haz Waste	GMP	downgradient
	JCM Management	E26	540 North Commercial Stret		199307019, Project 4397	Kyzen corp., 540 North Assoc., JCM, Inc., EPE Corp., Forty-Five North Assoc.	LUST	Closed	downgradient
	Morgan Self Storage	F33	400 Bedford Street		200205010, Project 11973	Anchor Electric, Morgan Storage, Anchor Electric co.	Haz Waste	GMP	side to downgradient
	Kered Clothing, Inc.	G37	670 North Commercial Street		na	670 North Commercial Street	LUST	Closed	side to downgradient
	PSNH Hydraulic Spill	H42	40 Dow Street		200601029, Project 15286		Initial Response Spill Site	Closed	upgradient
	Remillard Property	H54	1382 Elm Street		199807072, Project 8312		Initial Response Spill Site	Closed	upgradient
	Target Cleaners	O61	1196 Elm Street		na		**EDR Historical Cleaners	na	former or current dry cleaning facility upgradient
	Manchester Place	I63	1200 Elm Street		199402007, Project 4712		Haz Waste	GMP	upgradient, halogenated VOC contamination in site groundwater, concentrations unknown, Target not in GMZ, site out of compliance with GMP
	New England Telephone Co.	I64	1228-1230 Elm Street		199101023, Project 2621		LUST	Closed	upgradient
	North End Laundry and Dry Cleaning	I73	1231 Elm Street		na		**EDR Historical Cleaners	na	former or current dry cleaning facility upgradient
	Bird Bath Laundromat	I75	1237 Elm Street		na		**EDR Historical Cleaners	na	former or current dry cleaning facility upgradient
	1037-1045 Elm Street	R86	1037-1045 Elm Street		199907059, Project 9291	City of Manchester	OPUF	GMP	upgradient, fuel oil contamination in site groundwater, no VI hazard , Target not in GMZ
	other sites are unlikely to impact the Target Property due to distance, nature of the release, and/or hydrologic setting								

TABLE 2

Summary of Contaminated Sites - Potential Construction Target Properties

N.H. Capitol Corridor Rail and Transit Alternatives

Target Property	Contaminated Sites								
	Site Name	EDR Detail Map Identifier	Site Address	Federal Identifiers	State Identifiers	Alternate Names	Site Type	Status	Comments
Stickney Avenue	*NHDOT	C	11 Stickney Avenue		199004021, Project 10311	NHDOT - Mechanical Services, Materials Research, Highway Garage 12; Mr. B's Truck and Equipment Painting, LLC	UIC	Closed	
	*NHDOT	C	11 Stickney Avenue		199004021, Project 16899	NHDOT - Mechanical Services, Materials Research, Highway Garage 12; Mr. B's Truck and Equipment Painting, LLC	UIC	Closed	
	*NHDOT	C	11 Stickney Avenue		199004021, Project 10764	NHDOT - Mechanical Services, Materials Research, Highway Garage 12; Mr. B's Truck and Equipment Painting, LLC	Initial Response Spill Site	Closed	
	*NHDOT	C	11 Stickney Avenue		199004021, Project 6249	NHDOT - Mechanical Services, Materials Research, Highway Garage 12; Mr. B's Truck and Equipment Painting, LLC	Haz Waste	GMP	MtBE exceeds AGQS, other petroleum and halogenated VOCs do no exceed applicable standards, no VI hazard identified, monitored under Project 1921
	*NHDOT	C	11 Stickney Avenue		199004021, Project 10347	NHDOT - Mechanical Services, Materials Research, Highway Garage 12; Mr. B's Truck and Equipment Painting, LLC	OPUF	Closed	
	*NHDOT	C	11 Stickney Avenue		199004021, Project 1921	NHDOT - Mechanical Services, Materials Research, Highway Garage 12; Mr. B's Truck and Equipment Painting, LLC	LUST	GMP	MtBE exceeds AGQS, other petroleum and halogenated VOCs do no exceed applicable standards, no VI hazard identified
	Prescott and Sons Oil	G33	196 North Main Street -rear (Storrs Street Extention)		199407068, Project 12362	Johnny Prescott and Sons Oil Co.	LAST	GMP	incorrectly located on EDR Detail Map, abutts rail line to the west, upgradient, monitoring suspended due to petroleum free product, ongoing free product recovery activities, upgradient, no VI hazard identified
	Agway, Inc.	D	650 South Commercial Street		198605615, Project 29335	Former Agway, Inc.	OPUF	Closed	
	Cindy Ann Cleaners, LLC	E	169 North Main Street	NHD037704228	198604252	Cindy Ann Cleaners, Inc.	UST and Haz Waste Generator	Active	upgradient, UST facility, small quantity Haz Waste generator; no violations, no current monitoring
	Cindy Ann Cleaners, LLC	E	169 North Main Street			Cindy Ann Cleaners, Inc.	EDR Historical Cleaners		upgradient, current as of 2012

TABLE 2

Summary of Contaminated Sites - Potential Construction Target Properties

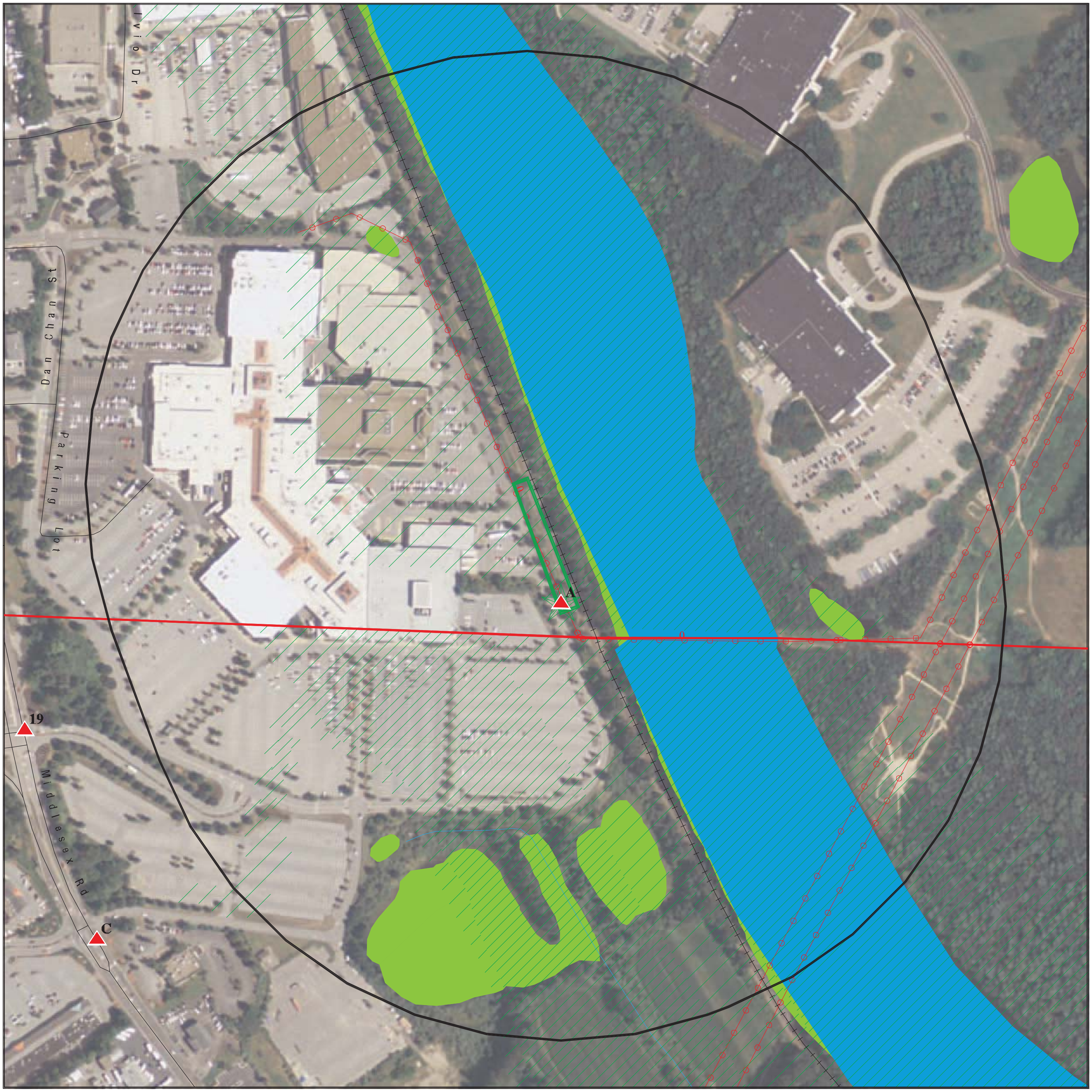
N.H. Capitol Corridor Rail and Transit Alternatives

Target Property	Contaminated Sites								
	Site Name	EDR Detail Map Identifier	Site Address	Federal Identifiers	State Identifiers	Alternate Names	Site Type	Status	Comments
Stickney Avenue	Hess Station 29500	E	175 North Main Street	NHD982200776	199306008, Project 4319		LUST	GMP	upgradient, petroleum VOCs, Target Property no in GMZ, impact to Target Property unlikely
	Hess Station 29500	E	175 North Main Street	NHD982200776	199306008, Project 12767		Oil Spills/Releases	Closed	
	Exxon Division of CFI 2861	G	196 North Main Street		199007029, Project 12037	Conoco Phillips	Initial Response Spill Site	Closed	
	Exxon Division of CFI 2861	G	196 North Main Street		199007029, Project 2239	Conoco Phillips	LUST	Closed	
	Exxon Division of CFI 2861	G	196 North Main Street		199007029, Project 13294	Conoco Phillips	LUST	GMP	upgradient, petroleum VOCs, LNAPL, no VI hazard, Target Property not in GMZ, impact to Target Property unlikely
	South Commercial Street	I	32 South Commercial Street		198905028, Project 12091	South Commercial Street Mobil	Initial Response Spill Site	Closed	
	South Commercial Street	I	32 South Commercial Street		198905028, Project 1052	South Commercial Street Mobil	LUST	GMP	upgradient, petroleum VOCs, no VI hazard, Target Property not in GMZ, impact to Target Property unlikely
	South Commercial Street	I	32 South Commercial Street		198905028, Project 27181	South Commercial Street Mobil	Unsolicited Site Assessment	Closed	
	Merrimack Cleaners	J	12 Loudon Road	NHD986484111	na		EDR Historical Cleaners	na	former or current dry cleaning facility downgradient
	other sites are unlikely to impact the Target Property due to distance, nature of the release, and/or hydrologic setting								

The EDR Detail Maps are included in Attachment A
*Indicates the Target Property
Sites underlined are discussed in the text
Contaminated Sites: site where contamination is known to exist or has existed in the past
**The historical dry cleaning facilities identified are not necessarily contaminated sites or release sites but are included due to the high-risk significance of halogenated VOCs
VOC: Volatile Organic Compounds, often petroleum or solvent (halogenated) related
AUR: Activity and Use Restriction
GMP: Groundwater Management Permit
VI: Vapor Intrusion
Haz Waste: Hazardous Waste Discharge
LUST: Leaking Underground Storage Tank (petroleum)
OPUF: On-Premises-Use Facility
ADS: Asbestos Disposal Site
na: not available/applicable
MOST: Motor Oil Storage Tank
HWRB: NHDES Hazardous Waste Remediation Bureau
SI: Site Investigation
ETHER: Ether contaminated site.
GW-2: NHDES groundwater vapor intrusion threshold
OCRB: NHDES Oil Remediation and Compliance Bureau
UIC: Underground Injection Control (commonly floor drains not related to septic or sewer systems)
LNAPL: Light Non-Aqueous Phase Liquid, generally floating free-phase petroleum product
LAST: Leaking Aboveground Storage Tank
DOT: U.S. Department of Transportation
HMIRS: Hazardous Materials Incident Reporting System

ATTACHMENT A

DETAIL MAP - 3845941.2s

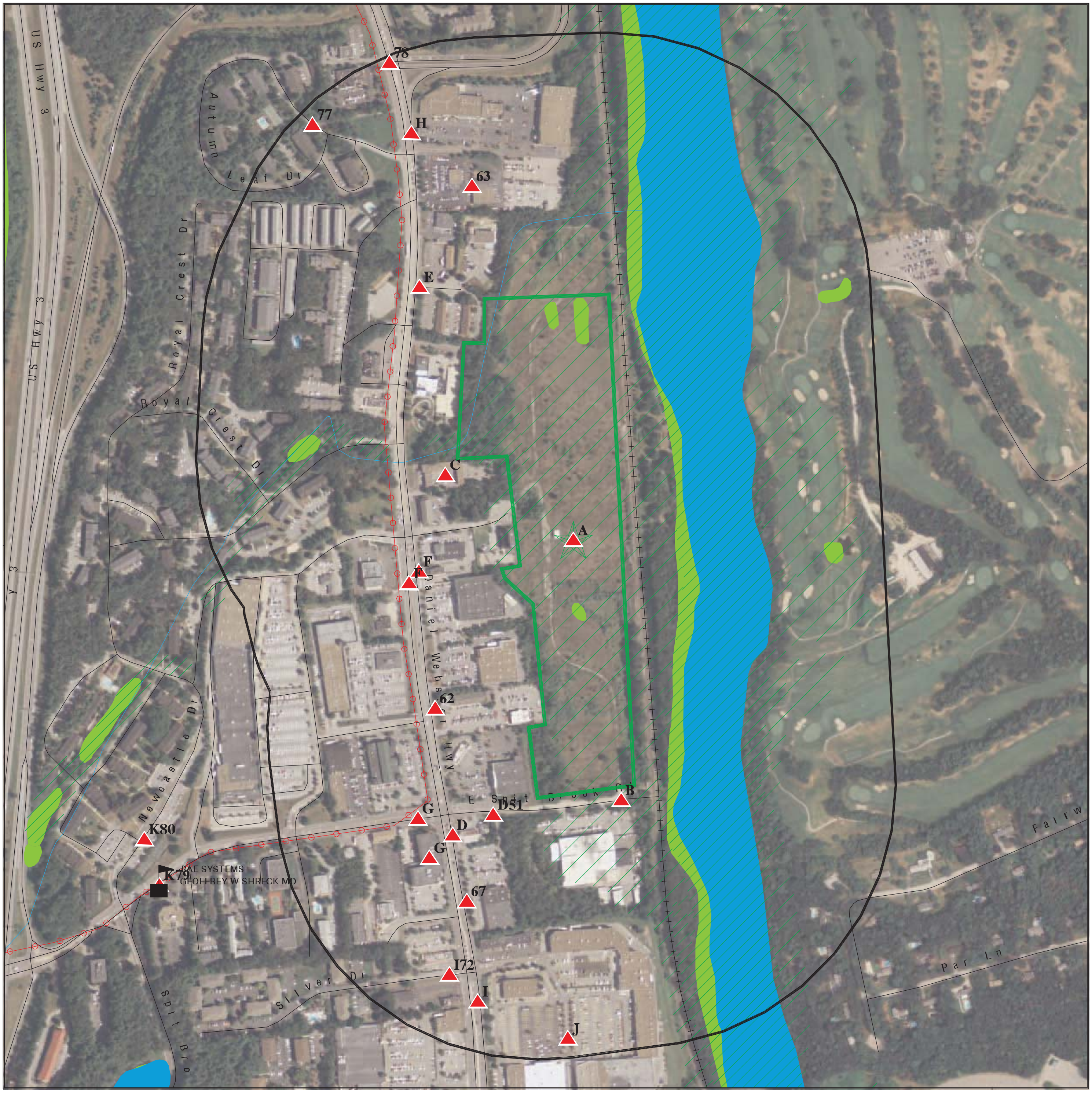


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Inferred Groundwater Flow
- Area of Potential Impact
- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Pheasant Lane Mall Property	CLIENT:	Nobis Engineering, Inc.
ADDRESS:	310 Daniel Webster Highway	CONTACT:	Stan Bonis
	Nashua NH 03060	INQUIRY #:	3845941.2s
LAT/LONG:	42.7003 / 71.4339	DATE:	February 04, 2014 1:15 pm

DETAIL MAP - 3789088.2s



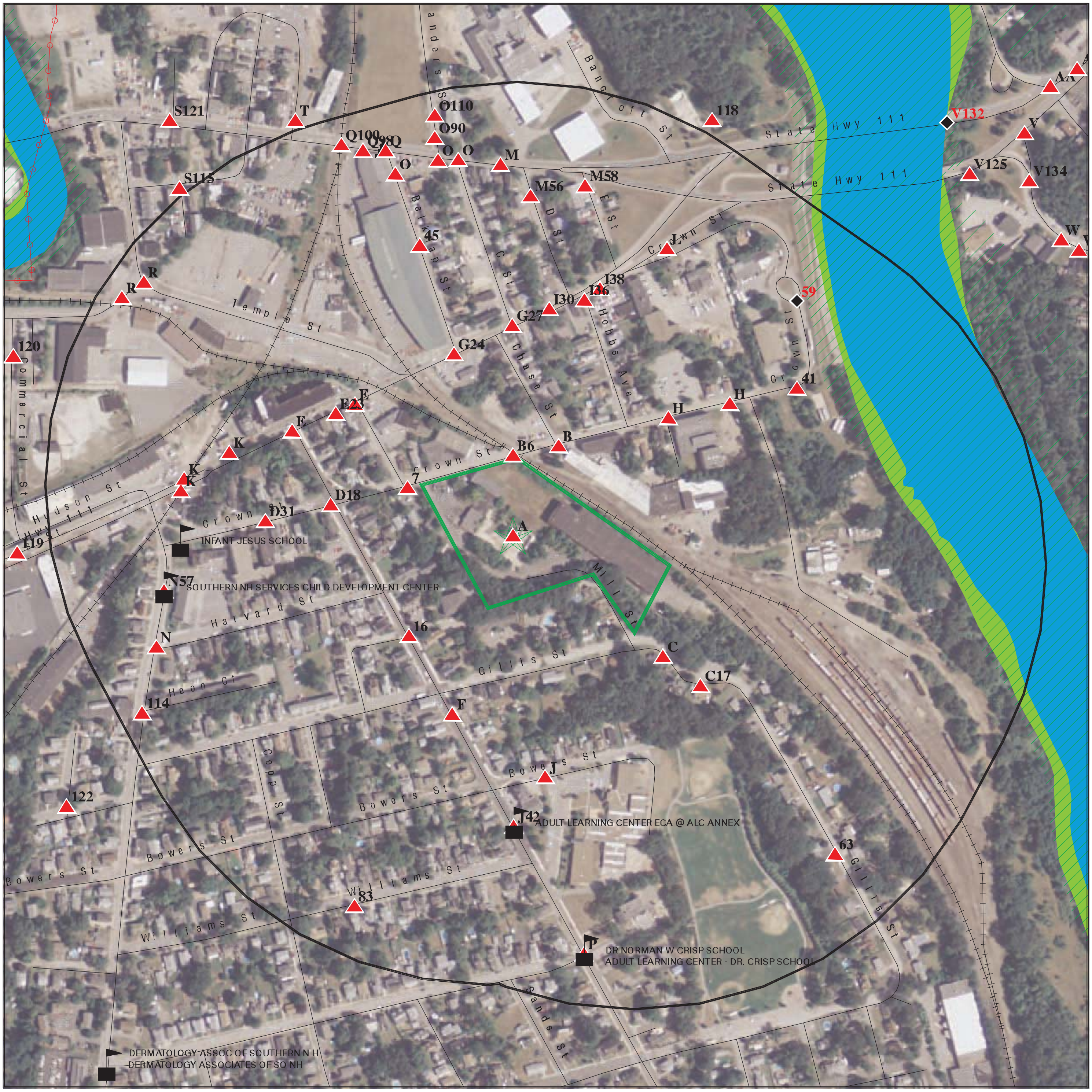
0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Inferred Groundwater Flow
- Area of Potential Impact
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Former Hampshire Chemical Property	CLIENT:	Nobis Engineering, Inc.
ADDRESS:	Spitbrook Road Nashua NH 03060	CONTACT:	Stan Bonis
		INQUIRY #:	3789088.2s
LAT/LONG:	42.7141 / 71.4395	DATE:	November 19, 2013 5:44 pm

DETAIL MAP - 3789088.8s



0 — 1/16 — 1/8 — 1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

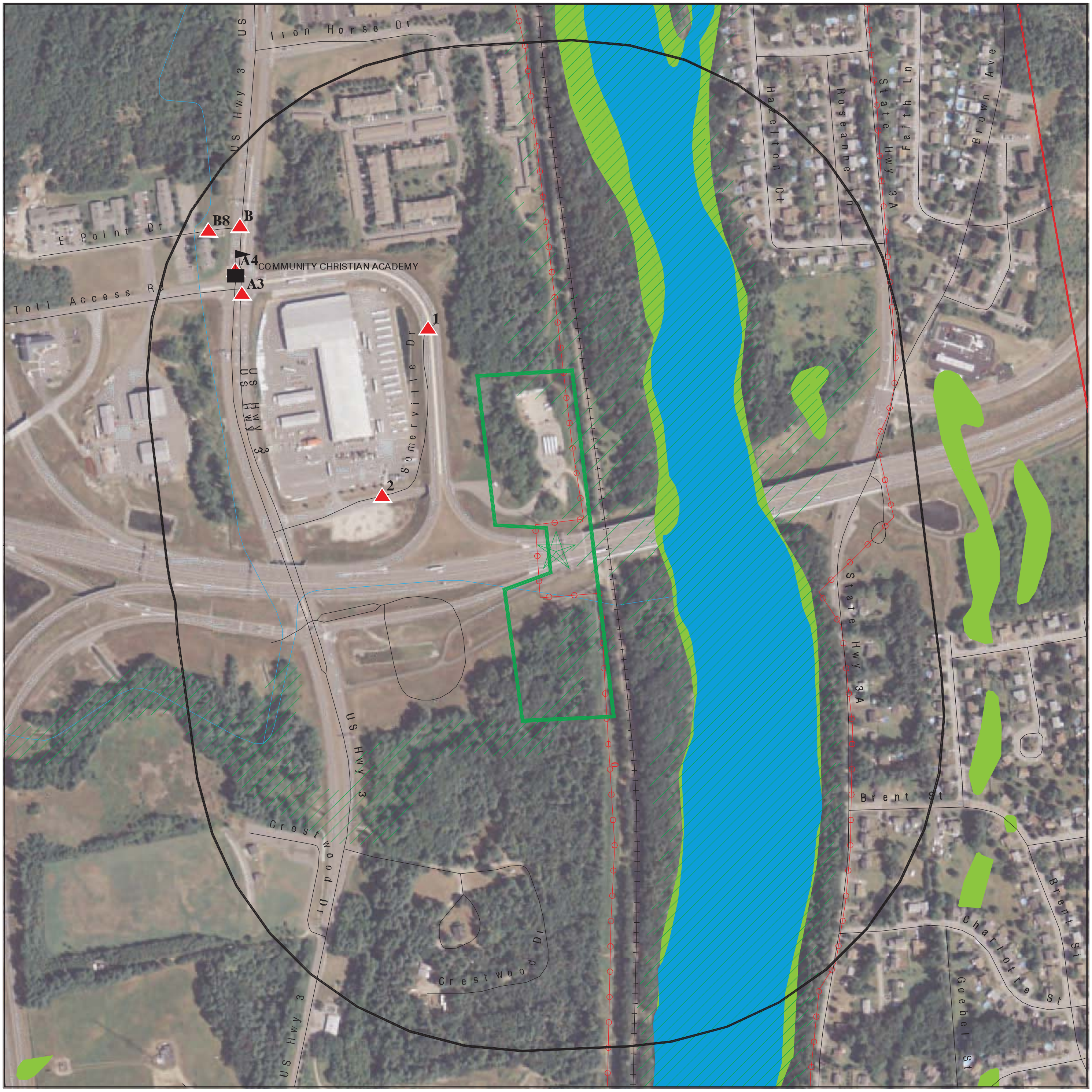
Inferred Groundwater Flow

Area of Potential Impact

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Crown Street Property	CLIENT:	Nobis Engineering, Inc.
ADDRESS:	25 Crown Street Nashua NH 03060	CONTACT:	Stan Bonis
		INQUIRY #:	3789088.8s
LAT/LONG:	42.7598 / 71.4484	DATE:	November 18, 2013 5:36 pm

DETAIL MAP - 3789088.14s



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

Inferred Groundwater Flow

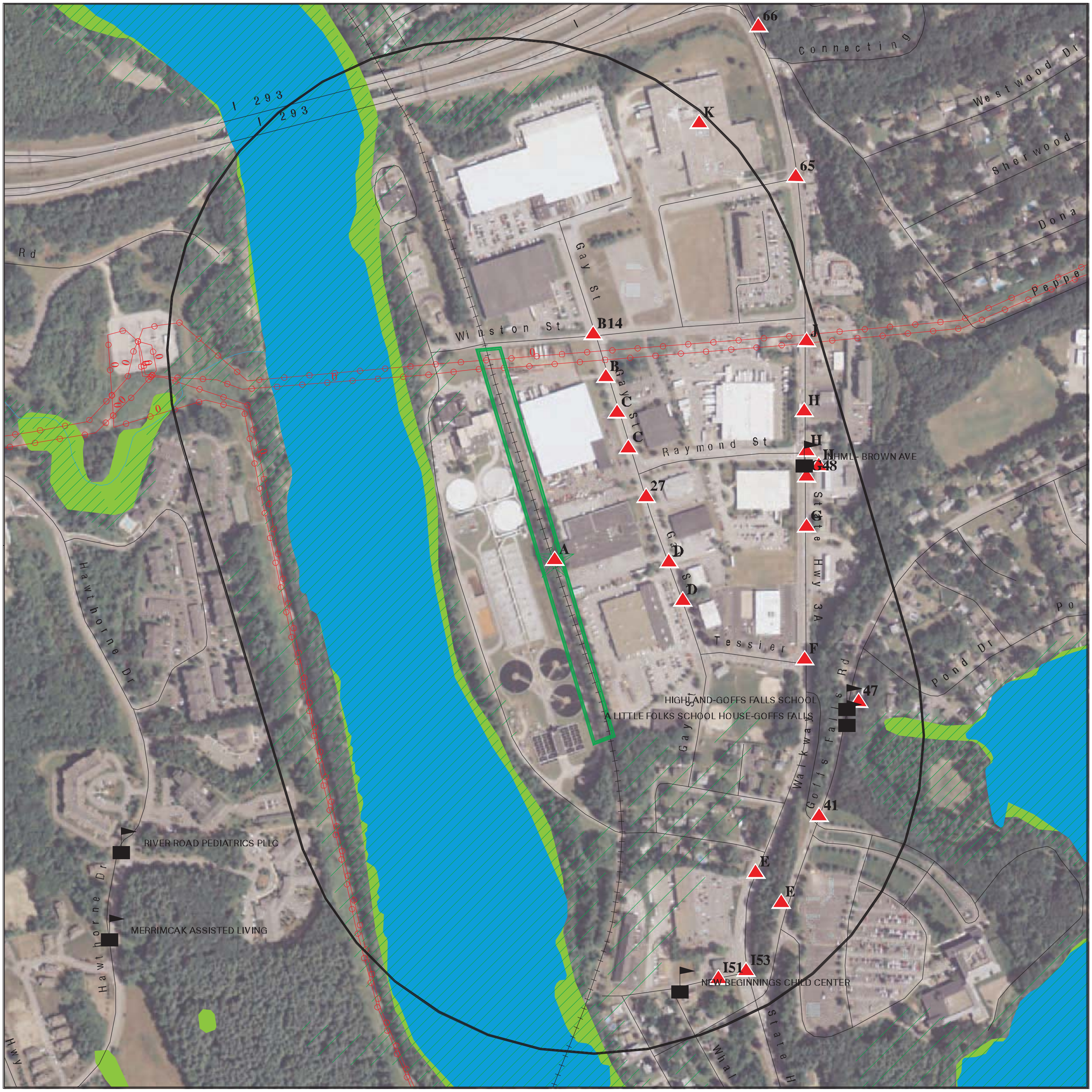
0 1/16 1/8 1/4 Miles

- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	MHT Airport / Wieczorek Drive Property	CLIENT:	Nobis Engineering, Inc.
ADDRESS:	Raymond Wieczorek Drive Bedford NH 03110	CONTACT:	Stan Bonis
		INQUIRY #:	3789088.14s
LAT/LONG:	42.9131 / 71.4554	DATE:	November 18, 2013 5:38 pm

DETAIL MAP - 3845941.9s



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

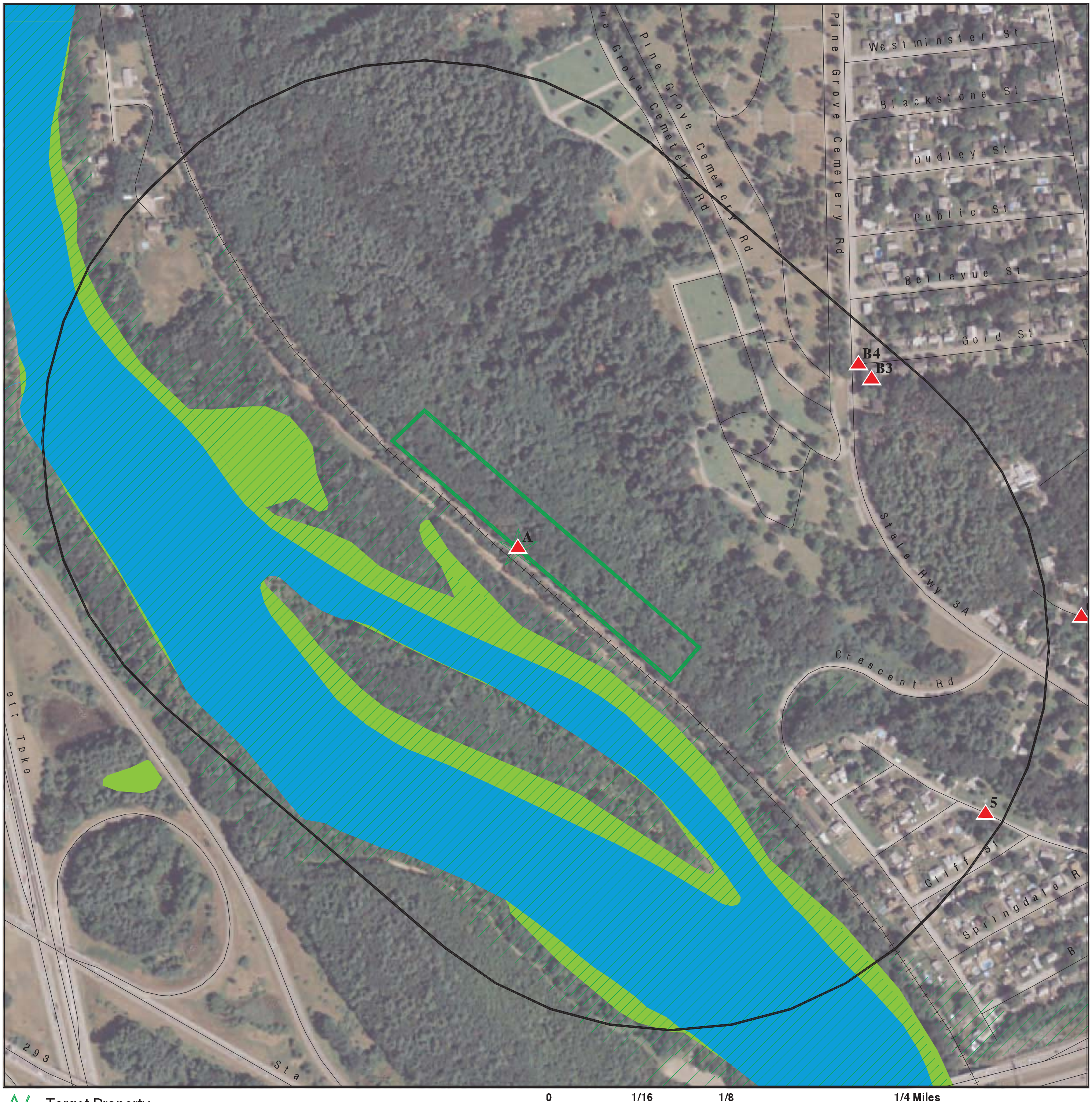
Inferred Groundwater Flow

Area of Potential Impact

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Manchester Wastewater Treatment Facility Property	CLIENT:	Nobis Engineering, Inc.
ADDRESS:	300 Winston Street Manchester NH 03103	CONTACT:	Stan Bonis
		INQUIRY #:	3845941.9s
LAT/LONG:	42.942 / 71.4565	DATE:	February 04, 2014 1:20 pm

DETAIL MAP - 3845941.16s



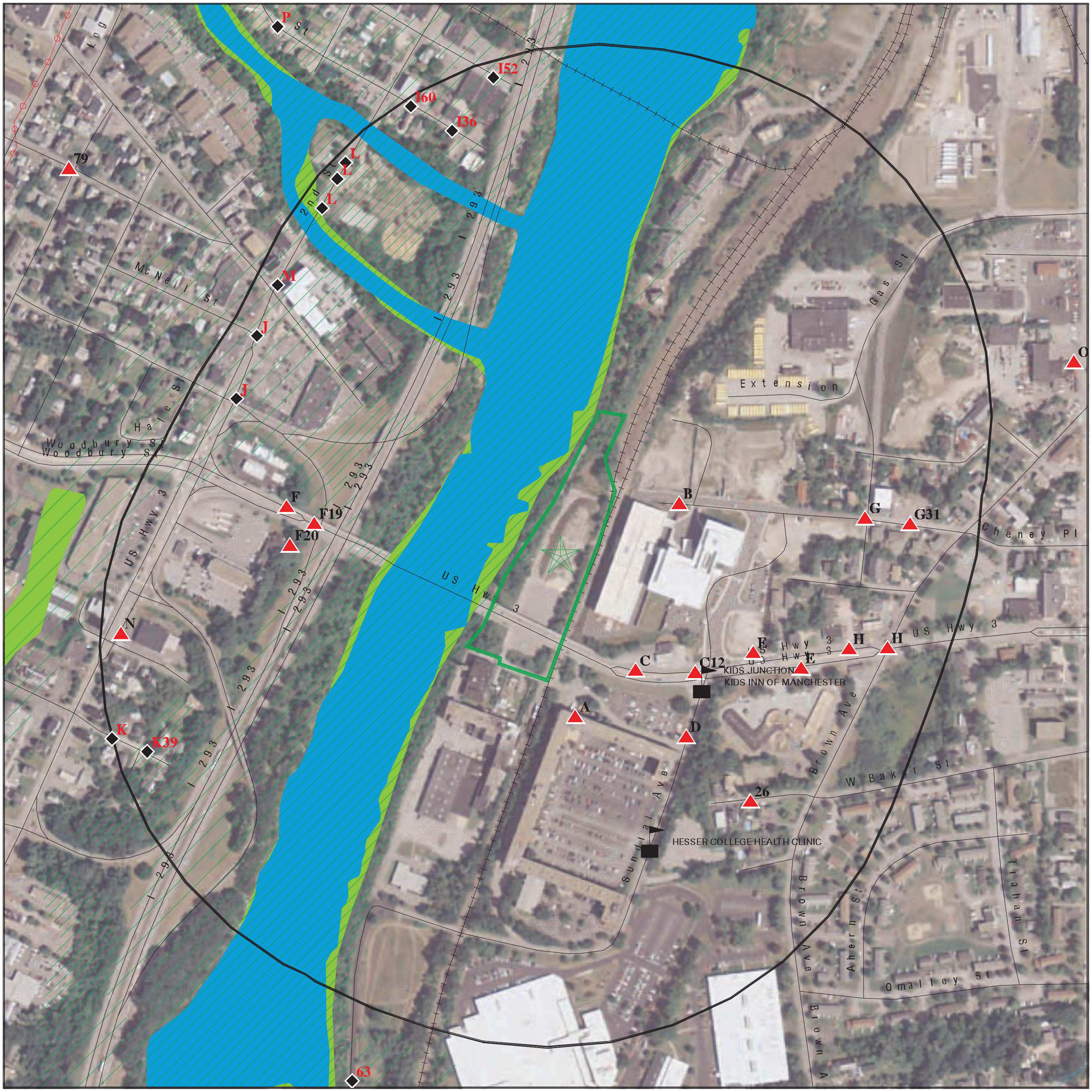
Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
Sensitive Receptors
National Priority List Sites
Dept. Defense Sites
Inferred Groundwater Flow
Area of Potential Impact

Indian Reservations BIA
Oil & Gas pipelines from USGS
100-year flood zone
500-year flood zone
National Wetland Inventory
State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Pine Grove Cemetery Property	CLIENT:	Nobis Engineering, Inc.
ADDRESS:	765 Brown Ave	CONTACT:	Stan Bonis
	Manchester NH 03103	INQUIRY #:	3845941.16s
LAT/LONG:	42.9531 / 71.4656	DATE:	February 04, 2014 1:20 pm

detail MAP - 4005641.2s



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

Inferred Groundwater Flow

Area of Potential Impact

Indian Reservations BIA

Power transmission lines

Oil & Gas pipelines from USGS

100-year flood zone

500-year flood zone

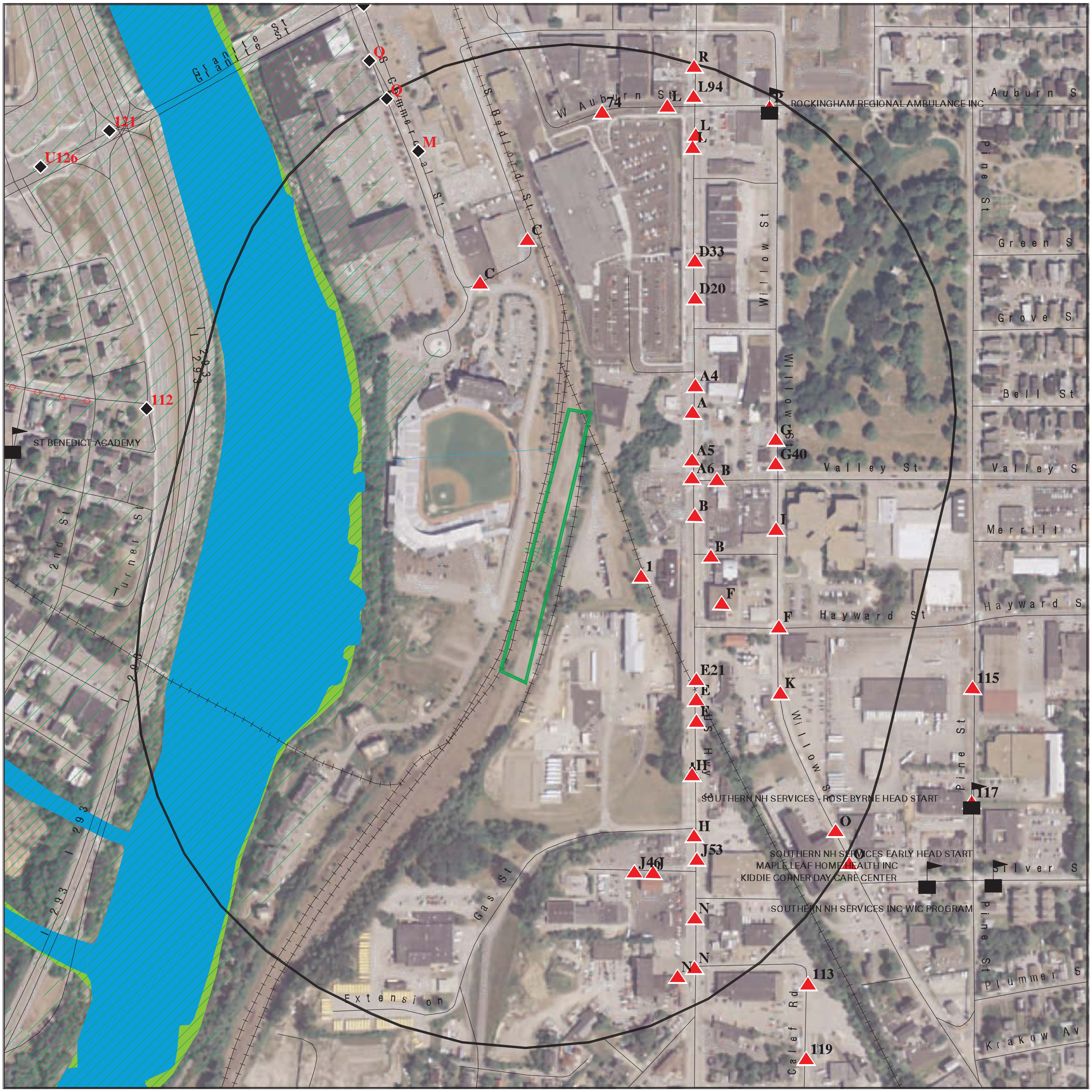
National Wetland Inventory

State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Hancock Street Property	CLIENT:	Nobis Engineering, Inc.
ADDRESS:	Hancock Street	CONTACT:	Stan Bonis
	Manchester NH 03101	INQUIRY #:	4005641.2s
LAT/LONG:	42.9745 / 71.4702	DATE:	July 15, 2014 3:32 pm

DETAIL MAP - 3860572.2s



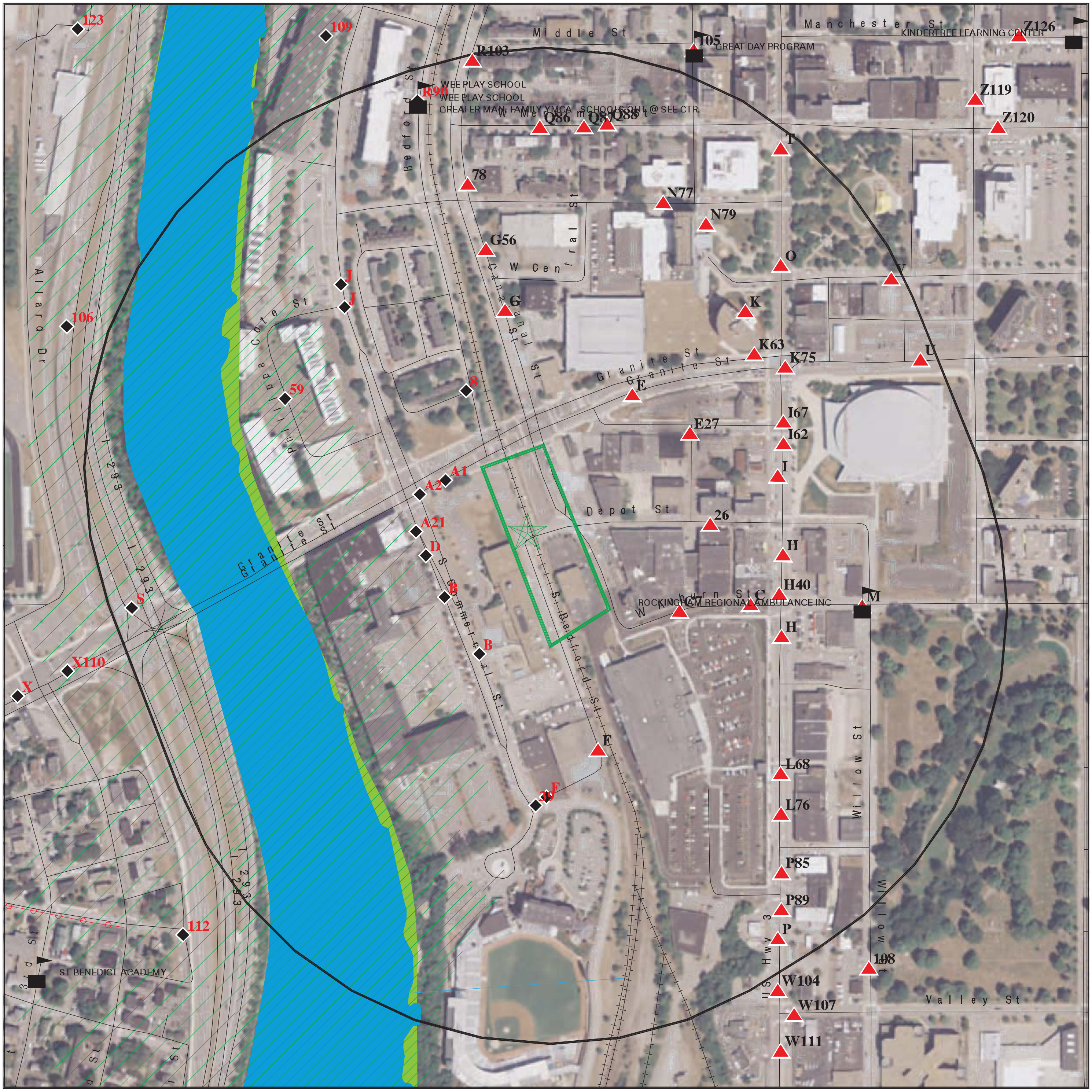
0 — 1/16 — 1/8 — 1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Inferred Groundwater Flow
- Area of Potential Impact
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Riverwalk Way / South Commercial Street Property	CLIENT: Nobis Engineering, Inc.
ADDRESS: South Commercial Street Manchester NH 03101	CONTACT: Stan Bonis INQUIRY #: 3860572.2s
LAT/LONG: 42.9806 / 71.4651	DATE: February 20, 2014 8:56 pm

DETAIL MAP - 3789088.20s



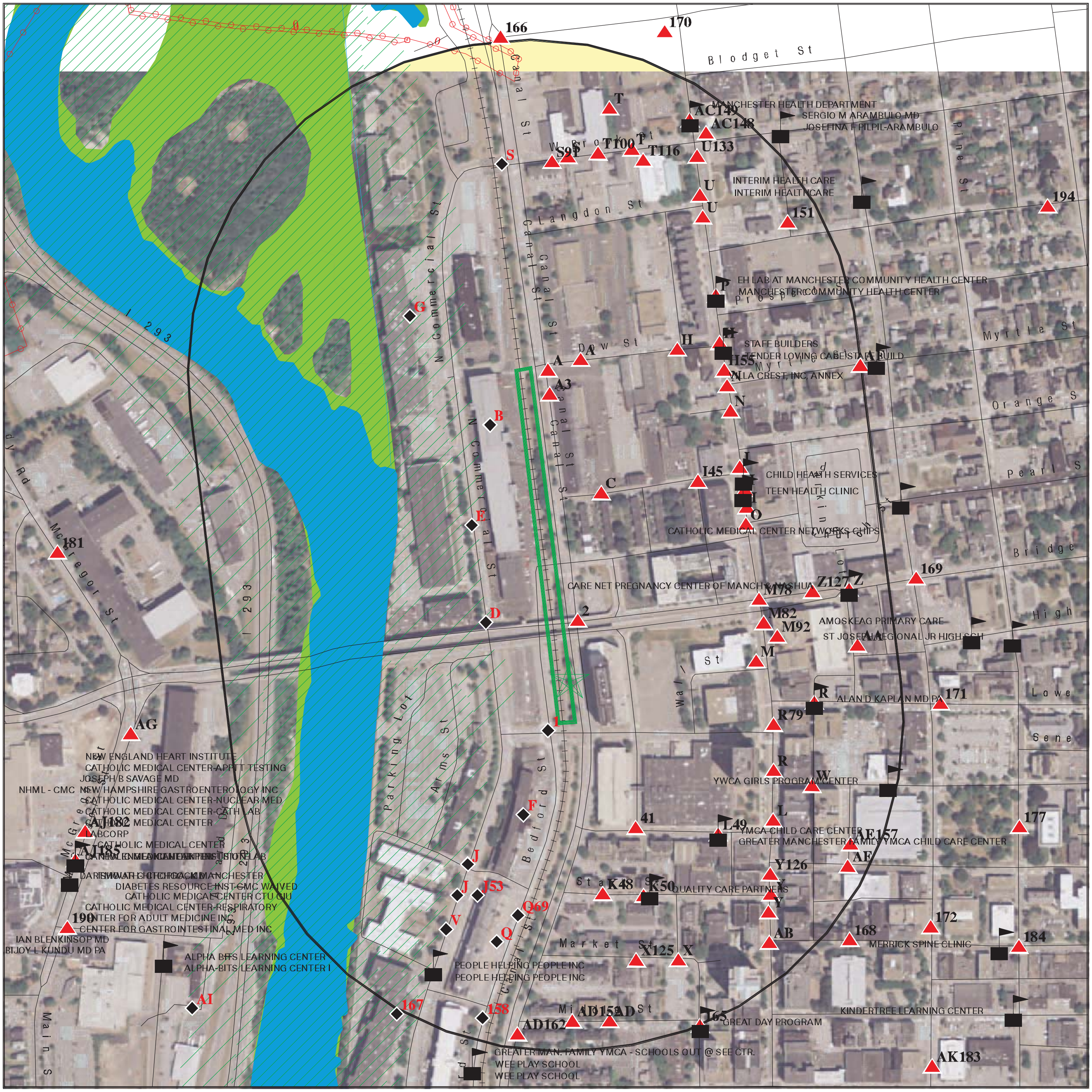
0	1/16	1/8	1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Inferred Groundwater Flow
- Area of Potential Impact
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Granite and Canal Street Property	CLIENT:	Nobis Engineering, Inc.
ADDRESS:	Granite and Canal Street Manchester NH 03101	CONTACT:	Stan Bonis
		INQUIRY #:	3789088.20s
LAT/LONG:	42.9857 / 71.4662	DATE:	November 18, 2013 5:37 pm

DETAIL MAP - 3845941.23s



0 1/16 1/8 1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

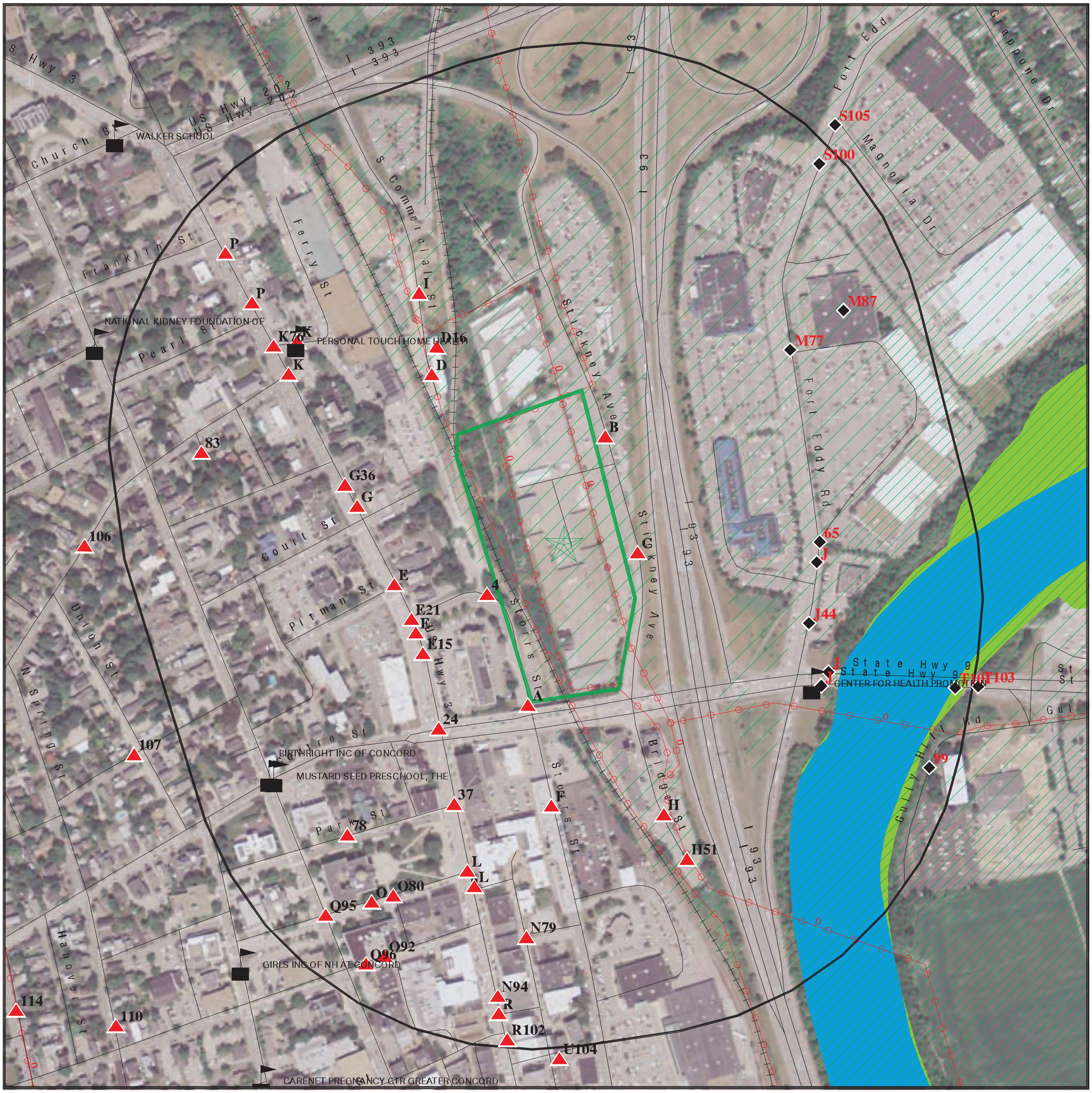
Inferred Groundwater Flow

Area of Potential Impact

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Spring Street and Canal Street Property	CLIENT:	Nobis Engineering, Inc.
ADDRESS:	Canal Street Manchester NH 03101	CONTACT:	Stan Bonis
		INQUIRY #:	3845941.23s
LAT/LONG:	42.9939 / 71.4661	DATE:	February 04, 2014 8:10 am

DETAIL MAP - 3789088.26s



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

Inferred Groundwater Flow

Area of Potential Impact

Indian Reservations BIA

Power transmission lines

Oil & Gas pipelines from USGS

100-year flood zone

500-year flood zone

National Wetland Inventory

State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Stickney Avenue Property	CLIENT:	Nobis Engineering, Inc.
ADDRESS:	Stickney Avenue	CONTACT:	Stan Bonis
	Concord NH 03301	INQUIRY #:	3789088.26s
LAT/LONG:	43.2104 / 71.5351	DATE:	November 19, 2013 1:00 pm

APPENDIX D

New Hampshire Capitol Corridor Rail and Transit Alternatives Analysis – Natural Resources Technical Report

New Hampshire DOT
Department of Transportation

New Hampshire Capitol Corridor
Rail and Transit Study

Natural Resources Technical Report

Prepared by:

The Smart Associates
Environmental Consultants, Inc.

72 North Main Street
Concord, NH 03301

September 2014

Table of Contents

TABLES

FIGURES

APPENDICES

1.0 Introduction

This report provides information on the existing natural resources within the New Hampshire portion of the New Hampshire Capitol Corridor Rail and Transit Study. The study area for this report, which is referred to as the "project corridor", includes the existing Pan Am Railways rail line and potentially affected areas adjacent to it from Nashua to Concord, New Hampshire.

In preparing this report, The Smart Associates, Environmental Consultants, Inc. (The Smart Associates) collected and reviewed background data and maps, coordinated with natural resource agencies, conducted a brief "windshield" survey of the entire corridor, and completed more detailed field reviews for 11 potential station/layover facilities. This report provides a summary of the natural resources present within the project corridor. Other environmental resources and issues, such as contaminated properties, historic and cultural resources, and socioeconomic concerns are not addressed.

Appendix A provides a brief overview of the Massachusetts portion (Lowell to Tyngsborough) of the Capitol Corridor Rail and Transit Study. Field reviews and extensive data collection were not completed for the Massachusetts portion of the project since the natural resource impacts are anticipated to be minor. Wetland, floodplain, and rare species data obtained from the MassGIS website are included in Appendix A.

2.0 Wetlands

Wetlands are federally protected under the Clean Water Act (CWA) and activities resulting in impacts to them require a permit from the U.S. Army Corps of Engineers (ACOE) under Section 404 of the CWA. Wetlands are also protected under State of New Hampshire statutes, with permits obtained through the New Hampshire Department of Environmental Services (NHDES) Wetlands Bureau. Compensatory mitigation is required for projects that involve 10,000 square feet or more of wetland impact under the New Hampshire statutes.

In New Hampshire, municipalities can chose to designate wetlands as "prime wetlands" (RSA 482-A:15 and administrative rules Env-Wt 700). Prime wetlands are generally considered to be exceptionally valuable because of their large size, undisturbed condition, and ability to support wildlife and provide other functions and values. Some prime wetlands have a 100-foot protected buffer zone. Impacts to prime wetlands and their buffer zones should be avoided if possible. If impacts are necessary, compensatory mitigation is required and a public hearing is required to be held prior to permit approval.

Wetlands along the project corridor were not field-delineated, but were identified using available mapping, such as National Wetland Inventory Maps, the NH Wetlands Base Map, US Geologic Survey (USGS) topographic maps, and aerial photographs.

Field reviews of the proposed station and layover facilities were conducted in order to obtain more accurate information on wetland resources. Approximate wetland boundaries within and adjacent to the proposed facilities were mapped using GPS, but wetland delineation flags were not placed in the field and surveyed. Photographs taken during the field reviews are included in Appendix B.

In order to more accurately evaluate wetland impacts and to apply for ACOE and NHDES permits, a formal wetland delineation within the entire project corridor and the station and layover facilities will need to be conducted during the project's preliminary design phase.

2.1 Summary of Resources – Proposed Rail Corridor

Wetland resources within the project corridor include palustrine and riverine systems that feed into the Merrimack River. Since the proposed rail corridor follows an existing railroad embankment, wetland and stream crossings are currently bridged or culverted. As a result, the wetland systems that are crossed by the rail embankment have already been impacted by the placement of fill and culverts.

Wetlands are scattered along the entire project corridor, although the large wetland systems are generally located outside of densely developed areas (refer to Figures 2-1a to 2-1g). Table 2-1 provides a summary of the large wetland systems that are located along the project corridor.

Prime wetlands within the project corridor are located in the municipalities of Hooksett and Nashua. Prime wetlands are identified in Table 2-1 (Large Wetland Systems) and on Figures 2-1a through 2-1g. Within the City of Nashua, the Merrimack River, the Nashua River, and Salmon Brook are also considered prime wetlands. None of the prime wetlands within the project corridor have a 100-foot buffer zone.

Table 2-1. Large Wetland Systems along Rail Corridor

Town	Federal Classification(s)	Prime Wetland?	Description
Concord	PUBH, PUBF, PEM1F, PSS1E, PFO1E	No	Located near I-93, Exit 12. Includes "South End Marsh" (conservation land owned by the City of Concord) and a NHDOT wetland mitigation area
Bow	PSS/EM1E, PSS1E, PUBHh, PUB/SS1F	No	Located near PSNH facility. Wetland system appears to have been altered by PSNH facility. Bow Bog Brook flows through wetland system.
Hooksett	PSS1E, PUBHh	Yes	Includes wetlands and open water areas located between Route 3A and Merrimack River.
Hooksett	PSS/EM1E	No	Wetland system associated with an unnamed tributary to Merrimack River. Located between Dale Road and Merrimack River.
Hooksett	PSS1E, PUBF	Yes	Wetland system associated with Messer Brook. Located near Hooksett/Manchester town line.
Manchester	PEM1F, PSS/EM1E, PFO/EM1E	No	Wetland system associated with unnamed tributaries to Merrimack River. Located approximately 1 mile north of Amoskeag Street bridge.
Merrimack	L1UBH, PSS1E, PSS1C	No	Horseshoe Pond and associated wetlands. Also includes Naticook Brook
Merrimack	PFO1E, PFO4E, PEM1Eb	No	Located near Mast Road, between Route 3 and Merrimack River
Nashua	R5UBHx, PUB/SS1Fh, PFO1E	Yes	Wetland system associated with Salmon Brook

PUBH = Palustrine, Unconsolidated Bottom, Permanently Flooded
PUBF = Palustrine, Unconsolidated Bottom, Semipermanently Flooded
PEM1F = Palustrine, Emergent, Persistent, Semipermanently Flooded
PSS1E = Palustrine, Scrub-shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated
PFO1E = Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded/Saturated
PSS/PEM1E = Palustrine, Scrub-scrub / Emergent, Persistent, Seasonally Flooded/Saturated
PUBHh = Palustrine, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded
PUB/SS1F = Palustrine, Unconsolidated Bottom / Scrub-shrub, Broad-leaved Deciduous, Semipermanently Flooded
PFO/EM1E = Palustrine, Forested, Broad-leaved Deciduous / Emergent, Persistent, Seasonally Flooded/Saturated
L1UBH = Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded
PSS1C = Palustrine, Scrub-shrub, Broad-leaved Deciduous, Seasonally Flooded
PFO4E = Palustrine, Forested, Needle-leaved Evergreen, Seasonally Flooded/Saturated
PEM1Eb = Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated, Beaver
R5UBHx = Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded, x = Excavated
PUB/SS1Fh = Palustrine, Unconsolidated Bottom / Scrub-shrub, Broad-leaved Deciduous, Semipermanently Flooded, Diked/Impounded

2.2 Summary of Resources – Station and Layover Facilities

Field reviews were conducted for 11 potential station and layover facilities and the results of these field reviews are described below. Although 11 sites were reviewed in order to collect data and evaluate impacts, only five station sites and one layover facility site will ultimately be selected for the project.

Stickney Avenue Station Site, Concord
No wetlands or watercourses are located within or adjacent to the site, based on a field review conducted in November 2013. The Merrimack River is located approximately 800 feet east of the site.

Bridge Street Station Site, Manchester
No wetlands or watercourses are located within or adjacent to the site, based on a field review conducted in January 2014. The Merrimack River is located approximately 500 feet west of the site.

Granite Street Station Site, Manchester
No wetlands or watercourses are located within or adjacent to the site, based on a field review conducted in November 2013. The Merrimack River is located approximately 700 feet west of the site.

Riverwalk Way Layover Facility Site, Manchester
No wetlands or watercourses are located within or adjacent to the site, based on a field review conducted in March 2014. The Merrimack River is located approximately 600 feet west of the site.

Queen City Bridge Layover Facility Site, Manchester
No wetlands or water courses are located within the site, based on a review of aerial photographs and National Wetland Inventory maps. A field review of the site was not conducted due to limited access. The Merrimack River is located on the west side of the site, approximately 50 to 100 feet from the edge of the site.

Riverdale Avenue Layover Facility Site, Manchester
This site includes forested wetland areas and several intermittent streams. Wetlands were identified during field reviews conducted in January, March, and September 2014. The limits of the field reviews (shown on Figure 2-2) included an approximate 2,300-foot by 250-foot corridor along the east side of the railroad embankment. The Merrimack River is located approximately 100 to 400 feet to the southwest of the railroad embankment.

The southern portion of the site includes a forested wetland that is classified as seasonally flooded/saturated, palustrine forested with broad-leaved deciduous vegetation (PFO1E). This wetland feeds two intermittent streams that flow through the site. One stream channel flows south through the forested wetland and enters a catch basin/drain at the southern edge of the site, which appears to outlet into the Merrimack River. The second stream runs north through the site, then flows southwest through a culvert under the railroad embankment and eventually enters the Merrimack River. In addition, two smaller streams/drainages enter the northern boundary of the site and flow into the main stream channel. These streams have steep banks that range from approximately 3 to 15 feet in height. Except for the forested wetland in the southern portion of the site, the streams are bordered by upland areas.

The northern edge of the site includes a forested wetland system that continues beyond the study area. This wetland is classified as seasonally flooded/saturated, palustrine forested with broad-leaved deciduous vegetation (PFO1E). Evidence of inundation (water-stained leaves, shallow roots, and little herbaceous cover) was noted during the September 2014 field review; however no standing water was present at the time of the field review. This wetland may potentially serve as a vernal pool since it appears to collect water and it is located away from the intermittent stream systems. A field visit during the spring (March to May) would be necessary to determine if vernal pool indicator species, such as wood frog (*Rana sylvatica*) and spotted salamander (*Ambystoma maculatum*) are present.

Dominant vegetation at this site includes white pine (*Pinus strobus*), oak (*Quercus* sp.), red maple (*Acer rubrum*), oriental bittersweet (*Celastrus orbiculatus*), goldenrod (*Solidago* sp.), and various ferns. Large portions of the site are densely vegetated with Japanese barberry (*Berberis thunbergii*) and burning bush (*Euonymus alatus*), which are both considered invasive species.

Brown Avenue Layover Facility Site, Manchester

No wetlands or watercourses are located within the site, based on a field review conducted in January 2014. A small forested wetland is located adjacent to the southern edge of the site (refer to Figure 2-3). This wetland is located between a residential area and the railroad embankment. The Merrimack River is located approximately 400 feet west of the site.

Raymond Wieczorek Drive (MHT Airport) Park and Ride Station Site, Bedford

Several wetlands and watercourses are located within the site. The site was field reviewed in November and December 2013. The limits of the field review (shown in Figure 2-4) included undeveloped areas located immediately north and south of Raymond Wieczorek Drive and west of the existing railroad embankment. A portion of the site located north of Raymond Wieczorek Drive is currently used for the storage of propane tanks. The Merrimack River is located approximately 200 feet east of the site.

North of Raymond Wieczorek Drive, the majority of the site is forested wetland. Emergent/scrub-shrub wetlands and a small area of open water are located near the railroad embankment. Upland areas include the propane tank facility and the eastern and western edges of the site. An unnamed stream flows through the forested portion of the wetland. The stream had a few inches of flowing water at the time of the field review, but it appears that it may run dry during summer months.

Wetlands within this portion of the site are classified as: seasonally flooded/saturated, palustrine forested with broad-leaved deciduous vegetation (PFO1E); seasonally flooded/saturated, palustrine emergent with persistent vegetation (PEM1E); seasonally flooded/saturated, palustrine emergent/scrub-shrub (PEM1E/PSS1E); and semipermanently flooded, palustrine, unconsolidated bottom (PUBF). Vegetation within the emergent and scrub-shrub wetland areas generally includes common reed (*Phragmites australis*), meadowsweet (*Spiraea latifolia*), cattail (*Typha latifolia*), raspberry (*Rubus idaeus*), goldenrod, and glossy buckthorn (*Frangula alnus*). Vegetation within the forested wetland areas includes red oak, red maple (*Acer rubrum*), cinnamon fern (*Osmundastrum cinnamomeum),* and royal fern *(Osmunda spectabilis)*. White pine is also present along the wetland edges.

South of Raymond Wieczorek Drive, there are two small forested wetlands and one emergent/scrub-shrub wetland. These three wetlands drain to Sebbins Brook, which flows into the Merrimack River. Within the site, the banks of Sebbins Brook are generally 3 to 6 feet in height, although in some areas the banks are much taller (up to 30 feet). Vegetation along the banks generally includes red oak, red maple, and silky dogwood (*Cornus amomum*), along with some highbush blueberry (*Vaccinium corymbosum*) and winterberry holly (*Ilex verticillata*).

Wetlands within the southern portion of the site are classified as seasonally flooded/saturated, palustrine forested with broad-leaved deciduous vegetation (PFO1E) and seasonally flooded/saturated, palustrine emergent/scrub-shrub (PEM1E/PSS1E). The forested wetlands are vegetated with red oak, red maple, and some winterberry holly. Very little herbaceous vegetation was present at the time of the field reviews. The emergent/scrub-shrub wetland is vegetated with goldenrod, meadowsweet, dogwood, and bittersweet (*Celastrus orbiculatus).*

Crown Street Park and Ride Station Site, Nashua
No wetlands or watercourses are located within or adjacent to the site, based on a field review conducted in December 2013. The Merrimack River is located approximately 1,000 feet east of the site.

Spit Brook Road Layover Facility Site, Nashua
The study area for this site includes the former Hampshire Chemical Property (refer to Figure 2-5). A portion of this property is enclosed by a security fence that prevents access. As a result, the portion of the property located outside the fence was field reviewed, but no field reviews were completed inside the fence. Information on wetland resources inside the fence were obtained from National Wetland Inventory and USGS maps.

One wetland is located in the southern portion of the site, outside of the fenced area. This wetland is classified as seasonally flooded/saturated, palustrine emergent with persistent vegetation and seasonally flooded/saturated, palustrine forested with broad-leaved deciduous vegetation (PEM1E/PFO1E). The emergent portion of the wetland is predominantly vegetated with reed canary grass (*Phalaris arundinacea*). Other vegetation includes purple loosestrife (*Lythrum salicaria*), soft rush (*Juncus effusus*), and blue vervain (*Verbena hastata*), along with some dogwood (*Cornus sp*.) shrubs at the edge of the wetland. The forested portion of the wetland is vegetated with ash (*Fraxinus sp*.), red oak (*Quercus rubra*), aspen (*Populus sp*.), honeysuckle (*Lonicera sp*.), and goldenrod. It appears that the wetland may flood periodically, but the soils were dry at the time of the field reviews (November and December 2013). A channel is present in the forested portion of the wetland, but it did not contain any flowing water at the time of the field reviews. Water appears to flow over a dirt access road (beyond the end of Spit Brook Road) and continue south beyond the project area.

A swale was also noted in the southern portion of the site; however this swale appears to be constructed and did not contain wetland vegetation or evidence of recent flow. As such, the swale does not appear to be a jurisdictional (regulated) wetland.

According to the NWI maps, two small wetlands are mapped inside the fence. These wetlands are located in the northern portion of the study area (refer to Figure 2-5) and are classified as palustrine, unconsolidated bottom, artificially flooded, excavated (PUBKx).

Spit Brook flows through the northern portion of the site and continues into the Merrimack River, which is located just east of the site. Spit Brook flows under Daniel Webster Highway, enters the western edge of the site, and flows through a forested area that appears to contain wetlands. Since access inside the fence was not obtained, the exact location of the stream channel and wetland boundaries could not be identified. According to NWI and USGS maps, it appears that the stream is culverted under the site from the edge of the forested area to the existing railroad embankment. The culvert outlet was not located during field reviews, however, so it is possible that the stream may outlet directly into the Merrimack River.

Pheasant Lane Mall Park and Ride Station Site, Nashua
No wetlands or watercourses are located within the site, based on a field review conducted in January 2014. The Merrimack River is located approximately 50 feet east of the site. Several wetlands and detention basins/stormwater treatment areas are located south of the site, adjacent to the Pheasant Lane Mall parking lot (refer to Figure 2-6).

3.0 Water Quality

3.1 Surface Water Resources

The dominant surface water feature within the project corridor is the Merrimack River which flows from north to south through the entire corridor from Concord to Nashua. The existing rail line parallels the Merrimack River crossing it twice: once in the Town of Hooksett and again from the City of Manchester to the Town of Bedford. Based upon a review of USGS topographic maps and the NHDES Watershed Report Cards[1], the existing rail corridor crosses 25 other rivers or streams between the Massachusetts border and the end of the project study area in Concord. Table 3-1 lists the name of each water body and the municipality in which the crossing is located. The crossing numbers provided in Table 3-1 reference the numbers shown on Figures 2-1a through 2-1g. Two crossings (Baker Brook and Spit Brook) occur in urban areas of Manchester and Nashua, respectively, and flow through culverts instead of natural channels. In addition to the water bodies cited in Table 3-1, Horseshoe Pond in Merrimack and South End Marsh and an unnamed pond in Concord, as well as numerous wetlands are also located within 100 feet of the existing rail line.

[1] Watershed Report Cards are available on the NHDES website (http://des.nh.gov/organization/divisions/water/wmb/swqa/report_cards.htm) and provide information on water quality, including impairments, for each 12 digit Hydrologic Unit Code (HUC12). The Watershed Report Cards that were reviewed for this report were prepared by NHDES using the Draft 2012 305(b)/303(d) Lists.

Table 3-1. Surface Water Crossings

Crossing # (as shown in Figures 2-1a to 2-1g)	Waterbody	Municipality
1	Unnamed tributary to the Merrimack River	Bow
2	Turkey River	Bow
3	Unnamed tributary to the Merrimack River	Bow
4	Bow Bog Brook	Bow
5	Unnamed tributary to the Merrimack River	Bow
6	Unnamed tributary to the Merrimack River	Hooksett
7	Unnamed tributary to the Merrimack River	Hooksett
8	Merrimack River	Hooksett
9	Unnamed tributary to the Merrimack River	Hooksett
10	Unnamed tributary to the Merrimack River	Hooksett
11	Peters Brook	Hooksett
12	Dalton Brook	Hooksett
13	Messer Brook	Hooksett
14	Unnamed tributary to the Merrimack River	Manchester
15	Rays Brook	Manchester
16	Baker Brook	Manchester
17	Unnamed tributary to the Merrimack River	Manchester
18	Merrimack River	Manchester
19	Sebbins Brook	Bedford
20	Unnamed tributary to the Merrimack River	Merrimack
21	Souhegan River	Merrimack
22	Naticook Brook	Merrimack
23	Pennichuck Brook	Merrimack/Nashua
24	Nashua River	Nashua
25	Salmon Brook	Nashua
26	Unnamed tributary to the Merrimack River	Nashua
27	Spit Brook	Nashua

Surface water quality is regulated statewide by the NHDES under rules found at Env-Wq 1700 and Nationally by the US Environmental Protection Agency (EPA) under the Clean Water Act. The state Surface Water Quality Regulations govern the discharge of potential pollutants to surface waters of the state and specify water quality standards intended to protect aquatic life and human health. State statute RSA-A:8 establishes two classes of surface water: Class A and Class B. Class A is the higher classification and designates water quality that is uniformly excellent and potentially acceptable for water supply uses after adequate treatment. Discharge of sewerage or waste into Class A waters is prohibited. Class B waters are considered acceptable for swimming, fishing, and water supplies after adequate treatment. In general, discharges to Class B waters are allowed provided that such discharges do not violate established water quality standards. Based upon data supplied by the NHDES, all of the surface waters within the project study area are considered Class B (K. Edwardson, personal communication).

The Clean Water Act requires each state to submit two surface water quality documents to the EPA every two years. Section 305(b) of the Clean Water Act requires the submittal of a report that describes the quality of surface waters and an analysis of the extent to which all such waters provide for the protection and propagation of a "balanced population of shellfish, fish, and wildlife and allow recreational activities in and on the water."

The second document is commonly referred to as the 303(d) List because it is required by Section 303(d) of the Clean Water Act. The 303(d) list identifies segments of rivers, lakes, impoundments, estuaries, and the ocean that do not meet water quality standards for their assigned uses. The impaired segments are identified as "assessment units" that are based upon the type of water body and the watershed in which they are found. The 303(d) List includes all surface waters that are:

- Impaired or threatened by a pollutant or pollutants;
- Not expected to meet water quality standards within a reasonable time even after application of best available technology standards for point sources or best management practices for nonpoint sources; and
- Require development and implementation of a comprehensive water quality study, referred to as a Total Maximum Daily Load (TMDL) study that is designed to facilitate achievement of applicable water quality standards.

Table 3-2 provides a list of all impaired surface waters located within the vicinity of the project corridor. This list includes all surface waters that are either crossed by or located within 100 feet of the existing rail line. Table 3-3 provides a list of all impaired surface waters located within a one-mile radius of the potential station and layover sites. The data shown in these tables were obtained from the Final 2012 "List of Threatened or Impaired Waters that Require a TMDL" and the 2012 Watershed Report Cards obtained from NHDES.

Pursuant to NHDES Regulation Env-Wq 1708.05 surface waters of national forests and surface waters designated as natural under state statute RSA 483:7-a, I are considered Outstanding Resource Waters (ORWs). As such, water quality in these water bodies must be maintained and protected, except "that some limited point source and nonpoint source discharges may be allowed providing that they are of limited activity which results in no more than temporary and short-term changes in water quality." Based upon data obtained from the NHDES OneStop Web Geographic Information System there are no ORWs within the project corridor. Other data on file with Web Geographic Information System identify a single surface water intake within ¼ -mile of the existing rail line, in the town of Merrimack.

Table 3-2. Impaired Waters along Rail Corridor

Crossing # (as shown in Figures 2-1a to 2-1g)	Assessment Unit ID	Water Body	Municipality	Impairments	TMDL?
2	NHRIV700060301-13	Turkey River – Bow Brook	Concord	Aluminum	No
				E. coli	Yes
--*	NHRIV700060302-24	Merrimack River	Concord	Aluminum	No
				DO Saturation**	No
				Dissolved Oxygen	No
				pH	No
--*	NHIMP700060302-07	Merrimack River – Garvins Falls Dam	Concord	pH	No
				E. coli	Yes
--*	NHRIV700060302-25-02	Merrimack River	Bow	DO Saturation	No
				Dissolved Oxygen	No
11	NHRIV700060802-07	Peters Brook	Hooksett	Aluminum	No
				pH	No
12	NHRIV700060802-08	Dalton Brook	Hooksett	pH	No
13	NHRIV700060802-09	Messer Brook	Hooksett	pH	No
				E. coli	Yes
--*	NHRIV700060802-14-02	Merrimack River	Hooksett	Aluminum	No
				BOD***	Yes
				DO Saturation	No
				pH	No
				E. coli	Yes
15	NHRIV700060802-15	Rays Brook	Manchester	Chloride	No
				E. coli	Yes
16	NHRIV700060803-08	Baker Brook	Manchester	Chloride	No
18	NHRIV700060803-14-02	Merrimack River	Manchester	Aluminum	No
				DO Saturation	No
				pH	No
				E. coli	Yes
19	NHRIV700060804-01	Sebbins Brook – Pointer Club Brook	Bedford	pH	No
--*	NHRIV700060804-11	Merrimack River	Merrimack	Dissolved Oxygen	No
				E. coli	Yes
21	NHRIV700060906-18	Souhegan River	Merrimack	Aluminum	No
				Dissolved Oxygen	No
				pH	No
				E. coli	Yes
--*	NHLAK700061002-03	Horseshoe Pond	Merrimack	Non-Native Aquatic Plants	Yes
				pH	Yes
				Chlorophyll-a	Yes
				Cyanobacteria Hepatotoxic Microcystins	Yes

Table 3-2. Impaired Waters along Rail Corridor (continued)

Crossing # (as shown in Figures 2-1a to 2-1g)	Assessment Unit ID	Water Body	Municipality	Impairments	TMDL?
--*	NHRIV700061002-13	Merrimack River	Merrimack	E. coli	Yes
--*	NHRIV700061002-14	Merrimack River	Nashua	pH	No
				Creosote	No
				E. coli	Yes
24	NHRIV700040402-09	Nashua River	Nashua	Non-Native Aquatic Plants	No
				E. coli	Yes
25	NHRIV700061201-07	Salmon Brook	Nashua	E. coli	Yes
--*	NHRIV700061206-24	Merrimack River	Nashua	Aluminum	No
				pH	No
				Chlorophyll-a	No
				E. coli	Yes

*Rail line runs parallel to waterbody segment but doesn’t cross it.
**DO saturation = Dissolved oxygen saturation
***BOD = Biochemical oxygen demand

Table 3-3. Impaired Waters near Proposed Station and Layover Facilities

Potential Station/Layover Site	Waterbody	Assessment Unit ID	Impairments	TMDL?
Stickney Avenue Station Site Concord	Merrimack River	NHRIV700060302-24	Aluminum	No
			DO saturation	No
			Dissolved oxygen	No
			pH	No
Bridge Street Station Site Manchester	Merrimack River	NHRIV700060803-14-02	Aluminum	No
			DO saturation	No
			pH	No
			E. coli	Yes
Granite Street Station Site Manchester	Merrimack River	NHRIV700060803-14-02	Aluminum	No
			DO saturation	No
			pH	No
			E. coli	Yes
Riverwalk Way Layover Facility Site Manchester	Merrimack River	NHRIV700060803-14-02	Aluminum	No
			DO saturation	No
			pH	No
			E. coli	Yes
Queen City Bridge Layover Facility Site Manchester	Merrimack River	NHRIV700060803-14-02	Aluminum	No
			DO saturation	No
			pH	No
			E. coli	Yes
Riverdale Avenue Layover Facility Site Manchester	Merrimack River	NHRIV700060803-14-02	Aluminum	No
			DO saturation	No
			pH	No
			E. coli	Yes
Brown Avenue Layover Facility Site Manchester	Merrimack River	NHRIV700060803-14-02	Aluminum	No
			DO saturation	No
			pH	No
			E. coli	Yes
	Merrimack River	NHRIV700060804-11	Dissolved oxygen	No
			E. coli	Yes
Raymond Wieczorek Drive (MHT Airport) Park and Ride Station Site Bedford	Merrimack River	NHRIV700060804-11	Dissolved oxygen	No
			E. coli	Yes
	Sebbins Brook	NHRIV700060804-01	pH	No
Crown Street Park and Ride Station Site Nashua	Merrimack River	NHRIV700061002-14	pH	No
			Creosote	No
			E. coli	Yes
	Merrimack River	NHRIV700061206-24	Aluminum	No
			pH	No
			Chlorophyll-a	No
			E.coli	Yes

Table 3-3. Impaired Waters near Proposed Station and Layover Facilities (continued)

Potential Station/Layover Site	Waterbody	Assessment Unit ID	Impairments	TMDL?
Spit Brook Road Layover Facility Site Nashua	Merrimack River	NHRIV700061206-24	Aluminum	No
			pH	No
			Chlorophyll-a	No
			E.coli	Yes
Pheasant Lane Mall Park and Ride Station Site Nashua	Merrimack River	NHRIV700061206-24	Aluminum	No
			pH	No
			Chlorophyll-a	No
			E.coli	Yes

Notes: DO saturation = Dissolved oxygen saturation

3.2 Groundwater Resources

Groundwater resources within the project corridor are generally associated with extensive stratified drift aquifers adjacent to the Merrimack River that were formed in glacial Lakes Merrimack and Hooksett (Ayotte, 1995). The transmissivities of these aquifers generally do not exceed 1,000-2,000 ft^2/day, but may locally exceed 4,000 to 6,000 ft^2/day (Ayotte, 1995 & Stekl, 1997). Mapped aquifers included in the NHDES OneStop Web Geographic Information System indicate that virtually the entire project study area, except the urban areas of Manchester is underlain stratified drift aquifers. These aquifers serve as a water supply source for communities, businesses, and private homes. Groundwater resources are regulated by the New Hampshire Groundwater Protection Act of 1991 and the federal Safe Drinking Water Act.

Data included in the Geographic Information System identify 14 public water supplies (4 in the Town of Merrimack and 10 in the Town of Bow) and over 130 groundwater wells within ¼ -mile of the existing rail line. In addition, approximately 2.3 linear miles of the existing rail line passes over portions of the Towns of Bow, Concord, and Merrimack that are classified as Wellhead Protection Areas (WPA) by the NHDES. None of the proposed station or layover areas are located within WPAs.

4.0 Coastal Resources/Shoreland

Coastal Resources include resources protected under the Federal Coastal Zone Management Act and the Coastal Barrier Resources Act. No such resources are located within the project corridor.

This section also includes resources protected under the New Hampshire Shoreland Water Quality Protection Act (SWQPA). The SWQPA (RSA 483-B) applies to all land within 250 feet of the reference line of all lakes, ponds, and impoundments greater than 10 acres in size, all fourth order and larger streams and rivers, tidal waters, and rivers designated under the New Hampshire Rivers Management and Protection Act. Development and vegetation clearing within the protected shoreland is regulated by the NHDES. For rivers, the reference line corresponds to the ordinary high water mark. For lakes, ponds, and artificial impoundments, the reference line is the surface elevation as listed in the “Consolidated List of Waterbodies subject to the Shoreland Water Quality Protection Act”, which is published by NHDES.

Several waterbodies within the project corridor are subject to the SWQPA (refer to Table 4-1 and Figure 4-1). These waterbodies were identified by reviewing the current NHDES "Consolidated List of Waterbodies Subject to the Shoreland Water Quality Protection Act". Segments of the existing rail line (approximately 22 miles in total) are located within 250 feet of the Merrimack River and there are two crossings of the Merrimack River. The other waterbodies listed in Table 4-1 are either crossed once by the rail line or border the rail line in one location.

Table 4-1. Waterbodies Subject to NH Shoreland Water Quality Protection Act

Waterbody Name	Town(s)
Merrimack River	Concord, Bow, Hooksett, Manchester, Bedford, Merrimack, Nashua
Turkey River	Bow
Garvins Falls Dam (on Merrimack River)	Concord, Bow
Hooksett Hydro Pond (on Merrimack River)	Hooksett
Amoskeag Dam (on Merrimack River)	Manchester
Souhegan River	Merrimack
Horseshoe Pond	Merrimack
Pennichuck Brook	Merrimack, Nashua
Nashua River	Nashua
Salmon Brook	Nashua

Note: Waterbodies that are located within approximately 250 feet of the existing rail line and the proposed station/layover facilities are included.

5.0 Floodplains

Digital Flood Insurance Rate Maps for the project corridor were obtained from New Hampshire's GRANIT GIS website (www.granit.unh.edu). Since the rail corridor is located along the Merrimack River, a large portion of the project is located within or adjacent to areas that are mapped as 100-year floodplains (refer to Figures 5-1a through 5-1g).

Most of the proposed station and layover facility sites are located within or adjacent to floodplain areas (refer to Figures 5-2 through 5-12). These areas are generally mapped as either "Zone AE" (100-year floodplain or 1 percent annual chance of flood) or "0.2 percent annual chance of flood hazard" (500-year floodplain). Portions of the Downtown Nashua site are mapped as "Zone X, Protected by Levee". Table 5-1 provides information on the floodplain areas located at each potential station and layover facility.

Table 5-1. Floodplains near Station and Layover Facilities

Potential Station/Layover Site	Floodplains
Stickney Avenue Station Site Concord	Site is mapped as 0.2% annual chance of flood hazard.
Bridge Street Station Site Manchester	None
Granite Street Station Site Manchester	None
Riverwalk Way Layover Facility Site Manchester	None
Queen City Bridge Layover Facility Site Manchester	A portion of the northern half of the site is mapped as 0.2% annual chance of flood hazard. Zone AE is mapped just west of the site, along Merrimack River
Riverdale Avenue Layover Facility Site Manchester	None mapped within site. Zone AE is mapped on southwest side of railroad embankment, along Merrimack River
Brown Avenue Layover Facility Site Manchester	None mapped within site. Zone AE is mapped along Merrimack River and 0.2% annual chance of flood hazard zone is mapped over a portion of the wastewater treatment facility.
Raymond Wieczorek Drive (MHT Airport) Park and Ride Station Site Bedford	Portions of site are mapped as either Zone AE or 0.2% annual chance of flood hazard
Crown Street Park and Ride Station Site Nashua	Portions of site are mapped as Zone X, Protected by Levee
Spit Brook Road Layover Facility Site Nashua	Majority of site is mapped as 0.2% annual chance of flood hazard; some areas are mapped as Zone AE.
Pheasant Lane Mall Park and Ride Station Site Nashua	Entire site is mapped as 0.2% annual chance of flood hazard. Zone AE is mapped along Merrimack River at edge of site.

6.0 Wild and Scenic Rivers/NH Designated Rivers

In 1968, the US Congress passed the Federal Wild and Scenic Rivers Act (P.L. 90-542) in order to preserve “certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values”. Currently, there are no river segments within the vicinity of the project corridor that are included in the federal Wild and Scenic Rivers Program.

In 1988, the New Hampshire Legislature passed the Rivers Management and Protection Act (RSA 483) which established a statewide rivers program based on a two-tier approach to river management and protection: 1.) state designation of significant rivers and protection of instream values and 2.) local development and adoption of river corridor management plans to protect shorelines and adjacent lands. Projects located within a ¼ mile of a Designated River require coordination with the River’s Local Advisory Committee (LAC).

Several rivers that are designated under the NH Rivers Management and Protection Act are located within a ¼ mile of the project corridor (refer to Table 6-1 and Figure 6-1).

Table 6-1. NH Designated Rivers along Rail Corridor

River	Town(s)
Upper Merrimack River	Concord, Bow
Lower Merrimack River	Merrimack, Nashua
Piscataquog River	Manchester
Souhegan River	Merrimack

Two sections of the Merrimack River (Upper and Lower) were designated under the Rivers Management and Protection Act in 1990. The Upper portion runs through Franklin, Northfield, Boscawen, Canterbury, Concord and Bow. The Lower portion runs through Merrimack, Litchfield, Hudson, and Nashua. The existing rail line is located adjacent to designated segments of the Merrimack River in Concord, Bow, Merrimack, and Nashua. The two Merrimack River crossings, located in Hooksett and Manchester/Bedford, are not within designated river segments.

The Piscataquog River consists of three branches (South, Middle and North), which were all designated under the NH Rivers Management and Protection Act in 1993. The three branches flow through the communities of Deering, Francestown, Lyndeborough, New Boston, Weare, Goffstown, and Manchester. In Manchester, the Piscataquog River flows into the Merrimack River at Bass Island. The existing rail line is located within a ¼ mile of the Piscataquog River, but it is on the opposite side of the Merrimack River.

The Souhegan River was designated in 2000 and includes the communities of New Ipswich, Greenville, Wilton, Milford, Amherst, and Merrimack. The project corridor crosses the Souhegan River near where it flows into the Merrimack River.

7.0 Wildlife, Fisheries, and Natural Communities

7.1 Wildlife Habitat

Information on wildlife habitat within the project corridor was obtained from the New Hampshire Wildlife Action Plan and from field reviews conducted in 2013 and 2014. A variety of habitat types are located within the project corridor, as discussed below. In Concord, Manchester, and Nashua, the existing rail line crosses through developed urban areas that provided limited habitat. Other segments of the rail line cross through undeveloped forested land that provide valuable habitat. The entire study area is located along the Merrimack River, which is an important corridor for migrating birds. Bald eagles spend the winter along the Merrimack River and use large trees along the banks for perching and roosting.

7.1.1 Habitat Types

The following paragraphs provide information on the habitat types found within the project corridor. This information is based on data obtained from the New Hampshire Wildlife Action Plan (NH Fish and Game Department, 2005) and cursory field reviews.

<u>Appalachian Oak Pine Forest</u> – This habitat is scattered throughout the undeveloped portions of the project corridor. It is a habitat type that is found at lower elevations in southern New Hampshire. Soils

are typically nutrient-poor and sandy. A variety of wildlife species use this habitat, such as eastern hognose snake (*Heterodon platirhinos*), whip-poor will (*Antrostomus vociferus*), veery (*Catharus fuscescens*), northern myotis (*Myotis septentrionalis*), white-tailed deer (*Odocoileus virginianus*), and black bear (*Ursus americanus*).

Floodplain Forests – Floodplain forests are located in low areas adjacent to river channels and are characterized by frequent flooding. Since the majority of the existing rail line is located adjacent to the Merrimack River, floodplain forest habitat is scattered throughout the project corridor. Floodplain forests provide breeding habitat for a variety of bird species, such as red-shouldered hawk (*Buteo lineatus*), veery, and Cerulean warbler (*Dendroica cerulean*). Mammal species that are typically associated with this habitat include beaver (*Castor canadensis*) and mink (*Mustela vison*). Floodplain forests also provide important habitat for reptiles and amphibians.

Grasslands – Grasslands include areas that are vegetated predominantly with grasses, forbs, and sedges and have very little tree or shrub cover. They generally include hayfields and pastures, fallow fields, cropland, airports, and landfills. Many of the open areas along the undeveloped portions of the project corridor include grassland habitat, although this habitat type is disperse and the individual blocks of habitat are typically small. Grasslands provide habitat for several rare, threatened, or endangered bird species, including upland sandpiper (*Bartramia longicauda*), grasshopper sparrow (*Ammodramus savannarum*), eastern meadowlark (*Sturnella magna*), and vesper sparrow (*Pooecetes gramineus*). Other rare species that utilize grassland habitat include northern black racer (*Coluber constrictor*), northern leopard frog (*Rana pipiens*), and wood turtle (*Glyptemys insculpta*).

Hemlock Hardwood Pine Forest – This is the most common forest habitat in New Hampshire and covers almost 50% of the state. Vegetation generally includes white pine (*Pinus strobus*), eastern hemlock (*Tsuga canadensis*), American beech (*Fagus grandifolia*), and oak (*Quercus* sp.). Within the project corridor, this habitat type occupies large portions of the undeveloped forested areas. A variety of species are associated with this habitat, including northern goshawk (*Accipiter gentilis*), veery, Cerulean warbler, northern myotis, white-tailed deer, and black bear.

Marsh and Shrub Wetlands – This habitat type includes emergent and scrub-shrub wetlands that are found throughout the project corridor, as discussed in Section 2.0. Many wildlife species use this habitat type, including red-winged blackbird (*Agelaius phoeniceus*), beaver, painted turtle (*Chrysemys picta*), and great blue heron (*Ardea herodias*). This habitat also supports rare species such as Blanding's turtle (*Emydoidea blandingii*), New England cottontail (*Sylvilagus tranisitionalis*), and spotted turtle (*Clemmys guttata*).

Talus Slopes and Rocky Ridges – Talus slopes include areas of boulders or rocks while rocky ridges are characterized by shallow bedrock or rock outcrops. According to the New Hampshire Wildlife Action Plan, this habitat type is found in one segment of the project corridor located north of Martins Ferry Road/Depot Road in Hooksett. Rare species that may be associated within this habitat type include timber rattlesnake (*Crotalus horridus*) and bobcat (*Lyns rufus*).

Shrublands – Shrubland habitat includes areas dominated by shrubs with scattered forbs, ferns, and grasses. These habitats often include disturbed areas such as power line rights-of-way and old agricultural fields. Within the project corridor, shrubland habitat can be found in areas adjacent to the existing rail line and at power line crossings. Shrubland habitat is declining in New Hampshire and is associated with rare species such as New England cottontail, northern black racer, and wood turtle. Other species that inhabit shrublands include ruffed grouse (*Bonasa umbellus*) and woodcock (*Scolopax minor*).

7.1.2 Habitat Value

The New Hampshire Wildlife Action Plan was reviewed to obtain information on habitat value within the project corridor. The Wildlife Action Plan provides a ranking of habitat condition for the entire state. The ranking is based on biological, landscape, and human impact factors. Biological factors include rare plant and animal species and overall biodiversity. Landscape factors include the size of the habitat and its proximity to other habitats. Human impact factors include considerations such as road density, pollution, and recreational use. Sixteen habitat types were assessed as part of the Wildlife Action Plan. The higher-value habitat areas are ranked as follows:

- "Highest Ranked Habitat in New Hampshire" includes the top 15% by area of each forest habitat type and the top 10% by area of other habitat types. Habitat areas for critically imperiled species are also included as highest ranking in the state.
- "Highest Ranked Habitat in Region" includes the top 15% by area of forests and the top 50% by area of other terrestrial habitats within each ecoregion of New Hampshire. A similar method was also used to rank surface water, floodplain, and wetland areas.
- "Supporting Areas" consist of habitats that are necessary to keep the highest ranked habitats in good condition and includes upland areas near surface waters, along with some intact forest blocks and exemplary natural communities.

The existing rail line crosses through "Highest Ranked Habitat" in various locations (refer to Figure 7-1). Table 7-1 provides a summary of the habitat value by municipality. Table 7-2 provides information on wildlife habitat for the potential station and layover facilities.

Table 7-1. Habitat Value along Rail Corridor

Municipality	**Habitat Value**
Concord	No Highest Ranked Habitat in NH is located within the project corridor. The area near the "South End Marsh" is mapped as Highest Ranked Habitat in Region. Other areas along the existing rail line are mapped as Supporting Areas.
Bow	Most of the project corridor in Bow is mapped as either Highest Ranked Habitat in NH or Supporting Area.
Hooksett	A few areas along the Merrimack River are mapped as Highest Ranked Habitat in NH, including the existing rail line crossing. Other locations are mapped as Highest Ranked Habitat in Region or Supporting Area, but these areas are scattered.
Manchester	Most of the Merrimack River in Manchester is mapped as Highest Ranked Habitat in NH and some areas adjacent to the river are mapped as either Highest Ranked in Region or Supporting Area. The existing rail line is located within these higher ranked habitat areas particularly in the southern part of Manchester. The rail line crossing of the Merrimack River at the Manchester-Bedford town line is located within an area that is mapped as Highest Ranked Habitat in NH.
Bedford	The majority of the project corridor in Bedford is mapped as Highest Ranked Habitat in NH. This habitat is associated with the Merrimack River.
Merrimack	The existing rail line crosses through an area mapped as Highest Ranked Habitat in NH between Horseshoe Pond and Pennichuck Brook. Other small segments of the project corridor are mapped as Highest Ranked Habitat in Region or Supporting Area.
Nashua	One isolated area mapped as Highest Ranked Habitat in NH is located adjacent to the existing rail line near the outlet of the Nashua River. Other locations are mapped as Highest Ranked Habitat in Region or Supporting Area, but these areas are scattered.

Note: Data obtained from NH Wildlife Action Plan Highest Ranking Condition Habitat Maps.

Table 7-2. Habitat Value at Potential Station and Layover Facilities

Potential Station/Layover Site	Habitat Value
Stickney Avenue Station Site Concord	The site is not mapped as Highest Ranking Habitat or as a Supporting Area. Most of the site is currently developed and includes buildings and parking lots. No wildlife was observed during a site visit.
Bridge Street Station Site Manchester	The site is not mapped as Highest Ranking Habitat or as a Supporting Area, although Highest Ranked Habitat is NH is located west of the site along the Merrimack River. The site is located in downtown Manchester and is surrounded by development. Wildlife observations during a site visit included American crow (*Corvus brachyrhynchos*)
Granite Street Station Site Manchester	The site is not mapped as Highest Ranking Habitat or as a Supporting Area, although Highest Ranked Habitat is NH is located west of the site along the Merrimack River. The site is located in downtown Manchester and is surrounded by development. No wildlife was observed during a site visit.
Riverwalk Way Layover Facility Site Manchester	The site is not mapped as Highest Ranking Habitat or as a Supporting Area, although Highest Ranked Habitat is NH is located west of the site along the Merrimack River. The site is located in downtown Manchester and is surrounded by development. No wildlife was observed during a site visit.
Queen City Bridge Layover Facility Site Manchester	The entire site is mapped as Highest Ranked Habitat in NH, due to its proximity to the Merrimack River. The majority of the site is currently developed, although a small forested area is located in the northern portion of the site.
Riverdale Avenue Layover Facillity Site Manchester	The entire site is mapped as either Highest Ranked Habitat in NH or Highest Ranked Habitat in Region. With the exception of the existing rail line, the site is currently undeveloped and includes forested upland and wetland areas. Wildlife observations during site visits included a variety of songbirds and white-tailed deer scat and tracks.
Brown Avenue Layover Facility Site Manchester	The site is located adjacent to Highest Ranked Habitat in NH that is mapped along the Merrimack River. The site itself is mapped as a Supporting Area, but it is currently developed and doesn't appear to provide much habitat. Wildlife noted during a site visit included ducks in the wastewater treatment facility pools.
Raymond Wieczorek Drive (MHT Airport) Park and Ride Station Site Bedford	The entire site and the adjacent area along the Merrimack River are mapped as Highest Ranked Habitat in NH. The undeveloped portions of the site generally consist of forested wetland and upland areas that provide quality habitat. Wildlife observed during site visits included a variety of songbirds and mallard ducks (*Anas platyrhynchos*).
Crown Street Park and Ride Station Site Nashua	The site is not mapped as Highest Ranking Habitat or as a Supporting Area. Most of the site is currently developed and includes buildings and pavement. No wildlife was observed during a site visit.

Table 7-2. Habitat Value at Potential Station and Layover Facilities (continued)

Potential Station/Layover Site	Habitat Value
Spit Brook Road Layover Facility Site Nashua	The site is not mapped as Highest Ranking Habitat or as a Supporting Area. The site is an open field that provides habitat although there are known contamination issues. Wildlife observed during field reviewed included red-tailed hawk (*Buteo jamaicensis*), white-tailed deer, and various songbirds.
Pheasant Lane Mall Park and Ride Station Site Nashua	The site is not mapped as Highest Ranking Habitat or as a Supporting Area. Although the site is located adjacent to the Merrimack River, most of the surrounding area is developed. No wildlife was observed during a site visit.

Note: Data obtained from NH Wildlife Action Plan Highest Ranking Condition Habitat Maps and from site visits conducted by The Smart Associates, Environmental Consultants, Inc. in 2013-2014.

7.2 Fisheries

The perennial streams crossed by the existing rail line likely provide habitat for fish and other aquatic organisms. A field survey of the existing culvert and bridge crossings was not conducted; however it is possible that the current structures could be hindering the movement of aquatic organisms.

Fish species that can be found in the Merrimack River and its perennial tributaries include yellow perch (*Perca flavescens*), chain pickerel (*Esox niger*), small mouth bass (*Pomoxis nigromaculatus*), large mouth bass (*Micropterus salmoides*), and American eel (*Anguilla rostrata*), among others (Nashua Regional Planning Commission, 2008)

The Merrimack River, as well as several of its tributaries, is designated as Essential Fish Habitat (EFH) for Atlantic salmon (*Salmo salar*). The Magnuson-Stevens Fishery Conservation and Management Act requires the federal government to identify EFH and make conservation recommendations to agencies whose actions could damage it. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."

Atlantic salmon were extirpated in the Merrimack River in the early 1800's by the construction of dams in Lawrence and Lowell, Massachusetts which blocked their upstream migration from the Atlantic Ocean. Salmon are currently stocked by the New Hampshire Fish and Game Department (NHF&G) and the U.S. Fish and Wildlife Service at several locations in the Merrimack River watershed as part of the Merrimack River Anadromous Fish Restoration Program (NH Fish and Game Department, 2014). Other anadromous fish species that are beginning to return to the Merrimack River include blueback herring (*Alosa aestivalis*), alewife (*Alosa pseudoharengus*), and American shad (*Alosa sapidissima*) (Nashua Regional Planning Commission, 2008).

In addition to the Merrimack River, the following perennial streams within the project corridor are identified as EFH for Atlantic salmon: Turkey River, Bow Bog Brook, Dalton Brook, Messer Brook, Rays Brook, Baker Brook, Sebbins Brook/Pointer Club Brook, Souhegan River, and Nashua River. Of these streams, the Merrimack River, the Souhegan River, and the Nashua River are considered of greater importance with regard to Atlantic salmon restoration efforts (US Army Corps of Engineers, 2012).

7.3 Threatened and Endangered Species

Endangered species are provided protection on both federal and state levels. The Federal Endangered Species Act of 1973 (16 USC 1531-1543, Sec. 2A) is the federal legislation that provides protection, while the State of New Hampshire protects species through the Native Plant Protection Act of 1987 and the New Hampshire Endangered Species Conservation Act of 1979.

The New Hampshire Natural Heritage Bureau (NHB) was contacted in February 2014 to obtain information on rare, threatened, and endangered plant and animal species within the vicinity of the project corridor. The response received from NHB is included in Appendix C. Table 7-3 provides a summary of the species that are present.

NHB also provided information on exemplary natural communities that occur within the project corridor (refer to Table 7-4 and Appendix C). Exemplary natural communities include rare natural communities as well as more common natural communities that are undisturbed or are of high quality. Natural communities are generally characterized by plant species composition, vegetation structure, and physical conditions (e.g. water, climate, nutrient levels) (Sperduto and Nichols, 2010).

A meeting was held with NHF&G and NHB on March 7, 2014 to present the project and discuss potential issues regarding listed species and exemplary natural communities (refer to Appendix D for meeting minutes). During this meeting, the following recommendations were provided by NHF&G and NHB:

- Existing perennial stream culverts should be updated to comply with the NHDES stream crossing rules to allow for fish & wildlife passage.
- Nesting and roosting sites for bald eagles are located along the Merrimack River. NHF&G mentioned that there could be mortality issues with bald eagles and faster train speeds. Other impacts could result from vegetation clearing along the Merrimack River.
- New Hampshire Audubon (Chris Martin) should be contacted to obtain more information on primary foraging areas used by the peregrine falcons that nest in the Brady-Sullivan building in downtown Manchester.
- Expansion of the rail corridor in Bow could have impacts on Eastern hognose snake. Field surveys would likely be required.
- Field surveys in key locations along the rail corridor would likely be needed for New England cottontail.
- A spring field survey at the Spit Brook Road Layover Facility Site in Nashua is recommended for grasshopper sparrow since the large open field may provide habitat for this species.
- Field surveys to determine the extent of the rare plant species and exemplary natural communities listed in Tables 7-3 and 7-4 are recommended by NHB.

More details on the existing rail line, the proposed improvements, and vegetation clearing will be needed for NHF&G and NHB to provide more detailed comments. It is recommended that continued coordination with these agencies occur during the design phases of the project to obtain feedback and to determine the need for any field surveys.

Table 7-3. Rare, Threatened, and Endangered Species

Protected Species	Legal Status		Last Reported	Town(s)
	State	Federal		
Invertebrate Species				
Brook Floater (*Alasmidonta varicosa*)	Listed Endangered	Not listed	2004	Manchester
Plant Species				
Clasping Milkweed (*Asclepias amplexicaulis*)	Listed Threatened	Not listed	2009	Hooksett
Golden Heather (*Hudsonia ericoides*)	Listed Endangered	Not listed	1985	Hooksett
Houghton's Umbrella Sedge (*Cyperus houghtonii*)	Listed Endangered	Not listed	1989	Concord
Licorice goldenrod (*Solidago odora*)	Listed Endangered	Not listed	2003	Hooksett
Northern blazing star (*Liatris novae-angliae*)	Listed Endangered	Not listed	2012	Hooksett
Wild lupine (*Lupinus perennis*)	Listed Threatened	Not listed	1995-2011 (depending on location)	Hooksett, Concord, Merrimack
Vertebrate Species				
Bald Eagle (*Haliaeetus leucocephalus*)	Listed Threatened	Not listed	2006-2013	Manchester, Concord, Bedford
Banded Sunfish (*Enneacanthus obesus*)	Special Concern	Not listed	2005 1938 (Merrimack location)	Manchester, Merrimack
Blanding's Turtle (*Emydoidea blandingii*)	Listed Endangered	Not listed	2010	Merrimack
Eastern Hognose Snake (*Heterodon platirhinos*)	Listed Endangered	Not listed	2003-2012 (depending on location)	Londonderry, Bow, Merrimack
New England Cottontail (*Sylvilagus transitionalis*)	Listed Endangered	Not listed	2002	Merrimack, Bedford, Bow
Northern Leopard Frog (*Rana pipiens*)	Special Concern	Not listed	2004-2006	Concord, Litchfield
Pied-billed Grebe (*Podilymbus podiceps*)	Listed Threatened	Not listed	1988	Concord
Spotted Turtle (*Clemmys guttata*)	Listed Threatened	Not listed	1988	Concord
Swamp Darter (*Etheostoma fusiforme*)	Special Concern	Not listed	2005	Hooksett
Vesper Sparrow (*Pooecetes gramineus*)	Special Concern	Not listed	2002	Merrimack
Wood Turtle (*Glyptemys insculpta*)	Special Concern	Not listed	2010-2012 (depending on location)	Bow

Source: NH Natural Heritage Bureau, 2014

Table 7-4. Exemplary Natural Communities

Exemplary Natural Community	Last Reported	Town(s)
Acidic Riverside Seep	2007	Concord
Dry Appalachian Oak Forest	1984	Hooksett
Pitch Pine – Scrub Oak Woodland	1985	Hooksett
Semi-Rich Oak – Sugar Maple Forest	1992-2006 (depending on location)	Hooksett, Manchester, Bedford
Sugar Maple – Silver Maple – White Ash Floodplain Forest	2006	Concord

Source: NH Natural Heritage Bureau, 2014

8.0 References

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- 2010-2011 1-Foot Color Aerial Photographs (Source: NH Department of Transportation; last revision 2012)
- National Wetlands Inventory (Source: US Fish and Wildlife Service; last revision 2001)
- NH Wetlands Base Map (Source: NH Department of Environmental Services; last revision 2010)
- NH Wildlife Action Plan (Source: NH Fish and Game Department, Wildlife Division; last revision 2008)
- Digital Flood Insurance Rate Maps (Source: FEMA; last revision 2013)
- Political Boundaries (Source: Digital Line Graphs, USGS; last revision 2009)

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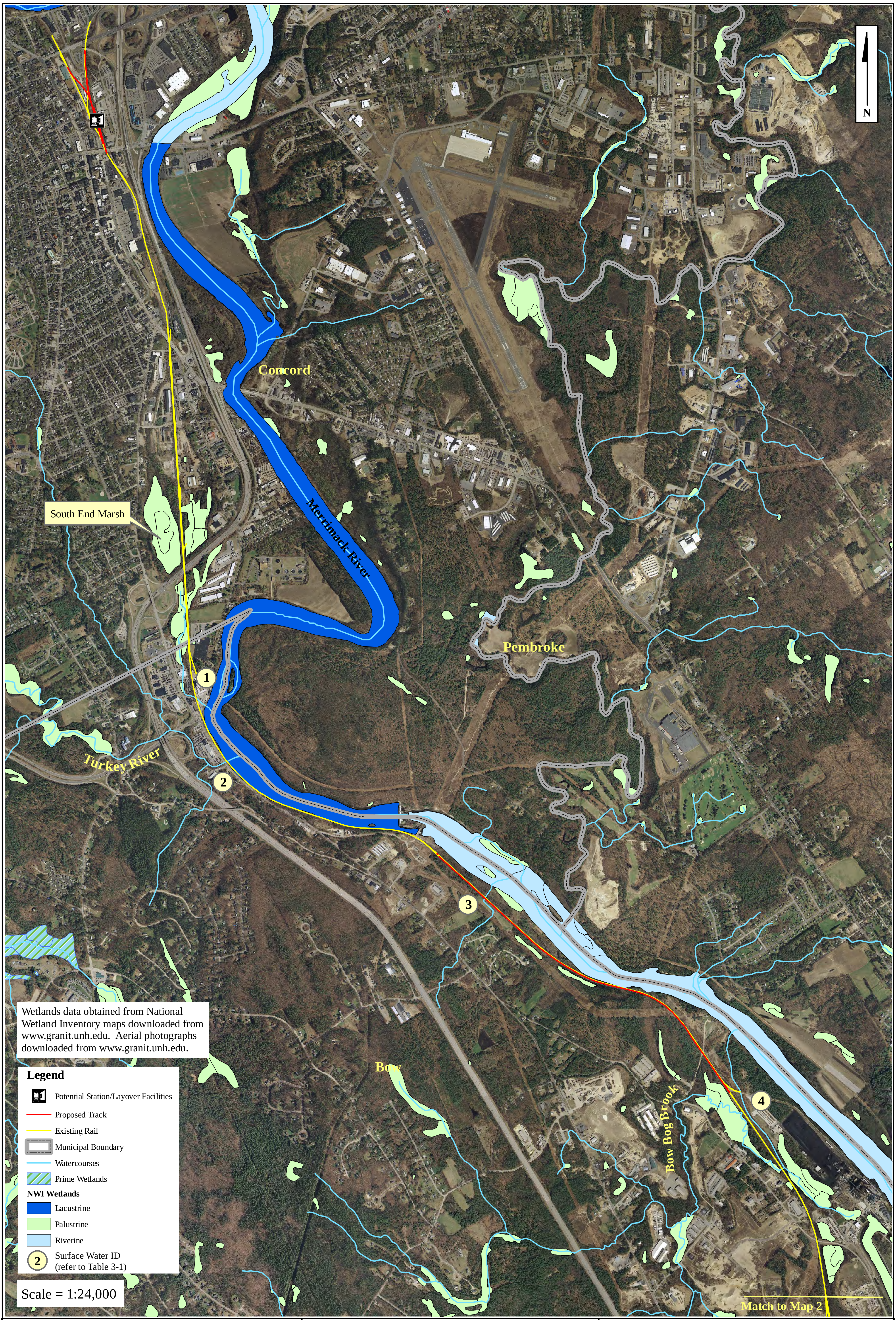
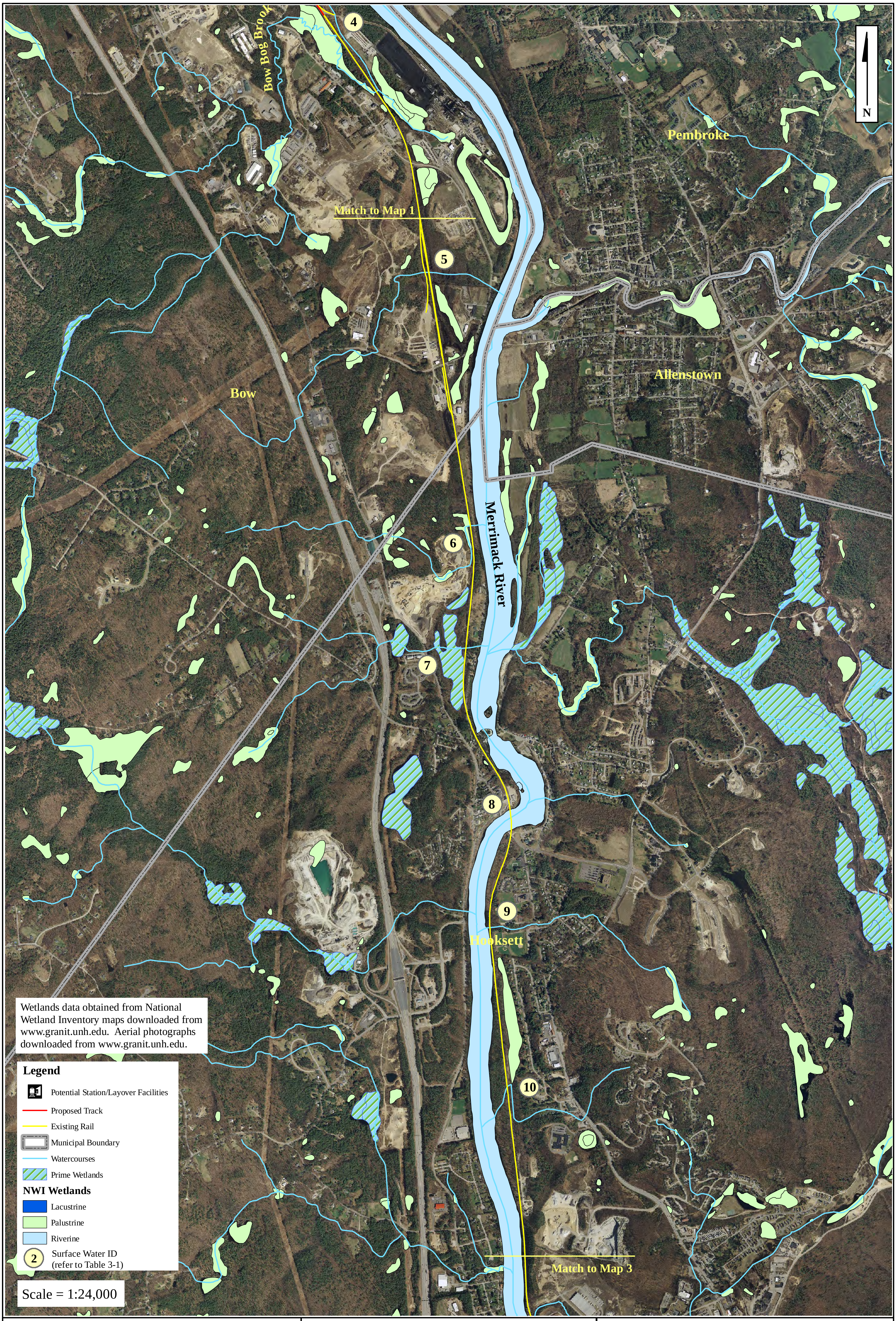
FIGURES

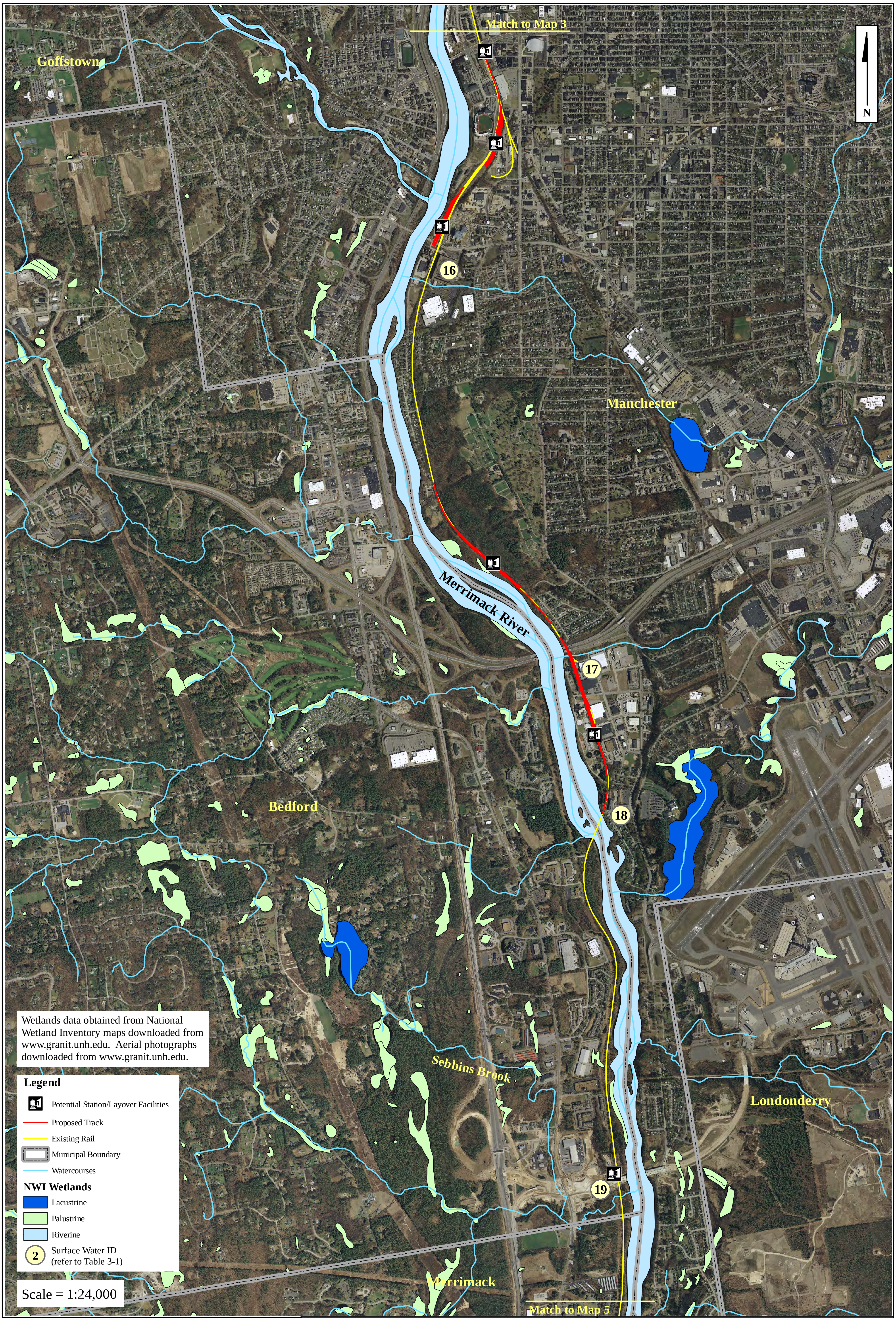


New Hampshire Capitol Corridor Rail and Transit Study	Figure 2-1a Wetlands and Surface Waters Map 1 of 7	The Smart Associates Environmental Consultants, Inc. Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure 2-1b Wetlands and Surface Waters Map 2 of 7	The Smart Associates Environmental Consultants, Inc. Date: September 2014

New Hampshire Capitol Corridor Rail and Transit Study	Figure 2-1c Wetlands and Surface Waters Map 3 of 7	The Smart Associates *Environmental Consultants, Inc.* Date: September 2014



New Hampshire Capitol Corridor
Rail and Transit Study

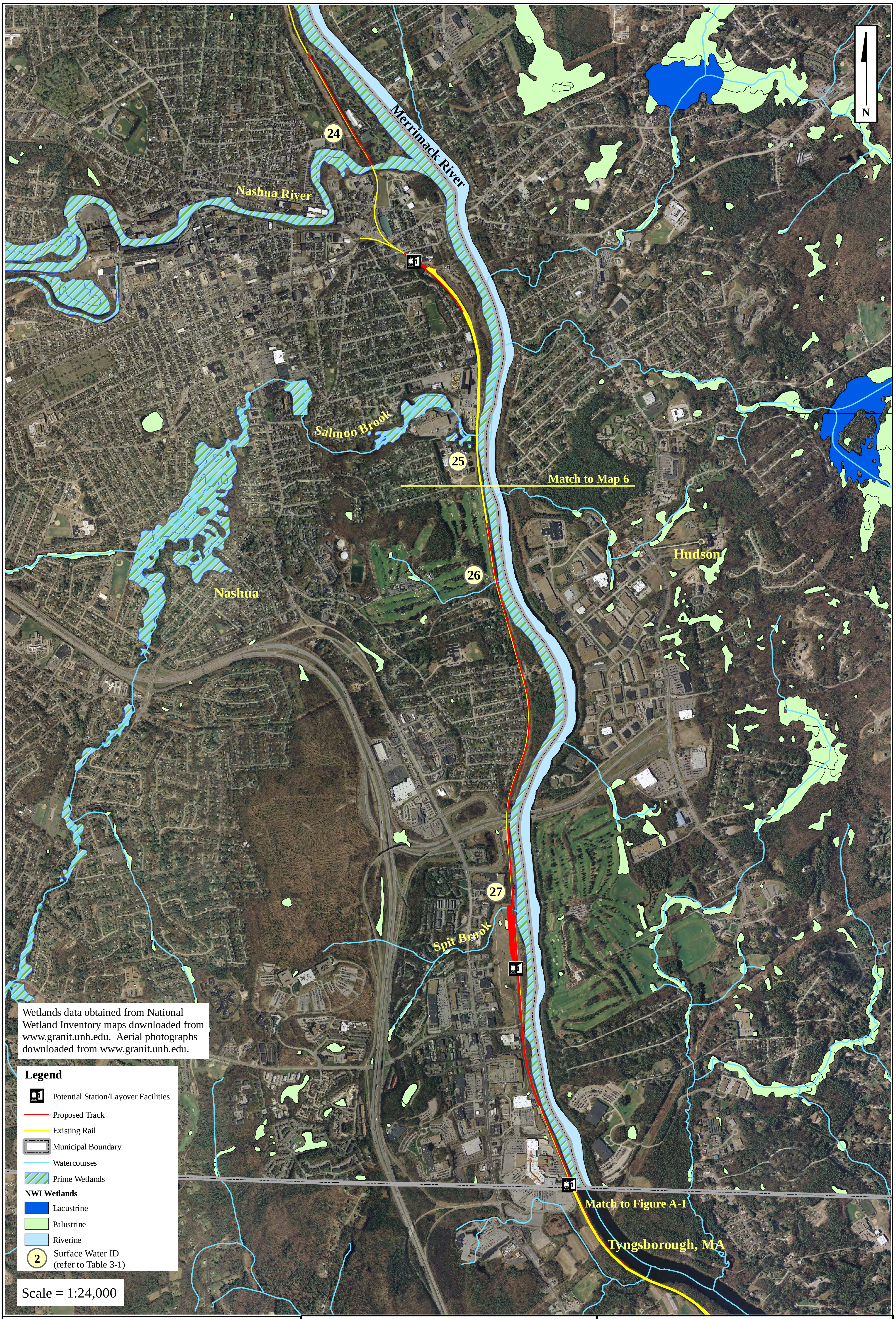
Figure 2-1d
Wetlands and Surface Waters
Map 4 of 7

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014

New Hampshire Capitol Corridor Rail and Transit Study	Figure 2-1e Wetlands and Surface Waters Map 5 of 7	The Smart Associates *Environmental Consultants, Inc.* Date: September 2014

New Hampshire Capitol Corridor Rail and Transit Study	Figure 2-1f Wetlands and Surface Waters Map 6 of 7	The Smart Associates *Environmental Consultants, Inc.* Date: September 2014



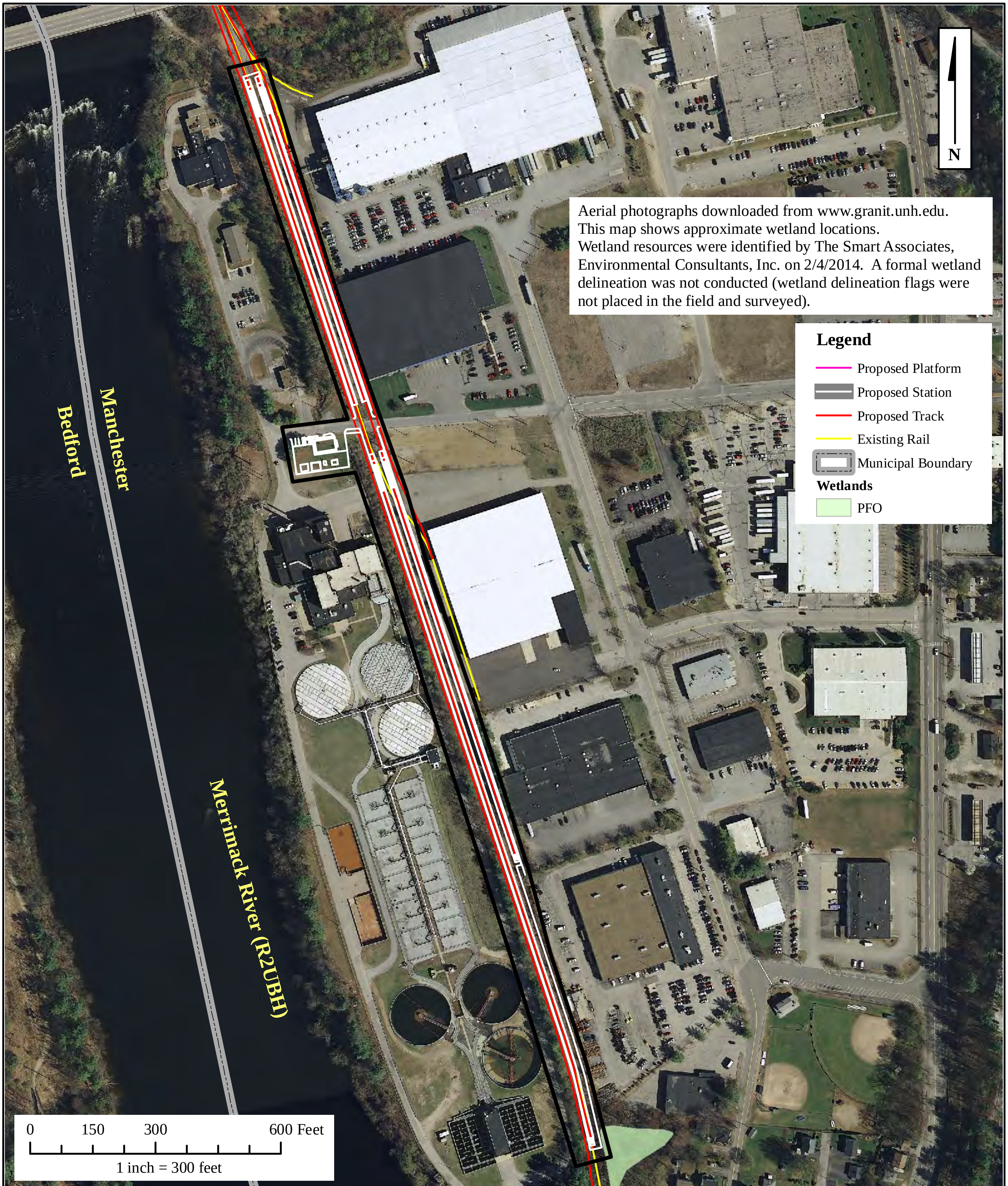
New Hampshire Capitol Corridor Rail and Transit Study	Figure 2-1g Wetlands and Surface Waters Map 7 of 7	The Smart Associates Environmental Consultants, Inc. Date: September 2014

New Hampshire Capitol Corridor
Rail and Transit Study

Figure 2-2
Wetland Resources
Riverdale Avenue Layover Facility Site
Manchester, NH

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014

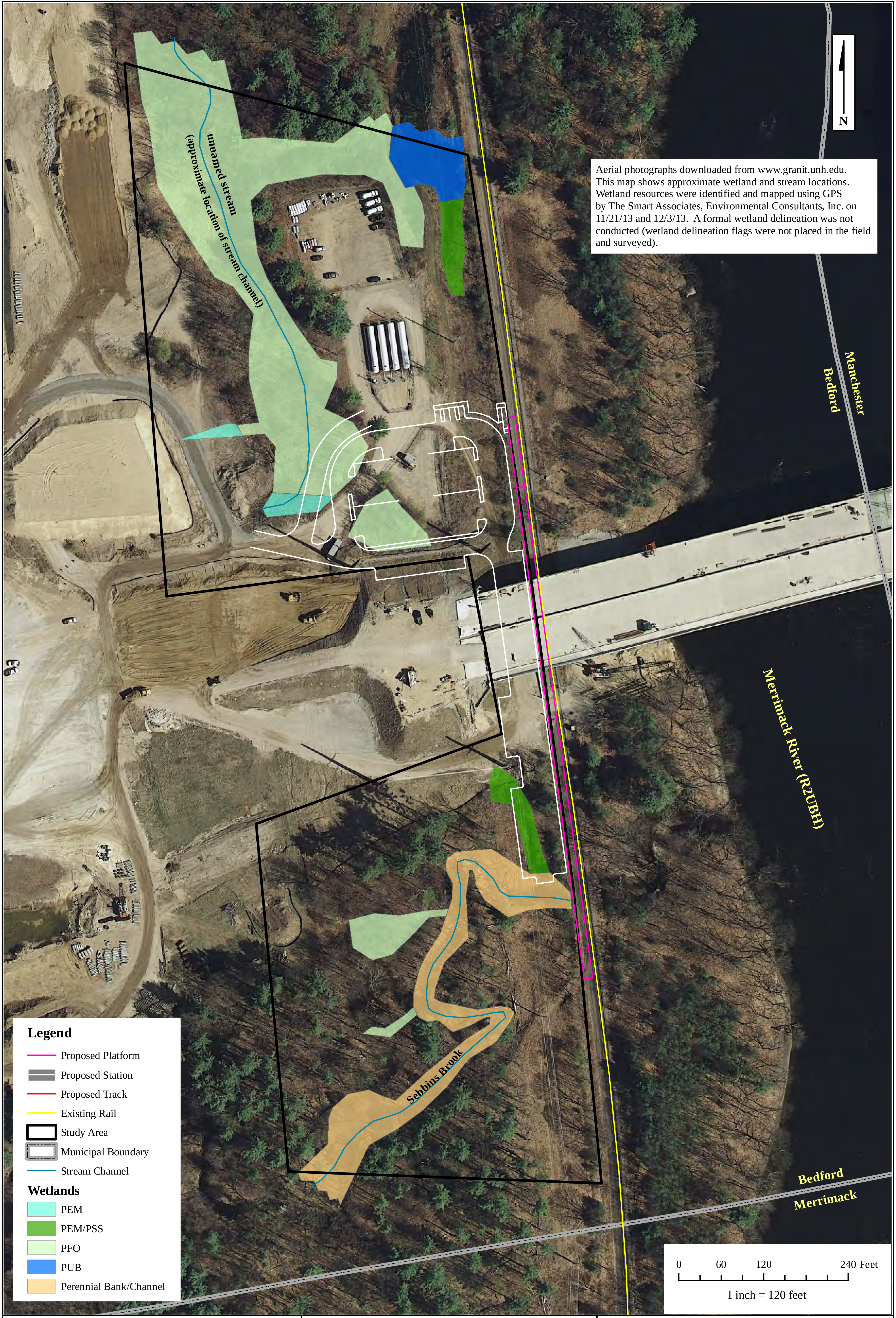


New Hampshire Capitol Corridor
Rail and Transit Study

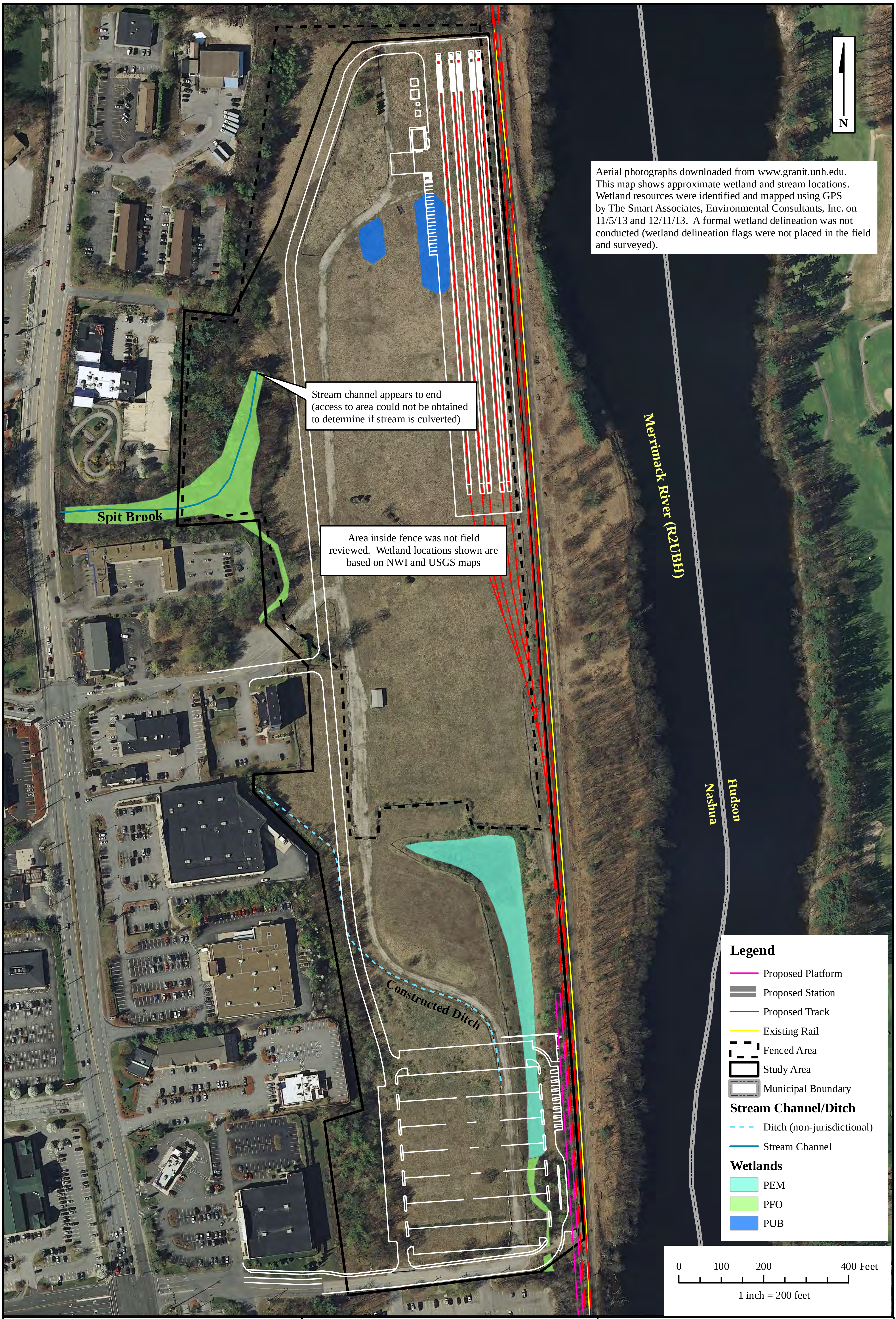
Figure 2-3
Wetland Resources
Brown Avenue Layover Facility Site
Manchester, NH

The Smart Associates
Environmental Consultants, Inc.

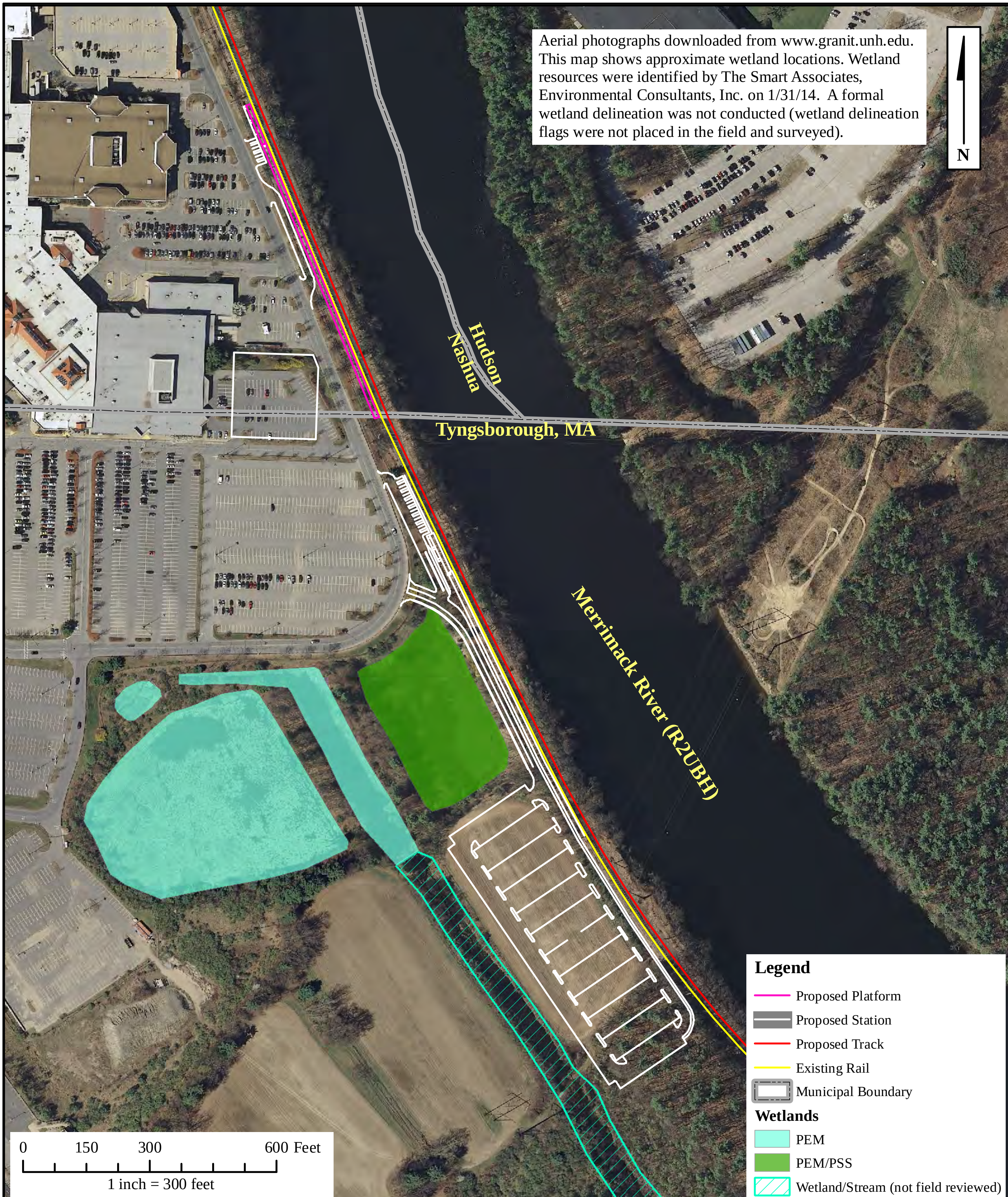
Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure 2-4 Wetland Resources Raymond Wieczorek Drive (MHT Airport) Park and Ride Station Site Bedford, NH	The Smart Associates Environmental Consultants, Inc. Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure 2-5 Wetland Resources Spit Brook Road Layover Facility Site Nashua, NH	The Smart Associates Environmental Consultants, Inc. Date: September 2014

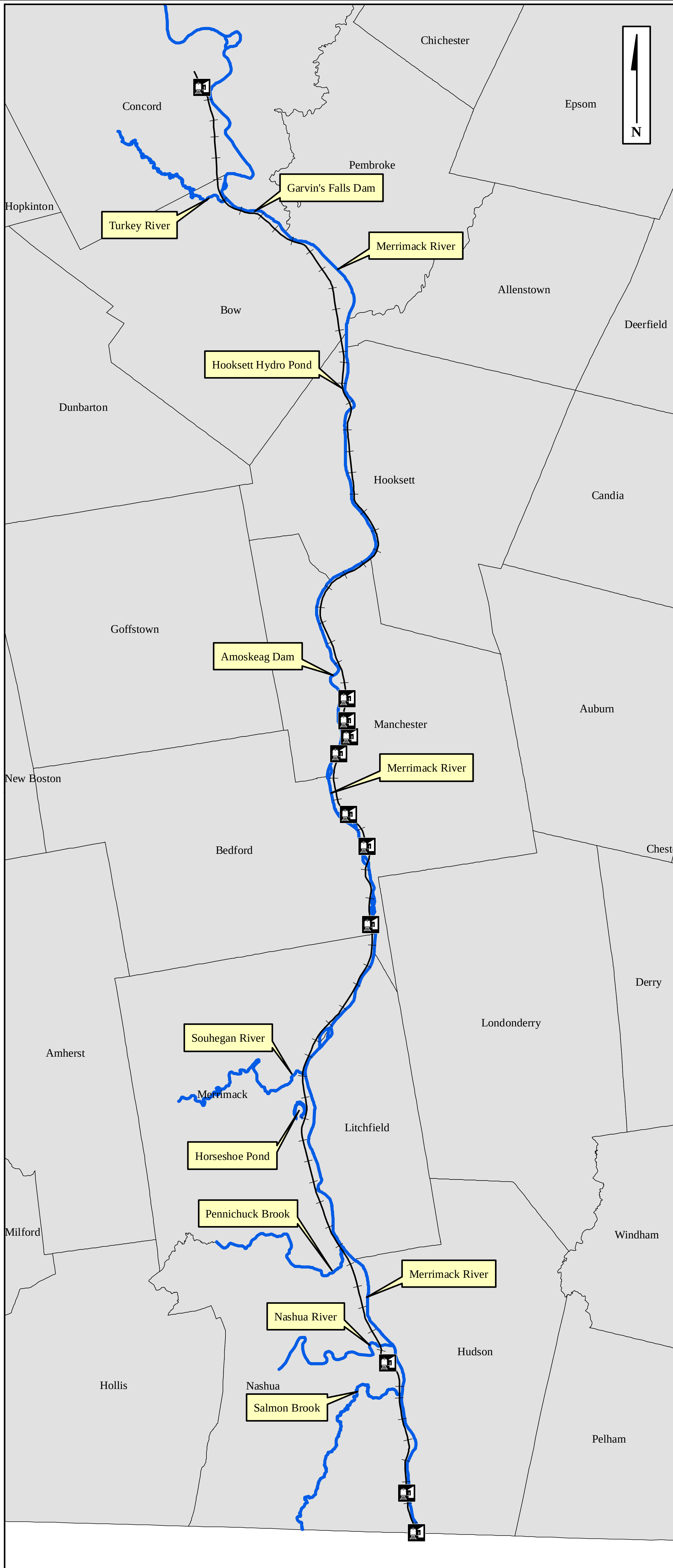


New Hampshire Capitol Corridor
Rail and Transit Study

Figure 2-6
Wetland Resources
Pheasant Lane Mall
Park and Ride Station Site
Nashua, NH

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014



Waterbodies along Rail Corridor that are subject to the NH Shoreland Water Quality Protection Act:

Rivers & Streams:

Merrimack River (Concord, Bow, Hooksett, Manchester, Bedford, Merrimack, and Nashua)

Turkey River (Bow)

Souhegan River (Merrimack)

Pennichuck Brook (Merrimack, Nashua)

Nashua River (Nashua)

Salmon Brook (Nashua)

Lakes, Ponds, and Impoundments:

Garvin's Falls Dam - on Merrimack River (Concord, Bow)

Hooksett Hydro Pond - on Merrimack River (Hooksett)

Amoskeag Dam - on Merrimack River (Manchester)

Horseshoe Pond (Merrimack)

Legend

Potential Station/Layover Facilities

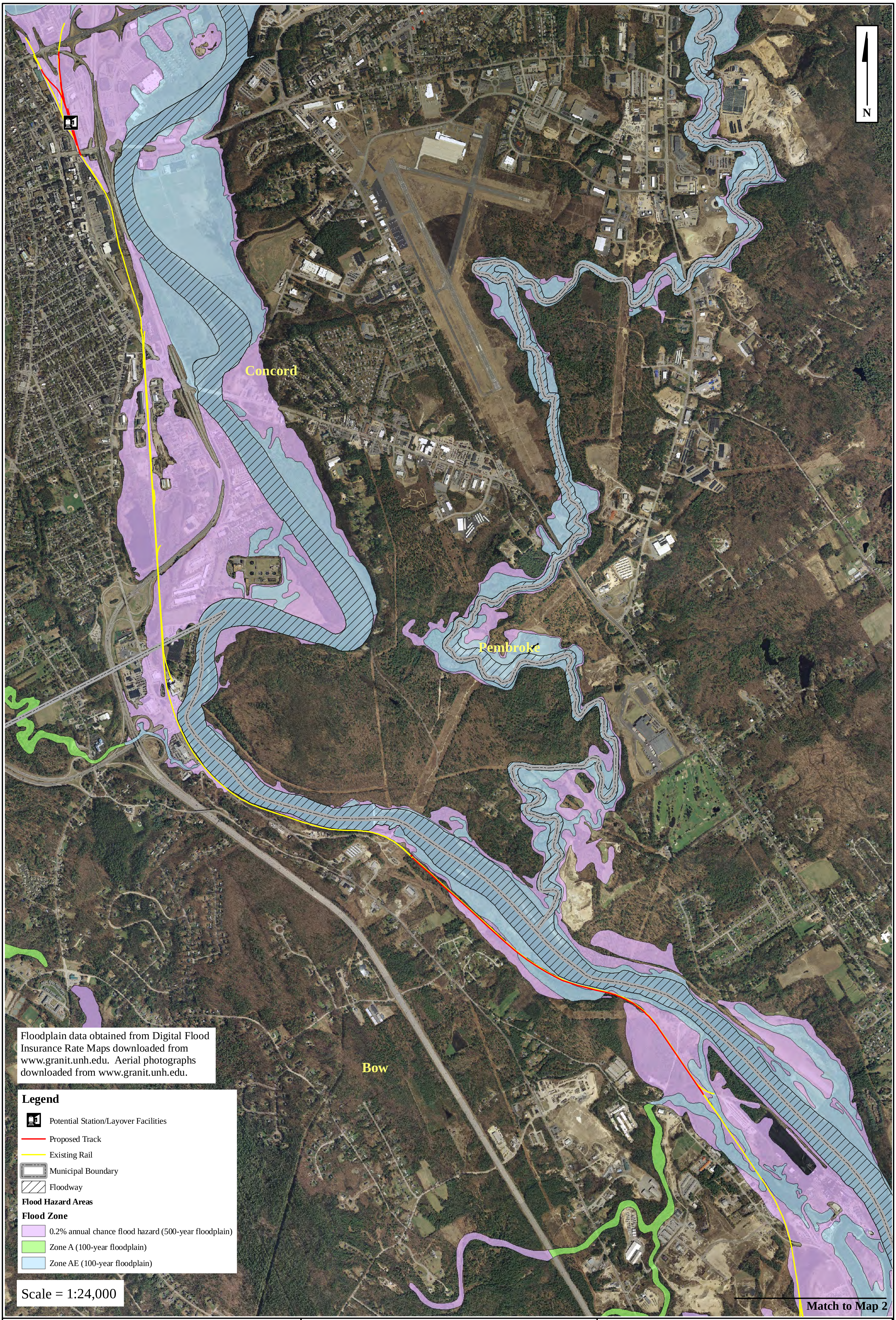
Rail Corridor

0 1 2 3 4 5 Miles

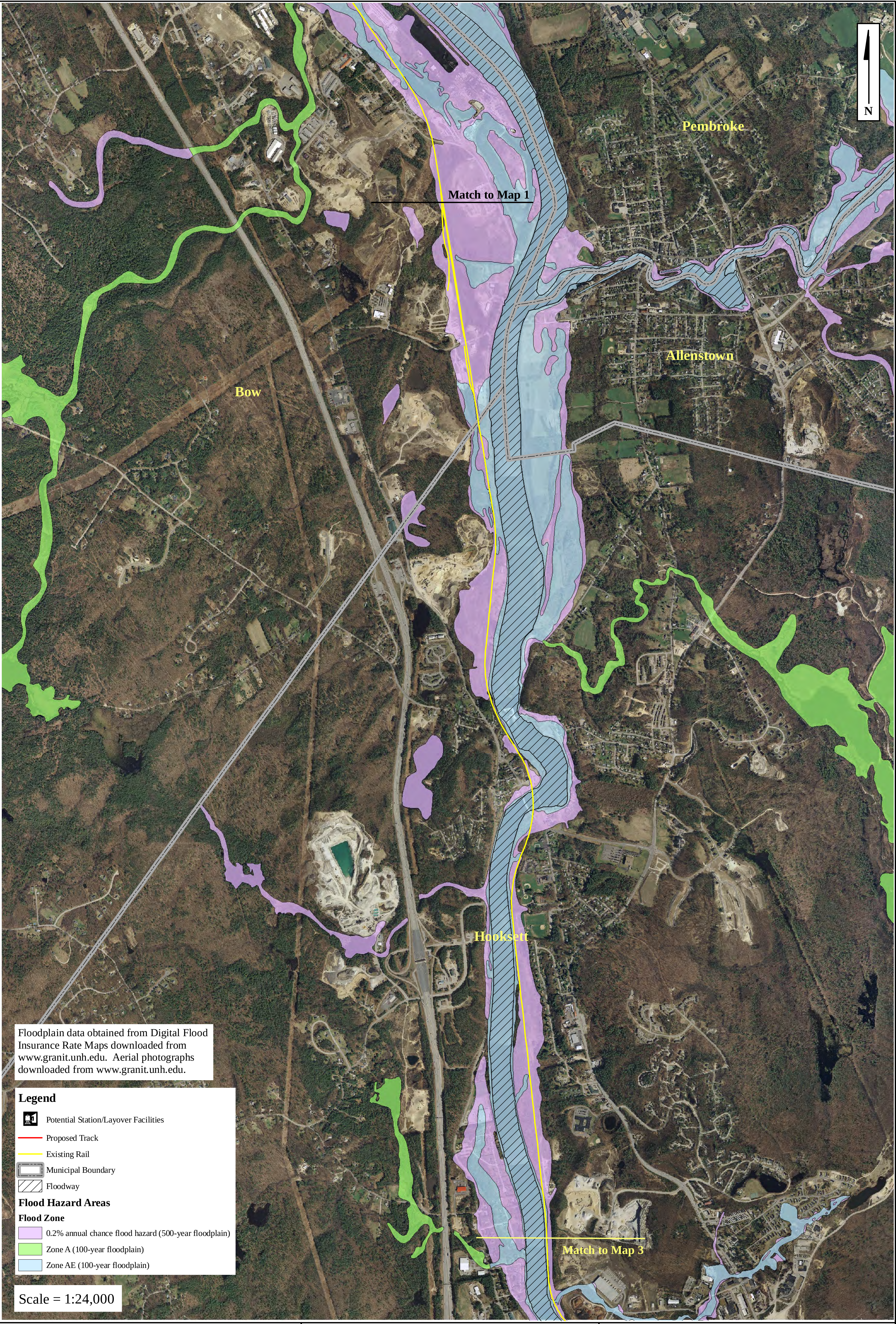
1 inch = 2.5 miles

Waterbodies that intersect or are located within 250 feet of the rail corridor are shown on map. Other waterbodies are not shown.

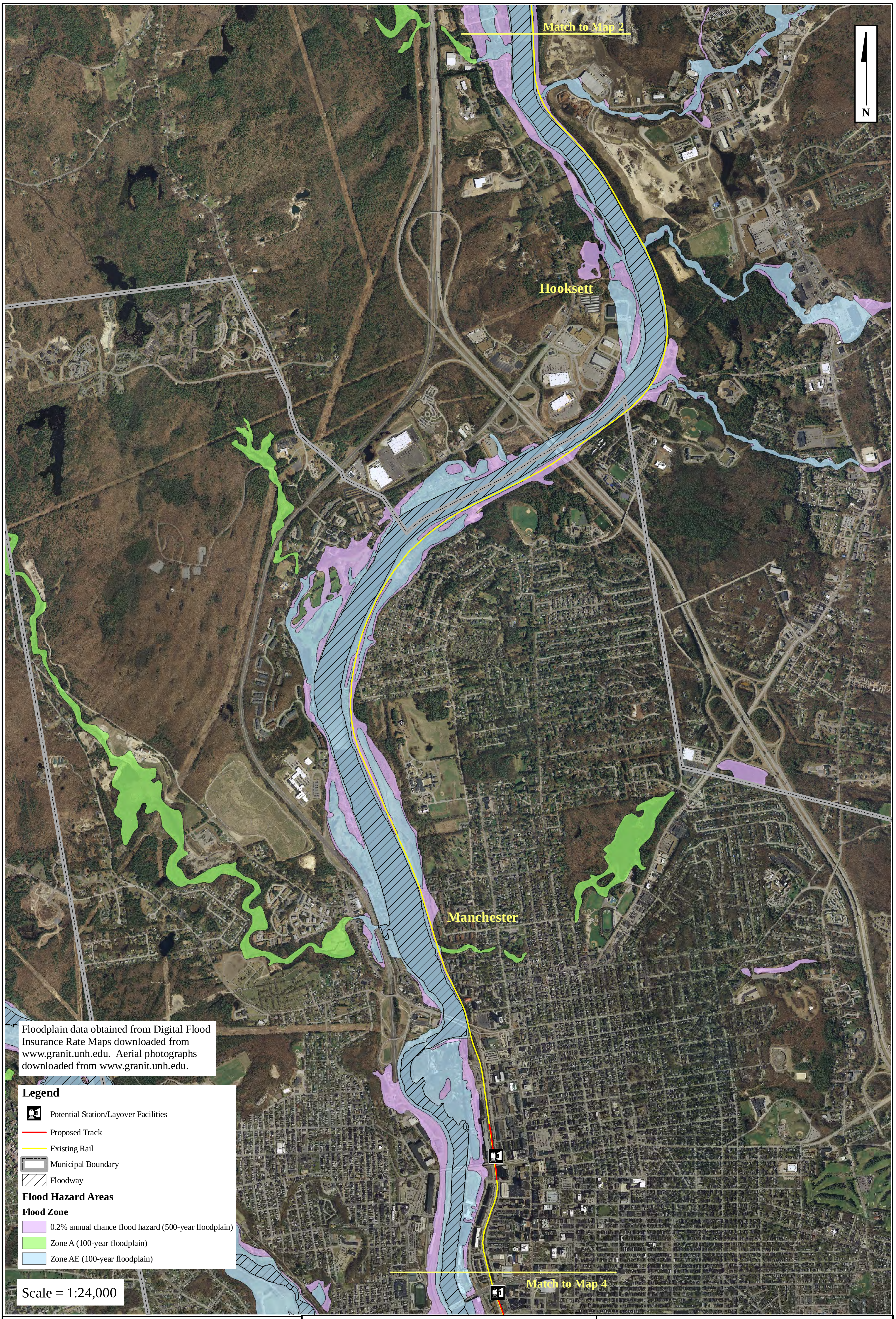
New Hampshire Capitol Corridor Rail and Transit Study	Figure 4-1 Waterbodies Subject to NH Shoreland Water Quality Protection Act	The Smart Associates Environmental Consultants, Inc. Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure 5-1a Floodplains Map 1 of 7	The Smart Associates Environmental Consultants, Inc. Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure 5-1b Floodplains Map 2 of 7	The Smart Associates Environmental Consultants, Inc. Date: September 2014

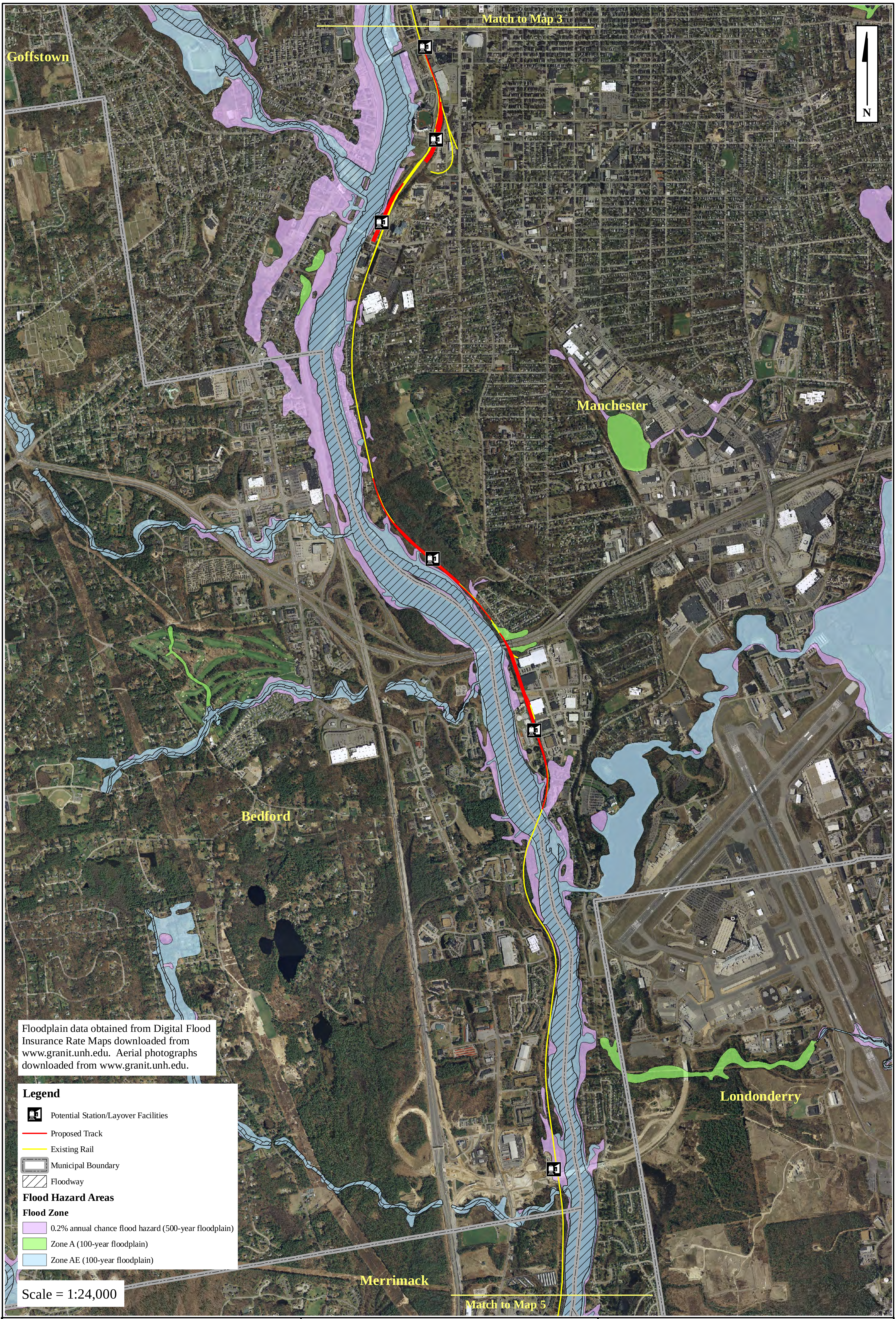


New Hampshire Capitol Corridor
Rail and Transit Study

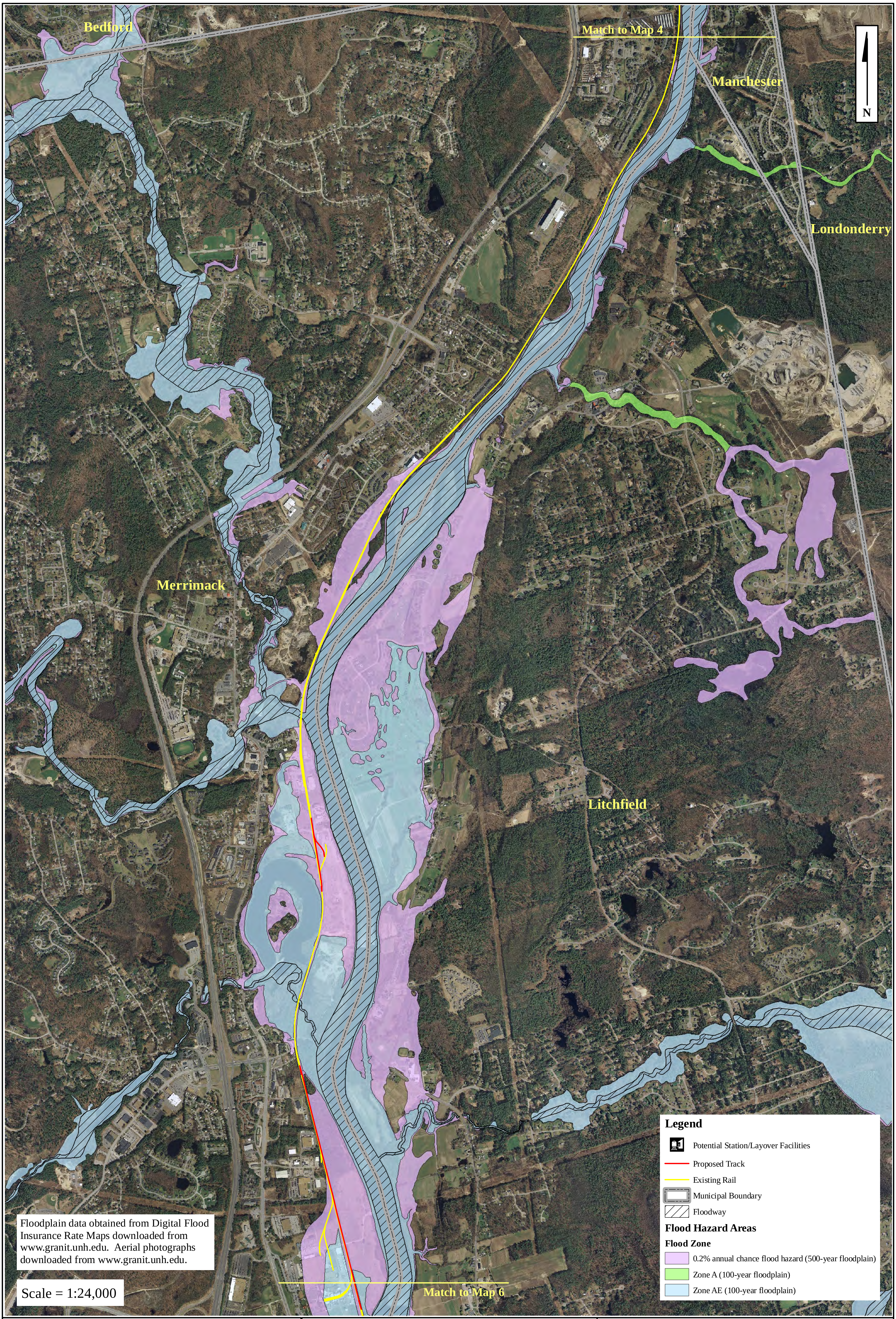
Figure 5-1c
Floodplains
Map 3 of 7

The Smart Associates
Environmental Consultants, Inc.

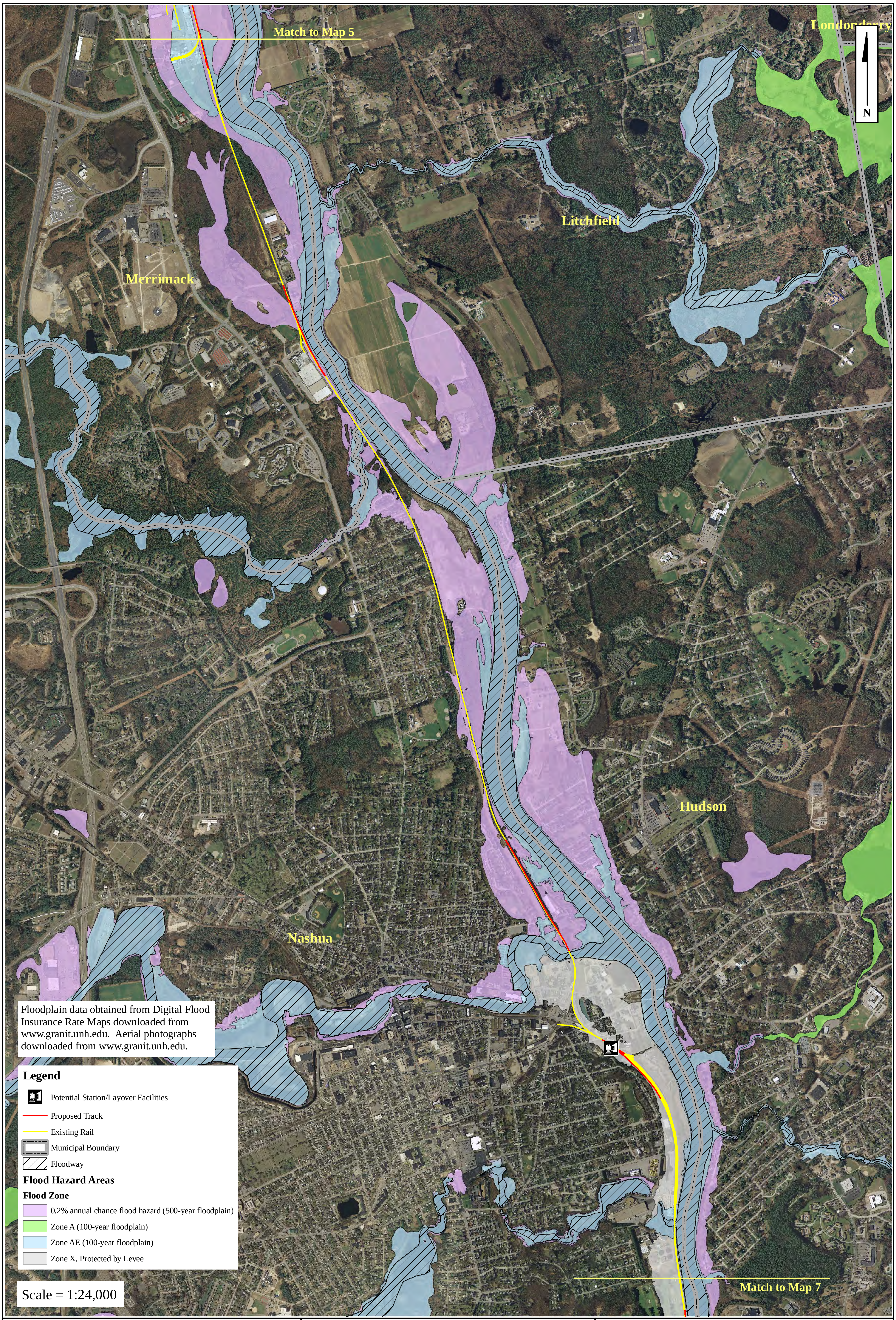
Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure 5-1d Floodplains Map 4 of 7	The Smart Associates *Environmental Consultants, Inc.* Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure 5-1e Floodplains Map 5 of 7	The Smart Associates Environmental Consultants, Inc. Date: September 2014

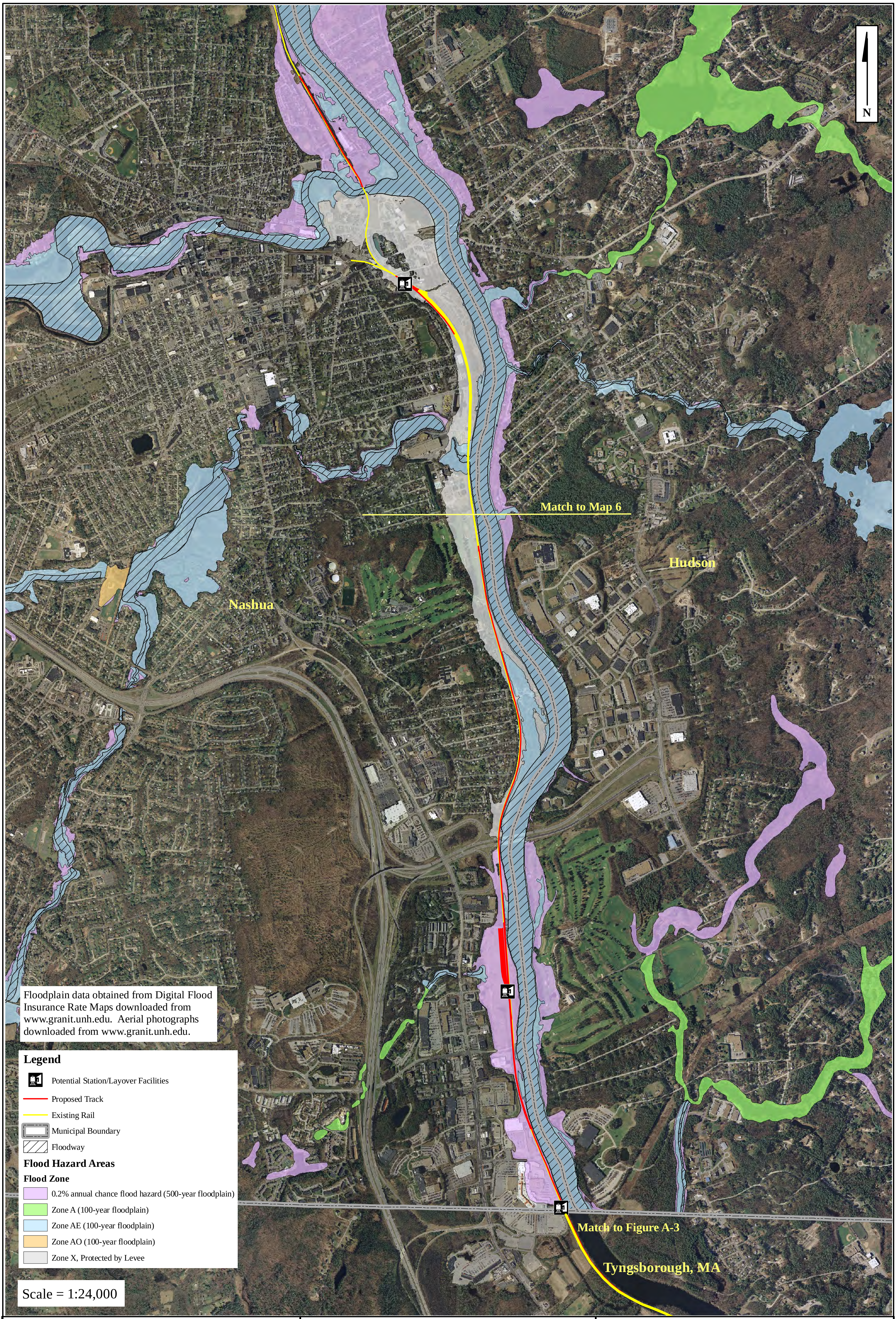


New Hampshire Capitol Corridor
Rail and Transit Study

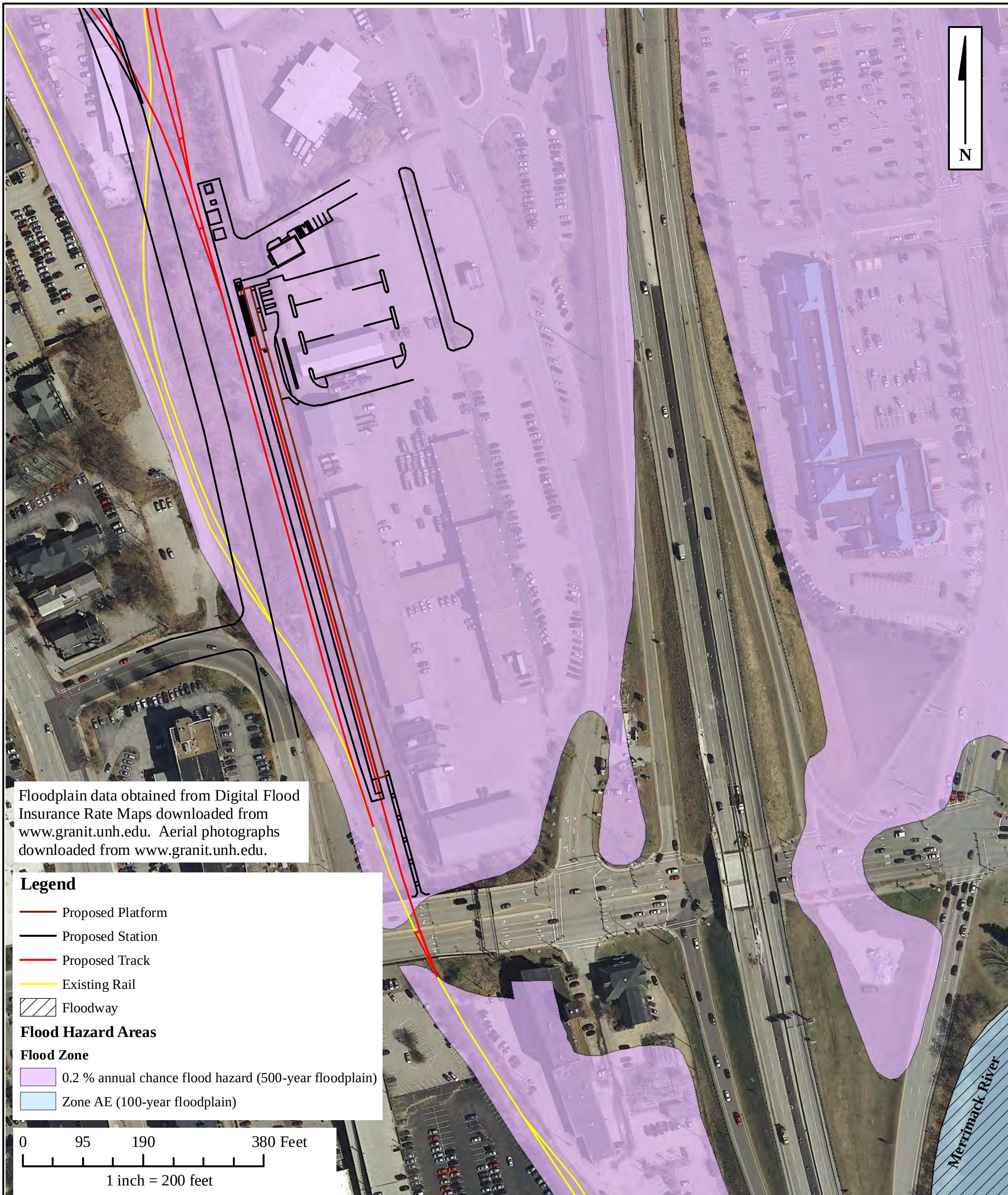
Figure 5-1f
Floodplains
Map 6 of 7

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure 5-1g Floodplains Map 7 of 7	The Smart Associates *Environmental Consultants, Inc.* Date: September 2014



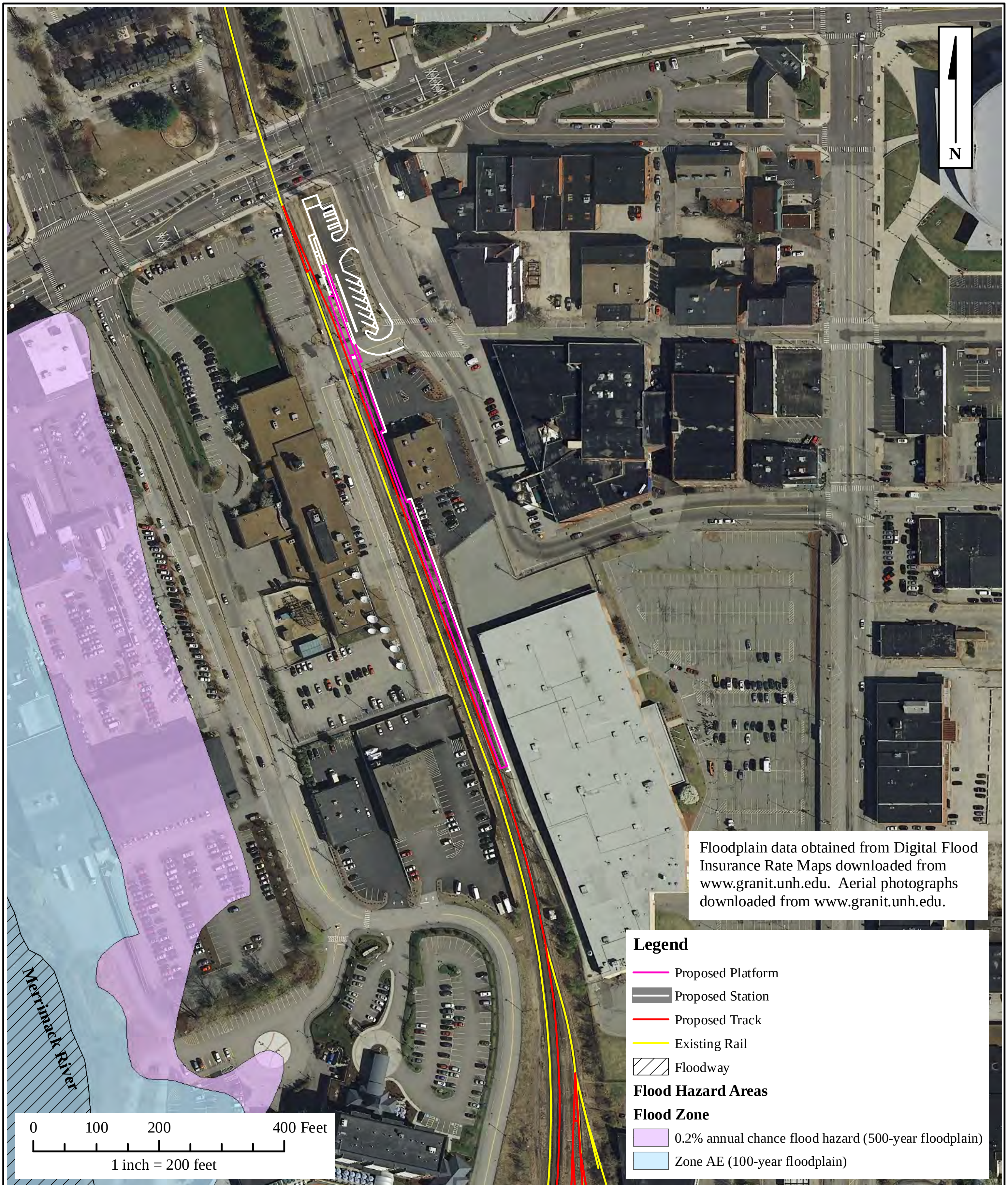
New Hampshire Capitol Corridor Rail and Transit Study	Figure 5-2 Floodplains Stickney Avenue Station Site Concord, NH	The Smart Associates Environmental Consultants, Inc. Date: September 2014

New Hampshire Capitol Corridor
Rail and Transit Study

Figure 5-3
Floodplains
Bridge Street Station Site
Manchester, NH

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014

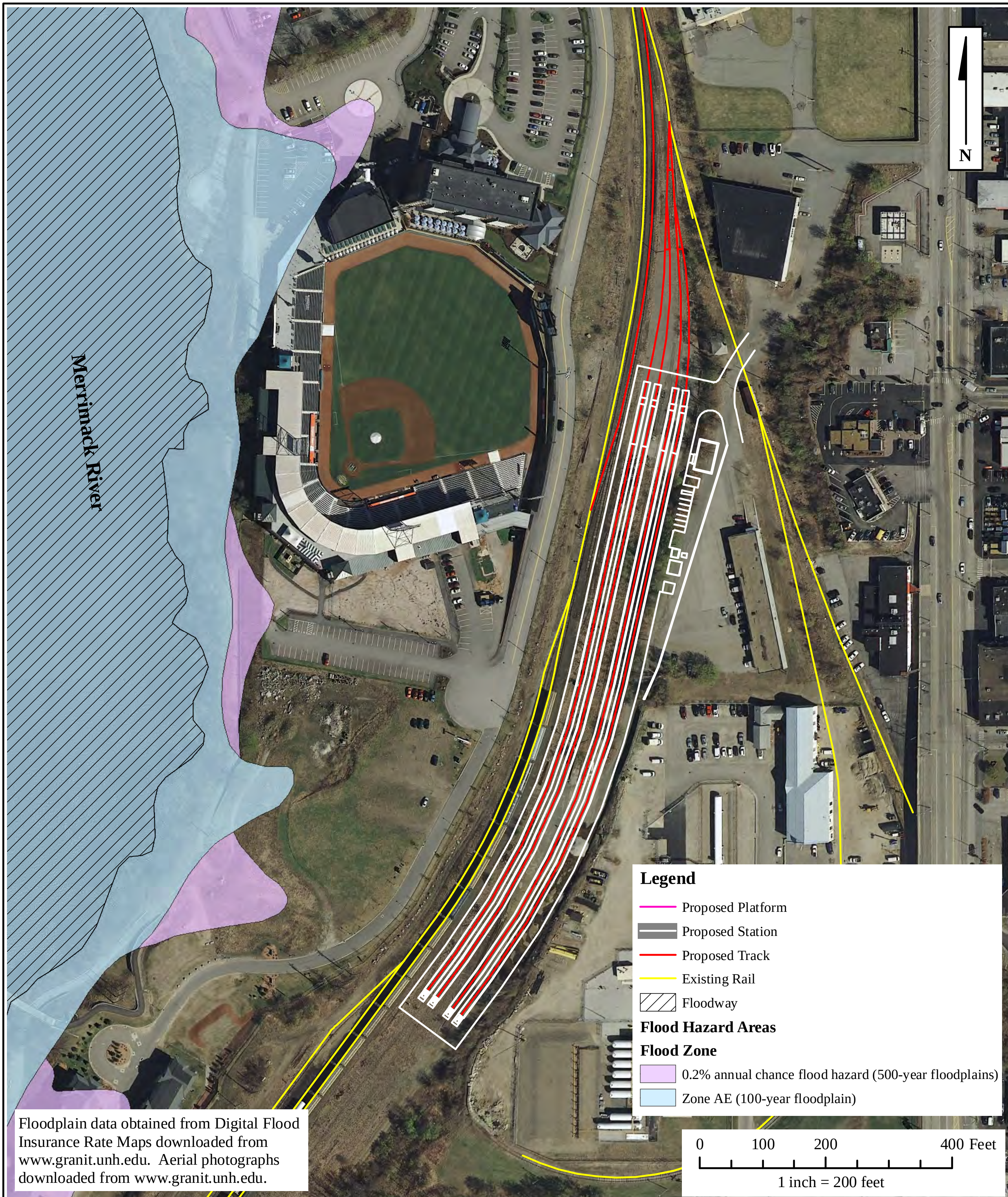


New Hampshire Capitol Corridor Rail and Transit Study

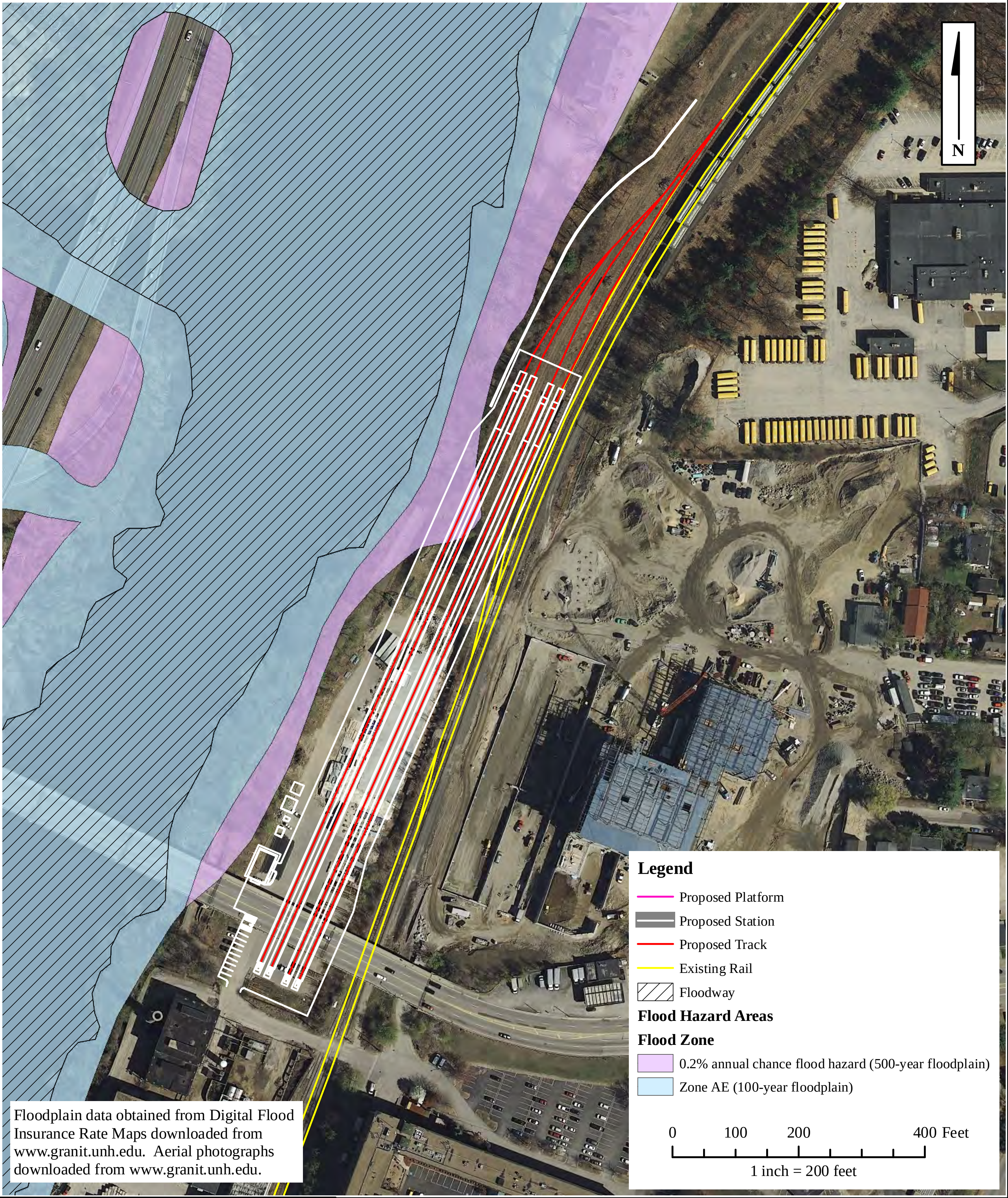
Figure 5-4
Floodplains
Granite Street Station Site
Manchester, NH

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure 5-5 Floodplains Riverwalk Way Layover Facility Site Manchester, NH	The Smart Associates Environmental Consultants, Inc. Date: September 2014

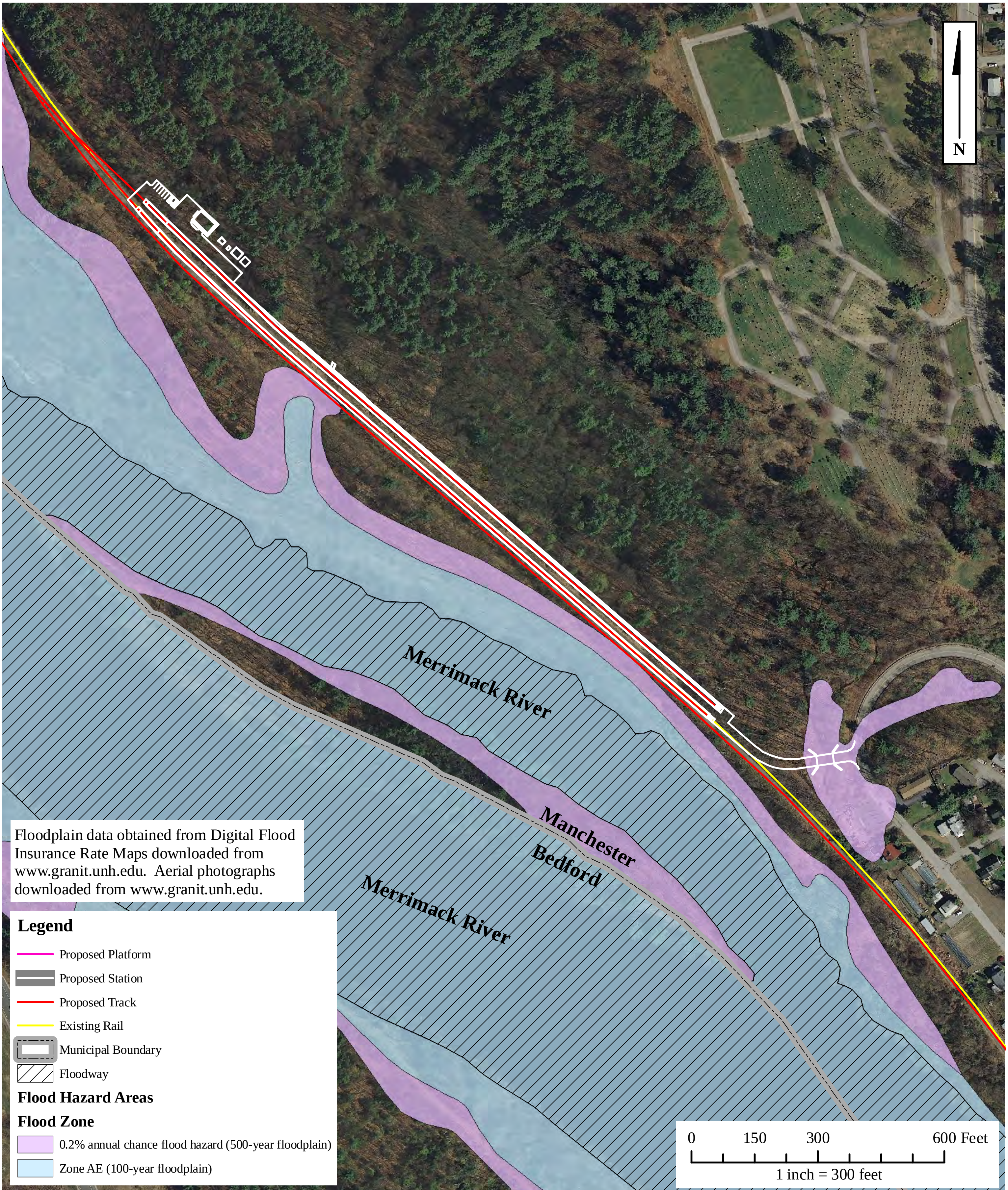


New Hampshire Capitol Corridor
Rail and Transit Study

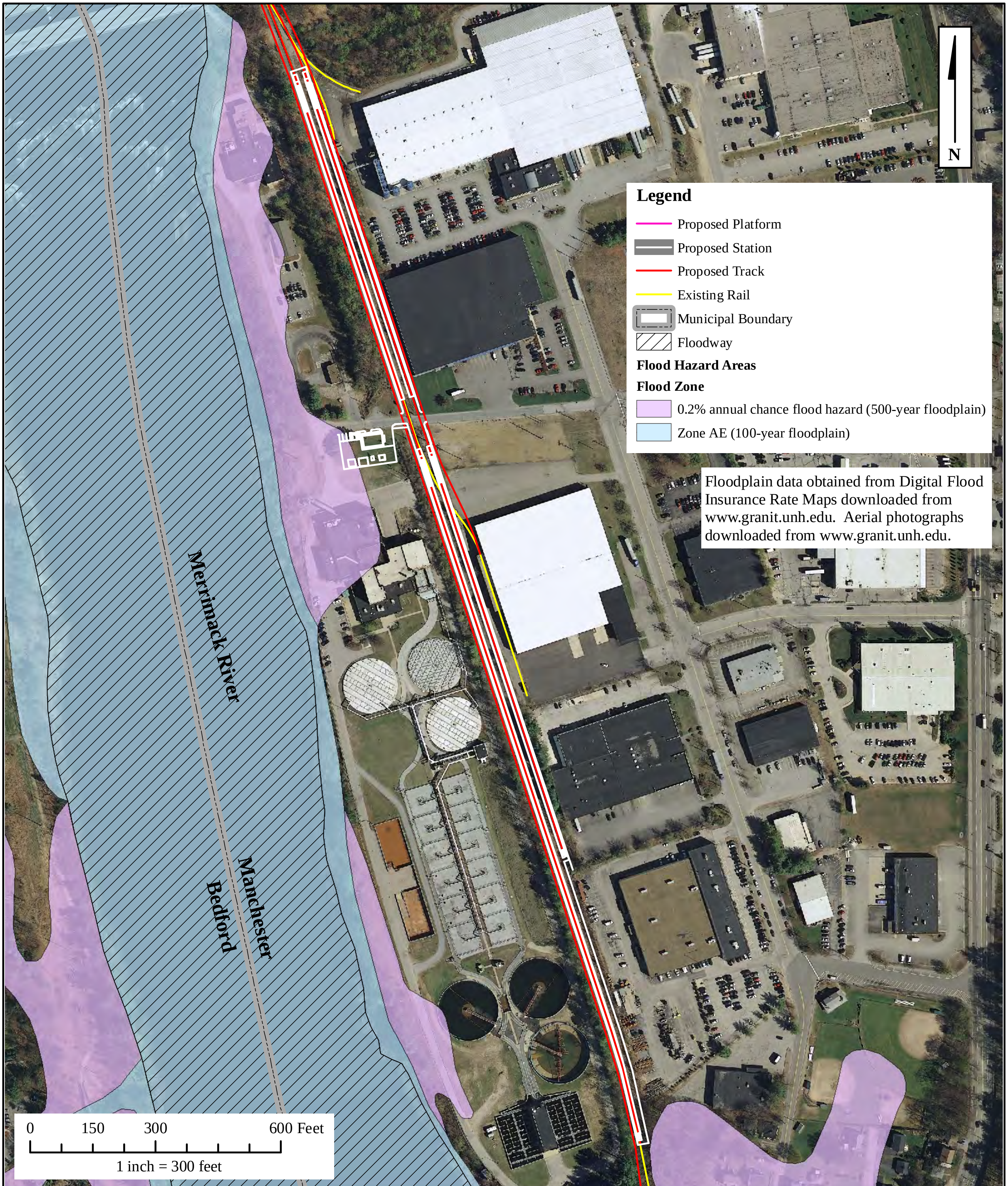
Figure 5-6
Floodplains
Queen City Bridge
Layover Facility Site
Manchester, NH

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure 5-7 Floodplains Riverdale Avenue Layover Facility Site Manchester, NH	The Smart Associates Environmental Consultants, Inc. Date: September 2014

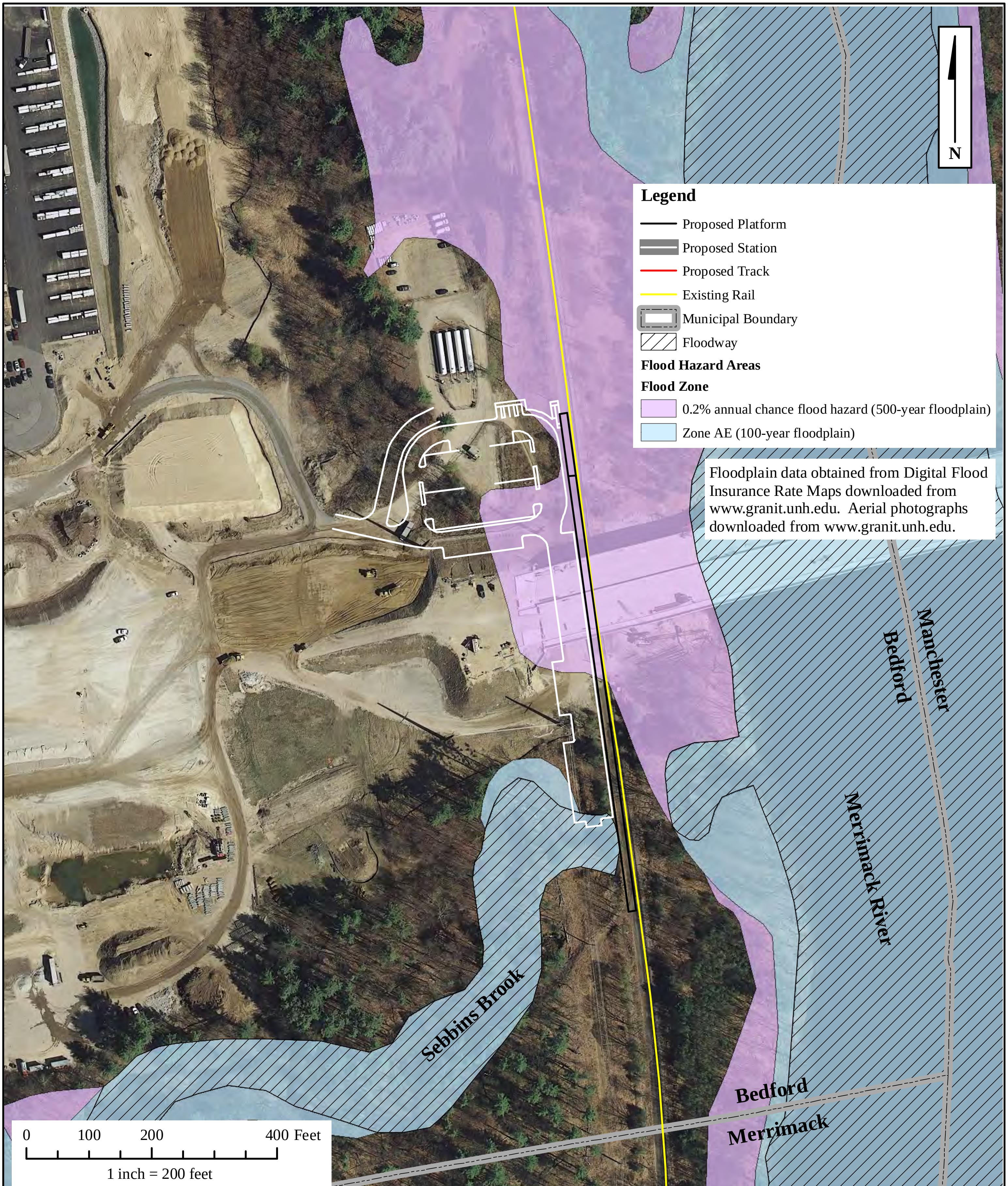


New Hampshire Capitol Corridor
Rail and Transit Study

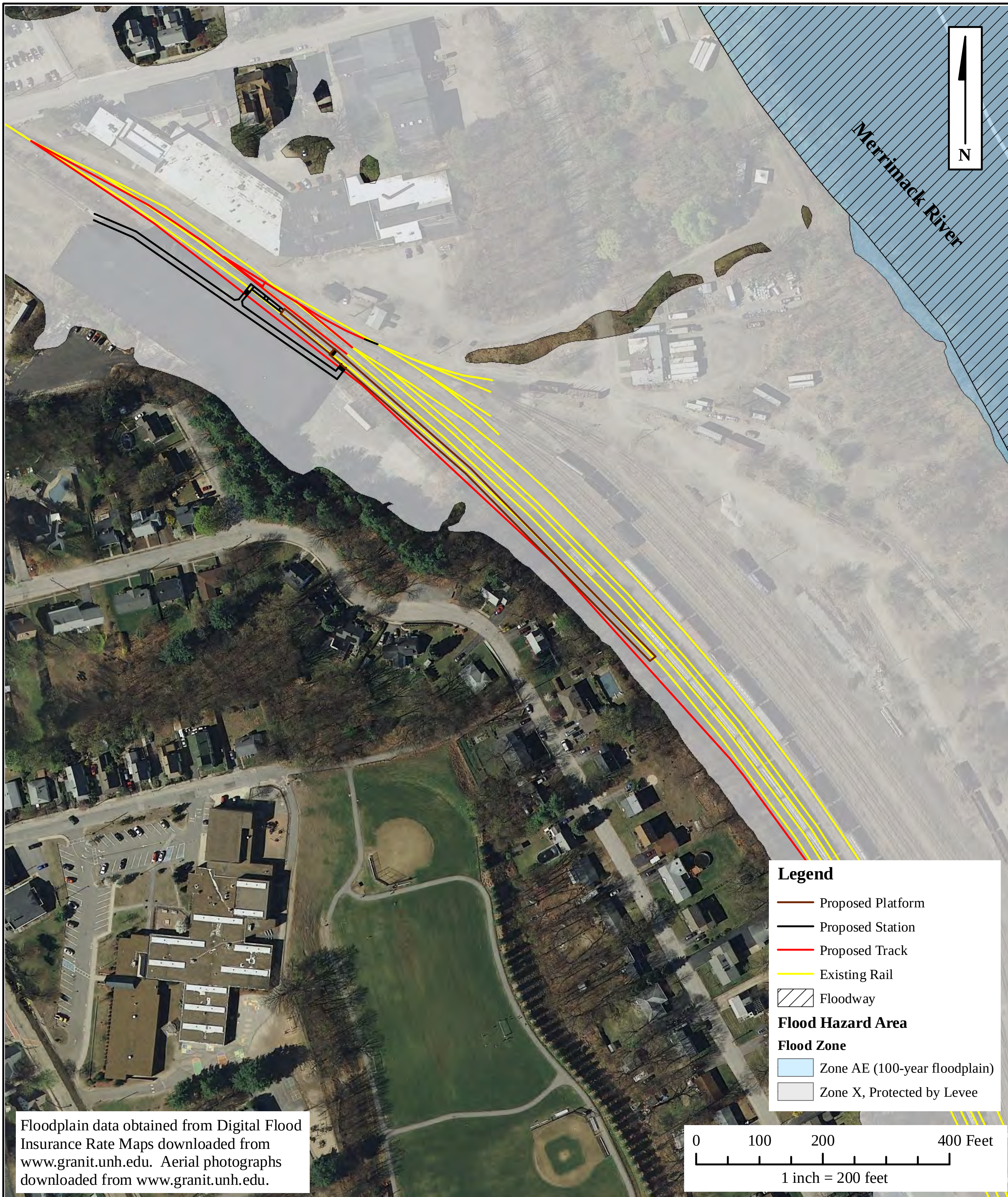
Figure 5-8
Floodplains
Brown Avenue Layover Facility Site
Manchester, NH

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure 5-9 Floodplains Raymond Wieczorek Drive (MHT Airport) Park and Ride Station Site Bedford, NH	The Smart Associates Environmental Consultants, Inc. Date: September 2014

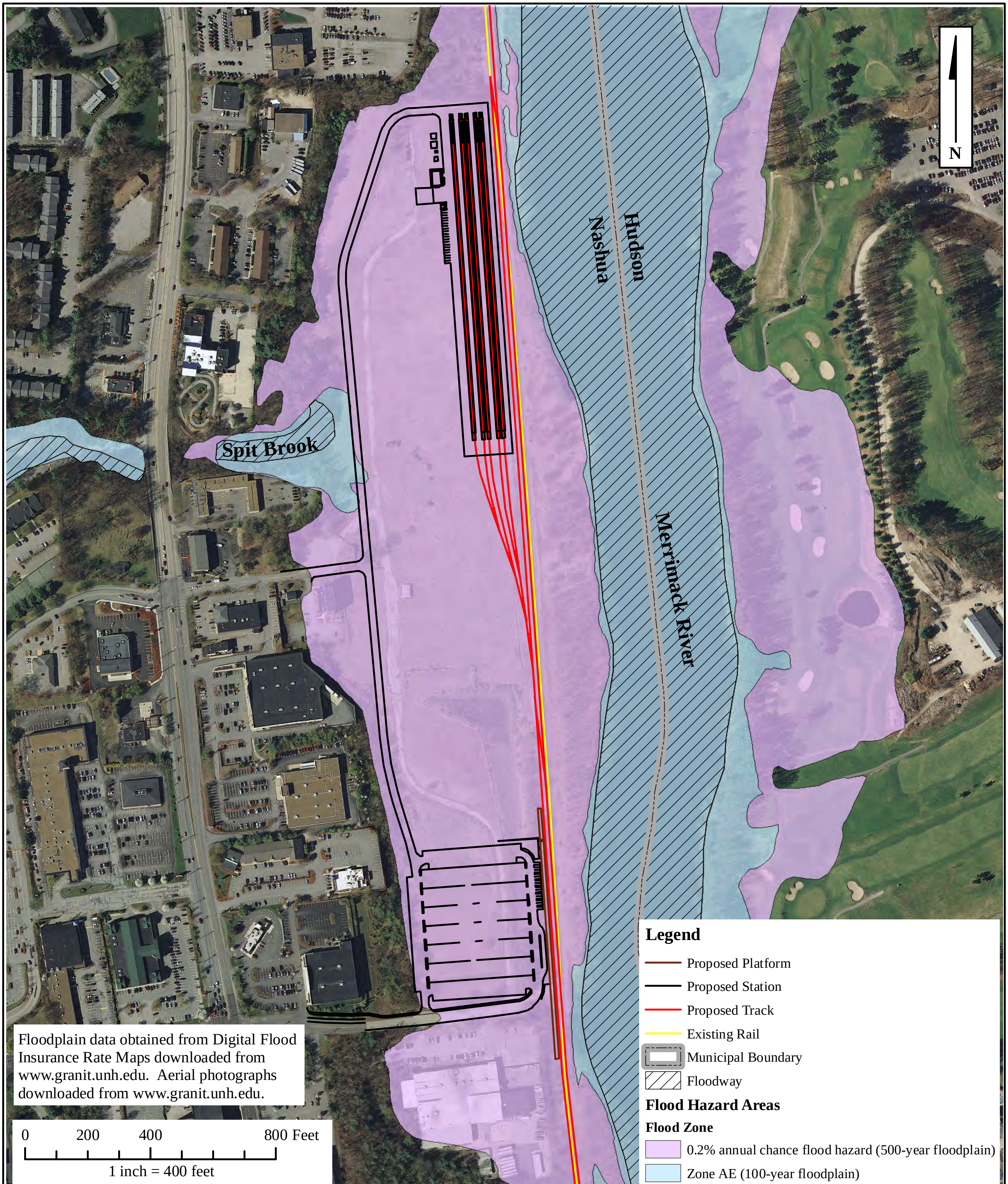


New Hampshire Capitol Corridor Rail and Transit Study

Figure 5-10
Floodplains
Crown Street Park and Ride
Station Site
Nashua, NH

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014

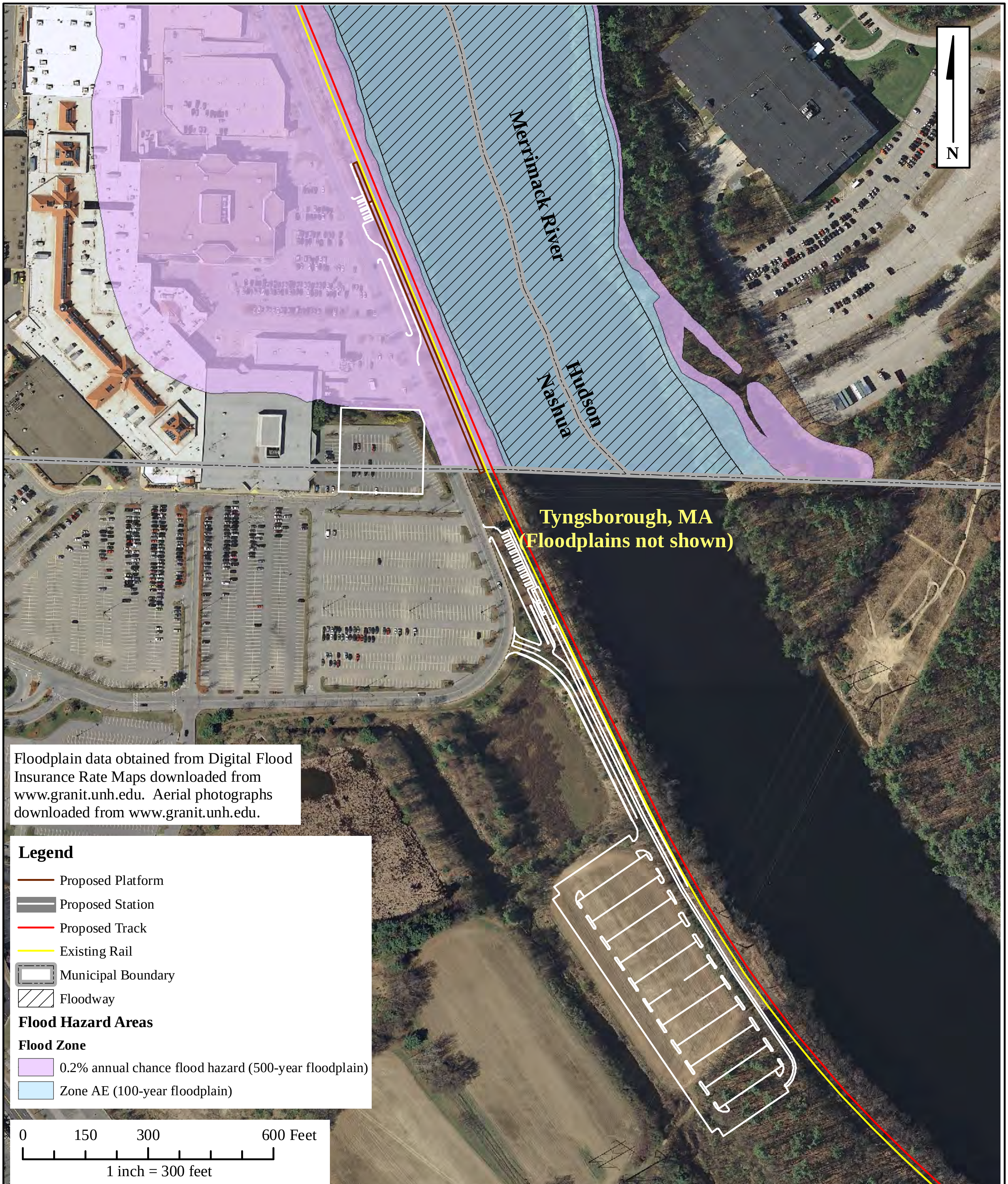


New Hampshire Capitol Corridor Rail and Transit Study

Figure 5-11
Floodplains
Spit Brook Road Layover Facility Site
Nashua, NH

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014

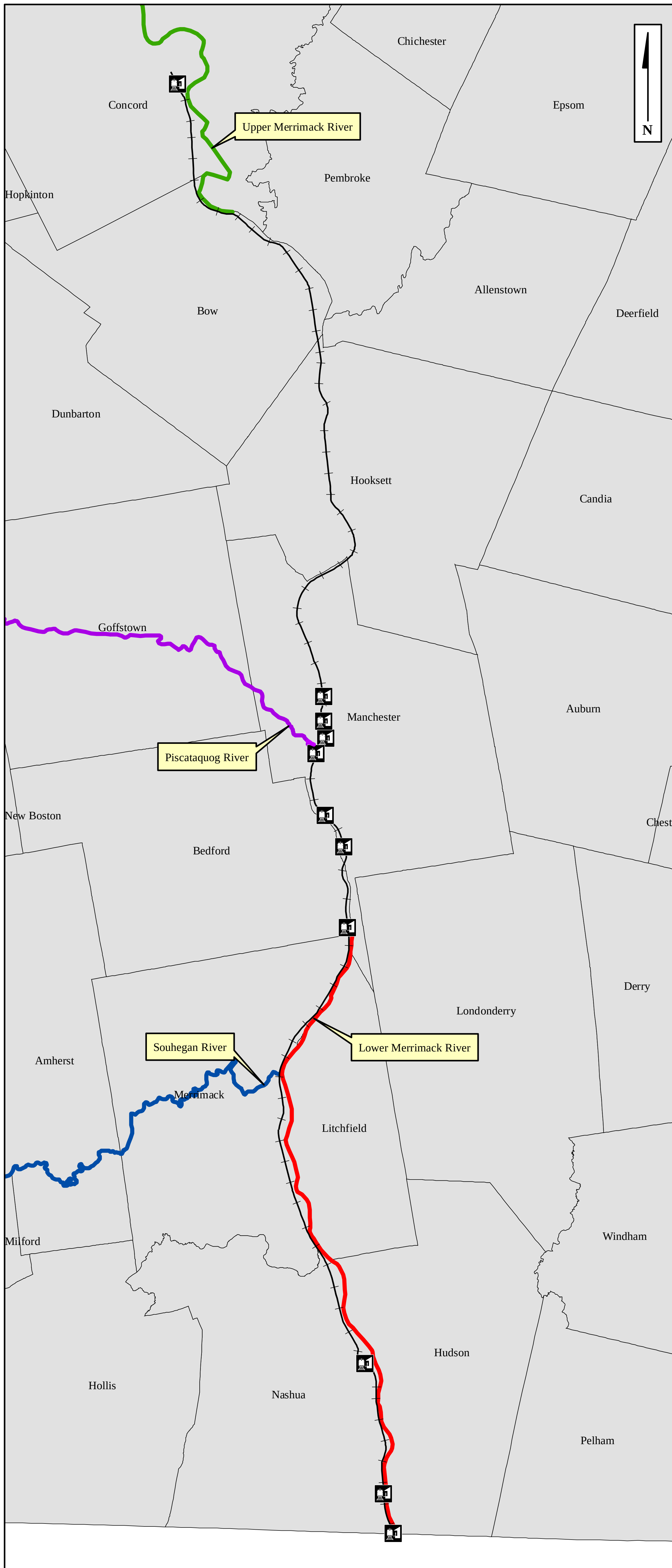


New Hampshire Capitol Corridor
Rail and Transit Study

Figure 5-12
Floodplains
Pheasant Lane Mall
Park and Ride Station Site
Nashua, NH

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014



New Hampshire Designated Rivers Within 1/4 Mile of Rail Corridor

Upper Merrimack River (Concord, Bow)

Lower Merrimack River (Merrimack, Nashua)

Piscataquog River (Manchester)

Souhegan River (Merrimack)

Legend

Potential Station/Layover Facilities

Rail Corridor

0 1 2 3 4 5 Miles

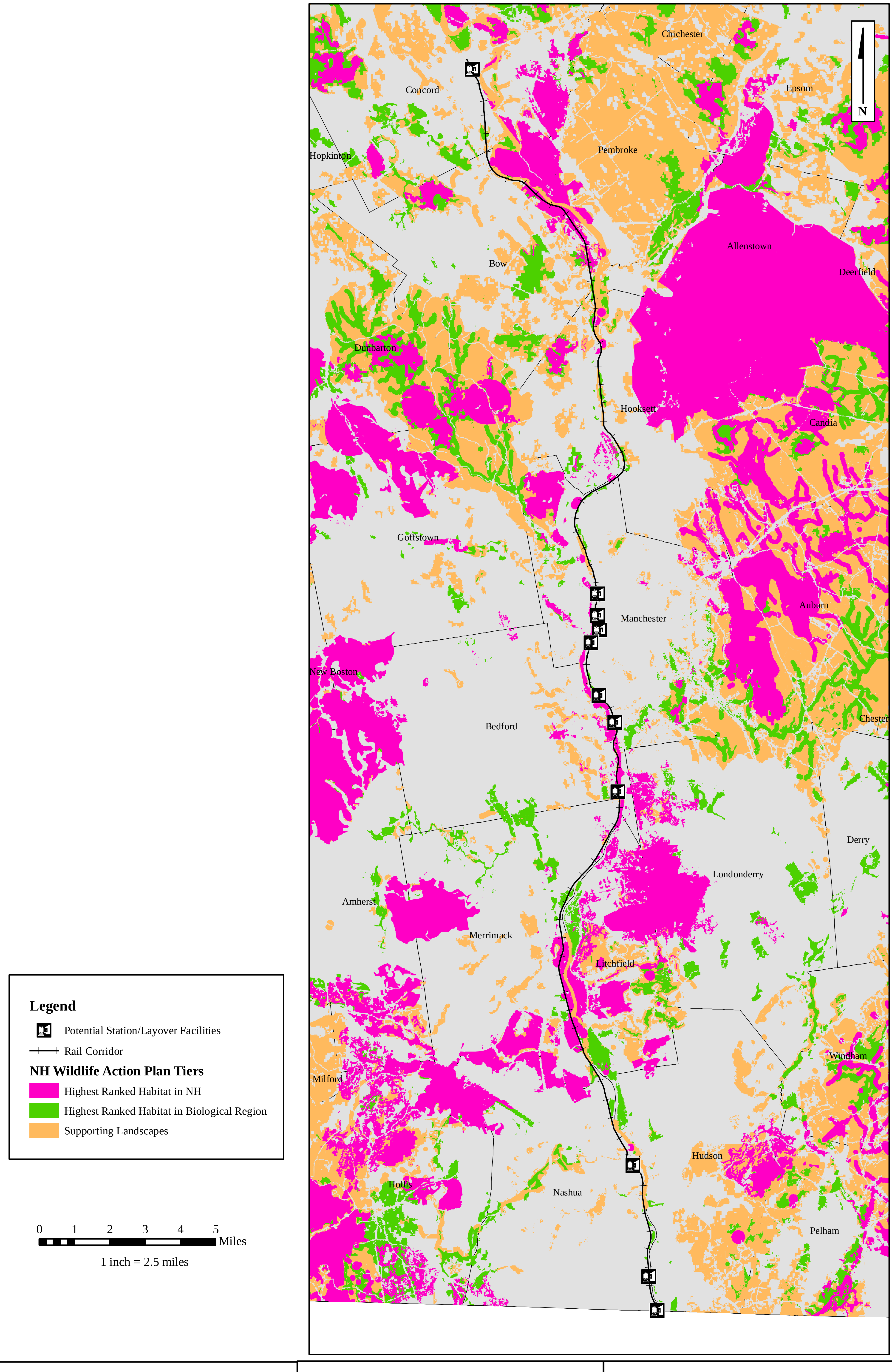
1 inch = 2.5 miles

New Hampshire Capitol Corridor
Rail and Transit Study

Figure 6-1
NH Designated Rivers

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014



New Hampshire Capitol Corridor
Rail and Transit Study

Figure 7-1
Highest Ranked Wildlife Habitat

The Smart Associates
Environmental Consultants, Inc.

Date: September 2014

APPENDIX A

Massachusetts Maps and Data

APPENDIX A – MASSACHUSETTS MAPS AND DATA

Wetlands and Surface Waters

In Massachusetts, wetlands are federally regulated under the Clean Water Act and activities resulting in impacts to them require a permit from the U.S. Army Corps of Engineers (ACOE) under Section 404 of that same Act. Wetlands are also regulated at the state-level by the Wetlands Protection Act (WPA), which is administered by the municipal conservation commissions, with overview by the Massachusetts Department of Environmental Protection (MassDEP). The regulations (310 CMR 10.00) implementing the Wetlands Protection Act (*M.G.L. c. 131 s.40)* govern both inland and coastal wetlands, as well as floodplain and Riverfront Areas. The regulations identify "Areas Subject to Protection Under the Act" for which locally issued permits are required including any activity that involves filling, dredging, removing, or altering these areas. Areas subject to protection under the WPA within the project corridor include the following resource areas:

- Banks;
- Bordering Vegetated Wetlands;
- Land Under Water Bodies and Waterways;
- Land Subject to Flooding (Bordering and Isolated Areas); and
- Riverfront Area.

Banks include naturally occurring banks and beaches that are located between a waterbody and a Bordering Vegetated Wetland, floodplain, or upland. They can be vegetated or comprised of exposed soil or rock. Banks are generally significant for groundwater supply, flood control, storm damage prevention, pollution prevention, and for fish and wildlife habitat.

Bordering Vegetated Wetlands include wet meadows, marshes, swamps, bogs, and other freshwater wetlands that border on streams, rivers, ponds, and other surface waters. Boundaries are delineated based on vegetation, soils, and the presence of wetland hydrology. Bordering vegetated wetlands are important for groundwater supply, flood control, storm damage prevention, pollution prevention, wildlife habitat, and fisheries.

Land Under Waterbodies and Waterways is defined as "the bottom of, or the land under, the surface of the ocean or any estuary, creek, river, stream, pond, or lake." The boundary of Land Under Water Bodies and Waterways is the mean annual low water level. Land Under Waterbodies and Waterways is important for groundwater supply, public and private water supply, flood control, storm damage prevention, pollution prevention, wildlife habitat, and fisheries. Work within Land Under Water Bodies and Waterways should not impact the water carrying capacity within the defined channel, groundwater and surface water quality, fisheries, or wildlife habitat.

Bordering Land Subject to Flooding is defined as "an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds, or lakes." It extends from the banks of the waterway or water body. If a bordering vegetated wetland occurs, then it extends from the edge of the wetland. Isolated land subject to flooding is defined as "an isolated depression or a closed basin without an inlet or an outlet." Land Subject to Flooding is important for flood control and storm damage prevention. Work that will impact Land Subject to Flooding may require mitigation that would compensate for a loss in flood storage. In addition, the work should not impact important wildlife habitat.

A Riverfront Area is defined as “the area of land between a river’s mean annual high water line and a parallel line measured horizontally. The riverfront area may include or overlap other resource areas or their buffer zones. Riverfront areas are important for the protection of private and public water supplies, groundwater supply, flood control, storm damage prevention, pollution prevention, and the protection of wildlife habitat, fisheries, and shellfish. The regulated Riverfront Area is generally 200 feet wide except for the following locations, in which the Riverfront Area is 25 feet wide:

- Municipalities with a population of 90,000 people or more;
- Municipalities with a population density of greater than 9,000 people per square mile;
- Areas designated by the Secretary of the Executive Office of Environmental Affairs as a "densely developed area"; and
- Certain identified land within Waltham and Milton (see Section 18, "riverfront area", in the Rivers Protection Act).

The buffer zones adjacent to some resource areas are also protected under the Wetland Protection Act. Within the project corridor, buffer zones include areas within 100 feet from the boundary of any bordering vegetated wetland or bank.

The main surface water feature located along the project corridor is the Merrimack River. Protected resource areas that are associated with the Merrimack River include Land Under Water Bodies and Waterways, Bank, Bordering Land Subject to Flooding, and Riverfront Area. In Tyngsborough and Chelmsford, the Riverfront Area is 200 feet wide and in Lowell the Riverfront Area is 25 feet wide. The majority of the proposed new rail in Tyngsborough is located within the 200-foot Riverfront Area. In Chelmsford, approximately 1 mile of the proposed new rail is located within the 200-foot Riverfront Area. The proposed new rail in Lowell is located beyond the 25-foot Riverfront Area.

Other wetland and water resources crossed by the project corridor include:

- Unnamed tributary to the Merrimack River and adjacent wetlands – located north of Parlee Farms in Tyngsborough;
- Bridge Meadow Brook - located north of the Route 3A bridge over the Merrimack River in Tyngsborough;
- Unnamed tributary to the Merrimack River (flows from Uptons Pond) – located in Tyngsborough near intersection of Route 3A and Westford Road;
- Deep Brook and adjacent wetlands - located in Chelmsford near Wotton Street;
- Stony Brook and adjacent wetlands - located in Chelmsford near Church Street;
- Black Brook - located in Lowell near the intersection of Middlesex Street and Pawtucket Street and appears to be piped under the project corridor and the surrounding urban area;
- Pawtucket Canal – located in Lowell and is crossed twice by the project corridor; and
- River Meadow Brook – located in Lowell near the Lowell Connector and the southern end of the project corridor.

Figures A-1 and A-2 show the locations of wetlands and surface waters. These maps were prepared using the MassDEP Wetlands datalayer downloaded from the MassGIS website.

The project corridor is not located near any Outstanding Resource Waters, as designated by the Massachusetts Surface Water Quality Standards (314 CMR 4.00)

Floodplains

The Digital Flood Insurance Rate Maps (DFIRMs) available on the MassGIS website were reviewed to determine the locations of flood hazard areas within the project corridor (refer to Figures A-3 and A-4).

The project corridor crosses through the 100-year floodplain (Zones A and AE) in several locations. These floodplains are associated with the Merrimack River and its larger tributaries (Deep Brook, Stony Brook, Pawtucket Canal, and River Meadow Brook). The largest Zone A floodplain area is located in Chelmsford, where approximately 1 mile of proposed new rail is located within an area mapped as Zone A floodplain.

In addition to the Zone A and Zone AE floodplains described above, large portions of the project corridor are located within areas mapped as "0.2 percent annual chance of flood hazard", which corresponds to the 500-year floodplain.

Wildlife Habitat and Rare Species

Endangered species are protected at the federal level by the Endangered Species Act of 1973 (16 USC 1531-1543, Sec. 2A) and at a state level by the Massachusetts Endangered Species Act (M.G.L. c.131A). The Massachusetts Natural Heritage and Endangered Species Program (NHESP) is the state agency that is responsible for the protection of plant and animal species that are listed as threatened, endangered, and of special concern in Massachusetts.

Information on important wildlife habitat and recorded occurrences of rare, threatened, and endangered species was obtained from the MassGIS website. Data reviewed included:

- NHESP Priority Habitats of Rare Species – Under the Massachusetts Endangered Species Act (MESA) areas that are important for the protection of state-listed species are identified as Priority Habitat of Rare Species ("Priority Habitat"). Priority Habitat is defined as "the geographic extent of habitat for state-listed species". Projects or activities that occur within a Priority Habitat require review under MESA and consultation with the NHESP.
- NHESP Estimated Habitats of Rare Species – Estimated Habitat of Rare Species ("Estimated Habitat") is a sub-set of Priority Habitat and includes the geographical extent of habitat of state-listed rare wetlands wildlife. These areas are protected by both MESA and the Massachusetts WPA.
- NHESP Certified Vernal Pools – Vernal pools provide important breeding habitat for amphibian and invertebrate species. NHESP Certified Vernal Pools include vernal pools that have been reviewed and certified by NHESP according to the Massachusetts Division of Fisheries and Wildlife's *Guidelines for Certification of Vernal Pool Habitat*.
- NHESP Potential Vernal Pools – The Potential Vernal Pool data that was reviewed includes the locations of potential vernal pools that have been identified using aerial photography. These potential vernal pools have not been certified by NHESP and field review is necessary to verify if a vernal pool exists.

Within the project corridor, the Merrimack River is identified as both Priority Habitat and Estimated Habitat. The existing rail line crosses through or is located adjacent to these designated areas in several locations.

Seven potential vernal pools are mapped within the vicinity of the project corridor in Tyngsborough and Chelmsford. Field reviews would be necessary to confirm if these areas are indeed vernal pools. No certified vernal pools are located in the vicinity of the project corridor.

The project corridor is not located within any Areas of Critical Environmental Concern (ACECs). ACECs are areas in Massachusetts "where unique clusters of natural and human resource values exist, which are worthy of a high level of concern and protection" (301 CMR 12.3). ACEC are nominated at the community level and designated at the state level.

A meeting was held with NHESP on August 13, 2014 to present the project and discuss potential issues regarding listed species (refer to Appendix D for meeting minutes). NHESP identified three species of concern within the project corridor, including bald eagle (*Haliaeetus leucocephalus*), riverine clubtail (*Stylurus amnicola*), and cobra clubtail (*Gomphus vastus*).

Bald eagle is listed as threatened in Massachusetts but is not federally listed. Bald eagles forage along the Merrimack River in the project corridor. NHESP recommended retaining large trees within the project corridor if possible.

Riverine clubtail and cobra clubtail are two species of dragonfly. Riverine clubtail is listed as endangered and cobra clubtail is listed as special concern in Massachusetts. Neither species is federally listed. Potential impacts to these species could occur from the conversion of vegetation or loss of vegetation structure as well as from water quality degradation.

More details on the existing rail line, the proposed improvements, and vegetation clearing will need to be provided to NHESP as the project design progresses. The project will need to be reviewed under the Massachusetts Endangered Species Act (MESA) and an application will need to be filed with NHESP.

References

Data Reviewed and/or Downloaded from the MassGIS website (http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/):

- DEP Wetlands (1:12,000), January 2009
- USGS Color Ortho Imagery, 2008
- FEMA National Flood Hazard Layer, October 2013
- NHESP Priority Habitats of Rare Species, October 2008
- NHESP Estimated Habitats of Rare Wildlife, October 2008
- NHESP Certified Vernal Pools, updated continually, downloaded on April 9, 2014
- NHESP Potential Vernal Pools, December 2000

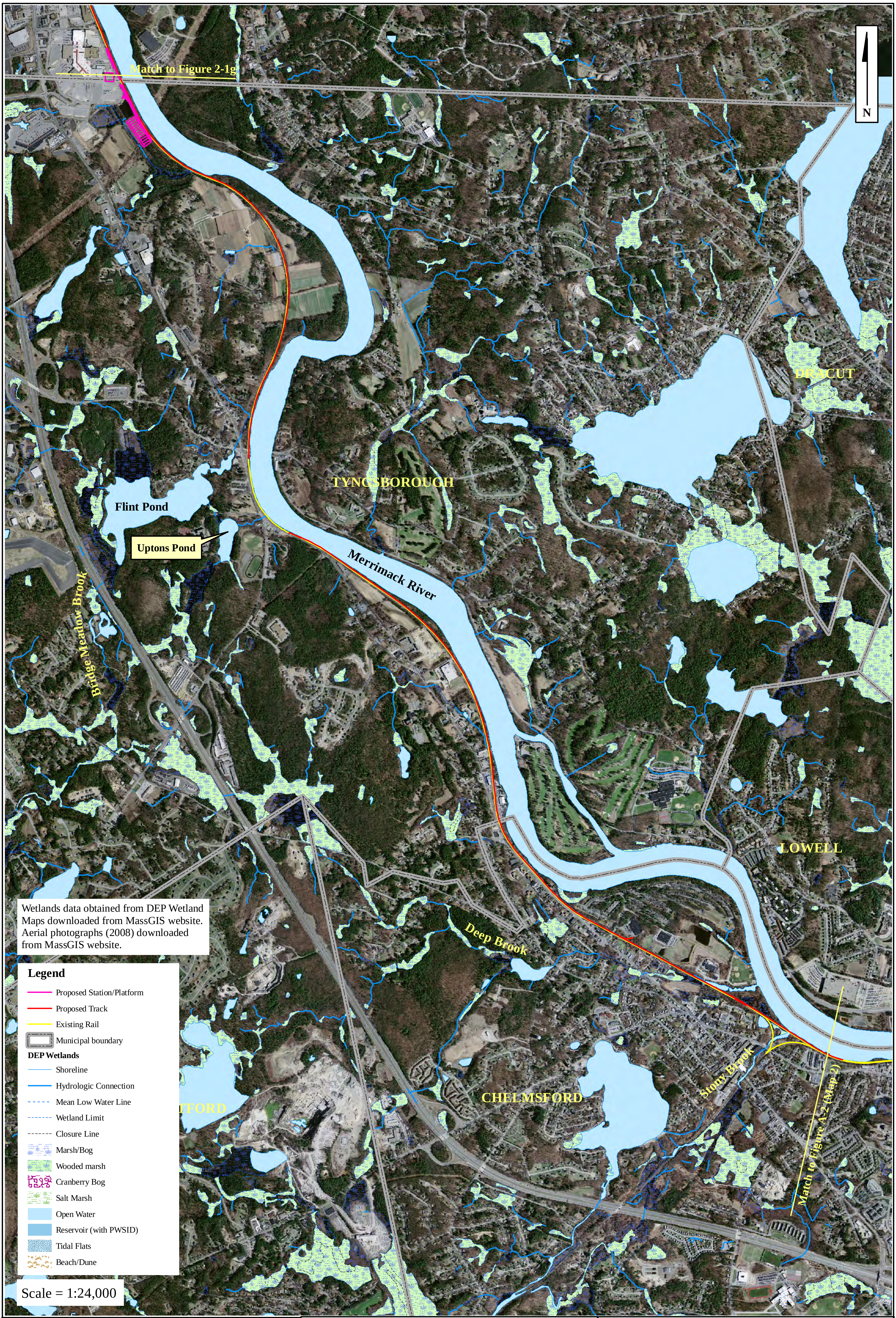
Lowell Quadrangle, Massachusetts – New Hampshire, 7.5 Minute Series. US Department of the Interior, Geological Survey. Revised 1979.

Massachusetts Department of Conservation and Recreation. Areas of Critical Environmental Concern (ACEC) Viewer. Available at: http://maps.massgis.state.ma.us/map_ol/acecs.php. Viewed on April 25, 2014.

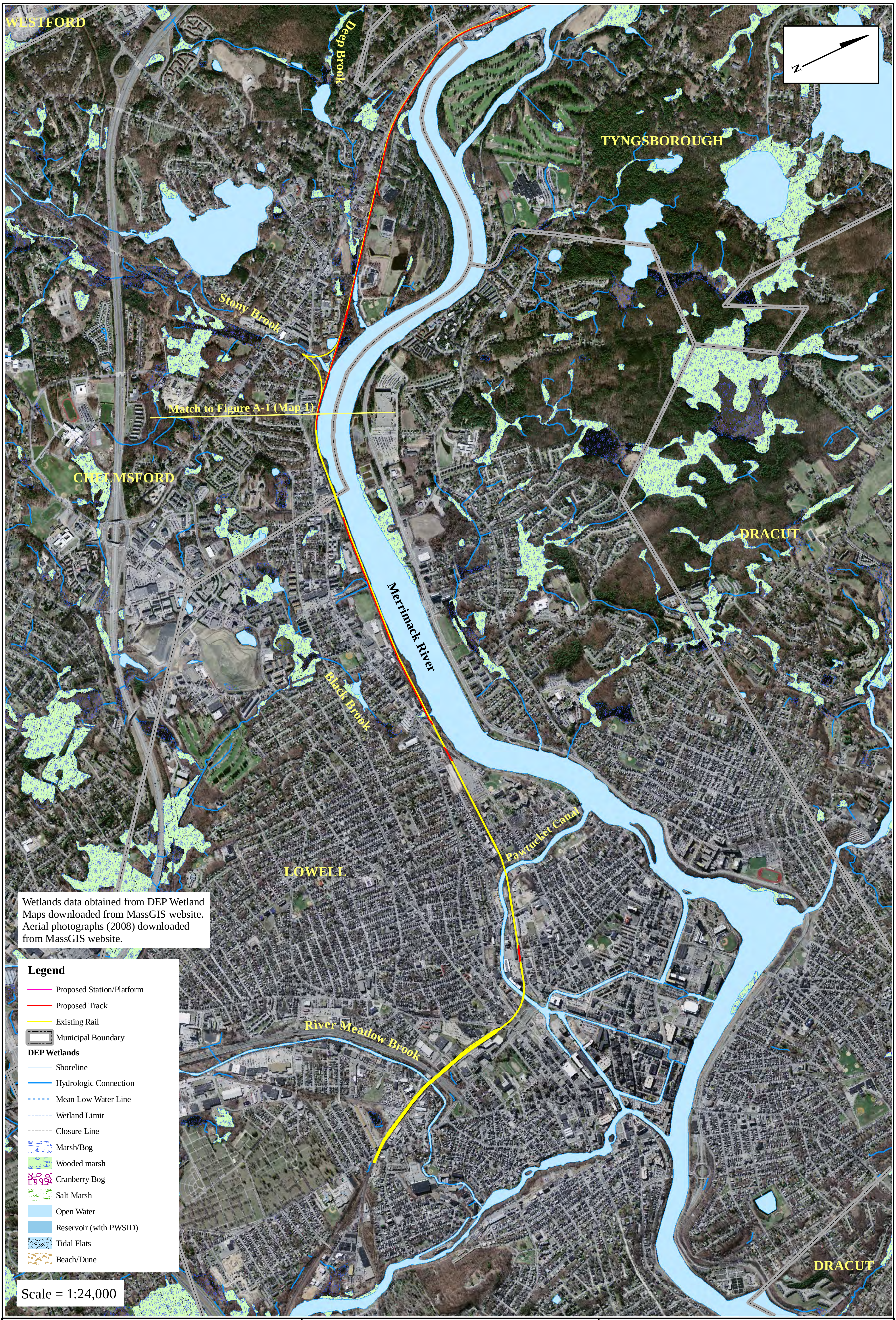
Nashua South Quadrangle, New Hampshire - Massachusetts, 7.5 Minute Series. US Department of the Interior, Geological Survey. Revised 1979

Regulations Reviewed:

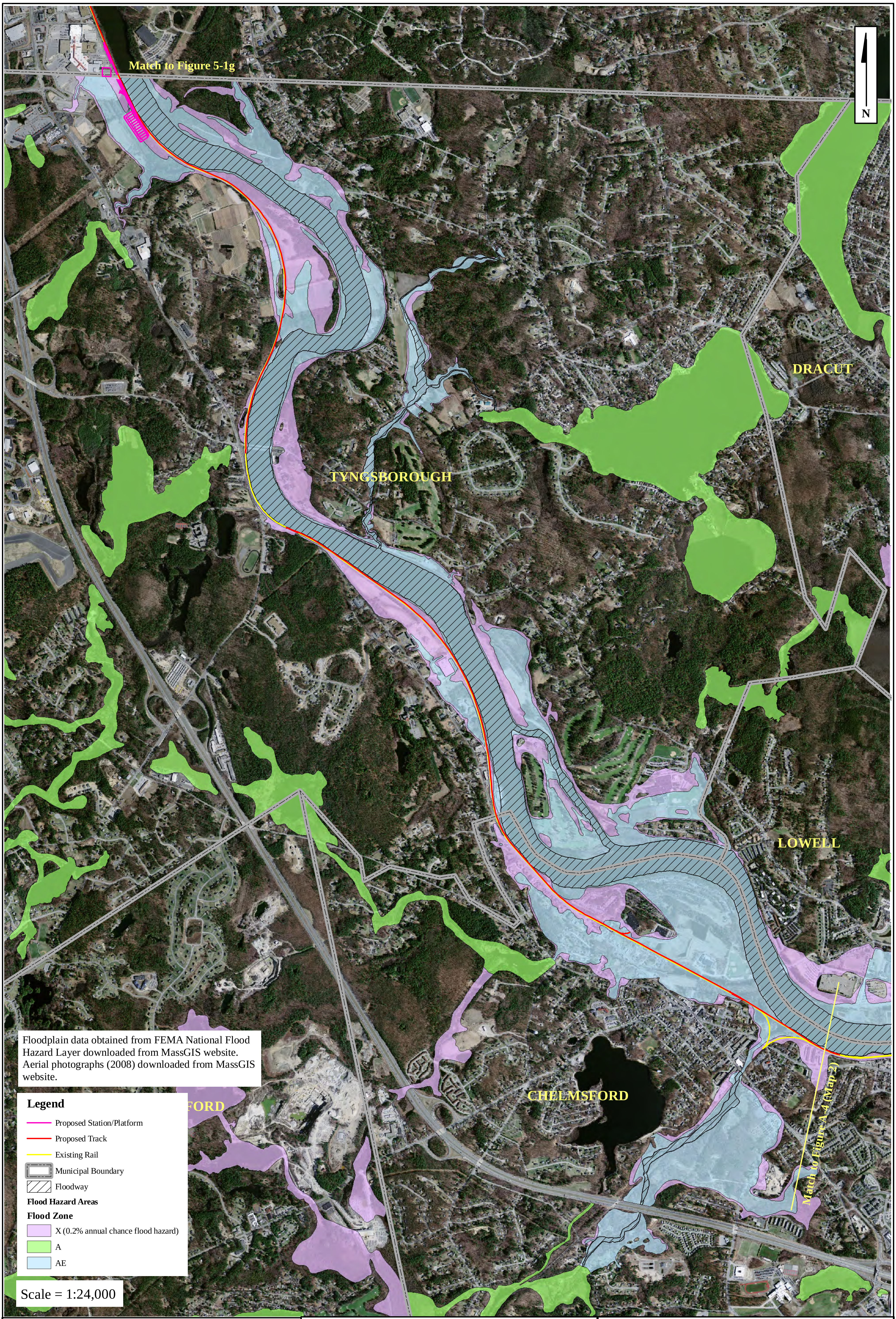
- 301 CMR 12.00 Areas of Critical Environmental Concern
- 314 CMR 4.00 Massachusetts Surface Water Quality Standards



New Hampshire Capitol Corridor Rail and Transit Study	Figure A-1 MassDEP Wetlands Map 1 of 2	The Smart Associates Environmental Consultants, Inc. Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure A-2 MassDEP Wetlands Map 2 of 2	The Smart Associates Environmental Consultants, Inc. Date: September 2014

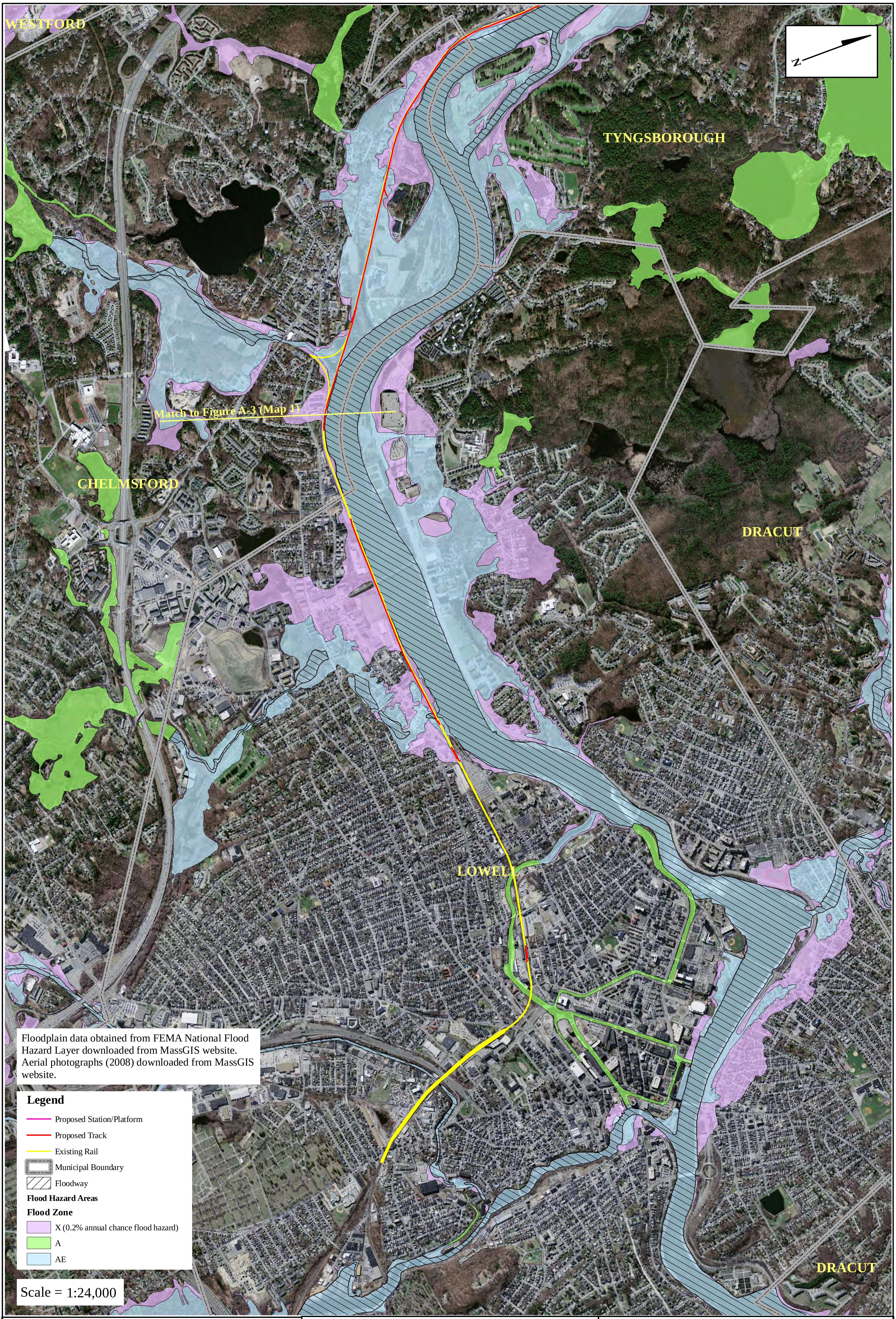


New Hampshire Capitol Corridor
Rail and Transit Study

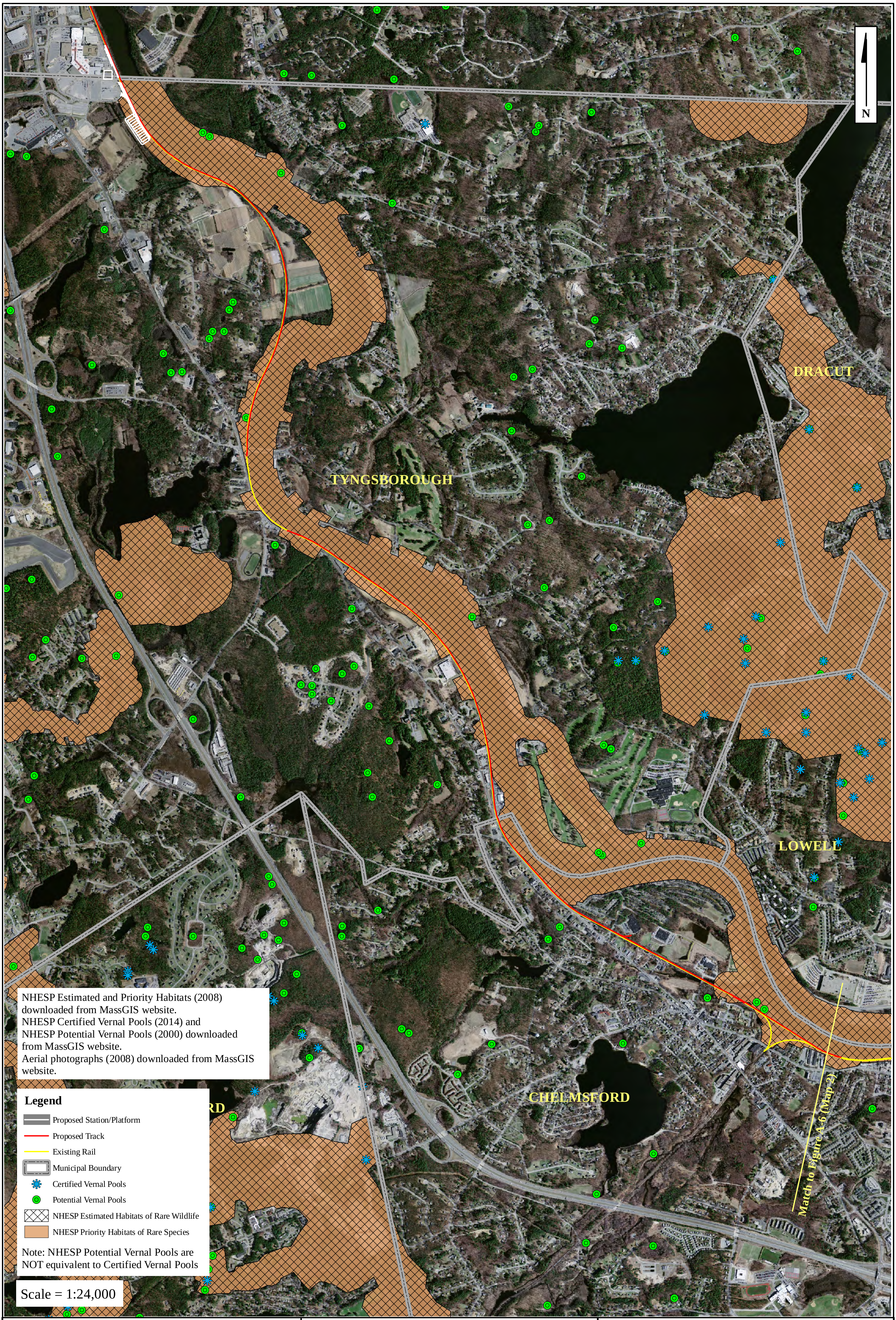
Figure A-3
Floodplains - Massachusetts
Map 1 of 2

The Smart Associates
Environmental Consultants, Inc.

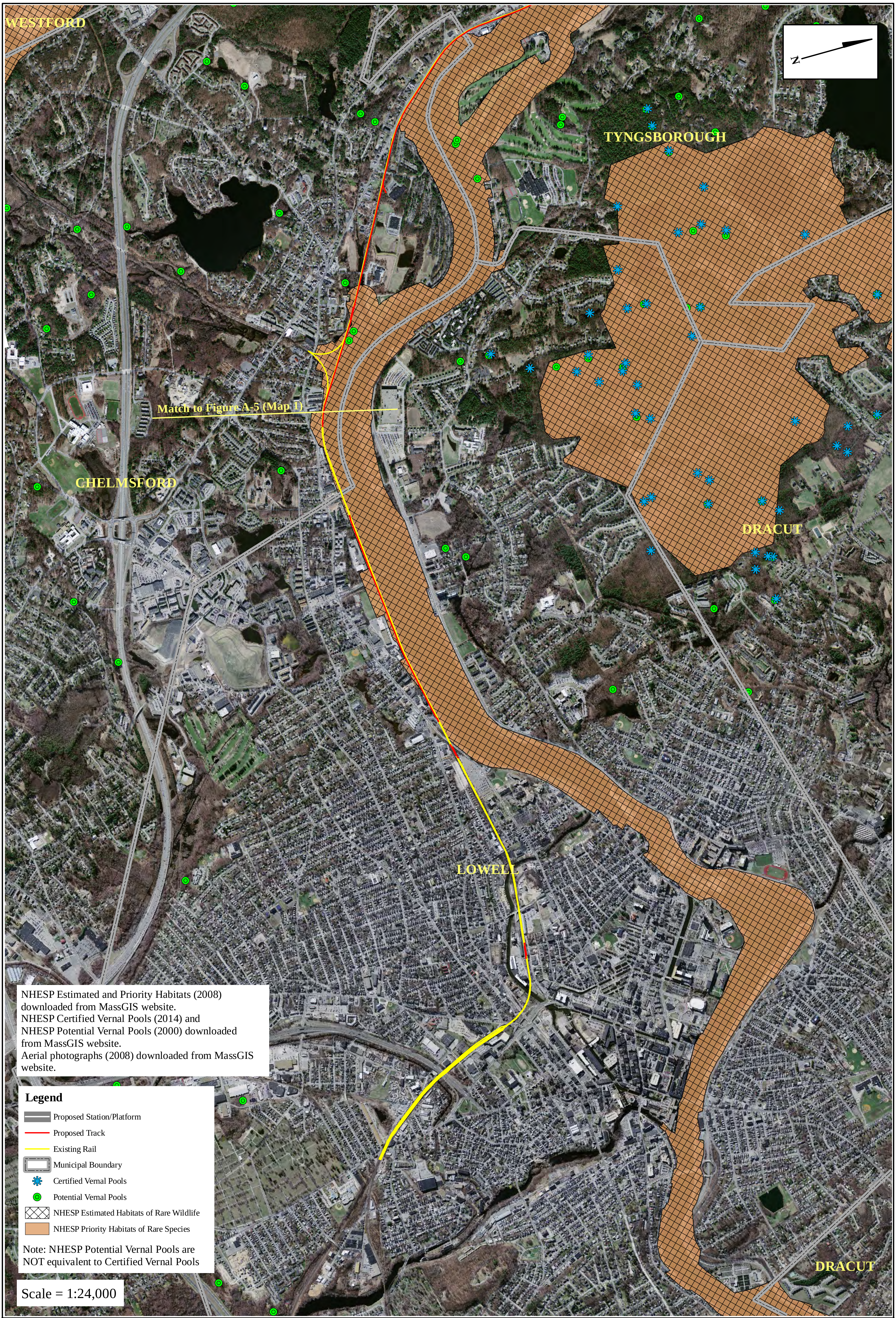
Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure A-4 Floodplains - Massachusetts Map 2 of 2	The Smart Associates *Environmental Consultants, Inc.* Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure A-5 NHESP Rare Species and Wildlife Map 1 of 2	The Smart Associates Environmental Consultants, Inc. Date: September 2014



New Hampshire Capitol Corridor Rail and Transit Study	Figure A-6 NHESP Rare Species and Wildlife Map 2 of 2	The Smart Associates Environmental Consultants, Inc. Date: September 2014

APPENDIX B

Photographs

Representative Photographs
Taken in November-December 2013 and January-March 2014

View toward the existing rail line near the Garvins Falls Dam in Bow

View south of the existing rail line and the Merrimack River near Hall Street in Concord

View north of the existing rail line and the Merrimack River near Depot Road in Hooksett

Representative Photographs
Taken in November-December 2013 and January-March 2014

View toward the existing bridge crossing of the Merrimack River in Manchester/Bedford

View of the Souhegan River crossing in Merrimack

View north along existing rail line at Stickney Avenue Station/Layover Site in Concord

Representative Photographs
Taken in November-December 2013 and January-March 2014

View north along existing rail line at Bridge Street Station Site in Manchester

View south along existing rail line at Granite Street Station Site in Manchester

View south along existing rail line at Riverwalk Way Layover Site in Manchester

Representative Photographs
Taken in November-December 2013 and January-March 2014

View of forested wetlands and stream at Riverdale Avenue Layover Site in Manchester

View north along existing rail line at Brown Avenue Layover Site in Manchester

View toward driveway and wetlands at Raymond Wieczorek Drive (MHT) Station Site in Bedford

Representative Photographs
Taken in November-December 2013 and January-March 2014

View toward wetlands and propane storage area at Raymond Wieczorek Drive (MHT) Station Site in Bedford

View of Sebbins Brook crossing under existing rail line at Raymond Wieczorek Drive (MHT) Station Site in Bedford

View toward existing rail line and small field at Crown Street Station Site in Nashua

View of northern portion (within fenced area) of Spit Brook Road Station/Layover Site in Nashua

View of emergent wetland in southern portion of Spit Brook Road Station/Layover Site in Nashua

View of upland field in southern portion of Spit Brook Road Station/Layover Site in Nashua

View along existing rail line at Pheasant Lane Mall Station Site in Nashua

View south toward existing rail line and wetland located south of Pheasant Lane Mall parking lot in Tyngsborough, MA

APPENDIX C

NH Natural Heritage Report

(*Internal Use Only – Not for Public Distribution*)

APPENDIX D

Agency Correspondence and Meeting Minutes

Jennifer Riordan

From: "Coppola, Melissa" <Melissa.Coppola@dred.nh.gov>
Date: Wednesday, February 26, 2014 10:17 AM
To: "'Jennifer Riordan'" <jriordan@smartenvironmental.com>
Subject: RE: NHB review: NHB14-0614

Hi Jenn,
We would recommend updated surveys for all the species and communities that you highlighted in the table. Plus, I would add the clasping milkweed, and pitch pine-scrub oak woodland (both in Hooksett, not highlighted on your list) to the list of elements to survey. Surveys would have to occur during the growing season (May-August).

Updated survey information will help us to better understand the existing population and the potential for impacts. Once this data is collected we would need to meet discuss the details of the project in the sensitive areas and figure out how best to avoid and minimize impacts to rare plants and exemplary natural communities.

Best,
Melissa

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Melissa Coppola
Environmental Information Specialist
Division of Forest & Lands- Natural Heritage Bureau
PO Box 1856
Concord, NH 03302-1856
603-271-2215 ext. 323
NHB web page

From: Jennifer Riordan [mailto:jriordan@smartenvironmental.com]
Sent: Friday, February 21, 2014 2:18 PM
To: Coppola, Melissa
Subject: Fw: NHB review: NHB14-0614

Hi Melissa,

Thanks for sending the review memo. This email is to follow-up regarding the plants and natural communities located within the project corridor. The project is the NH Capitol Corridor Rail and Transit Study, which is a planning study of potential rail and bus transit improvements between Boston, MA and Concord, NH. The rail improvements would follow an existing rail corridor. Throughout most of the corridor, the existing rail embankment is wide enough to allow for the addition of a rail line, so impacts should be limited to the existing embankment. Stations and layover facilities would be located at several sites in Nashua, Manchester, Bedford, and Concord. The construction of the station and layover facilities would involve impacts beyond the existing rail embankment.

I reviewed your memo and made some notes on the locations of the species records relative to the rail corridor (see attached table). The species and communities highlighted in green appeared to be the ones with the greatest potential for impacts. The other species/communities are historical records or are located further from the rail corridor (on the opposite side of the Merrimack River, for example).

At this point, we are preparing a technical report that will summarize the natural resources present. A
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NEPA document will also eventually be prepared. Any information on potential impacts, required field surveys, etc. would be helpful to include in the technical report.

Please let me know if you need any further information on the project or would like to discuss on the phone or in person.

Thanks,

Jenn

Jennifer Riordan, CWS, CPESC
The Smart Associates
Environmental Consultants, Inc.
72 N. Main Street
Concord, NH 03301-4983
(603) 224-7550 Phone
(603) 224-7890 Fax

From: Coppola, Melissa
Sent: Wednesday, February 12, 2014 3:03 PM
To: mailto:jriordan@smartenvironmental.com
Subject: NHB review: NHB14-0614

Attached, please find the review we have completed. If your review memo includes potential impacts to plants or natural communities please contact me for further information. If your project had potential impacts to wildlife, please contact NH Fish and Game at the phone number listed on the review.

Best,
Melissa

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Melissa Coppola
NH Natural Heritage Bureau
Environmental Information Specialist
Division of Forest & Lands- Natural Heritage Bureau
PO Box 1856
Concord, NH 03302-1856
603-271-2215 ext. 323
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New Hampshire Capitol Corridor Rail and Transit Study

Meeting with NH Fish and Game Department and NH Natural Heritage Bureau

3/7/14, 9:30 AM – 11:00 AM
Location: NH Fish and Game Headquarters, Concord

Attendees:

Kim Tuttle, NH Fish and Game Department (NH F&G)
Mike Marchand, NH F&G
Heidi Holman, NH F&G
Melissa Coppola, NH Natural Heritage Bureau (NHB)
Carl Chamberlin, URS Corporation (URS)
Jennifer Riordan, The Smart Associates

Minutes:

- Project Overview
  - Carl Chamberlin (URS) provided an overview of the project, which involves the analysis of various transit investments between Boston, MA and Concord, NH. The investments could include expanded bus service and/or new commuter rail service. Three alternatives for rail service are being considered:
    - Commuter Rail to Nashua only
    - Commuter Rail to Manchester, Manchester Airport, and Nashua
    - Intercity rail to Concord, Manchester, Manchester Airport, and Nashua
  - Although expanded bus service is also being considered under this project, most of the impacts to natural resources would result from the rail improvements, particularly the construction of new station and layover facilities.
  - URS was hired by the Federal Transit Administration (FTA) and the Federal Railroad Administration (FRA) to evaluate a full range of alternatives. URS' study will be completed in 2014.
  - 2020 is the earliest that the rail service would begin.
  - Additional information on the project is available at: http://www.nhcapitolcorridor.com/
  - Questions asked:
    - Mike Marchand (NH F&G) asked if there is existing rail along the entire corridor. C. Chamberlin replied that there is single-track rail to Concord. Some portions of the rail corridor will be upgraded to two tracks.
    - Melissa Coppola (NHB) asked if there is a standard width that the rail embankment will need to be widened. C. Chamberlin replied that there is no standard width. Some of the existing bridges may need minor rehab to accommodate a second track. Bridge replacement is not currently proposed.
    - M. Marchand mentioned that the I-93 Expansion Project widened I-93 away from the median to leave space for a potential rail corridor within the median. This resulted in some extensive wetland impacts. M. Marchand asked if a rail corridor in the I-93 median is being considered as an alternative. C. Chamberlin replied that although there is an existing rail ROW along I-93, the rail is no longer there and would require more significant investment than the rail corridor being proposed for this project. As a result, the I-93 rail corridor is not

included as alternative due to cost issues. M. Marchand recommended documenting these cost considerations in the NEPA Environmental Assessment
    - M. Marchand asked if the project has been presented at a DOT Natural Resource Agency Coordination Meeting. C. Chamberlin said that they are planning to attend the April meeting.
    - M. Marchand asked how fast the trains will go. The maximum speed would be 70 miles per hour, with slower speeds through cities. The freight trains that currently use the rail corridor go approximately 10 to 30 (40 max) miles per hour.
- <u>Proposed Station & Layover Facilities</u>
  - The proposed stations would be one of two types:
    - "Park and ride" style would consist of a platform and parking area.
    - "Transit-oriented development" (TOD) style would consist of a platform only.
  - Concord Station – Stickney Ave.
    - "Park and ride" style station
    - Would also function as a layover facility
    - New England cottontail could be a concern along the rail corridor in Concord.
  - Manchester – Bridge St.
    - TOD style station
    - Brady-Sullivan building is located a few blocks to the south.
  - Manchester – Granite St.
    - TOD style station
  - Manchester – Riverwalk Way (near Fisher Cats baseball stadium)
    - Layover facility
  - Manchester – near cemetery
    - Layover facility
    - Located near Carthagina Island, on east bank of Merrimack River
    - Potential exemplary natural community and threatened/endangered species issues
  - Manchester – near Wastewater Treatment Facility and I-293
    - Layover facility
  - Manchester Airport
    - "Park and ride" style station
    - Would be located on west bank of Merrimack River, near Ray Wieczorek Drive.
    - A bald eagle mitigation site (preserved as part of the Manchester Airport Access Road project) is located north of the site, along the Merrimack River.
  - Downtown Nashua – Crown St.
    - TOD style station
  - Nashua – Spit Brook Rd.
    - Located at former Hampshire Chemical Site
    - The less contaminated portion of the site would be used as a station (park and ride style), the other half would be used as a layover facility.
    - Most of the site is an open field and could provide grasshopper sparrow habitat.
  - Nashua – Pheasant Lane Mall
    - "Park and ride" style station.
    - Additional parking at the mall would need to be provided.
- Recommendations from NH F&G and NHB:

- Existing perennial stream culverts should be updated to comply with the NH Department of Environmental Services stream crossing rules to allow for fish & wildlife passage.
- More details on the existing rail line, proposed improvements, and vegetation clearing will be needed from NH F&G and NHB to provide comments. The following species may be of particular concern:
    - Bald eagle – Nesting and roosting sites are located along Merrimack River. NH F&G mentioned that there could be mortality issues with bald eagles and faster train speeds. Other impacts could result from vegetation clearing along the Merrimack River.
    - Peregrine falcon – Chris Martin at NH Audubon should be contacted to obtain more information on primary foraging areas used by the falcons that nest in the Brady-Sullivan building in downtown Manchester.
    - Eastern hognose snake – Expansion of the rail corridor in Bow could have impacts. Field surveys would likely be required.
    - New England cottontail – Field surveys in key locations along the rail corridor would likely be needed.
    - Grasshopper sparrow – A spring field survey at the former Hampshire Chemical site in Nashua is recommended.
    - Several rare plant species and exemplary natural communities are located along the rail corridor. Field surveys to determine the extent of these species/communities are recommended by NHB.

Capitol Corridor Rail and Transit Study

Meeting with Massachusetts Natural Heritage and Endangered Species Program
August 13, 2014, 3:00 pm – 4:00 pm

Attendees:
David Paulson, Massachusetts Natural Heritage and Endangered Species Program
Carl Chamberlin, URS
Jenn Riordan, The Smart Associates

Notes:

- Carl Chamberlin provided an overview of the project, which involves the analysis of various transit investments between Boston, MA and Concord, NH. The investments could include expanded bus service and/or new commuter rail service.
- Although expanded bus service is also being considered under this project, most of the impacts to natural resources would result from the rail improvements, particularly the construction of new station and layover facilities.
- David Paulson said that the project had been previously reviewed by the Massachusetts Natural Heritage and Endangered Species Program (NHESP). The file tracking number is 01-8857.
- David said that there are three species of concern within the project corridor in Massachusetts and all occur along the Merrimack River. These species are:
    - Bald eagle.
    - Riverine clubtail (dragonfly)
    - Cobra clubtail (dragonfly)
- Bald eagles forage along the Merrimack River in the project corridor. If possible, large trees in the project corridor should be retained.
- For both the riverine clubtail and the cobra clubtail, conversion of vegetation/loss of vegetation structure and water quality impacts would be the main concerns.
- Carl explained that the existing rail lines will be replaced in Lowell. A second track will be added for a portion of Lowell and Chelmsford. The existing rail line originally had double-track to Concord. One track now remains and the second track was left as an access road. In general, vegetation removal along the tracks will be limited since the corridor is already maintained.
- Some bridges will need to be replaced. David stated that if bank stabilization is proposed, NHESP would need to know how much is proposed and may require softer stabilization techniques or specific vegetation.
- Proposed stations in Massachusetts:
    - A station may be located in Chelmsford.
    - A station is proposed at the Pheasant Lane Mall on the MA/NH border. Two options are being evaluated:
        - Option 1 – includes structured parking in the existing mall parking lot.
        - Option 2 – includes parking south of the mall.
        - Option 1 would result in less impervious surface since it is within an existing paved area. This option would be preferred by NHESP.

- David suggested providing a draft version of the MESA application to NHESP prior to filing.
- Carl explained that a Tier 1 Environmental Assessment (EA) is currently being prepared for the project. It is anticipated that this EA will be available to the public in November. NHESP could review and provide comments on the project at that time.
- David suggested looking at the online factsheets if more information on the three listed species is needed for the EA.

APPENDIX E

New Hampshire Capitol Corridor Rail and Transit Alternatives Analysis – Sustainable Land Use Report

New Hampshire DOT
Department of Transportation

Appendix E
Sustainable Land Use Technical Report

Table of Contents

List of Tables

1 Introduction

1.1 Purpose of Report

This Sustainable Land Use Technical Report was prepared in support of Task 7 of the New Hampshire Capitol Corridor Rail & Transit Alternative Analysis (AA) Study. The objective of this report is to evaluate the sustainability of the potential land use impacts of the project in the Study corridor.

1.2 Methodology

The approach for preparing this report included the following tasks:

- Defining the scope of analysis
- Reviewing station locations for the seven intermediate alternatives
- Reviewing station area land use and economic development characteristics
- Evaluating final alternatives against the defined goals

2 Sustainable Land Use Goals

As stated in the Purpose and Need document (Appendix 2 to the Capitol Corridor AA Final Report), a sustainable transportation system is one that meets and balances the existing environmental, social, and economic needs of a community without compromising resources for future generations. Each transit investment alternative was evaluated for its ability to meet land use goals in these three categories.

- Environmental Goals:
    - Catalyze more compact, infill transit-supportive land use and development patterns, thereby reducing the need for additional infrastructure (sewer, water, power) to support new development, and supporting maintenance of existing open/rural space
    - Reduce reliance on cars for trips/errands
- Social Goals:
    - Expand mobility and transportation choice for all ages
    - Support low-income households through increased access to jobs
- Economic Goals:
    - Attract employers to New Hampshire
    - Attract and retain regional employers to New Hampshire and Boston
    - Provide improved residency location choice in New Hampshire for commuters to Boston or regional jobs

2.1 Environmental Goals

The following situations describe the degree to which the transit investment may meet the defined environmental goals.

Sub goal 1: Catalyze more compact, infill transit-supportive land use and development patterns, thereby reducing the need for additional infrastructure (sewer, water, power) to support new development, and supporting maintenance of existing open/rural space.

Transit investments have shown ability to catalyze or influence a Transit-Supportive Development (TSD) or Transit-Oriented Development (TOD) around station areas. Four pre-conditions are necessary for this to occur:

- Favorable real estate market conditions
- Available land for development
- Transit-supportive land use policies and plans (comprehensive plans, neighborhood plans, zoning ordinances, parking policy, etc.)
- Urban design that supports efficient and pleasant station access

These four conditions are generally mode/service-neutral. Variations in the ability to support this sub goal come from the differing degrees to which various modes and service schedules influence TSD/TOD. Fixed guideway modes (heavy rail, light rail, commuter rail, and streetcar) historically have tended to have more significant impact on development than flexible modes (express bus, standard bus, vanpool, bikeshare, etc.). Service that is more frequent and faster also tends to have a more significant impact than service that is infrequent (e.g., peak hour only, or long head-ways) or offers slower trips (e.g., all-stops vs. express or skip-stop).

By concentrating more development in existing areas (infill) around stations, not in outlying greenfield areas, transit service can reduce the need for additional infrastructure investments at the urban edge.

Likewise, as increased choice in places to live, work, and visit become available through the development of TSD/TOD, demand for development at the urban fringe that can consume agricultural land and place pressure on previously undeveloped open spaces may be reduced. The conveniences of locating closer to transit stations may come to outweigh the benefits of edge/semi-rural living for some households or businesses, increasing demand for space in existing urban areas or new infill development.

Therefore, the following can be concluded:

- Rail alternatives will meet this goal better than bus alternatives
- Alternatives with more runs/trips will meet this goal better than alternatives with fewer trips

Sub goal 2: Reduce reliance on cars for trips/errands.

Increased transit service indicates increased choice in how people travel for work, shopping, entertainment/recreation, and other purposes. Some households may choose to use transit for their trips instead of cars, which may reduce Vehicle Miles Travelled (VMT) by single-occupancy vehicles. Overall reductions in VMT reduce roadway congestion and emissions produced by passenger automobiles. The degree to which overall mode share shifts between single-occupancy passenger automobile based trips and transit, and changes in the absolute numbers of vehicle-based trips is complex and depends upon a number of circumstances:

- Travel patterns for various types of trips: local vs. regional, single-destination vs. chained trips, work vs. non-work
- Service frequency
- Station location and proximity to desired destinations
- Population and employment growth in station areas and across the service area
- Other exogenous factors, such as fuel costs

Mode-shift and VMT changes and related emissions reductions were not modeled for this Study. However, the following can be concluded:

- Alternatives that offer additional runs or trips will support this goal, with alternatives offering more frequent service coverage meeting the goal comparatively better
- Alternatives that introduce new station locations or transit access points will also meet this goal comparatively better than alternatives that use the same alignment and station locations as existing conditions

2.2 Social Goals

The following situations describe the degree to which the transit investment may meet the defined social goals.

Sub goal 1: Expand mobility and transportation choice for all ages.

Compared to the existing transit service, alternatives that introduce more opportunities for people to move efficiently from place-to-place increase mobility. This can result from increased options for routes, increased windows for travel time, and new modes or means for travel (transportation choice). Therefore, the following can be concluded:

- Alternatives that offer additional runs or trips will support this goal, with alternatives offering more frequent service coverage meeting the goal comparatively better
- Alternatives that introduce new station locations or transit access points (as destinations and as intermediate stops) will also meet this goal comparatively better than alternatives that use the same alignment and station locations as the baseline

Sub goal 2: Support low-income households through increased access to jobs.

Alternatives that introduce new connections – origins and/or destinations – or make it easier to get from place-to-place increase access. Connections to employment centers will result in increased access to jobs. Therefore, the following can be concluded:

- Alternatives that introduce new station locations or transit access points (as destinations and as intermediate stops) will meet the "increased access to jobs" component of this goal comparatively better than alternatives that use the existing alignments/routes and station locations as the baseline (assuming that one or more of the station locations [new or existing] feature employment uses within walking or connecting distance of the station)
- New station/stop locations that are located within areas that have a presence of low-income households, or that have connections (via feeder bus, pedestrian or non-motorized paths, or roadways) to areas with a presence of low-income households will meet the "supports low-income households" component of this goal comparatively better than alternatives that feature station locations in areas where household incomes meet or exceed area median incomes

2.3 Economic Goals

The following situations describe the degree to which the transit investment may meet the defined economic goals. As discussed in the *Social Goals* section above, alternatives that create more opportunities for people to move efficiently from place-to-place and open up more connections to transportation serve to increase access and mobility. Access and mobility also affect the economies of the places served by transportation, at local and regional levels.

Sub goal 1: Attract employers locally to New Hampshire, and attract and retain regional employers from New Hampshire to Boston.

Employers in most industry sectors consider a variety of labor force characteristics when choosing locations for their business concerns. These may include typical levels of educational attainment and availability of specialized skills required by their business processes, but also consider to some degree how easy it will be for employees to get to work or to conduct any intra-workday travel that may be required. Good access and high degrees of resident mobility correspond to workforce stability, on-time performance, and lower levels of turnover related directly to employees' ability to get to work consistently and on time.

From the perspective of current or prospective employees, the transportation infrastructure that provides access to a job site also affects the decision to take a job with that company, whether the employer contributes financially to its construction and operation or not. Other factors being equal, employees may choose a job that is easier to get to, or for which they have multiple choices in how to get to, over another similar job that is less accessible. In this way, employers may also present transportation access as a job benefit and way to attract and retain quality employees.

Therefore, the following can be concluded:

- Alternatives that offer increased access and mobility will support this goal, with alternatives offering more frequent service and/or new station locations or transit access points meeting this goal comparatively better than alternatives that use the same alignment and station locations as the baseline
- Alternatives that provide more reliable service (i.e., rail-based or in dedicated right-of-way) will meet this goal comparatively better than alternatives that simply provide more service

Sub goal 2: Provide improved residency location choice in New Hampshire for commuters to Boston or regional jobs.

For many households, the decision on where to live may include preferences for a certain style or price-point of housing stock, neighborhood, or community, and proximity to shopping, healthcare, and open and space/recreation (among other types of destinations). Other factors may include proximity to extended family, or ties to an area where household members grew up or previously lived. For many, access to employment is also important: choice and convenience in ways to get to work, travel time length and consistency, and impacts of the commute on quality-of-life. Transportation investments that increase access across a region and increase the number of potential connections between residential centers and employment centers provide more choice to employees as to where they can live according to their preferences (e.g., a rural New Hampshire hamlet with a short drive to a transit station) and still work in the region (e.g., Boston's financial district).

Multiple choices will help retain skilled employees and productive citizens in the region, because they are not obligated to move away from their preferred residence location to access jobs. Communities may have an additional desire to maintain the balanced age distribution necessary for healthy communities, and retaining workers in all age groups accomplishes that policy goal. (For example, young professional workers from New Hampshire who work in Boston are less likely to move to Massachusetts to work in their industry of choice.)

Therefore, the following can be concluded:

- Alternatives that offer increased access will support this goal, with alternatives offering more new station locations or transit access points meeting this goal comparatively better than alternatives that use the same alignment and station locations as the baseline

3 Review of Station Characteristics

3.1 Summary of Final Alternatives

This section describes the baseline, three bus, two commuter rail, and one intercity rail investment options that advanced through preliminary screening leading towards the selection of recommended strategies (see Tables 3.1 and 3.2). Details concerning each final investment option are listed below with more detail available in the Task 7 Technical Report, Detailed Evaluation of Final Alternatives (Appendix 7 to the AA Final Report).

Table 3.1: Summary of Alternatives

Base	▪ No investment; existing bus and rail services are continued, but not expanded
Expanded Base	▪ New Hampshire's Boston Express (BX) bus service is increased from current 80 buses per day to 120 buses per day ▪ All peak buses run direct and non-stop between each NH park-and-ride lot and Boston South Station with service every 30 minutes ▪ Each park-and-ride lot sees hourly off-peak service making intermediate stops at each NH park-and-ride lot ▪ No changes to existing passenger rail services
Bus on Shoulder	▪ BX bus service of 80 daily trips is permitted to operate within the I-93 shoulder south of I-495 to bypass congestion in general travel lanes ▪ Savings of eight to 12 minutes predicted during the morning peak period ▪ No significant travel time savings predicted during the afternoon peak period
Expanded Bus on Shoulder	▪ 120 daily trips permitted to operate within the I-93 shoulder south of I-495 to bypass congestion in general travel lanes ▪ Savings of eight to 12 minutes predicted during the morning peak period ▪ No significant travel time savings predicted during the afternoon peak period
Manchester Regional Commuter Rail	▪ Extends Massachusetts Bay Transportation Authority (MBTA) commuter rail service north from Lowell, MA to Manchester, NH with intermediate stops at South Nashua, Nashua Crown St., and Bedford/Manchester-Boston Regional Airport (Bedford/MHT) ▪ BX I-93 service to Manchester, North Londonderry, Londonderry, and Salem is retained ▪ BX Route 3 service to Manchester, Nashua, and Tyngsborough is retained
Nashua Minimum Commuter Rail	▪ Extends MBTA commuter service north from Lowell, MA to South Nashua, NH ▪ BX I-93 service to Manchester, North Londonderry, Londonderry, and Salem is retained ▪ BX Route 3 service to Manchester, Nashua, and Tyngsborough is retained
Intercity 8	▪ Four daily intercity passenger rail round trips between Concord, NH and Boston, MA making intermediate stops at Manchester, Bedford/MHT, Nashua Crown St., and Lowell and Woburn, MA ▪ Base BX service is retained

Table 3.2: Stations Served by Alternatives

Location	Rail Station (Proposed)	Bus Station (Existing)	Stations Served by Alternative: Base	Expanded Base	Bus on Shoulder	Expanded Bus on Shoulder	Manchester Regional Commuter Rail	Nashua Minimum Commuter Rail	Intercity 8
Number of Stations (excluding existing MA + Boston terminal)			7 Bus	7 Bus	7 Bus	7 Bus	4 Rail 5 Bus	1 Rail 4 Bus	4 Rail 8 Bus
Concord, NH	X	X	B	B	B	B	B	-	R, B
Manchester, NH: Granite Street	X	X	B	B	B	B	R, B	B	R, B
Bedford/MHT	X		-	-	-	-	R	-	R
N. Londonderry, NH: Exit 5		X	B	B	B	B	B	B	B
Londonderry, NH: Exit 4		X	B	B	B	B	B	B	B
Nashua, NH: Exit 8		X	B	B	B	B	-	-	B
Nashua, NH: Crown Street	X		-	-	-	-	R	-	R
South Nashua, NH: Spit Brook Road or Pheasant Lane Mall	X		-	-	-	-	R	R	B
Tyngsborough, MA: Exit 36		X	B	B	B	B	-	-	B
Salem, NH: Exit 2		X	B	B	B	B	B	B	B

3.2 Summary of Land Use and Economic Development Conditions

A detailed analysis of the land use and economic development characteristics of proposed transit stations is contained in the technical memorandum *Land Use & Economic Development Analysis* dated January 2014 and in the draft supporting working memorandum *Land Use Evaluation of Alternatives for Preliminary Screening* dated September 2013. The findings from those memoranda are not repeated here, but are incorporated by reference.

4 Analysis Presented by Goal

This section of the report contains a qualitative assessment of each alternative's anticipated potential to meet the three sustainable land use goals. This qualitative assessment is based upon an understanding of service levels and route characteristics of the alternatives, as well as the varied land use and socio-economic characteristics of each of the station areas served by the alternative.

A station-level assessment is provided for each station area served by an alternative, with footnotes explaining the rationale for assessment. Assessments were absolute, not relative rankings among alternatives. Ratings are provided on the following scale:

- N/A: For the alternative, there is no service to this station
- No Change: This alternative is not anticipated to have any effect on this aspect of sustainable land use
- Negative: This alternative could potentially reduce sustainability
- Low: This alternative is anticipated to have some positive effect on this aspect of sustainable land use
- Medium: This alternative is anticipated to have a solidly positive effect on this aspect of sustainable land use
- High: This alternative is anticipated to have a very positive effect on this aspect of sustainable land use

These very localized assessments were then rolled-up as a composite assessment for the overall alternative. A summary of the composite goals is presented in Section 5.0.

4.1 Environmental Goals

Environmental Goals:

1. Catalyze more compact, infill transit-supportive land use and development patterns, thereby reducing the need for additional infrastructure (sewer, water, power) to support new development, and supporting maintenance of existing open/rural space
2. Reduce reliance on cars for trips/errands

Assessments for the Environmental Goals are presented in Tables 4.1 and 4.2. Each sub-goal was assessed separately due to different influencing factors.

Table 4.1: Evaluation of Environmental Goals by Alternative and Station

Location	Rail Station (Proposed)	Bus Station (Existing)	Alternative						
			Base	Expanded Base	Bus on Shoulder	Expanded Bus on Shoulder	Manchester Regional Commuter Rail	Nashua Minimum Commuter Rail	Intercity 8
Number of Stations (excluding existing MA + Boston terminal)			7 Bus	7 Bus	7 Bus	7 Bus	4 Rail 5 Bus	1 Rail 4 Bus	4 Rail 8 Bus
Composite/Environmental Goals			**no change**	**low**	**low**	**low**	**medium**	**low**	**low/ medium**
Composite/Environmental Sub-Goal 1: catalyze more compact, infill transit supportive land use and development patterns			**no change**	**low/no change**	**low/no change**	**low/no change**	**low/ medium**	**low**	**low**
Concord, NH	X	X	no change	n/a	n/a	n/a	n/a	n/a	low [3]
Manchester, NH: Granite Street	X	X	no change	low/no change	low/no change [2]	low/no change [2]	medium [4]	low/no change [1,2]	medium [4]
Bedford/MHT	X		n/a	n/a	n/a	n/a	low/no change [6]	n/a	low/no change [6]
N. Londonderry, NH: Exit 5		X	no change	low/no change [1]	low/no change [2]	low/no change [2]	low/no change	low/no change [1,2]	no change [1,2]
Londonderry, NH: Exit 4		X	no change	low/no change [1]	low/no change [2]	low/no change [2]	low/no change	low/no change [1,2]	no change [1,2]
Nashua, NH: Exit 8		X	no change	low/no change [1]	low/no change [2]	low/no change [2]	no change/ negative [5]	no change/ negative [5]	no change [1,2]
Nashua, NH: Crown Street	X		n/a	n/a	n/a	n/a	low/medium [3,4]	n/a	low/mediu m [3,4]
South Nashua, NH: Spit Brook Road or Pheasant Lane Mall	X		n/a	n/a	n/a	n/a	low [3]	low [3]	n/a
Tyngsborough, MA: Exit 36		X	no change	low/no change [1]	low/no change [2]	low/no change [2]	n/a	n/a	n/a
Salem, NH: Exit 2		X	no change	low/no change [1]	low/no change [2]	low/no change [2]	low/no change [1]	low/no change [1]	no change [1,2]

[1] *Traditional bus service was not correlated to changing or encouraging more transit-oriented land use and development patterns, particularly in systems with highway service and park-and-ride commuter stations*
[2] *Bus on shoulder was not correlated to changing or encouraging more transit-oriented land use and development patterns, particularly in systems with highway service and park-and-ride commuter stations*
[3] *Proposed station location, local real estate conditions, accessibility and urban design, and service schedule suggest some positive potential for transit-oriented development*
[4] *Proposed station location, local real estate conditions, accessibility and urban design, and service schedule suggest positive potential for TOD*
[5] *Elimination of bus service may reduce or eliminate the marginal correlations of bus service to TOD patterns*
[6] *Proposed station location, local real estate conditions, accessibility and urban design, function as a park-and-ride, and service schedule suggest little potential for TOD*

Table 4.2: Evaluation of Environmental Goals by Alternative and Station

Location	Rail Station (Proposed)	Bus Station (Existing)	Alternative: Base	Expanded Base	Bus on Shoulder	Expanded Bus on Shoulder	Manchester Regional Commuter Rail	Nashua Minimum Commuter Rail	Intercity 8
Number of Stations (excluding existing MA + Boston terminal)			7 Bus	7 Bus	7 Bus	7 Bus	4 Rail 5 Bus	1 Rail 4 Bus	4 Rail 8 Bus
Composite/Environmental Sub-Goal 2: reduce reliance on cars for trips/errands			**no change**	**medium**	**low**	**medium**	**medium**	**low/ medium**	**medium**
Concord, NH	X	X	no change	n/a	n/a	n/a	n/a	n/a	medium [7]
Manchester, NH: Granite Street	X	X	no change	medium [7]	low [8]	medium [8]	high [7,8]	low/no change [7,8]	medium [7]
Bedford/MHT	X		n/a	n/a	n/a	n/a	low [7]	n/a	medium [7]
N. Londonderry, NH: Exit 5		X	no change	medium [7]	low [8]	medium [8]	low/no change [7]	low/no change [7,8]	no change [7,8]
Londonderry, NH: Exit 4		X	no change	medium [7]	low [8]	medium [8]	low/no change [7]	low/no change [7,8]	no change [7,8]
Nashua, NH: Exit 8		X	no change	medium [7]	low [8]	medium [8]	no change/ negative [9]	no change/ negative [9]	no change [7,8]
Nashua, NH: Crown Street	X		n/a	n/a	n/a	n/a	high [7,8]	n/a	medium [7]
South Nashua, NH: Spit Brook Road or Pheasant Lane Mall	X		n/a	n/a	n/a	n/a	high [7,8]	high [7]	n/a
Tyngsborough, MA: Exit 36		X	no change	medium [7]	low [8]	medium [8]	n/a	n/a	n/a
Salem, NH: Exit 2		X	no change	medium [7]	low [8]	medium [8]	low/no change [7]	low/no change [7]	no change [7,8]

[7] *Increased service may provide more choice for use in some trips, but only between stations, as this is commuter service, not local service*
[8] *Increased travel speed may provide more choice for use in some trips, but only between stations, as this is commuter service, not local service*
[9] *Elimination of bus service may reduce or eliminate choice for some trips*

4.2 Social Goals

Social Goals:

- Expand mobility and transportation choice for all ages
- Support low-income households through increased access to jobs

Assessments for the Social Goals are presented in Tables 4.3. The two sub-goals have been assessed together due to the same influencing factors.

Table 4.3: Evaluation of Social Goals by Alternative and Station

Location	Rail Station (Proposed)	Bus Station (Existing)	Stations Served by Alternative: Base	Expanded Base	Bus on Shoulder	Expanded Bus on Shoulder	Manchester Regional Commuter Rail	Nashua Minimum Commuter Rail	Intercity 8
Number of Stations (excluding existing MA + Boston terminal)			7 Bus	7 Bus	7 Bus	7 Bus	4 Rail 5 Bus	1 Rail 4 Bus	4 Rail 8 Bus
Composite Assessment/Social Goals			**no change**	**low**	**low**	**low**	**low/medium**	**low**	**low/ medium**
Concord, NH	X	X	no change	n/a	n/a	n/a	n/a	n/a	medium [10]
Manchester, NH: Granite Street	X	X	no change	low [10]	low [10]	low [10]	medium [10]	low/no change [10]	medium [10]
Bedford/MHT	X		n/a	n/a	n/a	n/a	medium [10]	n/a	medium [10]
N. Londonderry, NH: Exit 5		X	no change	low [10]	low [10]	low [10]	low/no change [10]	low/no change [10]	low/no change [10]
Londonderry, NH: Exit 4		X	no change	low [10]	low [10]	low [10]	low/no change [10]	low/no change [10]	low/no change [10]
Nashua, NH: Exit 8		X	no change	low [10]	low [10]	low [10]	no change/ negative [11]	no change/ negative [11]	no change [10]
Nashua, NH: Crown Street	X		n/a	n/a	n/a	n/a	medium [10]	n/a	medium [10]
South Nashua, NH: Spit Brook Road or Pheasant Lane Mall	X		n/a	n/a	n/a	n/a	medium [10]	medium [10]	n/a
Tyngsborough, MA: Exit 36		X	no change	low [10]	low [10]	low [10]	n/a	n/a	n/a
Salem, NH: Exit 2		X	no change	low [10]	low [10]	low [10]	low/no change [10]	low/no change [10]	no change [10]

[10] *Increased service or new station will provide more choice for use in some trips, increasing access and mobility*
[11] *Elimination of bus service may reduce or eliminate choice for some trips, reducing access and mobility*

4.3 Economic Goals

Economic Goals:

- Attract employers locally to New Hampshire
- Attract and retains regional employers from New Hampshire to Boston
- Provide improved residency location choice in New Hampshire for commuters to Boston or regional jobs

Assessments for the Economic Goals are presented in Tables 4.4. The three sub-goals have been assessed together due to the same influencing factors.

Table 4.4: Evaluation of Economic Goals by Alternative and Station

Location	Rail Station (Proposed)	Bus Station (Existing)	Stations served by Alternative						
			Base	Expanded Base	Bus on Shoulder	Expanded Bus on Shoulder	Manchester Regional Commuter Rail	Nashua Minimum Commuter Rail	Intercity 8
Number of Stations (excluding existing MA + Boston terminal)			7 Bus	7 Bus	7 Bus	7 Bus	4 Rail 5 Bus	1 Rail 4 Bus	4 Rail 8 Bus
Composite Assessment/Economic Goals			**no change**	**medium**	**low**	**medium**	**medium**	**low**	**medium**
Concord, NH	X	X	no change	n/a	n/a	n/a	n/a	n/a	medium [12, 13]
Manchester, NH: Granite Street	X	X	no change	medium [13]	low [13]	medium [13]	medium [12, 13]	medium [12, 13]	medium [12, 13]
Bedford/MHT	X		n/a	n/a	n/a	n/a	medium [12]	n/a	medium [12]
N. Londonderry, NH: Exit 5		X	no change	medium [13]	low [13]	medium [13]	low/no change [13]	low/no change [13]	low/no change [13]
Londonderry, NH: Exit 4		X	no change	medium [133]	low [13]	medium [13]	low/no change [13]	low/no change [13]	low/no change [13]
Nashua, NH: Exit 8		X	no change	medium [13]	low [13]	medium [13]	no change/ negative [13,14]	no change/ negative [13,14]	low/no change [13]
Nashua, NH: Crown Street	X		n/a	n/a	n/a	n/a	medium [12]	n/a	medium [12]
South Nashua, NH: Spit Brook Road or Pheasant Lane Mall	X		n/a	n/a	n/a	n/a	medium [12]	medium [12]	n/a
Tyngsborough, MA: Exit 36		X	no change	medium [13]	low [13]	medium [13]	n/a	n/a	n/a
Salem, NH: Exit 2		X	no change	medium [13]	low [13]	medium [13]	low/no change [13]	low/no change [13]	low/no change [13]

[12] New stations provide more options for local residents to commute within alignment or to Massachusetts/Boston destinations, expanding worker market
[13] Increased service or more reliable service can be perceived as employment market asset
[14] Elimination of some bus service may reduce or eliminate access for some workers to commuting options

5 Summary of Analysis

5.1 Summary Assessment of Goals by Alternative

Table 5.1 presents the composite assessments for each of the three categories of sustainable land use goals by alternative. The summary assessment is a roll-up of the composite assessments.

Table 5.1: Summary of Goals by Alternative

	Alternative						
	Base	**Expanded Base**	**Bus on Shoulder**	**Expanded Bus on Shoulder**	**Manchester Regional Commuter Rail**	**Nashua Regional Commuter Rail**	**Intercity 8**
Environmental Goals	no change	low	low	low	medium	low	low/ medium
Social Goals	no change	low	low	low	low/medium	low	low/ medium
Economic Goals	no change	medium	low	medium	medium	low	medium
Summary Assessment	**no change**	**low**	**low**	**low/ medium**	**medium**	**low**	**medium**

In summary, the three rail alternatives have higher qualitative assessments of contributing to sustainable land use than the bus alternatives or base scenario. As described in Section 2.0, rail investments have typically been perceived by the public (riders and community stakeholders) as more permanent and as providing greater levels-of-service and benefit than bus enhancements.

APPENDIX F

New Hampshire Capitol Corridor Rail and Transit Alternatives Analysis – Corridor, Regional Equality Analysis Report

New Hampshire
Department of Transportation

Appendix F
Corridor, Regional, Equity Analysis Technical Report

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1 Introduction

Equitable access to transit investments – and the mobility benefits that these investments confer on riders – is an important consideration when assessing the alternatives developed through the Capitol Corridor Alternative Analysis (AA). Public transit investment supports broad improvements in mobility, but is a particularly critical tool in increasing the mobility of transit-reliant or -dependent populations, including households below the poverty line, minorities, and households in affordable housing units.

U.S. Census data was used to calculate statistics related to income, race, and housing for households and individuals in Census tracts within a half-mile of the Capitol Corridor alternatives (Pan Am Railways [PAR] right-of-way between the state lines of New Hampshire and Massachusetts and the potential rail station location in Concord, New Hampshire; Boston Express (BX) bus route between the state lines of New Hampshire and Massachusetts and the existing Manchester, New Hampshire BX station; and the Concord Coach bus route between the state lines of New Hampshire and Massachusetts and the existing Concord, New Hampshire Concord Coach station).

This data was also collected for the States of New Hampshire and Massachusetts, and the U.S. comparison between the alternatives within the larger geographic context will support the analysis of which alternatives minimize potential adverse impacts on concentrations of households below the poverty line, minority populations, and households in affordable housing units, while supporting equitable transit access by these populations.

2 Income and Poverty

Income is an important element of the equity analysis because the costs associated with car ownership are relatively fixed, and can consume a comparatively larger percentage of lower-income household budgets. Access to transit allows households to maintain mobility and access while reducing the household expenditures on transportation, which then increases the amount of discretionary budget available to the household.

Table 2.1 shows the median income of households in Census tracts within a half-mile of the Capitol Corridor alternatives, the States of New Hampshire and Massachusetts, and the U.S., as well as the percent of the population within a half-mile of the Capitol Corridor alternatives whose household income falls below the federal poverty line.

Table 2.1: Median Households Income and Percent of Population below the Poverty Line

	Median Household Income				% Below Poverty Line		
	2000	**2000$ Adjusted for 2011**	**2011**	**% Change Adjusted for 2011 $**	**2000**	**2011**	**% Change**
Capitol Corridor	--	--	$64,754	--	--	9.0%	--
New Hampshire	$49,467	$64,617	$64,664	0%	6.5%	8.0%	23%
Massachusetts	$50,502	$65,969	$65,981	0%	9.3%	10.7%	15%
U.S.	$41,994	$54,855	$52,762	-4%	12.4%	14.3%	15%

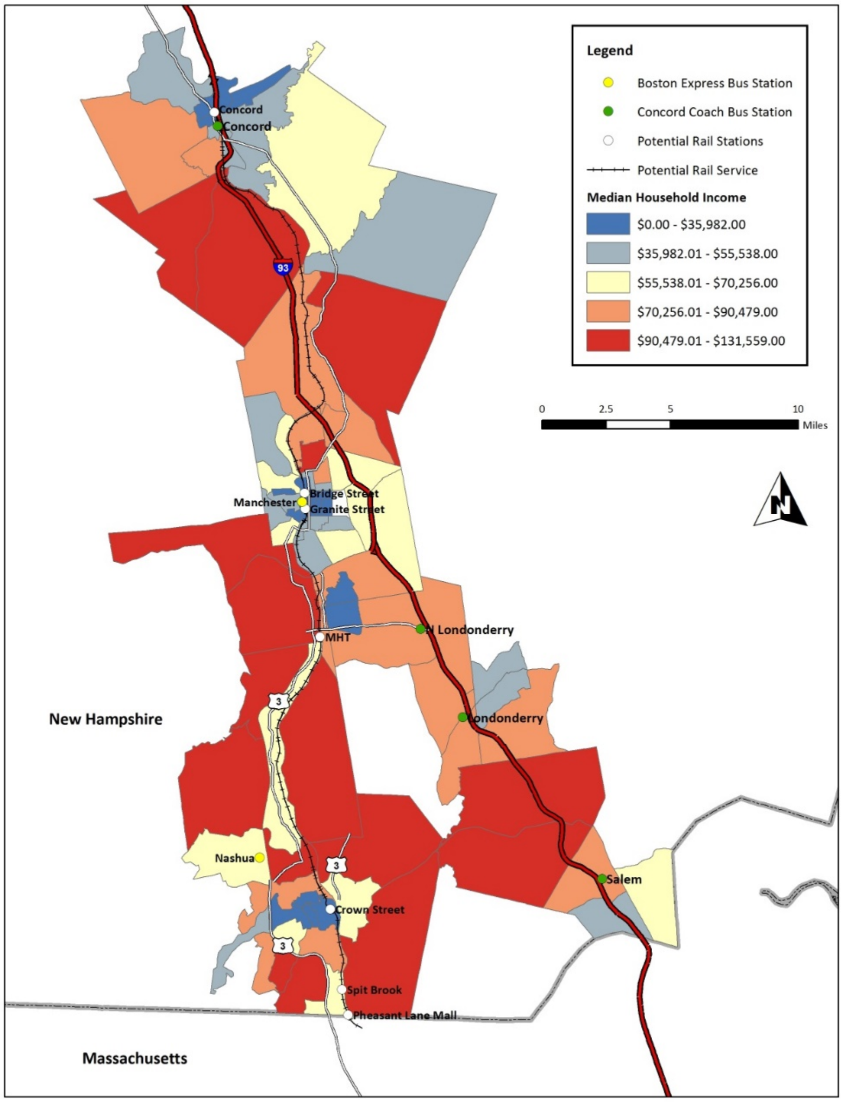
Source: U.S. Census 2000, ACS 2007-2011

The 2011 median household income of the Census tracts within a half-mile of the Capitol Corridor alternatives is approximately the same as the median household income for the State of New Hampshire. The 2011 percentage of the population below the poverty line is also lower in the Capitol Corridor than in Massachusetts or the U.S.

2.1 Median Household Income

While median household income within the Capitol Corridor is comparatively high, median household income declines in the urban areas, closer to where the potential rail stations would be located. Figure 2.1 shows Census tracts within a half-mile of all Capitol Corridor alternatives.

Figure 2.1: Median Income in Capitol Corridor by Census Tract



The median income in the cities of Concord, Manchester, and Nashua are all lower than the areas immediately surrounding each of these cities. Alternatives that have central-city station locations would expand the mobility options of the comparatively lower-income households that are concentrated in the urban areas. Service and operational improvements made to the BX service as part of the bus-based Capitol Corridor alternatives are unlikely to adversely impact comparatively lower-income households within the corridor; however, these alternatives are also unlikely to improve access to transit by this population because they will not result in the construction of new stations (and improved transit access) in areas with comparatively lower-income households.

2.2 Poverty

The percent of Capitol Corridor population living below the poverty line is consistent with or lower than state or national rates (Table 2.2).

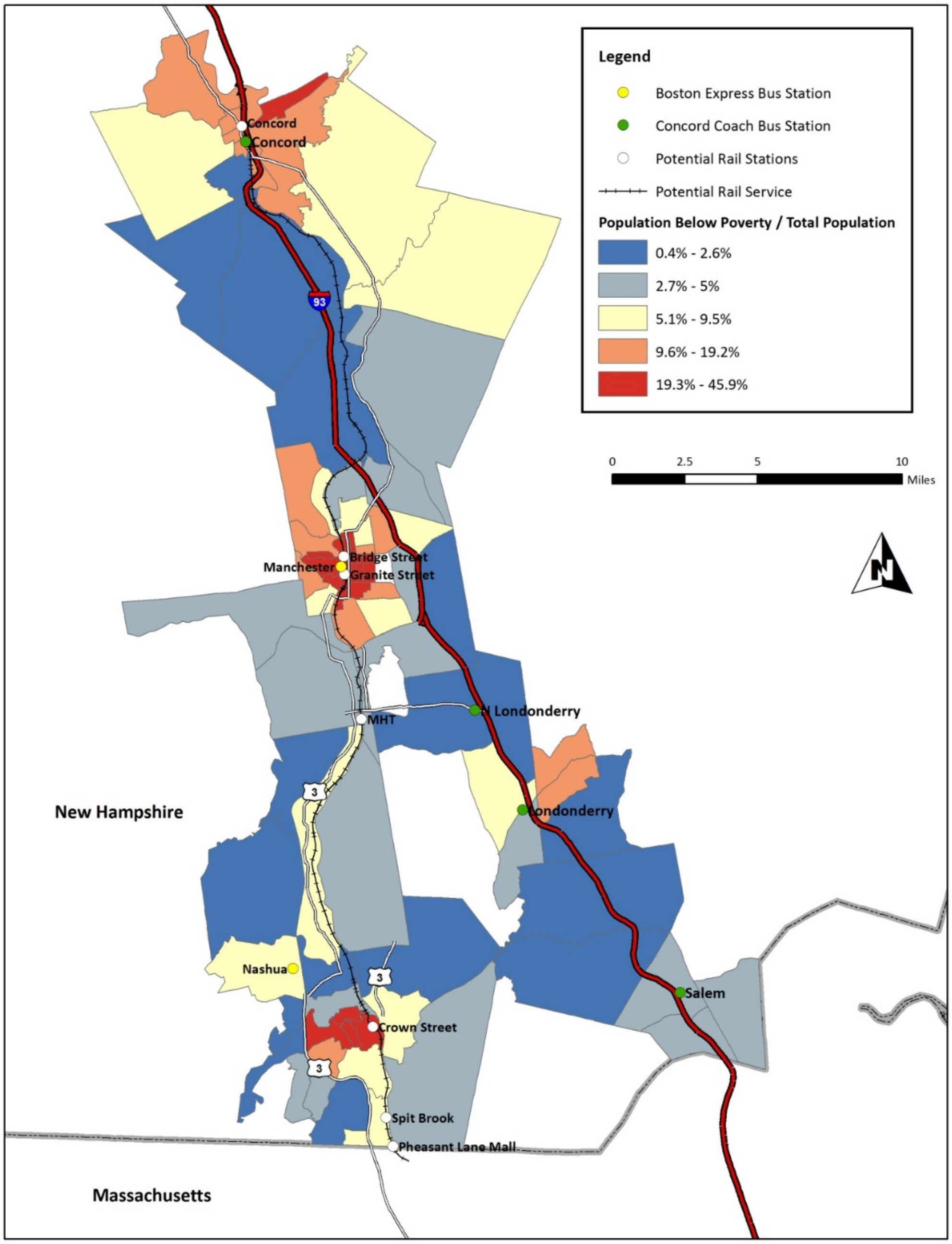
Table 2.2: Percent of Population Living below the Poverty Line

Geography	% Below Poverty Line
Capitol Corridor	9%
New Hampshire	8%
Massachusetts	11%
U.S.	14%

Source: U.S. Census, ACS 2008-2012

However, the poverty levels are comparatively higher in the central areas of Concord, Manchester, and Nashua. As Figure 2.2 shows, the poverty level in those downtowns ranges from 19 to 46 percent. Transit investments that directly serve these urban households living below the poverty line would promote equity through increased access to comparatively lower-cost transportation options. Service and operational improvements made to the BX service as part of the bus-based Capitol Corridor alternatives are unlikely to adversely impact people living below the poverty line within the corridor; however, these alternatives are also unlikely to improve access to transit by this population because they will not result in the construction of new stations (and improved transit access) in areas with comparatively large shares of the population living below the poverty line.

Figure 2.2: Percent of Population Living Below the Poverty Line



3 Minority Population

Approximately 10 percent of the population in Census tracts within a half-mile of the Capitol Corridor alternatives is non-white. Though this is higher than the minority population found within the State of New Hampshire (six percent), it is substantially lower than the percent of minority population found in the State of Massachusetts (19 percent) and the U.S. (26 percent), as shown in Table 3.1.

Table 3.1: Minority Population

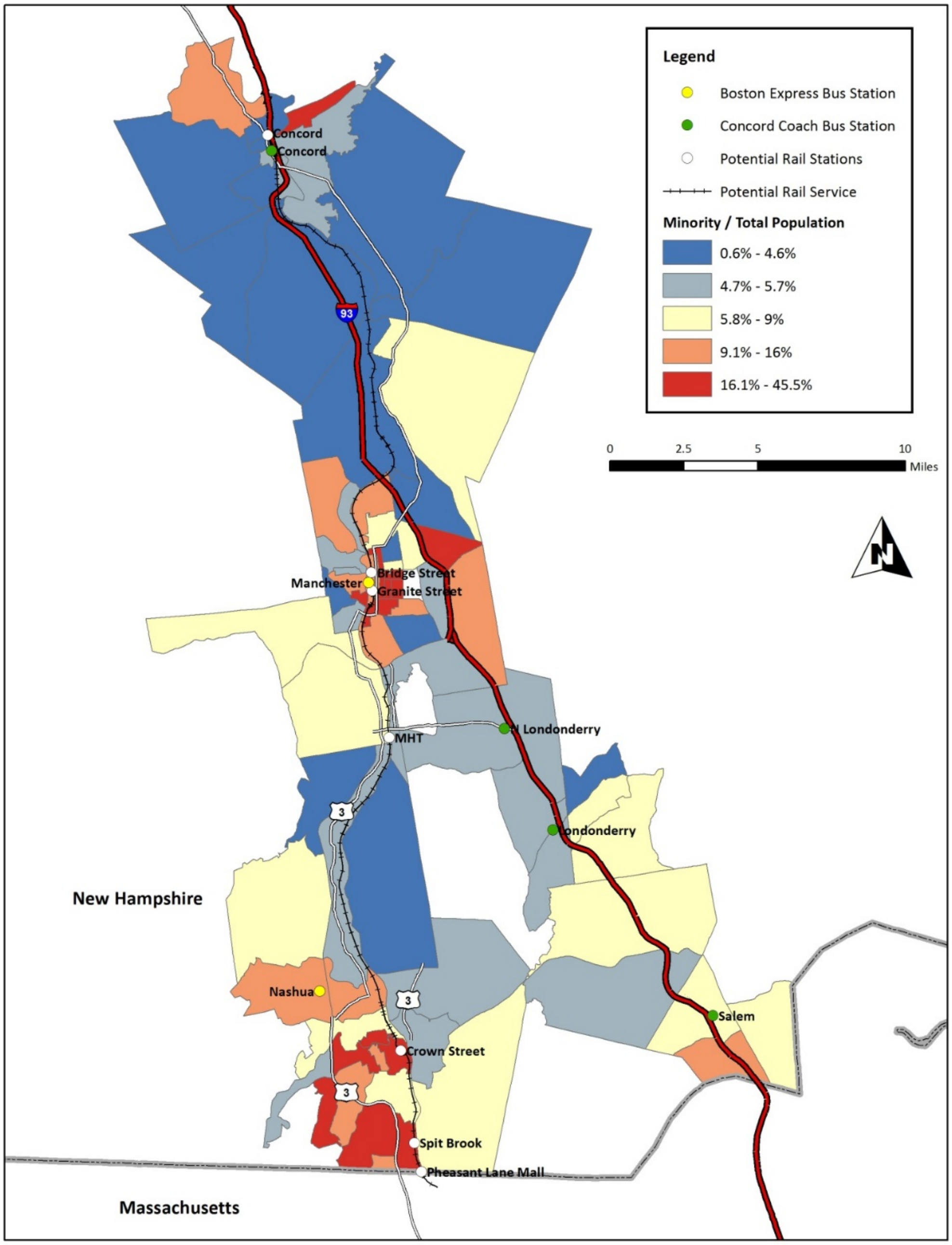
Geography	% Minority
Capitol Corridor	10%
New Hampshire	6%
Massachusetts	19%
U.S.	26%

Source: U.S. Census, ACS 2008-2012.

While the data shows that the share of minority population within the Capitol Corridor is comparatively lower than is found throughout Massachusetts and across the U.S., minority share of the population is comparatively higher in the central areas of Concord, Manchester, and Nashua. The minority population share in some parts of these cities reaches 45 percent. Figure 3.1 illustrates shares of minority population within the Capitol Corridor.

Alternatives that serve the downtown core of Concord, Manchester, and Nashua will serve the greatest shares of minority populations within the Capitol Corridor. Service and operational improvements made to the BX service as part of the bus-based Capitol Corridor alternatives are unlikely to adversely impact minority populations within the corridor; however, these alternatives are also unlikely to improve access to transit by this population because they will not result in the construction of new stations (and improved transit access) in areas with comparatively large shares of minority populations.

Figure 3.1: Minority Share of the Population



4 Affordable Housing

Many cities and states choose to develop voluntary or mandatory affordable housing statutes as a means to maintain an economically-diverse population and support diversity of housing choice.

New Hampshire has a Workforce Housing Law that went into effect on January 1, 2010. This law codifies and clarifies the 1991 New Hampshire Supreme Court decision in *Britton v. Town of Chester*, and requires all municipalities to provide reasonable and realistic opportunities for the development of workforce housing. It does not require that municipalities set aside a set percentage of its housing stock as affordable.

Here are some highlights of New Hampshire's Workforce Housing law:

- In every municipality that exercises the power to adopt land use ordinances and regulations, such ordinances and regulations must provide reasonable and realistic opportunities for the development of workforce housing, including rental multi-family housing. To provide such opportunities, lot size and overall density requirements for workforce housing must be reasonable. A municipality that adopts land use ordinances and regulations must allow workforce housing to be located in a majority, but not necessarily all, of the land area that is zoned to permit residential uses within the municipality.
- "Workforce housing" means housing that is intended for sale and that is affordable to a household with an income of no more than 100 percent of the median income for a four-person household for the metropolitan area or county in which the housing is located.
- "Workforce housing" also means rental housing that is affordable to a household with an income of no more than 60 percent of the median income for a three-person household for the metropolitan area or county in which the housing is located.
- Housing developments that exclude minor children from more than 20 percent of the units or in which more than 50 percent of the dwelling units have fewer than two bedrooms must not constitute workforce housing.

Concord, Manchester, and Nashua each have several affordable housing developments within a half-mile radius of the potential rail station locations. While the income of the households targeted for residence in these affordable housing units may not fall below the federal poverty line (as discussed in Section 2.0), additional comparatively lower-cost alternatives to car ownership (such as access to transit) can help to reduce the share of household income spent on transportation costs. Service and operational improvements made to the BX service as part of the bus-based Capitol Corridor alternatives are unlikely to adversely impact existing or planned affordable housing units; however, these alternatives are also unlikely to improve access to transit by this population because they will not result in the construction of new stations (and improved transit access) in areas with concentrations of affordable housing.

4.1 Concord

There are 11 affordable housing sites within a half-mile of the potential Concord rail station. Within the 11 sites, there are 398 affordable housing units (Figure 4.1 and Table 4.1).

Figure 4.1: Affordable Housing Sites in Concord

Table 4.1: Concord Affordable Housing Developments

Development Name	# of Units	Development Name	# of Units
Bicentennial Square	16	Pitman Place	105
Fellowship House	10	Pleasant Street	9
Firehouse Block	15	Union Street	4
Firehouse Block – Elderly	68	The Endicott Hotel	36
John F Kennedy	86	1820 House	4
		Mennino Place	45
		Total Units	**398**

4.2 Manchester

There are 17 affordable housing sites within a half-mile radius of the proposed Granite Street Manchester rail stations. There are a total of 675 affordable housing units within these 17 sites (Figure 4.2 and Table 4.2).

Figure 4.2: Affordable Housing Sites in Manchester

Table 4.2: Manchester Affordable Housing Developments

Development Name	# of Units	Development Name	# of Units
Amoskeag Millyard	48	Raymond Burns	121
Carpenter center	96	School and Third	16
Frances Warde House	26	Tree Street Renewal	23
Kalivas	100	Renaissance 2	10
Merrimack Place	16	Renaissance 6	14
Millyard Families 2	20	Renaissance 1	8
Millyard Transitional	12	Renaissance 3	14
O Malley	100	Renaissance MM	28
Renaissance 4	23	**Total Units**	**675**

4.3 Nashua

There is one affordable housing site within a half-mile of the potential Crown Street rail station; this site has 28 affordable housing units (Figure 4.3 and Table 4.3).

Figure 4.3: Affordable Housing Site in Nashua

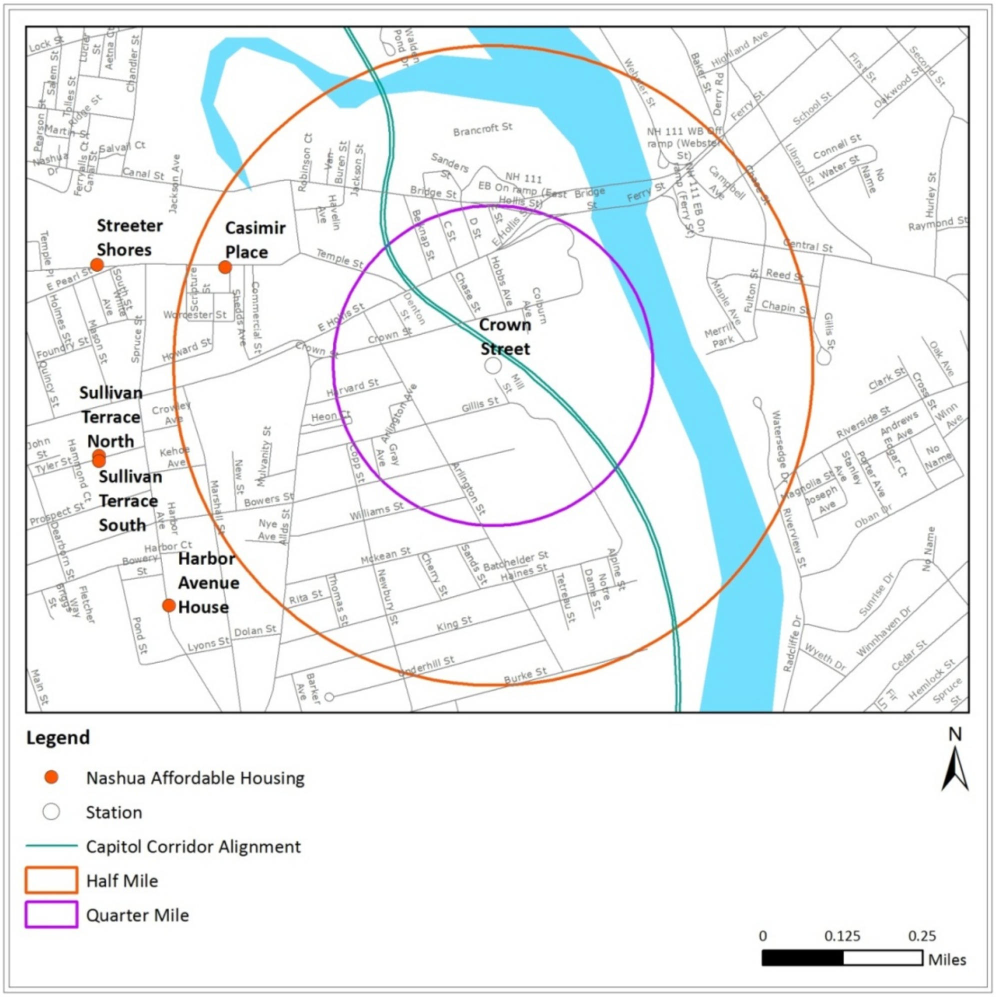


Table 4.3: Nashua Affordable Housing Development

Development Name	# of Units
Casimir Place	28
Total Units	**28**

5 Conclusion

The three populations considered as part of this equity analysis – population below the poverty line, minority populations, and households living in affordable housing units – tend to be concentrated in the central areas of Concord, Manchester, and Nashua. When compared to the base and bus alternatives, the rail alternatives offer comparatively higher levels of service and transit access to these populations with minimal adverse impacts anticipated. The equity of and access to the rail alternatives improves as transit service extends north from Nashua (to Manchester and/or Concord) because those alternatives (Manchester Regional Commuter Rail and Intercity 8), reach more individuals and households living below the poverty line, minority households, and households living in affordable housing units. The base and all bus alternatives would not adversely impact these populations either, but also would not offer expanded access to these populations through new station locations. Table 5.1 provides a summary of the equity metrics for each of the existing bus stations and proposed rail stations.

Table 5.1: Summary of Alternatives

Station Area (Half-Mile Buffer)	Proposed Rail Station	Existing Bus Station	Equity Metrics				Stations Served by Alternative(s)			
			Average Median Income	Population Below Poverty	Minority Population	Affordable Housing Units	Base and all Bus Alternatives	Intercity 8	Manchester Regional Commuter Rail	Nashua Minimum Commuter Rail
Concord, NH	X	X	$39,000	18.0%	9.7%	398	X	X		
Manchester, NH	X	X	$30,300	29.5%	26.1%	675	X	X	X	
Bedford/ Manchester-Boston Regional Airport	X		$65,500	4.5%	5.2%	0		X	X	
N. Londonderry, NH		X	$82,900	1.7%	4.7%	minimal	X			
Londonderry, NH		X	$84,700	3.9%	5.2%	minimal	X			
Nashua, NH		X	$80,500	4.4%	12.9%	minimal	X			
Nashua, NH: Crown Street	X		$52,500	14.9%	12.2%	28		X	X	
South Nashua, NH: Spit Brook Road or Pheasant Lane Mall	X		$76,900	4.8%	11.3%	0			X	X
Salem, NH		X	$75,300	3.7%	5.9%	minimal	X			

Sources: U.S. Census, American Community Survey 2008-2012; various local New Hampshire Housing Authorities

APPENDIX G

New Hampshire Capitol Corridor Rail and Transit Alternatives Analysis – Phase IA Cultural Resources Investigation Surveys – New Hampshire and Massachusetts

New Hampshire DOT Department of Transportation

URS

December 1, 2014

Ms. Brona Simon
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125
617-727-8470
Brona.Simon@sec.state.ma.us

RE: Project Notification Form
New Hampshire Capitol Corridor Rail and Transit Study
Lowell, Tyngsborough, and Chelmsford, Middlesex County, MA

Dear Ms. Simon:

Enclosed, please find a Project Notification Form and support documentation for the proposed New Hampshire Capitol Corridor Rail and Transit Study (the Project). The New Hampshire Department of Transportation (NHDOT) is working with the Massachusetts Department of Transportation (MDOT) to evaluate a diverse set of rail and bus options for improving connectivity and passenger service between the major population centers of New Hampshire and metropolitan Boston. The project is evaluating opportunities to improve inter-city transit service in the 73-mile corridor by leveraging existing transportation infrastructure, including the Pan Am Railway, US Route 3, and I-93. The Project will evaluate approximately 10-miles of existing railroad in Massachusetts that passes through Lowell, Tyngsborough, and Chelmsford in Middlesex County, paralleling the Merrimack River the majority of the route.

It is anticipated that the Project will receive funds from the Federal Transportation Administration (FTA) and the Federal Railroad Administration (FRA). Federal licenses, permits, or approvals may also be required as part of this project. As a federally funded/licensed project, the Project is subject to review under Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR Part 800). To satisfy requirements under Section 106, URS has prepared and attached a Phase IA Cultural Resources Investigation for your review.

If you have questions, please do not hesitate to contact me at 609-386-5444 or via e-mail at joel.dworsky@urs.com .

Yours truly,

Joel G. Dworsky
Senior Archaeologist/Geospatial Analyst

URS Corporation
Enclosure

APPENDIX A
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: New Hampshire Capitol Corridor Rail and Transit Study

Location / Address: (will follow the existing New Hampshire Main Line)

City / Town: Lowell, Tyngsborough, and Chelmsford - Middlesex County

Project Proponent

Name: New Hampshire Department of Transportation

Address: John O. Morton Building, 7 Hazen Drive, P.O. Box 483

City/Town/Zip/Telephone: Concord, New Hampshire 03302-0483 (603) 271-3734

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
Federal Railroad Administration	Grant
Federal Transit administration	Grant

Project Description (narrative):

See Section 1.1 in the Phase IA Cultural Resources Investigation report

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

No demolition is proposed.

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.

No rehabilitation is proposed.

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

Proposed work will only consist of the addition of a second railroad track within the existing right-of-way. The locations are depicted in mapping included in Appendix A of the aforementioned report.

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

See attachment

What is the total acreage of the project area?

Woodland		acres	Productive Resources:		
Wetland		acres	Agriculture		acres
Floodplain		acres	Forestry		acres
Open Space		acres	Mining/Extraction		acres
Developed	~120	acres	Total Project Acreage		acres

What is the acreage of the proposed new construction? ~120 acres

What is the present land use of the project area?

Railroad-related and industrial use.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of the person completing this form

12/1/2014
Date

Name:

Address: 437 High Street

City/Town/Zip: Burlington, NJ 08016-4514 Phone 609-386-5444

For supplemental information required as part of the Project Notification Form (including the Project Boundaries and Description, USGS map, architectural background information, and archaeological background information), please see Appendix A: Phase IA Cultural Resources Investigation

APPENDIX A

PHASE IA CULTURAL RESOURCES INVESTIGATION

November 2014

Prepared for:

The New Hampshire Department of Transportation

Phase IA Cultural Resources Investigation for the New Hampshire Capitol Corridor Rail and Transit Study

Lowell, Tyngsborough, and Chelmsford, Middlesex County, MA

Prepared by:

URS

Burlington, New Jersey

Phase IA Cultural Resources Investigation
for the
New Hampshire Capitol Corridor Rail and Transit Study
Lowell, Tyngsborough, and Chelmsford, Middlesex County, MA

Prepared for:

New Hampshire Department of Transportation

Prepared by:

Joel Dworsky
Vanessa Zeoli
Matthew Harris
Andrew Wyatt
Daniel Cassidey

URS

URS Corporation
437 High Street
Burlington, New Jersey 08016

November 2014

Abstract

URS Corporation (URS) conducted a Phase IA survey of the proposed construction area of potential effects (APE) for the New Hampshire Department of Transportation's Capitol Corridor Rail Transit Study. This report presents the results of a Phase IA reconnaissance of a project area spanning the existing rail corridor from Lowell, Massachusetts, to the Massachusetts-New Hampshire border. This report focuses on the section of the project area located in Massachusetts, contained within Middlesex County. The project APE for this survey effort is comprised of a 9-mile-long corridor of existing railroad bed connecting Lowell, Massachusetts, to Nashua, New Hampshire. The proposed APE was examined to establish the archaeological potential of the study corridor, as well as determine the impact of the proposed construction on extant historic structures. Vanessa Zeoli, architectural historian, examined the APE for evidence of historic structures and determined the potential effect the construction would have upon these resources. Joel Dworsky, archaeologist, conducted a Phase IA archaeological reconnaissance of a 1-kilometer buffer surrounding the APE to establish the archaeological sensitivity of the area. This effort included a review of the known prehistoric and historic sites, as well as a survey of historic maps of the region, a determination of archaeological potential was synthesized.

URS compiled determinations of archaeological sensitivity for the Lowell Study Area, the aforementioned 1-kilometer buffer surrounding the APE. Overall, the prehistoric potential for the study areas remained consistently high, owing in large part to the proximity of the construction APE to the Merrimack River. The historical archaeological sensitivity was also determined to be high, given the density of historic settlement within the study area. The archaeological sensitivity for historic archaeological resources was subdivided into site types. Analysis of these site types revealed that sites of an industrial or transportation-related association were the most likely form of historic archaeological material to be encountered. Both of these site types were frequently situated along the river and its tributaries, from which they derived operational power and transportation. As the extant rail bed follows the course of the Merrimack River, the likelihood of encountering industry/transportation-related resources is therefore high.

The historic architecture survey of the proposed construction APE consisted of an inventory of previously identified historic properties recorded within or adjacent to the proposed APE, as well as a windshield survey of the project APE. Several historic resources were identified during the survey effort.

Despite the high potential of encountering historic structures and archaeological sites in the area near the proposed APE, URS has determined that no further cultural resource survey is necessary in Massachusetts. Given that the project calls for the reestablishment of a secondary set of rails upon an existing rail bed that was historically utilized for the same purpose, as well as the knowledge that limited ground disturbance will occur during this effort, it has been determined that the proposed construction poses no adverse effects to cultural resources. However, the determination that no further archaeological work is required is contingent upon the construction effort causing no subsurface disturbance. Should construction move forward, any action that would disturb subsurface soils would either need to be monitored or archaeologically investigated via Phase IB survey, due to the high archaeological sensitivity of the area.

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1.0 Introduction

The Federal Railroad Administration (FRA), acting as the lead federal agency; the Federal Transit Administration (FTA), as a cooperating agency; and the New Hampshire Department of Transportation (NHDOT), as the project sponsors, are proposing to evaluate the feasibility of developing new rail and transit services in the 73-mile corridor between Boston, Massachusetts, and Concord, New Hampshire (Figure 1). To satisfy requirements under the National Environmental Policy Act (NEPA) of 1969, as amended, NHDOT is preparing an environmental assessment (EA). The New Hampshire Capitol Corridor Rail and Transit Study (the project) is a federal undertaking and, as such, is also subject to review under Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, and the implementing regulations, 36 CFR Part 800. To initiate consultation under Section 106 among the FRA, FTA, NHDOT, and the Massachusetts Historical Commission (MHC), URS has prepared a project notification form (PNF) and a Phase IA cultural resource reconnaissance. This investigation also serves to supplement and inform the EA, being completed as part of the NEPA process. The purpose of this Phase IA investigation is to record the presence or absence of archaeological and historic architectural resources within the area of potential effects (APE). This study is part of the initial stage of the project to evaluated existing conditions of the project area. The PNF and Phase IA investigation were all prepared in accordance with the guidelines set forth by the NHPA and the MHC.

1.1 *Project Description*

As noted above, the New Hampshire Capitol Corridor Rail and Transit Study is defining and evaluating opportunities to address transportation needs and preferences that involve transit and rail options in the 73-mile corridor between Boston, Massachusetts, and Concord, New Hampshire. While Massachusetts Bay Transportation Authority (MBTA) commuter rail service currently operates between Boston and Lowell, there has not been commuter rail passenger service north of Lowell since it was discontinued in 1967. A public-private partnership, supported by the state of New Hampshire, operates roughly 50 daily bus roundtrips within the corridor between New Hampshire and Boston; this service typically carries 1,800 passengers per day.

Increasing transportation demand and growing concerns about mobility, economic development, and quality of life have led the citizens and officials in New Hampshire and Massachusetts to explore options to improve transit service along the northern end of the Capitol Corridor. The New Hampshire Capitol Corridor Study is evaluating a diverse set of rail and bus options for improving connectivity in the Capitol Corridor by leveraging existing transportation infrastructure, including Pan Am Railway, Route 3, and I-93. The study, which will be completed in late 2014, will result in the recommendation of a preferred investment strategy that is responsive to local transportation need and the region's economic, social, financial, and environmental context—and that will be competitive for federal construction funding.

1.2 *Proposed Station and Layover Facilities*

Proposed station and layover facilities are only proposed for construction in New Hampshire; *no stations or layover facilities will be constructed in Massachusetts*. There are 10 potential station and layover alternatives being explored between Concord and Nashua, New Hampshire, during this preliminary phase. Station facilities will generally consist of 800-foot open platforms that will be constructed within the existing railroad right-of-way (ROW); 100-foot access platforms with ramps and stairs; a maintenance building; parking lots to accommodate commuters; street striping for new drop-off/pick-up traffic; grade crossings; and new tracks for platform access and turnouts. Layover facilities will generally consist of

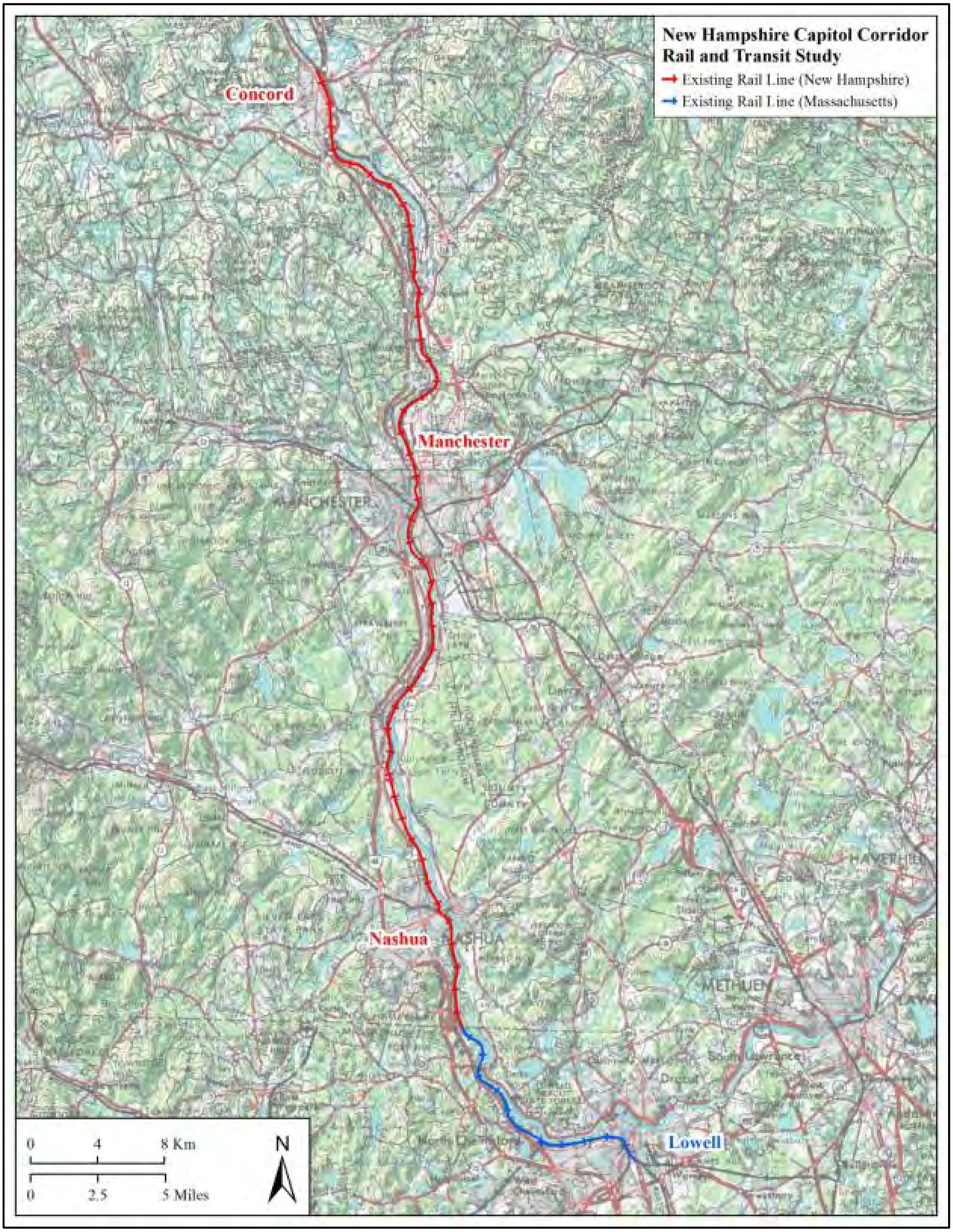

Figure 1- Project location map (Source: United States Geological Survey 2009).

maintenance and substation buildings; additional tracks for the layover area; retaining walls; and access roads. The following is a list of station and layover facility alternatives proposed in New Hampshire.

Station Facilities (seven alternatives proposed for station facilities)

- Stickney Avenue Station in Concord
- Spring Street Station in Manchester
- Granite Street Station in Manchester
- Ray Wieczorek Drive Station in Bedford
- Crown Street Station in Nashua
- Spit Brook Station in Nashua
- Pheasant Lane Mall Station in Nashua

Layover Facilities (five alternatives proposed for layover facilities)

- Stickney Avenue Layover Facility in Concord
- Granite Street Layover Facility in Manchester
- Cemetery Layover Facility in Manchester
- Water Treatment Plant Layover Facility in Manchester
- Spit Brook Layover Facility in Nashua

In addition to the station and layover facilities, a second track will be added to certain portions of the existing ROW along the 73-mile stretch. *The addition of a second track is the only improvement proposed in Massachusetts.* See Appendix B for a map showing the locations of the new track.

1.3 *Scope of Work and Project Personnel*

The Phase IA investigation involved background research, development of archaeological sensitivity models, and a field visit/reconnaissance of the project area. The background research was initiated in order to locate previously identified archaeological or historic architectural resources within or in close proximity to the project area and review the results of previous cultural resources work within the project area and its vicinity. The archaeological sensitivity models were developed to assess the potential (i.e., high, medium, or low) for archaeological resources within the project area. URS initiated the field visit/reconnaissance in order to ground-truth the initial research and identify any unrecorded archaeological or historic architectural resources.

The purpose of this study is not to definitively identify and document every cultural resource in the APE; rather, it only inventories any previously documented historic properties listed in or eligible for listing in the State Register of Historic Places (SRHP) and/or the National Register of Historic Places (NRHP), and indicates the likelihood that previously undocumented cultural resources exist.

Matthew Harris (Senior Archaeologist) and Vanessa Zeoli (Architectural Historian) served as Principal Investigators for this project. Historian and Graduate Archaeologist Joel Dworsky conducted the background research for the study and built the prehistoric/historic archaeological sensitivity model. Mr. Harris, Mr. Dworsky, and Ms. Zeoli were the principal authors of this report, but contributions were made by Senior Archaeologists Daniel Cassidey and Andrew Wyatt. Mr. Dworsky produced the graphics for the report.

2.0 Methodology

The purpose of this study is to gather information about previously documented archaeological and historic architectural resources and to assess the likelihood for the APE to contain cultural resources not previously documented.

2.1 *Background Research*

Background research was conducted online via MHC's Massachusetts Cultural Resource Information System (MACRIS) to determine if there were any cultural resources in the project area listed in or eligible for listing in the NRHP or SRHP. Information was also gathered on resources that were inventoried and documented in MHC's files, but may not have been evaluated for NRHP eligibility. To ensure URS had the most up-to-date information, the online research was followed by a visit to MHC to gather any additional information not contained in MACRIS. Information gathered during the visit to MHC included NRHP nominations, inventory forms, site forms, and any reports for cultural resource investigations that were previously conducted in the project area.

Additional online research was conducted to gather historical maps, atlases, aerial photographs, and city property records—as well as secondary source materials, like local and regional histories—in order to establish prehistoric and historic contexts. The NRHP website was also consulted to ensure the most up-to-date information was collected on resources listed in the NRHP, as well as on those that had been issued a determination of eligibility (DOE) from the Keeper of the National Register. Information gathered during background research was used to guide the development of the APE.

As part of the background research for this project, an archaeological literature review was conducted. During the literature review process, information about known archaeological sites in the region surrounding the project APE was collected at the MHC archives. Archaeological site forms were collected for any sites found to be located within a 1-kilometer radius of the proposed rail modifications. Relevant sites were determined through an examination of the spatial locations of the known sites, as recorded on maps at the aforementioned facility. Additionally, pertinent archaeological survey reports were consulted to provide information about the history of archaeological research conducted in the vicinity, as well as to provide additional information about the extent, integrity, and significance of the known archaeological sites identified during the early phase of the literature review. The archaeological data collected from the MHC was combined with relevant historic maps, documents, environmental surveys, journal articles, and regional histories. This information was synthesized and distilled into a series of determinations about the archaeological potential of the study area surrounding the project APE.

2.2 *Field Visit*

2.2.1 *Archaeology*

No archaeological field reconnaissance was undertaken within the APE in Massachusetts. The entirety of the proposed project APE is confined to the extant railroad bed. The proposed track modification that defines the project APE for the Capitol Corridor Rail Transit Study calls for the reintroduction of a secondary line of track paralleling the extant tract between Nashua, New Hampshire, and Lowell, Massachusetts. This secondary track existed until the 1960s, when commuter rail service was discontinued and the secondary track removed (Wallace 2001). As the entirety of the project APE consists of a thick bed of crushed bluestone gravel, which prevents visual access to the soil, there was no need from a visual inspection to be undertaken.

2.2.2 *Historic Architecture*

After reviewing the background research, a field visit was conducted of the project area March 25-29, 2014. The field visit consisted of a windshield survey to assess the general conditions of historic architectural resources in the APE. Historic architectural resources are defined as aboveground buildings, structures, objects, districts, or landscapes. The purpose of this study is not intended to definitively identify and document every historic aboveground resource in the APE; rather, it only inventories any previously documented historic properties that are listed in or eligible for listing in the SRHP and NRHP and indicates the likelihood that previously undocumented aboveground resources exist. Section 5 presents the results of the historic architectural investigation.

2.3 *Definition of the Area of Potential Effects*

The area of potential effects (APE) encompasses all areas where construction activities could directly or indirectly impact significant historic properties (Figure 2). In general terms, an APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist" (36 CFR §800.16[d], amended 2004).

The APE includes all areas affected during the construction of the project and by the end result of the improvements. Development of the APE took into consideration potential visual effects, auditory effects, direct and indirect effects, beneficial as well as adverse effects, physical effects, and changes in the way the land or historic properties are used. A project may have a single APE that includes all these effects, or may generate multiple APEs—one each for visual effects, direct effects, etc.—which may or may not overlap.

The Lowell Study Area is comprised of an area 1 kilometer on either side of the extant railroad corridor that runs along the banks of the Merrimack River (see Figure 2). This 9-mile corridor runs south from the state border with New Hampshire through the municipalities of Tyngsborough, Chelmsford, and Lowell. The study area terminates at the existing rail line's intersection with the extant commuter rail station in western Lowell. From this junction, the existing line continues southeast toward the center of Lowell, where there is an existing commuter rail station running service between Lowell and Boston. Even though the APE is confined to the extant rail corridor, it was decided that the Lowell Study Area should be comprised of a 1-kilometer buffer on either side of the extant railroad bed to ensure that a sufficient number of known archaeological sites were included within the study area dataset and afford a reasonable sample from which to draw conclusions about the archaeological sensitivity of the APE.

The APE for historic architectural resources is the area within which the proposed undertaking could reasonably be expected to have a physical or visual effect on historic properties of this type, if any exist. The portion of the project in Massachusetts only includes the railroad ROW, where a second track will be added. This area is the direct APE. Since new track will only be added to areas that already contain a track, there is no potential for visual impact. As a result, the APE was confined to the limits-of-disturbance (LOD) in the areas where the new track would be laid. See 60Appendix B for a map showing the areas proposed for a new track.

The APE was developed based upon the preliminary project plans and renderings. If project plans are modified from those included in this study, the APE will have to be adjusted accordingly and additional research and survey will be necessary to evaluate previously unsurveyed areas and the effects of the project on potentially significant archaeological or historic architectural resources.

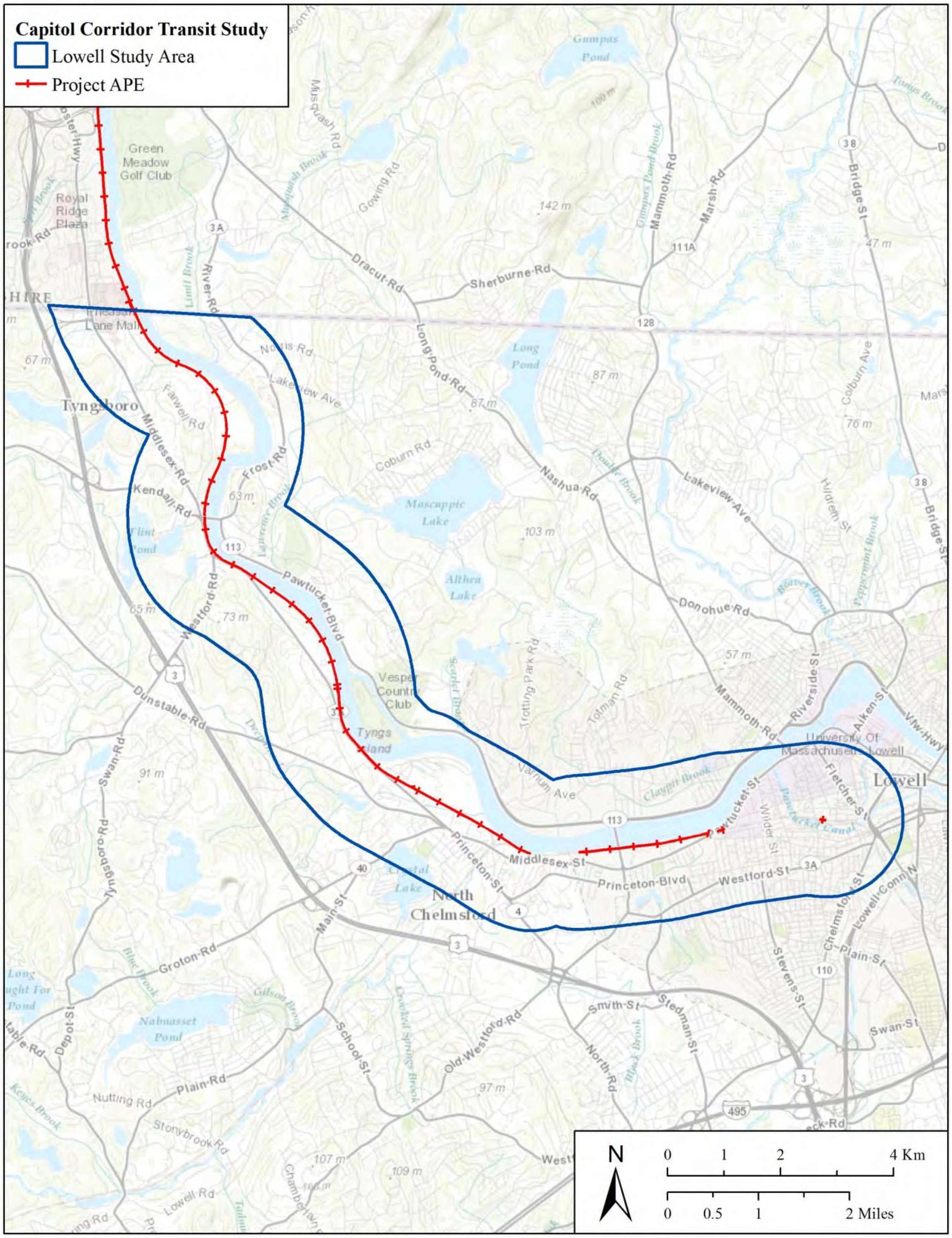

Figure 2 - A map showing the location of the project APE and the Lowell Study Area.

3.0 Environmental Background

3.1 *Physiography and Drainage*

The study area is located in the Seaboard Lowland portion of the New England physiographic province and are drained by the Merrimack River (Fenneman 1938) (Figure 3). The principal tributary of the Merrimack River near the study area is the Concord River, which joins the Merrimack to the east of the project area downstream from Pawtucket Falls. All project components are located within the Merrimack River Valley. Glacial outwash terraces and plains, stream terraces, and floodplains of the Merrimack River are the principal landforms.

3.2 *Geology and Soils*

The Lowell Study Area sits atop five principal types of bedrock (Zen et. al 1983). Figure 4 shows that the most dominant bedrock within the Lowell Study Area is part of the Berwick Formation, which formed during the Silurian period (Nicholson et al. 2006). The rock within the Berwick Formation was created through the metamorphic process (heat and pressure), which changed the chemical composition of the rock. The underlying bedrock in the areas contained within this formation is made of metamorphosed calcareous sandstone or siltstone, with occasional inclusions of muscovite schist. The next most common type of bedrock within the Lowell Study Area is granite. There are three principal granite formations occurring within the study area, and they tend to alternate with deposits of the aforementioned Berwick Formation. These three granite formations include: Chelmsford granite (Lower Devonian), Ayer granite (Lower Silurian), and Andover granite (Silurian or Ordovician) (Nicholson et al. 2006). Of these three, the most recent is Chelmsford granite, which is intrusive into the surrounding Berwick Formation, having emerged between 417 and 354 million years ago, during the Devonian period (Lambert 2006:196). The majority of the rock formations within the study area, with the notable exception of the aforementioned Chelmsford granite formation, were created during the Silurian period, dating to between roughly 443 and 417 million years ago (Lambert 2006:194). Sandwiched between the Ayers granite formation in the south of the Lowell Study Area and the southernmost band of the Berwick Formation is situated a band of Tadmuck Brook schist that may be contemporaneous with the Berwick Formation, having similarly formed in the Silurian period (Nicholson et al. 2006).

Soil data for the project area was derived from the United States Department of Agriculture's Web Soils online repository and is summarized in Table 1 (USDA 2010). Downstream from Tyng Island, all the way to the termination of the proposed rail modifications, is an area that is dominated by soils classified as undorthents (fill soil) and/or urban land (Figure 5). Ascertaining a dominant soil component for the Lowell Study Area—apart from the fill and urban land—is difficult, given the linear nature of the project area. Furthermore, many soil types that occur within the study buffer never actually encounter the APE for the proposed rail modifications and would therefore skew the data. Therefore, to get a more accurate idea of the dominant soil types, a 15-mile buffer of the proposed rail modifications was established and only soil types that fell within its confines were analyzed. Table 1 shows the breakdown of soil types in this buffer.

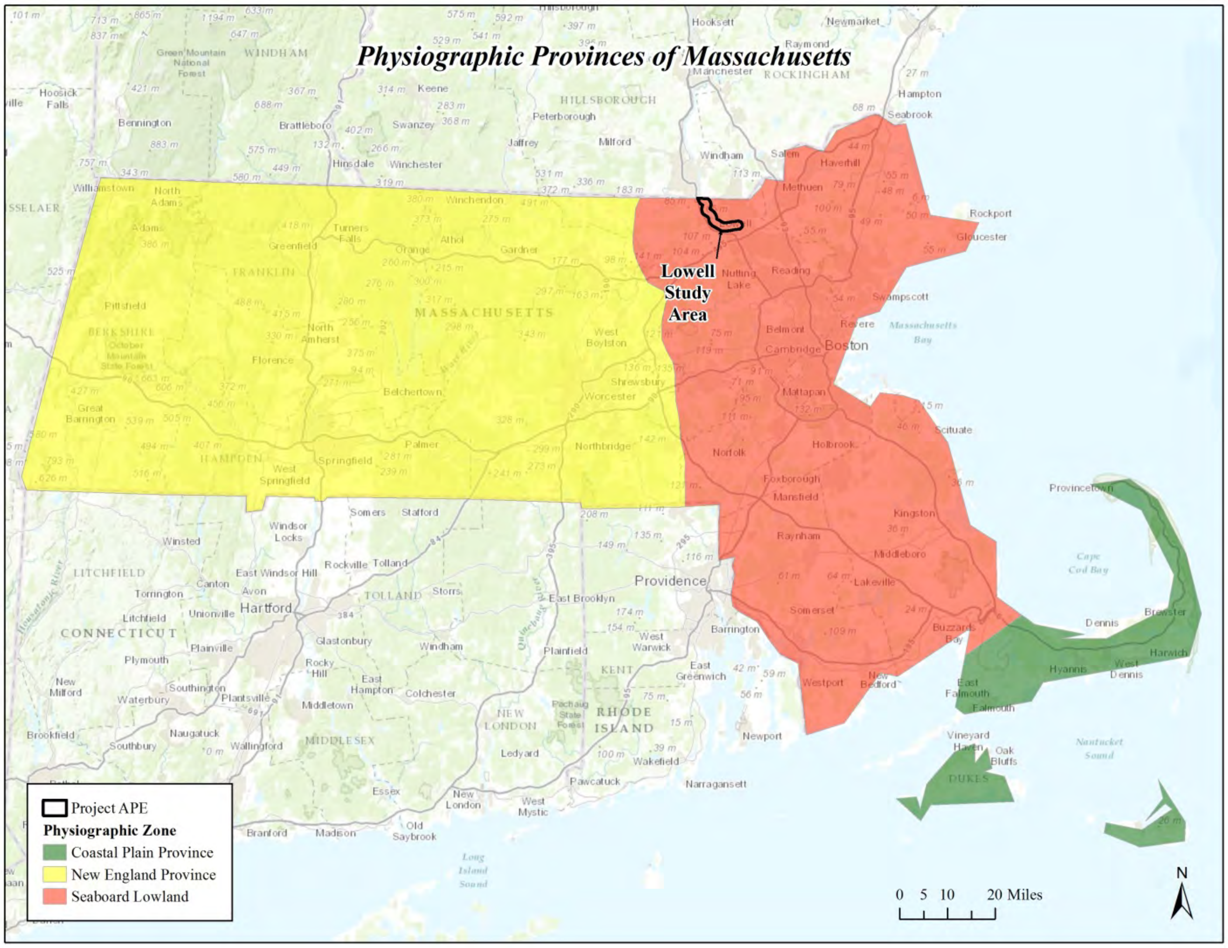

Figure 3 - Massachusetts physiographic zones (Source: U.S. Geological Survey 1983:317).

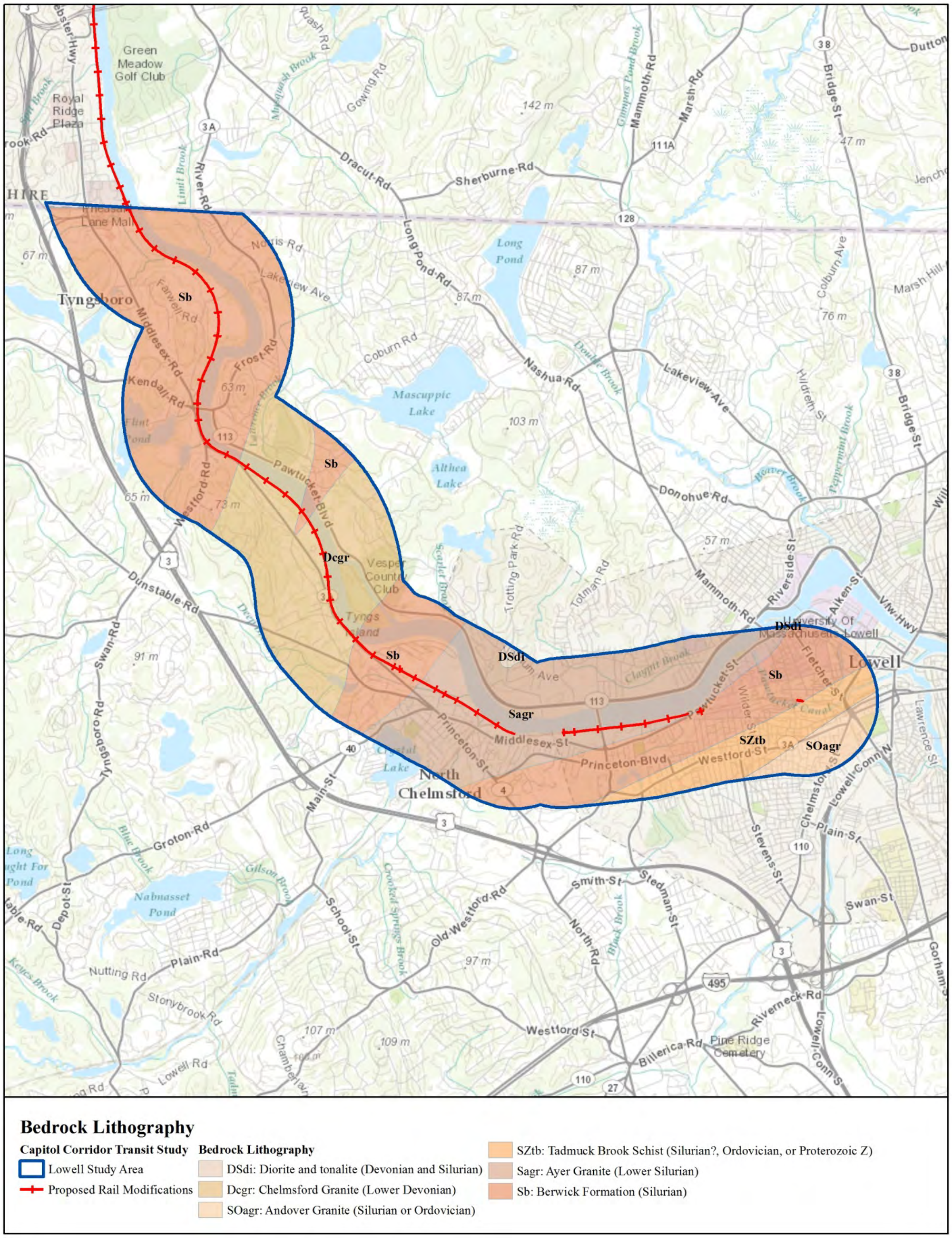

Figure 4 - Bedrock lithography of the Lowell Study Area (Source: Nicholson et al. 2006).

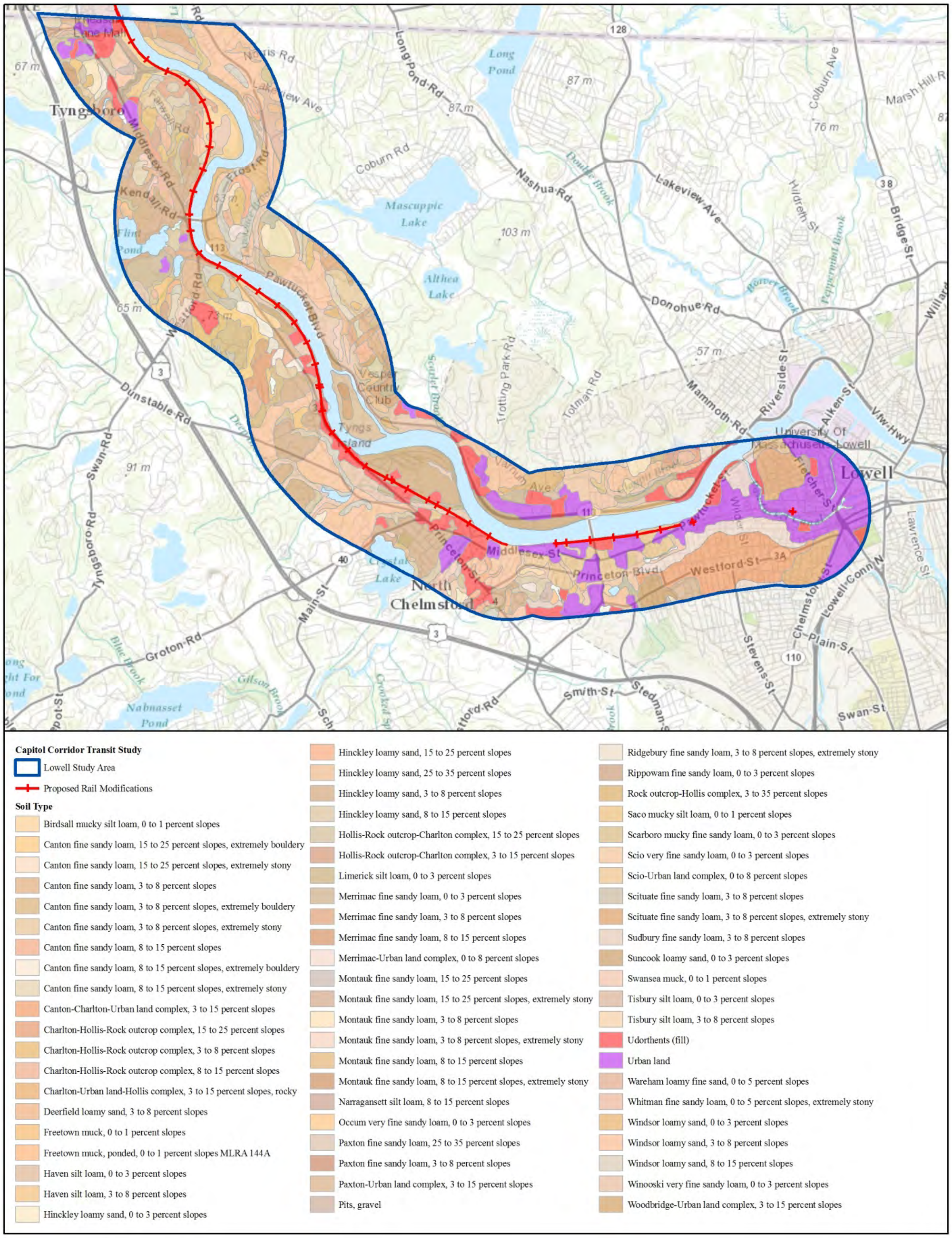

Figure 5 - A map of the soils contained within the Lowell Study Area (Source: USDA 2010).

Table 1 - Principal soils occurring within a 15-mile buffer of the proposed rail modifications within the Lowell Study Area.

Map Symbol	Soil Type Name and Description	Acres	Percent
223A	Scio very fine sandy loam, 0 to 3 percent slopes	0.509914	0.84
4A	Rippowam fine sandy loam, 0 to 3 percent slopes	0.32869	0.54
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	0.765095	1.26
8A	Limerick silt loam, 0 to 3 percent slopes	0.849843	1.40
255B	Windsor loamy sand, 3 to 8 percent slopes	1.271316	2.09
253D	Hinckley loamy sand, 15 to 25 percent slopes	2.455103	4.04
621B	Scio-Urban land complex, 0 to 8 percent slopes	2.934651	4.83
253B	Hinckley loamy sand, 3 to 8 percent slopes	3.359731	5.53
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	4.753771	7.83
97A	Suncook loamy sand, 0 to 3 percent slopes	5.524444	9.10
602	Urban land	5.621788	9.26
98A	Winooski very fine sandy loam, 0 to 3 percent slopes	5.897993	9.72
99A	Occum very fine sandy loam, 0 to 3 percent slopes	10.56253	17.40
655	Udorthents (fill)	15.87279	26.15
Totals		60.70766	100%

3.3 *Paleoenvironment*

As glacial ice ablated in New Hampshire and northern Massachusetts between circa 14,600 and 12,600 B.P. (Ridge 2003), thick till was emplaced on uplands, and three successively higher proglacial lakes occupied what would become the Merrimack River Valley (Lakes Tyngsboro, Merrimack, and Hooksett, from south to north). Koteff et al. (1984) suggests that these lakes drained sometime after 13,000 B.P., and the southern margin of the Laurentide ice sheet retreated from the upper Merrimack drainage by circa 12,000 B.P. (Ridge 2003). During this interval, the ancestral Merrimack River began eroding and reworking the glaciolacustrine sediments and constructing a series of lower stream terraces. Aeolian deposition capped stream terrace and proglacial lake deposits in places (Koteff et al. 1984:391–392), a process that continued into the late Holocene based on Dincauze's (1976:10–11) interpretation of soil parent material at the Neville Site.

Low-growing tundra vegetation, consisting of mosses, ferns, sedges, and grasses—along with dwarf birch and alder—colonized newly deglaciated landscapes. Pollen-based vegetation reconstructions for northern New England vary regarding the earliest trees to colonize tundra. Davis (1981) suggests that spruce dominated the first patchy, open woodlands in northern Massachusetts, as well as southeastern and central New Hampshire, between circa 12,700 and 11,800 B.P. This open woodland bordered tundra to the west and north. At the same time, a mixed woodland composed of poplar, spruce, and jack pine/red pine existed in the vicinity of Nashua, New Hampshire. After 12,000 B.P., the mixed woodland had moved north and west, replacing open woodland in the vicinity of Concord, New Hampshire, while more closed forests dominated by spruce (together with fir, birches, and poplar) had developed in southeastern New Hampshire and northern Massachusetts (Davis and Jacobson 1985). Newby et al. (2005) have linked a retraction of spruce/fir forests to southern Maine and southeastern New Hampshire and expansion of tundra between circa 11,000 and 10,000 B.P. to the Younger Dryas climate episode, coinciding with the arrival of Paleoindians in northern New England.

As in the case of flora, faunal communities of the Late Glacial had no modern analogs. These communities were characterized by the association of a number of Late Pleistocene species that are either extinct (e.g., mammoth, mastodon) or regionally extirpated (e.g., caribou), with other species (e.g., deer, moose, black bear) that have persisted in the area into the modern period (Lundelius et al. 1983).

Although there is no archaeological evidence in New England for Paleoindian exploitation of mammoth or mastodon, radiocarbon dates for these and other extinct species indicate that they were available to at least the earliest Paleoindian groups. Small fragments of calcined caribou bone have been recovered from the Whipple and Bull Brook Paleoindian sites (Spiess et al. 1998:226).

Rapid warming after the Younger Dryas fostered the arrival of oak, white pine, and maple into northern New England between 10,000 and 9000 B.P. These species quickly replaced spruce and fir, resulting in a new composition of the closed forests of southeastern New Hampshire/northern Massachusetts and southern Maine that came to be dominated by pine. Hemlock, beech, and birch followed between 9000 and 8000 B.P. The growing numbers and density of mast-producing species in early Holocene forests would have increased the carrying capacity of the environment, resulting in higher terrestrial game populations and diversified subsistence opportunities for Native American groups. Between 9000 and 6000 B.P., the center of pine abundance moved northwest, and forests composed of pine, birch, maple, beech, and hemlock became dominant. Other mast-bearing trees, hickory and chestnut, arrived in northern New England at 5000 and 2000 B.P., respectively (Davis 1981; Gaudreau 1988).

Early historic period vegetation patterns in the Northeast include a conifer-hardwood forest region in the northern sections and deciduous forests in the southern portions. This modern ecotone extended from southern Maine west along the Massachusetts-New Hampshire border. Pollen records indicate that the ecotone between the two major zones was established in the early Holocene and became more pronounced between 8000 and 6000 B.P. While the ecotone was stable from the early Holocene, the species composition of the two forest zones continued to change throughout the late Holocene (Gaudreau 1988).

4.0 General Cultural and Historic Background

4.1 *Prehistoric Background*

4.1.1 *The Paleoindian Period (Circa 11,500–9400 B.P.)*

Although several sites south of New England (i.e., Meadowcroft, Cactus Hill, Miles Point) may represent pre-Paleoindian habitation sites, the earliest documented occupation of New England and the Maritimes dates to the Paleoindian period, from approximately 11,500 to 9600 B.P. Paleoindian sites are most commonly identified by the presence of distinctive fluted and unfluted laceolate projectile points. Other parts of the toolkit included formal flake tool types and large, bifacial cores. In the greater Northeast, Paleoindian toolkits are marked by a conspicuous use of high-quality cryptocrystalline lithic materials that often originate at considerable distances from their point of discard. The former characteristic is inferred to result from a need for durability over numerous episodes of intensive use at locations distant from sources (Goodyear 1989; Spiess et al. 1998:239–242), while the distances from sites to sources have been used to estimate maximum travel distances.

In a recent synthesis of Paleoindian data for New England and the Maritimes, Spiess et al. (1998: 235–239) proposed a series of five chronological phases for the period based on stylistic changes in projectile forms. The earliest two phases, Bull Brook and Vail-Debert, are roughly coeval. Bull Brook phase fluted points are relatively straight-sided with moderately deep basal concavities and flutes that exceed half the length of the point. Vail-Debert fluted points are generally larger and exhibit the same outline as Bull Brook points, but have deep basal concavities and shorter flutes. Dates for these phases range from circa 11,500 to 10,500 B.P. Fluted points of the following Michaud-Neponset phase are generally narrower and thinner than earlier fluted point styles, display flaring basal ears, and are often fluted to within 10 millimeters of the tip. Crowfield phase fluted points expand markedly from the base, reach maximum width near midpoint, and display long, often multiple flutes. Michaud-Neponset and Crowfield points both display shallow basal concavities compared to Bull Brook and Vail Debert points. Spiess et al. suggested that the Michaud-Neponset phase ranged from 10,310 to 10,070 B.P. The Nicholas phase is the final proposed Paleoindian phase. The Nicholas point is unfluted, small, thin, and expands at the base, similar to Crowfield points. Dates for this phase are few and range from circa 10,120 to 9400 B.P.

In terms of general settlement patterns for the region, Spiess et al. (1998:229–230) have noted that the majority of larger Paleoindian sites contain at least one discrete locus of stone tools and debitage measuring 4 to 8 meters in diameter that are separated by sterile space. The Bull Brook site exhibited 42 such loci, followed by Debert (11 loci), Vail and Michaud (eight loci each), and Bull Brook II (six loci). The non-overlapping character of loci suggests that each represents short-term single occupations at each site. Subsistence data is sparse; however, faunal remains from several sites are limited to calcined medium to large mammal bone. Calcined caribou bone has been identified at the Whipple Site, calcined caribou and beaver bone was present at Bull Brook, and calcined caribou, Arctic fox, and hare have been identified at the Udora Site in Ontario. Extremely small numbers of carbonized fruit and berry seeds have been recovered from the Michaud and Hedden Sites in Maine. Spiess et al. (1998:223–227) suggested that these data support a model of Paleoindian subsistence that is similar in its broad outlines to ethnographic examples from the subarctic region, featuring specialized caribou hunting in some seasons combined with general foraging at other times.

The Whipple Site, located on an outwash terrace above the Ashuelot River in the southwestern corner of the state, is the most extensively excavated Paleoindian site in New Hampshire (Curran 1984, 1994). The site was comprised of three small, spatially separated loci, all of which produced a wide variety of stone tools types, and two of which contained datable features. Curran assigned the site to the Bull Brook phase of Grimes et al. (1984) based on formal similarities between the Whipple fluted points and those from the Bull Brook Site. Conventional radiocarbon dates from Locus C ranged from 9820 ± 420 B.P. to 11, 430 ± 395 B.P. (Curran 1984:13); however, a weighted mean of three assays yields a date of 10,680±400 B.P. The site contained a large number of calcined cervid bones, three of which were identified as caribou. Speiss et al. (1998:241–242) suggested that the Whipple assemblage is dominated by Champlain Valley chert and appreciable amounts of Munsungun chert from northern Maine, with much lower utilization of more locally available Cheshire quartzite. Curran interpreted the loci as short-term occupations by small family or task groups, and suggests that the loci may not have been coeval based on differing patterns of raw material discard (1984:14–15).

Isolated fluted points and small Paleoindian components have been identified in the Merrimack River Valley. Dincauze (1976:118) reported a fluted point tip from a later context at the Neville Site, and Curran (1994:41–45) described a complete fluted point from potentially intact subsurface contexts at the nearby Smyth Site. Curran (1994:41–43) also discussed the Thornton’s Ferry Sites (27-HB-1 and 27-HB-2), both of which are located on sandy glaciofulvial landforms within the former bed of glacial Lake Merrimack. Site 27-HB-2 yielded a single felsite fluted point base, jasper flake tools, and rhyolite debitage in subsoil deposits. At the time of Curran’s reporting, no clearly diagnostic Paleoindian artifacts had been recovered from 27-HB-1; however, chert flake tools and debitage of non-local material were recovered at a depth in the subsoil below Middle Archaic types, which were deemed to be possibly Paleoindian. Additional excavation and analysis in 2001 allowed Boisvert and Bennett (2004) to make a convincing case based on stratigraphy, raw material types, and debitage attributes that the site’s lower component is Late Paleoindian in age.

4.1.2 *The Archaic Period (Circa 9400–2500 B.P.)*

The Archaic period exhibits an increase in the density and horizontal dispersal of archaeological remains. It is characterized by a reliance on both animals and wild plant resources, which became increasingly stabilized and broad based over time. Group organization was presumed to still be fairly mobile, making use of seasonally available resources. Caldwell (1958) has termed the maximizing adaptation (scheduled hunter-forager) to the environment in the Eastern woodlands during the Archaic period “primary forest efficiency.” Group size gradually increased during this period, culminating in a fairly complex society in the Late Archaic.

The Early Archaic period (circa 9400–7000 B.P.) is marked by the end of the Pleistocene glacial climate and extinction of megafauna. To date, evidence of Early Archaic occupations is much more common in southeastern North America than in the Northeast. In addition, the southeastern sequence suggests a transition from Paleoindian to Early Archaic assemblages, which has not yet been demonstrated for the Northeast. Prior to 1970, there was virtually no evidence of any northeastern sites dating to the Early or Middle Archaic periods. In the last three decades, considerable information has been obtained to fill in that gap, but the picture is still incomplete. The period is characterized by greater diversity in projectile point forms and increasing reliance on diverse species of Holocene fauna, including white-tailed deer, anadromous fish, birds, and turtle (Petersen et al. 1986:9).

George Nicholas has been a frequent and vocal proponent of the idea that early Holocene occupations in the Northeast were much more abundant than was previously thought, and that they operated within an environment that was much more productive than originally described. He has identified former glacial lake basins as locations that are likely to have been established as resource-rich mosaics within a changing and somewhat unpredictable early Holocene landscape (Nicholas 1983, 1988).

Early Archaic projectile points have been found in relatively isolated contexts from the Lakes Region of New Hampshire to the lower coastal tributaries of northeastern Massachusetts (Bunker 1988:6). At least three Early Archaic components referable to Robinson's (1992) Gulf of Maine Archaic tradition are known for the Merrimack River Valley. The first to be excavated was the Weirs Beach Site, located at the outlet of Lake Winnipesauke (Bolian 1980; Maymon and Bolian 1992). The stratified Early Archaic component featured large amounts of quartz debitage, cores, steep-bite quartz endscrapers, and groundstone rods. Radiocarbon dates of 9155 ± 395 B.P. and 8985 ± 120 B.P. on wood charcoal from features placed the site in the Early Archaic subperiod. The Eddy Site (27-HB-0078), located on a stream terrace of the Merrimack River, was subjected to test excavations in 1985 in advance of topsoil mining (Bunker 1992). The site yielded a stratified sequence of Middle Archaic through Woodland occupations in the upper meter of alluvial deposits. Between approximately 1 meter and 1.77 meters below surface, four strata were encountered, each of which produced small quartz-dominated assemblages at the upper contacts of each stratum. Tools included unifaces, other flake tools, hammerstones, and one adze fragment. Quartz was the primary lithic material for cores and debitage. Radiocarbon dates on charcoal from 1.29 to 1.62 meters below surface range from 7830 ± 100 B.P. to 7595 ± 120 B.P. In 1993, excavations in the town of Merrimack by Louis Berger and Associates recovered an Early Archaic campsite at Site 27-HB-160 radiocarbon-dated at 8690 +80 B.P. (Carini 1994:IX-1). The site produced an assemblage of early-stage quartz debitage, chert bifacial reduction debris, unifacial tools, nuts, berries, and mammal bones. Neither site yielded projectile points; a minor role for bifaces and stone projectile points appears to be characteristic of pre-Neville complex Middle and Early Archaic occupations of the Gulf of Maine Archaic tradition (Robinson 1992:69).

The Middle Archaic, circa 7000–5000 B.P., is associated with warmer and drier climatic conditions. By this period, modern floral communities were established, characterized by mast-producing hardwoods. Rivers stabilized during this time and wetland and lake areas were reduced in size. Hunting continued to be important, and fish may have become a more predictable resource. There is evidence for shellfish exploitation during this period. Excavations at the Neville Site in Manchester documented the Neville stemmed point type, dating between 7800 and 7000 B.P., and the Stark stemmed point type, dating between about 7600 and 6400 B.P. (Dincauze 1976). In addition, the Merrimack point type was identified as dating to the end of the Middle Archaic period, close to 6000 B.P. The Neville and Stark point types are similar in style and age to the Stanly and Morrow Mountain types that Coe (1964) defined earlier in the Southeast, but the Merrimack type appears to be more spatially restricted.

After publication of the Neville Site research, sites and isolated finds associated with these Middle Archaic complexes were increasingly recognized and reported throughout the Northeast. The Neville and Stark types have proved to be relatively common throughout New England. In the lower Merrimack River Valley, excavations at the Eddy Site revealed another substantial Middle Archaic occupation focused on riverine exploitation, and evidence for upland mast forest exploitation is documented at the Smolt Site (Kenyon 1983). Abundant evidence for lithic reduction activities comes from assemblages recovered from several Middle Archaic sites in the Lakes Region of central New Hampshire (Cassedy 1984; Starbuck 1983).

The accumulated data for the Middle Archaic period in the Northeast suggest that, during this period, the prehistoric inhabitants were forming themselves into distinct bands and settling into defined territories. These bands were establishing base camps and occupying a greater variety of special-purpose sites in a carefully planned seasonal round (Snow 1980:183). Evidence for the first use of coastal resources, such as shellfish beds, appeared during this period. Several new tool types were developed during this period, including woodworking tools, such as gouges and axes, and large groundstone semi-lunar knives, commonly known by the Eskimo name, "ulu."

The Late Archaic period is generally dated circa 5000–2500 B.P. Prior to the 1960s, Late Archaic sites were virtually the only Archaic period sites recognized in the Northeast. William Ritchie's work at sites like Lamoka Lake in New York had produced his seminal definition of an "Archaic" stage of culture in North American prehistory (Ritchie 1932, 1936), but no earlier complexes were known.

Throughout the Northeast, archaeologists now recognize the Late Archaic period as one in which the numbers and types of sites increased dramatically—what Snow (1980:187) described as the Late Archaic "florescence." Unlike earlier time periods, anyone interpreting Late Archaic assemblages must contend with a sometimes confusing and complex array of data. Based on his work in New York, Ritchie (1994) recognized two major Late Archaic trajectories, the Lamoka and the Laurentian, which overlap in both time and space. Both trajectories are also represented in New England.

Although Ritchie believed Lamoka to be the oldest Late Archaic tradition, more recent research has documented that Laurentian manifestations appeared as early as the last centuries of the sixth millennium B.P. Initially, the Laurentian was subdivided into three phases—Vergennes, Brewerton, and Vosburg—based on projectile point morphology and, to some degree, chronology. These phases extend from about 5500 to 4300 B.P. (Funk 1988:36). Subsequently, the discovery of Otter Creek and Brewerton Side Notched projectile points dating to the fifth and early sixth millennia B.P. led Funk to posit a "Proto-Laurentian" assemblage composed of "broad side notched points with ground bases and notches generally resembling Otter Creek and Brewerton side notched points" (Funk 1988:29), along with "biface knives, a variety of unifacial end and side scrapers, and common forms of 'rough stone' tools such as hammerstones and pitted stones" (Funk 1991:9). Funk and others (Tuck 1977:37) suggested that the Proto-Laurentian assemblages are "closely allied with Middle Archaic complexes of the Southeast and Midwest, chiefly identified by Raddatz, Modoc Side Notched, Big Sandy, and other large, notched points similar to the Otter Creek type" (Funk 1991:9).

What Ritchie first defined as the Lamoka culture in the Finger Lakes region has been shown to be associated with a horizon of small, narrow-stemmed projectile points that extends across southern New England, and includes such types as the Sylvan and Wading River forms from the Hudson Valley and southeastern New York, as well as the Squibnocket complex from southern New England.

Following Tuck's (1978) definition of the Lamoka/Sylvan/Squibnocket complexes of central and southern New York and New England as the "Mast Forest Archaic," Snow (1980:226) proposed that we designate the Laurentian complex and related assemblages in northern New England and the St. Lawrence drainage as the "Lake Forest Archaic." As Snow described them, these two complexes coexisted, but each was more common within a particular geographic region. This scheme supposes that there was a "marginal belt of tension between the two coeval zones that persisted throughout the Late Archaic" (Snow 1980:227).

Site density increased relative to the preceding Middle Archaic, although there is no substantial shift in site location (Bunker 1988:11). The subsistence base of the Mast Forest tradition probably consisted of a generalized or diffuse adaptation (Dincauze 1974, 1975). Although white-tailed deer were a major source of food during the Mast Forest Archaic, these were supplemented by a broad range of vegetal foods, particularly nuts, and a broad range of finfish and shellfish resources. Evidence of technological innovations, such as weirs and nets, first appeared in the Late Archaic. Extensive salt marshes developed along the coast and at river mouths, providing a stable environment for increased exploitation of shellfish. Population of coastal areas appears to have increased dramatically at this time, particularly near the end of the Late Archaic period. Sites dating to the Late Archaic have been found throughout the Lakes Region and the Merrimack River drainage, as well as in the lower Androscoggin Valley. Carini (1994:IX-9) categorized these into "large base camps, small seasonal camps, and both large and small specialized resource procurement stations."

The end of the Archaic has also been commonly called the "Transitional," in reference to its presumed transitional status between the Archaic and Woodland periods. Since research continues to indicate that there is actually a great deal of cultural and biological continuity between the Archaic and the Woodland periods, Snow (1980:235) has suggested that the label "Terminal Archaic" is more appropriate.

As Snow defined it, the hallmark of the early part of the Terminal Archaic is the Susquehanna tradition of broad-stemmed projectile points and their associated assemblages. These points include several regional varieties, including the Genesee, Perkiomen, Snook Kill, and Susquehanna Broad types in New York. This Susquehanna tradition of broad-stemmed projectile points is analogous to Coe's (1964) Savannah River type from the southeastern United States. Characteristics of the Susquehanna tradition include a marked preference for a riverine adaptation and a predilection for the fine-grained lithic resources of the Piedmont province, including rhyolite, felsite, argillite, and slate (Dincauze 1975:27; Turnbaugh 1975:54).

The latter portion of the Terminal Archaic period is marked by the appearance of narrow, tapered Orient Fishtail projectile points. Named for the type locations at Orient Point on eastern Long Island, Orient Fishtail points tend to be found on Long Island, in the Hudson Valley, and in southern New England (Ritchie 1971).

A marked increase in ritualistic behavior is also a feature of the Terminal Archaic cultures. Red ochre cremation burials with an assortment of grave goods are common from sites of this period in northern Massachusetts, and a cremation burial containing a broad-bladed point was excavated from the Litchfield Site, southeast of the current project (Bunker 1988).

Another hallmark of the Terminal Archaic is the appearance of steatite (soapstone) cooking vessels toward the end of the Susquehanna tradition (which continued throughout the Orient tradition). The presence of these large steatite vessels suggests that "the people who made, traded, and used [them] had reached a point in the evolution of their settlement and subsistence systems where the use of heavy cooking vessels was advantageous" (Snow 1980:240). This implies that these people lived in more sedentary settlements, utilizing foodstuffs that required long processing with heat.

4.1.3 *The Woodland Period (Circa 2500–300 B.P.)*

The Early Woodland period in much of the Northeast is represented by the Meadowood phase, with its distinctive thin, side-notched projectile points and the first widespread appearance of ceramic vessels. This pottery, which has been given the type name Vinette I, appears on some Terminal Archaic sites, but did not become common until the Meadowood phase. The presence of pottery has long been one of the key defining attributes to separate sites of the Woodland period from those of the Archaic, in the absence of radiocarbon dates or chronologically distinctive stone artifacts. In addition to Meadowood projectile points, Adena, Rossville, and Lagoon points are also associated with this time period. Rossville and Lagoon points are particularly common on Early Woodland sites in the coastal areas of southern New England and Long Island Sound.

Early Woodland cultures in New England show considerable variation from the patterns seen in central and western New York. Sites in the latter regions show much greater participation in widespread trade networks that extended from the Gulf of Mexico to the Great Lakes. Exotic seashells, distinctive types of stone, and native metals like copper and lead moved between the far-flung reaches of the network. This trade network was also associated with an elaborate mortuary ceremonialism that included burying many of the exotic traded items in graves with the dead. The presumed core of this system was the Adena tradition of the Ohio River drainage, to which numerous elaborate sites with well-stocked graves have been attributed.

Adena/Middlesex-related burial sites have been found as far east as New England and the Maritime provinces, where they appear to be most common in the St. Lawrence and Connecticut River drainages. Cemetery sites near Lake Champlain and in New Brunswick have yielded a wide variety of objects associated with this complex, such as blocked-end smoking pipes, copper and shell ornaments, as well as stone tools from distant sources, such as Indiana, Ohio, Ontario, and Quebec.

Throughout the Northeast, Early Woodland habitation sites are generally less common than the cemetery sites, which has skewed the picture of the prehistoric lifestyles for this period. Many Northeastern Early Woodland burial sites actually predate classic Adena in Ohio, and it is likely that the Early Woodland manifestations in this region represent a complex interplay of traditions. Early ceramic vessels tend to be thin and grit tempered. Settlement patterns, at least in the earliest portion of the Woodland period, exhibit little variation from preceding Archaic patterns (Kenyon and McDowell 1983:21).

By the time of the Middle Woodland period, significant changes in subsistence practices began to appear in much of eastern North America. The use of plant foods started to intensify, and the cultivation of domesticated plants spread into the region between 1500 and 1000 B.P. This was often accompanied by increased sedentism in the settlement pattern, as people began to live in larger congregations for longer periods of time. Northern New England appears to have been situated on the climatic and cultural margins of plant cultivation, and it is still not clear how extensive a role domesticated plants played in the late prehistoric subsistence strategy. Seasonal shifts in settlement and subsistence may have characterized much of eastern New England. Inhabitants may have alternated between coastal resources in the fall, winter, and spring, and interior resources during the summer months (Bourque 1973; Snow 1980:301). Settlements from the later Woodland appear to have been localized, and there is no evidence for long-distance trade until the arrival of Europeans (Snow 1980:319), with the possible exception of lithic raw material. A slow trend toward population nucleation and increased sedentism characterizes the Woodland period, especially near the coast and along estuary heads (Lavin 1988:110, 114).

Local quartz was commonly utilized for stone tools throughout the Woodland period, but non-local materials, such as jasper and chalcedony, were also used. The earliest Middle Woodland point types include Fox Creek and Jack’s Reef, and triangular Levanna points began to be used circa A.D. 800–1000. Near the end of the Late Woodland period, smaller Madison triangular points became common. At approximately the same time, the ceramic technology shifted from elongated, thick-walled vessels to globular, thin-walled vessels. The shoulders and collars of these vessels were often incised and appliquéd with elaborate decorations.

The late prehistoric and Contact period native inhabitants of northern Massachusetts along the Merrimack River were members of the Penacook, a part of the larger Algonkian culture, which encompassed much of the Northeast beyond the Iroquoian tribes of New York and the St. Lawrence River. The Penacook had substantial settlements along the Merrimack at the time of contact and would yearly gather in large numbers to harvest anadromous fish. These gatherings would generally take place at the numerous falls along the Merrimack, including the Amoskeag Falls (location of the Neville Site) and Pawtucket Falls in the area that is now Lowell. By the time European explorers made contact with the natives in this region, they had already been decimated by the spread of disease which started when Europeans first encountered native groups along the coastal regions in the early seventeenth century. By the time of King Philip’s War, the population of the Penacook at the village of Wamesit near the Pawtucket Falls had been further reduced due to intertribal warfare with the Mohawk, who had extracted a terrible toll upon the Penacook, reducing their number to just a fraction of what it had been (Cogley 1999:151–154; Pendergast 1996:7). The bloody Indian wars of the latter part of the seventeenth century prompted many members of the Penacook, especially those under the leadership of the sachem Wannalancet, to remove to Canada and wait out the conflict, returning in 1685 (Piotrowski 2002:18). In response to the threat of further conflict with the Mohawk and of additional conflict with the English, Wannalancet sold the remaining Penacook lands near Wamesit to Johnathan Tyng in 1686 (Piotrowski 2002:18). By this point, most of the Penacook had removed to the area around Quebec in Canada. Other members of the Penacook who remained in the region joined in the Indian wars, which led to further loss both of lives and territory (Piotrowski 2002:19).

4.2 *Historic Background*

The region that comprises the Lowell Study area is made of three modern municipalities—namely, the city of Lowell, the town of Chelmsford, and the town of Tyngsborough. Of these three modern areas, only Chelmsford has maintained any consistency of name since its inception. The city of Lowell was once known as East Chelmsford, prior to the great industrial boom that took place there. Tyngsborough was once part of the town of Dunstable, a large portion of which is now part of New Hampshire—specifically, the area around the present-day city of Nashua. While the early histories of these communities are largely similar, Lowell headed off on a radically different course in the first quarter of the nineteenth century. This departure was an industrial boom that radically transformed the agrarian community of East Chelmsford into the industrial powerhouse of the city of Lowell, Massachusetts. Due to the intensity of settlement in the part of the study area occurring within Lowell, the likelihood of encountering historic resources there is increased. Therefore, additional time will be spent describing the history of the town of Lowell to ensure that proper context is provided for the examination of potentially surviving cultural resources within the study area.

4.2.1 *Early Settlement*

The story of Tyngsborough begins with the establishment of the settlement of Dunstable, Massachusetts. Early forays into the region were largely limited to ventures designed to carry on trade with the native populations of the Merrimack Valley. One such venture occurred in 1665 and was executed by John Cromwell, a fur trader who established a trading post along the Merrimac near a small falls. This experiment did not endure and was subsequently abandoned (Fox 1846:21). In 1673, the land where Tyngsborough now lies was part of a 200-square-mile land grant made to Edward Tyng (Fox 1846:16–17). Tyng established the town of Dunstable—named after his native town of Dunstable, England—near the confluence of the Merrimack and Nashua Rivers (the site of modern-day Nashua City). This early settlement encompassed the whole of the Lowell Study Area, and a great deal more territory besides. The initial settlement was successful in establishing small communities, but little else, as the events of the final quarter of the seventeenth century shifted focus away from community growth and toward community protection, stagnating the European settlement of the region well into the eighteenth century (Fox 1846:68).

In 1675, the region became the scene of a bloody conflict between the native peoples of New England and European settlers that would become known as King Philip’s War (Fox 1846:28). King Philip was the European name given to Metacomet, the grand sachem of the Wampanoag, who had been baptized as and given the Christian name Philip as a child (Waters 1917:84). This war raged for three years, although fighting slowed after the death of Metacomet on August 12, 1676 (Waters 1917:85; Allen 1820:161). A native raid on Chelmsford on March 18, 1676 resulted in the burning of up to 15 homes and the deaths of several citizens who were ambushed while crossing the river to tend their cattle (Waters 1917:113; Cowley 1868:20). Additional citizens died as a result of participating in the fighting on behalf of the

Massachusetts militia (Waters 1917:125). Not all of the native peoples in the area were hostile to the people of Chelmsford; in fact, the town was befriended by Wannalancet of the Wamesits, who occupied the area now known as Lowell (Allen 1820:157). Wannalancet aided the English settlers by using his influence to prevent attacks on their settlements and warning the communities of impending attacks from hostile native groups, like the Mohawk (Waters 1917:125; Old Residents' Historical Association of Lowell Mass 1874:393–394; Allen 1820:157; Cowley 1862:16). While Wannalancet and his people abstained from the conflict, the war seeded deep mistrust of all Indians across the region, and they were frequently harassed or attacked by groups of English settlers (Waters 1917:125; Cowley 1862:16). So in 1677, Wannalancet and his people departed the region and settled for a time in Canada (Fox 1846:21; Contributions of the Old Residents' Historical Association of Lowell Mass 1874:394; Cowley 1862:17). He returned in 1678 and resumed occupation in the region until 1686, when he sold his land to John Tyng and once more removed to Canada to live with the St. Francis Indians (Contributions of the Old Residents' Historical Association of Lowell Mass 1874: 395; Allen 1820: 27, 45; Cowley 1868:21). Wannalancet and his people had sustained losses of both territory and population at the hands of the English, who had stolen land, sold natives into slavery, and frequently broke treaties (Waters 1917:126). However, when King William's War erupted in the 1690s, the English sought out their old friend in Canada and persuaded him to return to his homeland to help mediate the conflict. Wannalancet obliged, but never again made it back to his people, dying in 1696, and was subsequently buried by his friend John Tyng (Contributions of the Old Residents' Historical Association of Lowell Mass 1874:398).

While King Philip's War had caused many of the occupants of the nascent towns of Chelmsford and Dunstable to flee, the cessation of the conflict in 1678 prompted many to return and the town grew once more under the umbrella of a tenuous peace (Fox 1846:37; Water 1917:127). When William and Mary took over the throne of England, the king of France, who had hoped that England would once more have become a Catholic country under James II, took up the cause of the Stuarts and declared war on the Protestant couple (Old Residents' Historical Association of Lowell Mass 1874: 396; Waters 1917:127). The resulting conflict came to be known as King William's War, noted above, which in 1690 began in the New World when French troops marched south from Canada with their native allies and attacked Schenectady, New York (Waters 1917:127). Once again, the region fell into conflict and the colonists of Dunstable and Chelmsford lived in constant and often justified fear of attack (Waters 1917:132–133). During this time, the towns were frequently garrisoned (Fox 1846:65–68, 82, 103). After years of bitter fighting in Europe and the colonies, Britain and France came once more to peace, signing the treaty of Ryswick in 1697. The conflict resolved nothing and much of the territory that had been won or lost during the conflict was restored to its previous owners (Waters 1917:138). Just five short years later, in 1702, Britain once more found itself at war with both France and Spain. The North American side of this conflict came to be known as Queen Anne's War, but this was only really a theater of the larger War of Spanish Succession, a Europe-wide contest to preserve the military balance of power in Europe, as well as the balance of power between European Protestants and Catholics, which had been established during the preceding Thirty Years War (Waters 1917:138). This war raged for 11 years, until the signing of the Treaty of Utrecht in 1713, which saw Britain acquire new North American territories like Arcadia (Waters 1917:138). Despite the positive outcome of these conflicts, the constant fighting and fear of Indian attacks that permeated every aspect of a European settler's life caused the efforts at establishing and expanding settlements to stagnate until well into the early eighteenth century (Fox 1846:68).

4.2.2 *Colonial Period*

During the latter portion of the seventeenth century and into the early part of the eighteenth century, many land disputes between competing charters and land grants occurred between the established colony of Massachusetts and the newly formed colony of New Hampshire. For much of this time, both colonies laid claim to the town of Dunstable and its surrounding territory, part of the original Tyng grant. This debate continued for well over 50 years, until the boundary between the two rival colonies was settled in

1741 (Stearns 1986:v; Fox 1846:147; Peters 2006:8). This decision split the original Tyng grant in half, with the northern portion and town of Dunstable going to New Hampshire and the southern portion of Dunstable going to Massachusetts (Fox 1846:147; Peters 2006:8). It was during this time that Massachusetts created the municipality of Tyngsborough out of part of the southern portion of their new territory. Thus, this boundary settlement led to the creation of Dunstable and Tyngsborough in Massachusetts and the town of Dunstable in New Hampshire (Fox 1846:150).

The first half of the eighteenth century was punctuated by two further wars—the War of Jenkins' Ear and King George's War, which saw men from Massachusetts involved in the conflicts, but did not have the same harrowing effect on the region as earlier wars, as the action was more distant (Waters 1917:157). The second half of the eighteenth century saw two additional wars, the French and Indian War and the American Revolution. Men from the region participated in both of these conflicts, but the fighting occurred elsewhere (Fox 1846:159–168). The result of the French and Indian War, which concluded in 1763, saw the French presence in Canada eliminated (Waters 1917:162). Many men from Chelmsford and Tyngsborough fought in this conflict for the British crown, some losing their lives in the process, but still the town survived and prospered as an agrarian community (Water 1917: 163–189). The French and Indian War had a devastating effect on the surviving native populations in the region, who were largely exterminated during this period; this was to be the last of the Indian wars.

In the wake of the French and Indian War, Britain—although a territorial victor in the conflict—found itself saddled with debt from the defense of its colonies and the prospect of further debt to defend them (Makin 1994:54; Rabushka 2009:715; Nestor 2004:25). Prior to this point, the colonies had been largely exempted from taxation, but the Crown decided to implement several new taxes as a way of replenishing the royal coffers and offsetting the cost for the defense of the North American colonies (Makin 1994:54–58; Nester 2004:24, 28–29). The colonists had reaped the benefits of the military presence during the war, so the people back in Britain thought it only fair that they be asked to contribute to paying off the debt amassed in their defense (Makin 1994:54). The new taxes were poorly received by colonists in North America, who had never paid much tax and who had long enjoyed more or less free trade due to the demonstrated inability of the Crown to enforce previous tax laws and customs duties, which had led to a culture of pervasive smuggling (Makin 1994:57; Nester 2004:24, 29). The new taxes were seen as oppression, especially as no colonist had a voice in parliament, and the result was the American Revolution, yet another conflict during which many individuals from the region were active participants (Cowley 1868:23). Once again, times got tough, men were away at war, and farms and families languished. It was not until the cessation of the conflict in 1789 and the birth of the United States that the region would finally know a sustained peace.

4.2.3 *Post Revolution to Pre-Industrial*

The towns of Tyngsborough and Chelmsford were still largely agrarian by the dawn of the nineteenth century (Figure 6). While water resources had been developed in the eighteenth century and small saw and gristmills flourished, large-scale manufacturing was as yet only a dream (Lowell Historical Society 2006:7; Cowley 1868:24). Communities like Chelmsford and Tyngsborough were still largely isolated due to limited roads and rivers that were made unnavigable by the presence of waterfalls.

The first attempt to improve transportation in the area was achieved in 1796 with the opening of the Pawtucket Canal, which bypassed the Pawtucket Falls and opened up river access to New Hampshire to the north (Lowell Historical Society 2006:7; Cowley 1868:25). The Pawtucket Canal only bypassed one falls and was of limited value as far as transportation, as it only connected the region to nearby Concord, Massachusetts, so it was soon overshadowed (Cowley 1868:25, 27). In 1792, with the formation of the Middlesex Canal Company, a much larger canal project was conceived that would open up the Merrimack River to trade (Mower 1991). When construction was completed in 1804, the canal, which was readily

Figure 6 - A map East Chelmsford by J. G. Hales, c. 1821.

accessible via the nearby town of Middlesex, provided a direct water route north to New Hampshire towns like Concord and south to the populous city of Boston (Mower 1991; Lowell Historical Society 2006:3). The Middlesex Canal came through the area near Tyngsboro, where a lock was established to bypass Wicasee Falls (Mower 1991). This newfound connectivity between towns along the Merrimack prompted new investment in the region and led to the first industrial boom town in the United States.

4.2.4 *Industrial Revolution*

By the first quarter of the nineteenth century, the Merrimack River Valley became the focus of industrial speculation. Due in part to the transportation opportunities made possible by the Middlesex Canal, investors were attracted to the area, which offered substantial waterpower to run large complexes of mills. Early attempts at establishing cotton mills in the region were undertaken in 1813 and 1815, but were small in scale and ultimately failed (Cowley 1868:32). Additional saw and gristmills were established during the second decade of the nineteenth century, as well as a powder mill, all of which met with some success (Cowley 1868:33).

The region might have remained home to only modest industry were it not for one group, now known as the Boston Associates, who—having recently developed a successful mill system in Waltham Massachusetts—went in search of another location to implement their business model (Lowell Historical Society 2006:8; Rosenberg 2011:299; Cowley 1868:42). In 1821, the Boston Associates opened the Merrimack Manufacturing Company in East Chelmsford (Lowell Historical Society 2006:8; Rosenberg 2011:299). This corporation expanded and repurposed the old Pawtucket Canal, using it to direct a controlled volume of water to power their mills, developing and controlling waterpower that they were able to lease to other mills (Rosenberg 2011:299; Cowley 1868:44–45). The Merrimack Manufacturing Company was a huge success, and East Chelmsford was quickly transformed from an agrarian community to a nascent industrial town. The Lock and Canal Company, originally formed in 1792 with the creation of the Pawtucket Canal and subsequently purchased by the Merrimack Manufacturing Company, was reorganized in 1825 as an independent corporation that managed and leased waterpower to other corporations to run their mills (Cowley 1868:49). The Merrimack Manufacturing Company, among others, set about building a community for their workers, which initially was principally comprised of boarding houses for their mill girls (Rosenberg 2011:299). In just five years, the community of East Chelmsford had grown enough to become a town of its own; in 1826, the town of Lowell was incorporated, named in honor of Francis Cabot Lowell of the Boston Associates (Lowell Historical Society 2006:8; Rosenberg 2011:299).

Throughout the first half of the nineteenth century, new mills sprang up all over Lowell. The Hamilton Manufacturing Company was established in 1825 and grew to include five mill buildings and a print shop by 1868 (Cowley 1868:50–51). In 1828, the Appleton Company was established (named for one of the Boston Associates, Nathan Appleton) and had grown to include three mill buildings by 1868 (Cowley 1868:51–52). The Lowell Manufacturing Company was founded the same year as the Appleton Company and had the same number of mill buildings by 1868, although they had a more diversified production than just cotton, as they also produced carpet and wool (worsted mill) (Cowley 1868:52–53). Other mill companies soon followed, including the Middlesex Company (1830), Suffolk Manufacturing Company (1831), Tremont Mills (1831), Lawrence Manufacturing Company (1831), Massachusetts Cotton Mills (1839), and Boott Cotton Mills (named for Kirk Boott of the Boston Associates), which was founded in 1835 (Cowley 1868:53–58). This boom in construction and population created a demand for countless other support industries that built and maintained the city. Thus, substantial groups of carpenters, blacksmiths, machinists, and all manner of other tradesmen were drawn to Lowell to supply its needs (Cowley 1868:61–62). The western part of Lowell had by 1846 found itself the center of the area’s lumber industry, where saw and planning mills produced the building materials the ever-growing town required (Cowley 1868:62). By the middle of the nineteenth century, just prior to the outbreak of the

Civil War, the town of Lowell's population had grown to nearly 40,000—nearly 20 times what it had been when the town was incorporated three decades earlier in 1826, and double what it had been when it received its charter as a city in 1836 (Cowley 1868:154, 116; Schouler 1868:420). The explosion of industry at Lowell had transformed the region from a sleepy agrarian backwater to a thriving industrial center.

Though the growth of Lowell is inexorably linked to the growth of the canals, their role of great importance after 1835 was tied to their ability to produce waterpower, not transportation. From the 1830s through the end of the century, the major driver of transportation became the railroad. The first railroad established in the region was the Boston-Lowell Railroad, opened in 1835 (Cowley 1868:78). The following year, a new charter was granted to extend the Boston-Lowell Railroad to Nashua, New Hampshire, accomplished in 1838 with the opening of the Nashua-Lowell Railroad (Gerstner & Gamst 1997:312–313). The Boston-Lowell Railroad received increasingly more connections, like the Boston-Portland (1839) and the Boston-Maine (1840) lines (Gerstner & Gamst 1997:315–316). Additional lines, like the Salem and Lowell Railroad, was established in 1848 (Cowley 1868:137). By the late 1830s, the railroads had become an important means of transportation in Lowell, as well as an economic opportunity. Lowell soon found itself involved in the production of steam locomotives. These locomotives became the workhorses of the Boston-Providence Railroad, among others (Gerstner & Gamst 1997:333–334). The coming of the railroads to Lowell increased the speed and reliability of trade and made the cost of shipping substantially cheaper than it had been via canal or road (Gerstner & Gamst 1997:312–304). Additionally, these rail lines enabled passengers to travel more quickly around New England. This transportation innovation spurred further economic growth and made distant markets more profitable by reducing the cost of freight (Gerstner & Gamst 1997:304). However, for the Middlesex Canal, the coming of the railroad spelled disaster. Unable to compete with the faster and cheaper trains, the canal was closed in 1860 (Mower 1991; Gerstner & Gamst 1997:294).

4.2.5 *Civil War to Twentieth Century*

The Civil War saw great upheaval in the United States, and the city of Lowell was no exception. Faced with a dwindling supply of cotton from the southern states, many mills in Lowell were forced to close down, displacing much of the work force (Lowell Historical Society 2005:8). Nevertheless, the citizens of Lowell rose to the occasion, supplying 5,266 men for service in the Union Army—more than had been asked of them (Schouler 1868:424). While the fighting men of New England were victorious in battle, the South would ultimately get its revenge. After the Civil War, the South began to invest in textile infrastructure, having realized during the conflict that their lack of manufacturing infrastructure had made them vulnerable (Minchin 2013:21–22). The South had a large pool of unskilled labor and ready access to cotton, and thus was able to cheaply produce textiles (Minchin 2013:21–22).

The late nineteenth century boom of textile manufacture in the American South started to undercut the northern textile industry, but the full effect of this industrial shift would not be felt until after the Great Depression (Minchin 2013:21–22). In the 1840–1850s, prior to the Civil War, Lowell saw a large wave of Irish immigrants arrive in search of work and join the small established Irish community within the city, which had existed since Kirk Boott had brought them over to dig the canals in the 1820–1830s (Dublin 1992:65–67). While there was already an established population of Irish workers at Lowell, this new wave of immigration greatly expanded their numbers. This expansion was followed by a wave of immigration from French Canada in the 1860s–1870s (Dublin 1992:67; Lowell Historical Society 2005:8). These new immigrants replaced the mill girls of the earlier part of the century, who had mostly returned home when the mills had been closed during the war (Dublin 1992:67). The heads of the mills believed that the only way they could compete with the emerging industry in the South was to employ cheap, unskilled immigrant labor. Cheap immigrant labor helped to keep down costs and enabled mill owners to remain profitable despite fluctuations in raw cotton supply (Dublin 1992:67). This shift in mindset meant that immigrant labor would dominate Lowell's industrial workforce through the end of the century.

In the latter part of the nineteenth century and early twentieth century, additional waves of immigration from Eastern Europe and the Mediterranean brought additional workers to the mills in Lowell that had regained prosperity and continued to grow (Dublin 1992:68). These new immigrants created their own ethnic communities within the city, much as the Irish and French Canadians had previously done. By the dawn of the twentieth century, Lowell was an extremely multi-ethnic city, with Irish, French-Canadian, Polish, Greek, Portuguese, Hungarian, Jewish, and Lithuanian neighborhoods (Dublin 1992:68, 70–74; Lowell Historical Society 2005:8).

4.2.6 *Decline of the Textile Industry*

For most of the late nineteenth century, the northern mills continued to hold their own with their southern counterparts. However, in 1895, the strain began to show and the cotton industry in Lowell began to decline (Dublin 1992:82). The process was slow and did not come to a tipping point until the depression that followed World War I. After World War I, the textile industry collapsed, which was bad for all cotton manufactures—but in the South, access to cheaper material, more modern machinery, and non-union labor enabled them to persevere (Minchin 2013:22, 33; Dublin 1992:82). Mills all over New England could no longer compete and folded (Minchin 2013:21–22, 249–250). While some mills shuttered their doors as early as 1914, the worst came during the year of 1926, when Lowell's economy saw the closing of the Hamilton Company, the Suffolk Mill, the Tremont Mill, the Massachusetts Mill, and the relocation of the Appleton Mill and Saco-Lowell Shop (Dublin 1992:82). The impacts for Lowell were dire. Immigration came to a standstill and population declined. Mills all across the city closed as the cotton industry shriveled, so that by the mid-1930s, the cotton industry in Lowell had regressed to the size it had been just after the first mills in Lowell were established back in the 1830s (Dublin 1992:85). Those mills that remained—namely the Boott, Lawrence, and Merrimack Mills—were the last vestiges of the cotton industry in Lowell through the 1940s (Minchin 2013:249). Unemployment ran rampant and the city entered a long period of post-industrial decline (Dublin 1992:85). This was briefly curtailed by the outbreak of World War II and the demand for textiles and munitions that came with it, but the resurgence was short-lived; when the war ended, so too did the economic upturn (Dublin 1992:89). In the 1950s, the remaining Boott and Merrimack Mills finally closed, signaling the end of the textile industry in Lowell and contributing to further economic hardship (Dublin 1992:90).

4.2.7 *Late Twentieth Century*

Lowell struggled throughout the 1960s to find its economic footing, but it was not until the 1970s that the city began to recover. In 1974, the Lowell Heritage State Park was established, followed by the Lowell National Historic Park in 1978 (Dublin 1992:90; Lowell Historical Society 2005:8). The establishment of the University of Lowell in 1975 created new economic opportunities for the city, as did the arrival of Wang Laboratories, involved in the new computer industry (Dublin 1992:90). These events started Lowell on a path to recovery. Higher education and the technology industry proved the path to Lowell's salvation, as the city saw new investment in these industries continue through the 1980s and into the 1990s. The derelict buildings left by the abandonment of the milling industry were put to new use and occupied once more. As these new industries have grown, Lowell has once more begun to attract immigration. Lowell's modern immigrants come from Southeast Asia and Latin America, and like their predecessors at the dawn of the twentieth century, they have established ethnic neighborhoods of their own, enriching the cultural tapestry of the city (Dublin 1992:91; Lowell Historical Society 2005:8).

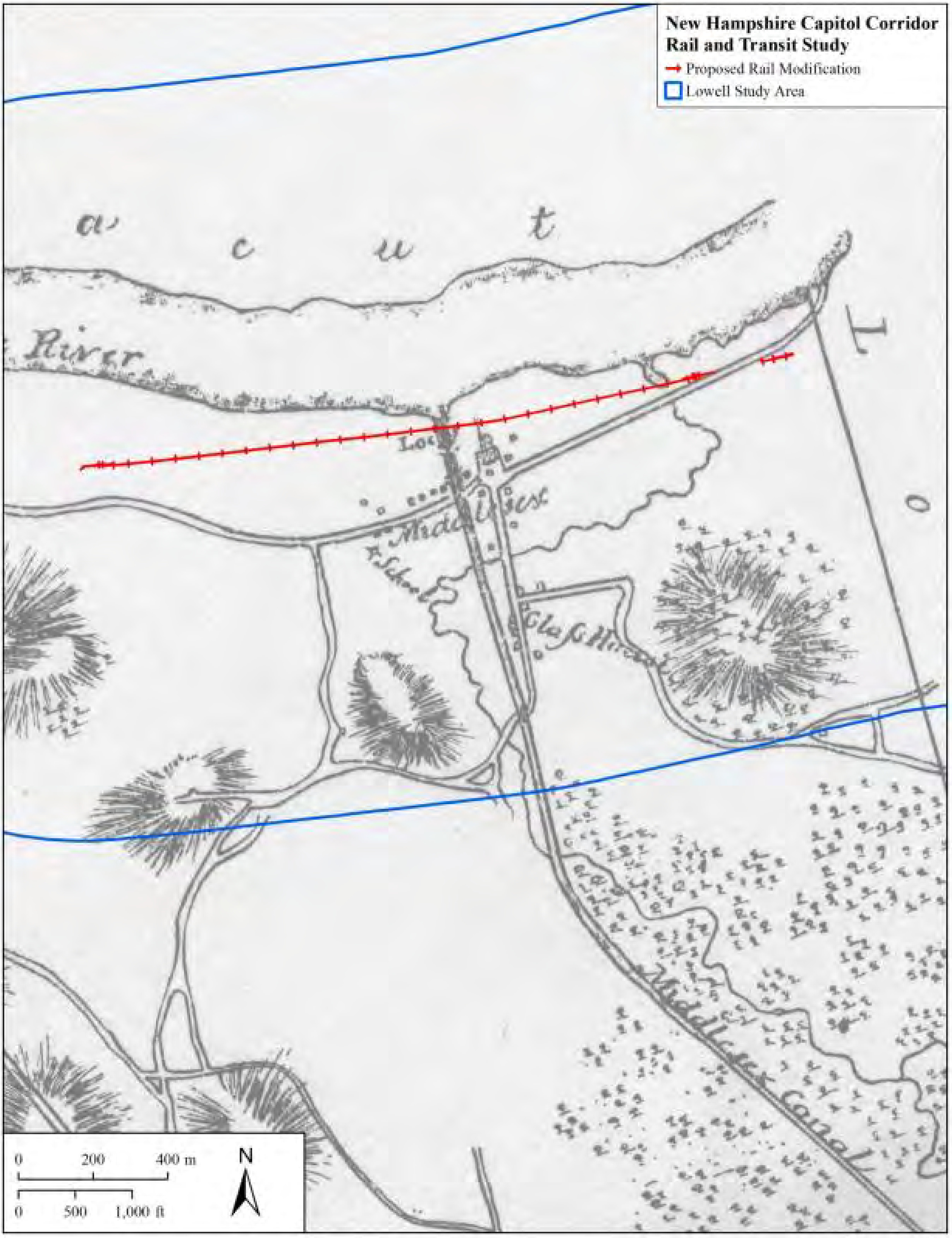

Figure 8 - Map showing the location of Middlesex Village, c. 1831 (John G. Hales 1831).

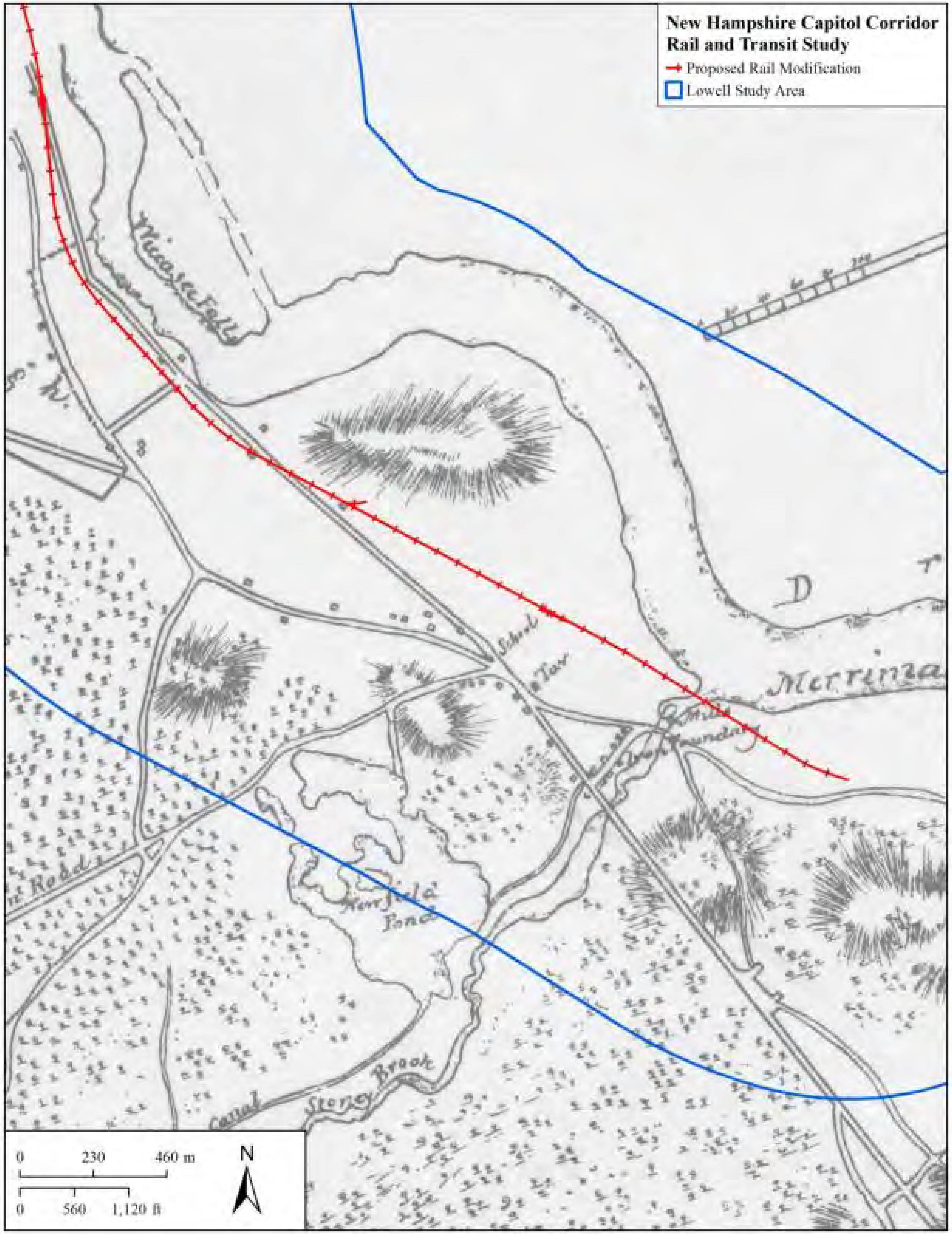

Figure 9 - A Map showing the location of Chelmsford, c. 1831 (John G. Hales 1831).

Figure 10 - Middlesex Village, c. 1856.

Figure 11 - Chelmsford, c. 1856.

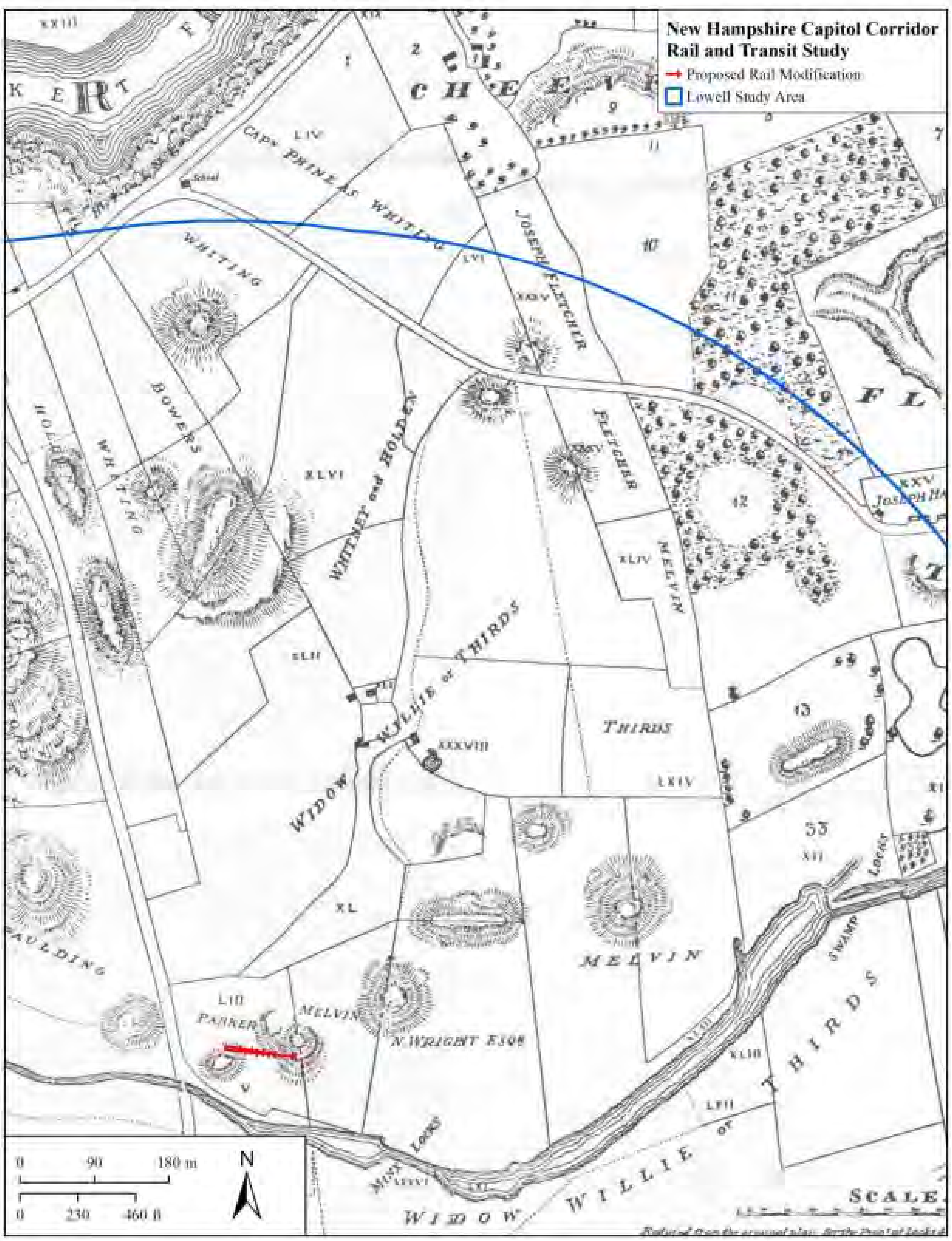

Figure 12- A map of East Chelmsford, now Lowell, c. 1821 (Hales 1821).

Figure 13 - The city of Lowell, c. 1842 (Beard and Hoar 1842).

Figure 14 - A Map of the City of Lowell, c. 1871 (Walling 1871).

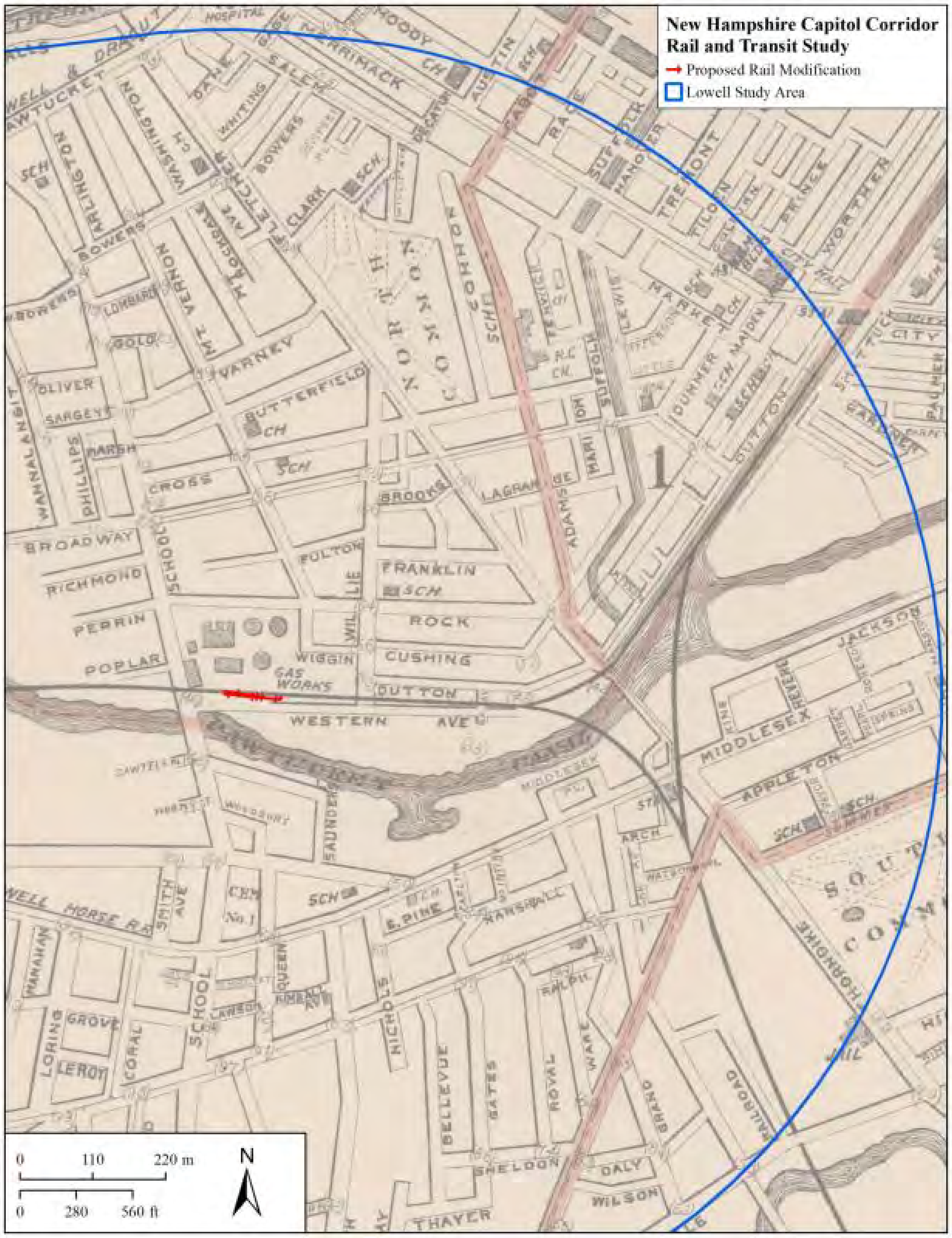

Figure 15 - City of Lowell, c. 1891 (Walker 1891).

5.2 *Historic Architectural Resources*

5.2.1 *NRHP Properties in the APE*

Background research gathered from MACRIS, a MHC visit, and other online sources determined that there are four NRHP-listed resources in the APE. One of those resources, the Lowell Locks and Canals Historic District, is also a National Historic Landmark (NHL). An NHL is a nationally significant historic place designated by the Secretary of the Interior because it possesses exceptional value or quality in illustrating or interpreting the heritage of the United States (NPS 2014). See Table 3 below for more detailed information. For resource locations, see Appendix B.

Table 3 - NRHP-Listed Properties in the APE

NRHP Inventory #	MHC Inventory #	Name	Address	Built Date	Listing Date
76001972	LOW.C	Lowell Locks and Canals Historic District	Between Middlesex St and the Merrimack River	18th and 19th centuries	NRHP: 8/13/1976 NHL: 12/27/1977
78003149	LOW.BC	Lowell National Historic Park	Around Merrimack Street	18th and 19th centuries	6/5/1978
03000170	---	Lowell Historic Preservation District	Around Merrimack River	18th and 19th centuries	1/19/2001
72000117 09000939	LOW.CJ	Middlesex Canal and Archaeological District	Merrimack River (Lowell, MA) to Charles River (Boston, MA)	1803	8/21/1972 11/19/2009

The **Lowell Locks and Canals Historic District** is a 125-acre district that consists of 10 canals and their accompanying gates, locks, and dams; seven mill yards and ruins of another; the Locks and Canals yard; the Lowell Machine Shop; and several company boarding houses, plus the residence of a company agent. The district is significant for its association with the industrial history of the United States (Criterion A) and for its engineering merit (Criterion C). Its period of significance is 1821–1930 (Adams 1977). The APE passes through the district at two railroad bridge crossings: near the intersection of Dutton Avenue and Western Avenue, and a Warren truss bridge just east of Walker Street. Only the Warren truss bridge is over 50 years in age; the Boston Bridge Works constructed it in 1928. The nomination form does not mention the bridge or give any indication that it is a contributing or noncontributing resource to the district.

The **Lowell National Historic Park** was the first urban park established in the United States in 1978. The park, comprising many sites in Lowell, is dedicated to the rich textile history of Lowell and its larger role in the Industrial Revolution in America. The historic park was named an NHL in 1978, but wasn't documented until 1985. Subsequently, the North Atlantic Regional Office of the National Park Service (NPS) prepared a List of Classified Structures (LCS) indicating the contributing and noncontributing resources in the district. The APE passes through the historic park and crosses the Pawtucket Canal, which is a contributing resource to the district. The 1928 Warren truss bridge (in the APE) also falls in the historic park, but there is no indication that it is a contributing or noncontributing resource to the district.

The **Lowell Historic Preservation District** was created by the legislation establishing Lowell National Historic Park and includes more than 500 acres in the central historic and industrial center of the city. No documentation was found during the research phase that indicates contributing and noncontributing resources have been identified. The district was not listed at all in the MACRIS database.

The **Middlesex Canal Historic and Archaeological District** begins in Lowell at the Merrimack River, just west of where it is intersected by Baldwin Street. From there, the district runs southeast to the Charles River in Boston. The district contains 225 individual contributing resources, 220 sites, and five buildings along its 27.25-mile route. The portion of the canal that falls within the APE is located in the northernmost portion (referred to as Segment 1 or L-1 in the nomination) of the district, but in this location, commercial and industrial development has covered over the canal. The 2009 NRHP nomination form indicates that a segment of canal and a basin may be located beneath the modern development, and that they are both significant contributing features of the district. No aboveground architectural resources associated with the canal exist within the project APE.

5.2.2 *Previously Surveyed Resources Not Evaluated for NRHP Eligibility*

Background research conducted via MACRIS and MHC also determined that there are seven historic architectural resources within the APE that have been previously surveyed and evaluated, but have not been determined eligible or ineligible by MHC or the NRHP. See Table 4 and the following paragraphs for more detailed information on those resources.

Table 4 Previously Surveyed Properties

MHC Inventory #	Name	Location	City	Built Date	Resource Type	Eligibility Recom.
CLM.917	Stony Brook Railroad Bridge	East of Middlesex St	Chelmsford	1850	Structure: Bridge	Eligible
CLM.920	Wotton Road - Deep Brook Railroad Bridge	Wotton Road	Chelmsford	1937	Structure: Bridge	Not Eligible
TYN.900	Tyngsborough Bridge	Middlesex Rd	Tyngsborough	1930	Structure: Bridge	Eligible
TYN.903	Mill Brook Railroad Bridge	Mill Brook	Tyngsborough	1928	Structure: Bridge	Not Eligible
TYN.904	Ferry Road Railroad Bridge	Ferry Road	Tyngsborough		Structure: Bridge	Unknown
TYN.912	Kendall Road Bridge over B & M Railroad	Kendall Rd	Tyngsborough	1930	Structure: Bridge	Potentially Eligible
TYN.922	Nashua & Lowell Railroad Cattle Tunnel	Farwell Rd	Tyngsborough	ca. 1838	Structure: Tunnel	Eligible

The **Stony Brook Railroad Bridge** (CLM.917) is an 84-foot-long stone double-arch bridge that carries the Nashua and Lowell Railroad/Boston and Maine Railroad over the mouth of Stony Brook at the Merrimack River in Chelmsford. According to the historic structure inventory form completed for a Phase II MBTA historical property survey in 1988, the bridge is the only intact stone-arch bridge on the line (Stott 1988). In the inventory form, the bridge was recommended eligible for listing in the NRHP.

The **Wotton Road - Deep Brook Railroad Bridge** (CLM.920) is a 16-foot-long steel I-beam stringer bridge with ashlar stone abutments that carries the Nashua and Lowell Railroad/Boston and Maine Railroad over Deep Brook in Chelmsford. It was built in 1937. According to the historic structure inventory form completed for a Phase II MBTA historical property survey in 1987, “the bridge is an example of a common type of twentieth century bridge construction and does not possess enough historic or engineering significance to merit further research or documentation” (Scott 1987a). As a result, it was recommended not eligible.

The **Tyngsborough Bridge** (TYN.900) is a 656-foot-long steel rib arch bridge that carries Sherburne Avenue over the railroad line and the Merrimack River. It was constructed in 1930. According to the historic bridge inventory form completed in 1991, it is a landmark bridge and a well-preserved example of a very uncommon type. It is the second oldest of five identified steel rib through arch bridges recorded in a historic bridge database created by the Massachusetts Department of Public Works (Roper 1991). As a result, it was recommended potentially eligible.

The **Mill Brook Railroad Bridge** (TYN.903) is a 17-foot-long reinforced concrete slab bridge with stone abutments and ballasted deck that carries the Nashua and Lowell Railroad/Boston and Maine Railroad over Mill Brook in Tyngsborough. The bridge was constructed in 1928. According to the historic bridge inventory form completed in 1987, “the bridge is an example of a common type of twentieth century bridge construction and does not possess enough historic or engineering significance to merit further research or documentation” (Scott 1987b). As a result, it was recommended not eligible.

The **Ferry Road Railroad Bridge** (TYN.904) is located approximately 225 feet north of the Tyngsborough Bridge. The inventory form for this resource was not found during the records search at MHC; therefore, construction date and details are unknown.

The **Kendall Road Bridge** (TYN.912) is a 67-foot-long single-span steel I-beam stringer with a concrete deck. The bridge was constructed in 1930. The Masshighway historic bridge inventory form completed in 1997 indicates that the Kendall Road Bridge is essentially an approach to the Tyngsborough Bridge, and is an integral part of the landmark steel rib through arch bridge (Roper 1997). As a result, it was recommended potentially eligible.

The **Nashua and Lowell Railroad Cattle Tunnel** (TYN.912) is a granite stone constructed tunnel that passes under the railroad to enable cattle to have access to pasture on both sides of the ROW. An MHC Form F (for structures) was completed in June 2002 and indicates that the tunnel was constructed by the railroad in or around the time the line was built in 1838 (Johnson 2002). It was recommended eligible for listing in the NRHP.

5.2.3 *Resources Not Previously Surveyed in the APE*

Prior to and following the site visit, additional online research was conducted to identify any architectural resources over 50 years in age within the APE that were not previously surveyed or documented. The most informative sources were historic and current aerial images available on Historic Aerials (www.historicaerials.com), Google Earth, and Bing Maps. The Historic Aerials website maintains images of Lowell from 1938, 1963, 1965, 1971, 1978, 1995, and 2005; Chelmsford from 1963, 1965, 1971, 1978, 1995, and 2005; and Tyngsborough from 1938, 1963, 1965, 1971, 1978, 1995, 2001, 2003, and 2005. Google Earth maintains aerial images from the 1990s, 2000s, and 2010s. By reviewing aerial images from the 1950s–60s and comparing them with current images, it was possible to locate buildings that may be over 50 years in age within the APE. Photographs available via Google Earth Street View and Bing’s Bird’s-Eye-View provided an initial view of the buildings in the project area that aided with identification in the field.

Background research and the field visit determined that there are two previously unidentified properties that may be over 50 years in age or older within the direct APE. By virtue of their age, properties that are over 50 years old are considered potentially eligible for listing in the NRHP and have the potential to be effected during the undertaking. The two resources include a railroad line and a railroad bridge. The railroad line itself, part of the Nashua and Lowell Railroad/Boston and Maine Railroad, passes through the entire APE. See Table 5 below for a list of properties over 50 years in age that have not been previously surveyed.

Table 5 - Resources Not Previously Surveyed in the APE

Name/Address	Block/Lot	City	Resource Type	Built Date
Nashua and Lowell Railroad/Boston & Maine Railroad	----	ALL	Railroad line	c. 1838
Warren Truss Railroad Bridge over Pawtucket Canal	Between Walker St and Dulton Ave	Lowell	Warren Truss Bridge	1928

The **Nashua and Lowell Railroad** opened in 1838 as a continuation north of the Boston and Lowell Railroad. The initial track was laid on granite and, later, a second track was added with a wood base. In 1887, the **Boston and Maine Railroad** took over the entire line. The line and associated features have been altered over the years; currently the line has been reduced to one track (serving freight), and most of the stations and associated buildings (train sheds, water towers, flag houses, etc.) have been demolished. Within the APE, the only structures that appear to be part of the railroad line are tracks and bridges; no additional buildings or facilities appear to be within the ROW.

The **Warren Truss Railroad Bridge** is a steel Warren truss bridge constructed in 1928 by the Boston Bridge Works. It is a double-track railroad bridge that extends approximately 180 feet across the Pawtucket Canal. The bridge falls within the direct APE for the project.

6.0 Conclusions and Recommendations

6.1 *Archaeological Resources*

The literature review for the Capitol Corridor Rail Transit Study project revealed that the Massachusetts portion of the project, termed the Lowell Study Area, had a high probability for encountering both historic and prehistoric cultural resources. This determination was based upon the analysis of previously recorded archaeological sites, historical documentary research, and historic maps. The assessment of sensitivity largely concentrates on the potential of the soil to contain cultural resources. The designation of archaeological potential or sensitivity only takes into account the presence, or likely presence, of archaeological resources within the study area; it does not include other factors, like the impact of disturbance or the archaeological integrity of the sites used in the analysis. Therefore, an area classified as high probability might contain no resources due to past ground-disturbing activities, stripping, or grading. Additionally, the nature of the proposed project may negate the need for archaeological investigation if no ground disturbance is to occur. Bearing all this in mind, URS recommends that no further archaeological reconnaissance is necessary prior to the construction of the proposed track modifications, as no ground disturbance will occur. The Capitol Corridor Rail Transit Project proposes the construction of a secondary rail line paralleling the existing main rail line running between Lowell, Massachusetts, and Nashua, New Hampshire. This secondary rail line existed up until the mid-1960s, when decreasing demand for commuter rail service (due in large part to the postwar boom of the auto industry) led to the decommissioning of the secondary track, which was subsequently removed. However, the rail bed upon which that secondary track ran remains to this day, and can easily accommodate new track without requiring ground-disturbing activities. New track can be laid upon the existing bed, which has already been graded, compacted, and leveled, and is at present capping any soils left intact after these activities were completed in the first half of the nineteenth century (Wallace 2001). The presence of fill soils or redeposited strata does not necessarily negate the possibility of intact cultural deposits existing beneath. Filling episodes often act as caps, protecting underlying natural strata, even in urban areas (Marlatt et al. 2006:13). While it is possible that there are surviving cultural resources beneath the extant railroad bed, in the case of the proposed project, the extant rail bed is not being impacted, and thus, any potential resources lying beneath it will similarly remain free of disturbance. Therefore, since no soil is being disturbed, there is no potential adverse effect and no need for additional survey.

While the archaeological sensitivity of the Lowell Study Area may seem irrelevant given the scope of the proposed work, this is not the case. In the event that any additional rail bed needs to be constructed, moved, or altered during the course of the project, the archaeological potential of the study corridor would immediately become relevant. Any activity associated with the construction effort—including, but not limited to, the establishment of access roads, removal of existing railroad bed or other soil caps, or the establishment of new sections of rail bed—will need to be monitored by qualified archaeologists or subjected to an intensive Phase IB field survey prior to commencement of the work to ensure that there are no cultural resources present that might be adversely affected. Additionally, the placement of any support/maintenance facilities or construction staging areas will require Phase IB testing prior to their construction or usage to ensure that no cultural resources are negatively impacted.

6.2 *Historic Architectural Resources*

The NHDOT proposes to build station and layover facilities and make track improvements to the existing railroad corridor between Lowell, Massachusetts, and Concord, New Hampshire, as part of an effort to establish new commuter service. In Massachusetts, improvements would only consist of an additional second track in the existing ROW in certain areas along the alignment. Historically, as noted above, this line contained a double track, but sometime in the twentieth century, the second track was abandoned.

Since the project would be limited to the existing ROW and would only consist of replacing a second track that existed historically, there is very little possibility for physical impacts and no possibility for visual impacts. As a result, no additional work is recommended.

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APPENDIX A

8.0 Project Notification Form

APPENDIX A
MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: New Hampshire Capitol Corridor Rail and Transit Study

Location / Address: (will follow the existing New Hampshire Main Line)

City / Town: Lowell, Tyngsborough, and Chelmsford - Middlesex County

Project Proponent

Name: New Hampshire Department of Transportation

Address: John O. Morton Building, 7 Hazen Drive, P.O. Box 483

City/Town/Zip/Telephone: Concord, New Hampshire 03302-0483 (603) 271-3734

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name	Type of License or funding (specify)
Federal Railroad Administration	
Federal Transit Administration	

Project Description (narrative):

See Section 1.1 in the Phase IA Cultural Resources Investigation report

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

No demolition is proposed.

Does the project include rehabilitation of any existing buildings? If so, specify nature of rehabilitation and describe the building(s) which are proposed for rehabilitation.

No rehabilitation is proposed.

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

Proposed work will only consist of the addition of a second railroad track within the existing right-of-way. The locations are depicted in mapping included in Appendix A of the aforementioned report.

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

See attachment

What is the total acreage of the project area?

Woodland	______	acres	Productive Resources:		
Wetland	______	acres	Agriculture	______	acres
Floodplain	______	acres	Forestry	______	acres
Open space	______	acres	Mining/Extraction	______	acres
Developed	______	acres	Total Project Acreage	______	acres

What is the acreage of the proposed new construction? ______ acres

What is the present land use of the project area?

Railroad-related and industrial use.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

______________________________ ______________________________

Signature of the person completing this form Date

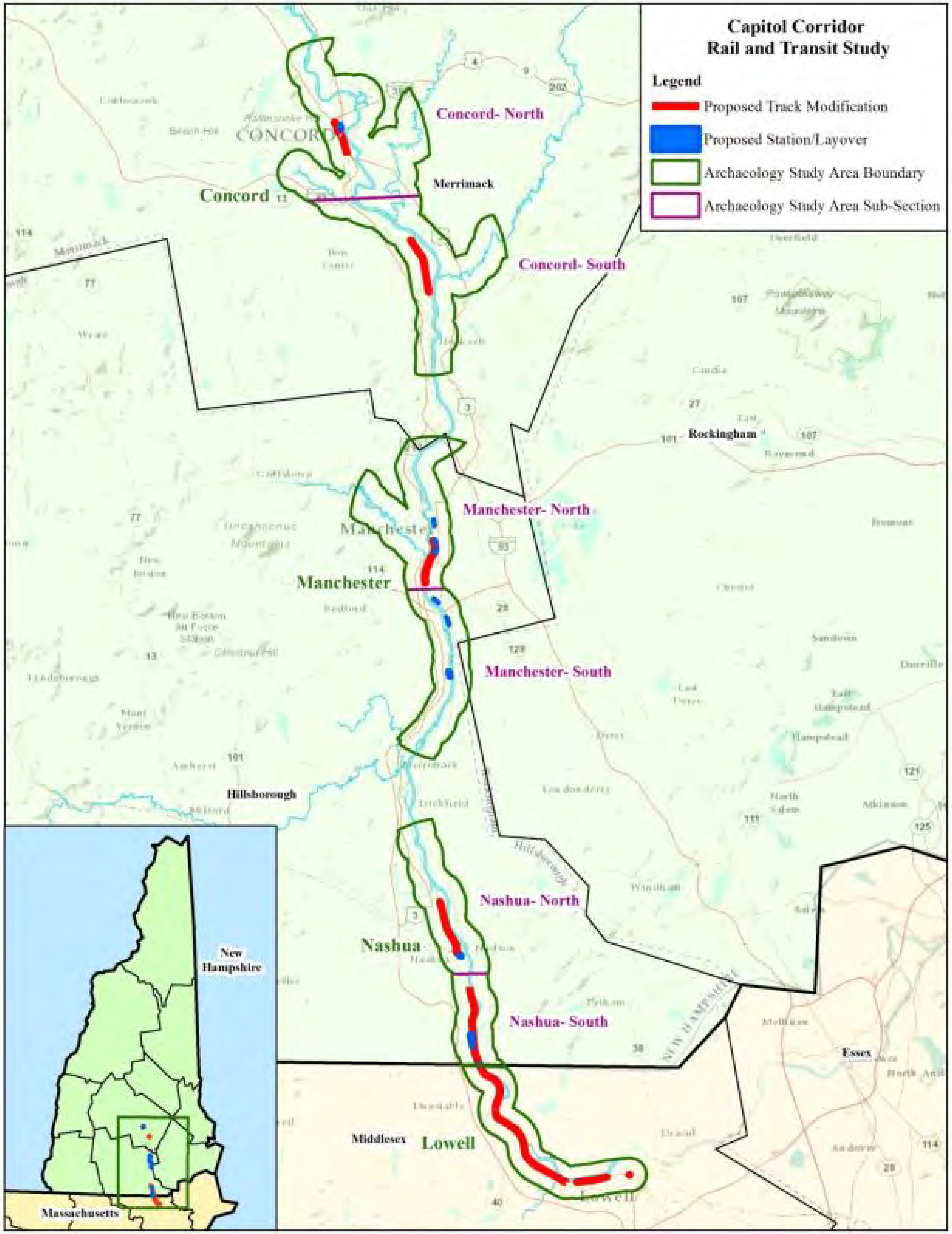
Name: Vanessa Zeoli

Address: 437 High Street

City/Town/Zip: Burlington, NH 08016-4514 Phone: 609-386-5444

For supplemental information required as part of the Project Notification Form (including the Project Boundaries and Description, USGS map, architectural background information, and archaeological background information), please see the attached Phase IA Cultural Resources Investigation

9.0 Resource Location Map



Project overview map showing station locations, track modifications and archaeological study areas.

APPENDIX E

10.0 Professional Qualifications

Andrew Wyatt

Senior Archaeologist

Area of Expertise

- Archaeology of Historic
- And Prehistoric Native Americans
- Section 106 of the National Historic Preservation Act
- Archaeological Surveys and Excavations
- Lithic and Ceramic Analysis
- Geomorphology
- Technical Report Production
- Historic Contexts
- Public Involvement

Years of Experience

With URS: 2
With Other Firms: 24

Education

M.A./2007/Temple University/Anthropology

B.A./1988/State University of New York at Albany/Anthropology & Mediterranean Archaeology

Continuing Education

- SRI Foundation- Section 106 Principles and Practice, February 2003

Overview

Mr. Wyatt has 26 years of experience in archaeological investigations and Section 106 of the National Historic Preservation Act in the Middle Atlantic and northeastern United States. Andrew possesses a strong background in archaeological field and laboratory methods along with extensive training and experience in lithic and ceramic analysis and geomorphology. His primary specialization is the study of Native American groups through archaeology and ethnohistory. Although the majority of his work has been focused in Pennsylvania, he been has directed field surveys, artifact analysis, and written technical reports for projects in Delaware, New York, Maryland, Ohio, and Virginia. His current responsibilities include project management, project scoping, proposal, workplan, and technical report preparation. Mr. Wyatt worked at the Pennsylvania State Historic Preservation Office as an archaeological reviewer, gaining a comprehensive understanding of agency coordination under Section 106 as well as the cultural resource management needs and responsibilities of federal and state agencies, private entities, and the public. He is the author or co-author of more than 70 technical reports, 25 professional papers, several peer-reviewed publications, as well as numerous presentations and materials for the general public.

Select Project Experience

Phase IB Archaeological Investigation, Northeast Pocono Reliability Project, PPL Electric Utilities, Northeastern PA: Co-Principal Investigator for a 64-mile electric transmission line right of way and two 100+ acre substations. Tasks include logistical coordination of staff, supervision of fieldwork, report preparation, and SHPO consultation. Identified nine historic Euro-American sites and one Native American archaeological site. Worked with client to avoid those which were potentially eligible for listing on the National Register of Historic Places (NRHP).

Phase I Archaeological Investigation, Clarion Area Wastewater System Upgrade, Pennsylvania-American Water Company, Clarion and Strattanville Boroughs, Clarion and Monroe Townships, Clarion County, PA: Principal Investigator, report author for identification-level survey of eight miles of collection line and wastewater treatment plant upgrade.

Phase IB Archaeological Archaeological Investigation, Rochester Area Reliability Project, Rochester Gas & Electric, Monroe County, NY. Principal Investigator for a 24-mile electric transmission line right of way. Tasks include SHPO consultation, logistical coordination of staff, supervision of fieldwork, and report preparation. Identified two historic Euro-American sites and three

Native American archaeological sites. Worked with client to avoid those which were potentially eligible for listing on the National Register of Historic Places (NRHP).

Phase I Archaeological Archaeological Investigation, MF-42 Gas Line Replacement Project, Rochester Gas & Electric, Monroe County, NY: Principal Investigator for a 1.5 mile natural gas line replacement. Tasks included SHPO consultation, development of costs and scope, logistical coordination of staff, supervision of fieldwork, report preparation. Assisted client by performing investigation within an expedited construction schedule.

Phase I Archaeological Investigations, Cabot Oil and Gas Company, Meshoppen Creek Impoundment, Lemon Township, Wyoming County, PA: Principal Investigator for identification-level survey of a proposed 30-acre freshwater impoundment. Tasks include development of costs and scope, logistical coordination of staff, supervision of fieldwork, report preparation, and SHPO consultation.

Phase I and Limited Phase II Archaeological Investigations, Angelina Gathering Company, N Gathering Line Modifications, Stevens Township, Bradford County, PA: Prinicipal Investigator for identification-level survey and archaeological site boundary definition within natural gas pipeline corridor. Assisted client in avoiding a potentially NRHP-eligible archaeological site within an expedited construction schedule through close coordination with SHPO.

Phase I Archaeological Surveys, Marcellus Shale Gas Development Projects, Williams Field Services Company, Angelina Gathering Company, CONE Gathering, LLC, SWEPI, Northeastern and Western, PA: Served as Principal Investigator for multiple Phase I identification-level surveys in northcentral Pennsylvania. Tasks include development of costs and scope, logistical coordination of staff, supervision of fieldwork, report preparation and SHPO coordination. Projects are ongoing and accomplished under fast-paced timelines for fieldwork and reporting.

Phase I Archaeological Surveys, Marcellus Shale Gas Development Projects, Talisman Energy USA, Bradford, Tioga, and Susquehanna Counties, PA: Served as Principal Investigator, author or co-author of technical reports for Phase I identification-level surveys in north central Pennsylvania.

Phase I/II/III Archaeological Studies at the Lemoyne Site, Norfolk Southern Railway Company, Borough of Lemoyne, and the National Park Service, Cumberland County, PA: Principal Investigator and Field Director for identification, excavation and analysis of an early 17th century A.D. Susquehannock village. Primary technical report author for all phases of investigation and coordinator of an interdisciplinary team of faunal and paleobotanical specialists for Phase III mitigation studies. This project was conducted in advance of new rail line construction by Norfolk Southern on park property owned by the Borough of Lemoyne, with Section 106 oversight by the National Park Service. The investigation resulted in a new perspective on Susquehannock village relocation, chronology, and agricultural practices. Mr. Wyatt also directed public involvement efforts which included site tours, presentations geared toward all ages, and a published booklet explaining the site's importance.

Phase I/II/III Archaeological Studies, S.R. 0056 Transportation Improvement Project, PennDOT and FHWA, Bedford County, PA
Report co-author, primary artifact analyst for three prehistoric Native American quarry-related sites. Developed research strategy and coordinated the work of geologists to chemically characterize local cherts.

Phase II/III Archaeological Studies, PennDOT and FHWA, Schantz Road Realignment, Lehigh County, PA: Principal Investigator and Field Director of Phase III fieldwork on an early Federal period Pennsylvania German farmstead that also contained significant prehistoric Native American occupations.

Managed in-house artifact analysis as well as multidisciplinary team of paleobotanical and lithic use-wear specialists.

Phase III Archaeological Studies, PennDOT and FHWA, Route 309 Connector Project, Bucks & Montgomery Counties, PA: . Primary report author and artifact analyst for Phase III mitigation of a prehistoric Native American site with a strong Late Woodland component. Managed an interdisciplinary team of paleobotanical, lithic use-wear, and protein residue specialists to interpret a short-term ancestral Lenape campsite. Co-produced a booklet for the public detailing archaeological investigations done for the transportation project and its importance for understanding Lenape prehistory.

Phase III Archaeological Studies, PennDOT and FHWA, SR 147 Climbing Lane, Northumberland County, PA: Co-Principal Investigator, primary artifact analyst and technical report author for Phase III mitigation of stratified, multicomponent Native American site on the Susquehanna River floodplain. Managed an interdisciplinary team of pedological, paleobotanical, lithic use-wear, and protein residue analysts. This investigation uncovered rarely-seen evidence for hunter-gatherer storage behavior circa 3500 B.C., and prompted a re-evaluation of Late Archaic settlement patterns in the central Susquehanna River drainage. Project results were widely disseminated through professional papers and presentations for local residents.

Selected Professional Papers and Presentations

Wyatt, Andrew
2012 "Reconsidering Susquehannock Settlement Patterns, Excavations at the Lemoyne Site, Cumberland County, Pennsylvania." Paper presented at the Pennsylvania Archaeological Council Symposium "Recent Research on the Susquehannocks" as part of the 83rd Annual Meeting of the Society for Pennsylvania Archaeology, Clarion, Pennsylvania.

Andrew Wyatt and Barbara J. Shaffer
2010 "Small is Beautiful: Data Recovery Excavations at a Multi-Component Native American Campsite in Montgomery County, Pennsylvania." Poster presented at the 90th Annual Meeting of the Transportation Research Board, Washington, D.C.

Wyatt, Andrew
2009 "Early Seventeenth Century Susquehannock Settlement Patterns Reconsidered: Results from the Lemoyne Borough Memorial Park Site, Cumberland County, Pennsylvania." Paper presented at the 76th Annual Meeting of the Eastern States Archaeological Federation, Johnstown, Pennsylvania.

Wyatt, Andrew
2009 "Final Excavation Results from the Lemoyne Borough Memorial Park Site (36Cu194): A Washington Boro Stage Susquehannock Site in Cumberland County, Pennsylvania." Paper presented at the 80th Annual Meeting of the Society for Pennsylvania Archaeology, Harrisburg, Pennsylvania.

Wyatt, Andrew
2008 "Preliminary Excavation Results from the Lemoyne Borough Memorial Park Site (36Cu194): A Washington Boro Stage Susquehannock Site in Cumberland County, Pennsylvania." Paper presented at the Statewide Conference on Heritage, Harrisburg, Pennsylvania.

Andrew Wyatt, Barbara J. Shaffer, and Joseph S. Hollinger
2008 "Norfolk Southern Rail Connector Project, Lemoyne Borough, Cumberland County, Pennsylvania." Poster presented at the 87th Annual Meeting of the Transportation Research Board, Washington, D.C.

Burns, Jonathan A. and Andrew Wyatt
2007 "Rockshelters as Persistent Places: The View from Camelback." Paper presented at the 78th Annual Meeting of the Society for Pennsylvania Archaeology, Allentown, Pennsylvania.

Andrew Wyatt and Robert Eiswert
2006 "Late Archaic Occupation at the Raker I Site, Northumberland County, Pennsylvania: Implications for Settlement Models in the Central Susquehanna Drainage." Paper presented at the 77th Annual Meeting of the Society for Pennsylvania Archaeology, Washington, Pennsylvania.

Andrew Wyatt and Barbara J. Shaffer
2006 "Archaeological Investigations at the Raker I Site: A Stratified Late Archaic and Late Woodland Site Along the Susquehanna River, Northumberland County, Pennsylvania." Poster presented at the 85th Annual Meeting of the Transportation Research Board, Washington, D.C.

Wyatt, Andrew
2005 "Late Archaic Occupation at the Raker I Site, Northumberland County, Pennsylvania." Paper presented to the Northumberland County Historical Society, Sunbury,Pennsylvania.

Wyatt, Andrew
2004 "Water From A Deeper Well: An Analysis of Final Cordage Twist Direction on Woodland Pottery from the Central and Northern Susquehanna Drainage." Paper presented at the75th Annual Meeting of the Society for Pennsylvania, Clarion, Pennsylvania

Wyatt, Andrew, Francine Arnold, and Barbara Shaffer
2003 "Prehistoric Lithic Reduction Sequencing and Historic Farm Life at the Snook Farm Site (36BD217) and other Sites in Bedford County." Paper presented at the74th Annual Meeting of the Society for Pennsylvania, State College, Pennsylvania

Wyatt, Andrew
2002 "Prehistoric Lithic Workshop Sites on Chestnut Ridge in Bedford County, Pennsylvania." Paper presented at the73rd Annual Meeting of the Society for Pennsylvania, Greensburg, Pennsylvania

Wyatt, Andrew
1998 "A Context for the Significance of the Harding Flats Site." Paper presented at the 65th Annual Meeting of the Eastern States Archaeological Federation, Wilkes-Barre, Pennsylvania.

Wyatt, Andrew
1997 "Early and Middle Woodland Period Settlement Data for the Susquehanna Basin in Pennsylvania." Paper presented at the 68th Annual Meeting of at the Society for Pennsylvania Archaeology, Wilkes-Barre, Pennsylvania.

Wyatt, Andrew
1994 "Preliminary Report on Excavations at the Folk Site, Northumberland County, Pennsylvania." Paper presented at the 65th Annual Meeting of the Society for Pennsylvania Archaeology, Morgantown, Pennsylvania.

Wyatt, Andrew
1993 "The Pennsylvania Compliance Report Database Project." Paper presented at the 64th Annual Meeting of the Society for Pennsylvania Archaeology, Resica Falls, Pennsylvania.

Publications

Wyatt, Andrew and Barbara Shaffer
2013 "Before Lemoyne: A Susquehannock Village in Memorial Park, Lemoyne Borough, Pennsylvania." Prepared for Norfolk Southern Railway Company and the Borough of Lemoyne.

Booklet summarizing excavation and analysis of early 17th century Susquehannock site prepared for the public. Published by Norfolk Southern Railway Company.

Wyatt, Andrew
2012 "Reconsidering Susquehannock Settlement Patterns: Excavations at the Lemoyne Site, Cumberland County, Pennsylvania." *Archaeology of Eastern North America 40.*

Wyatt, Andrew and Barbara Shaffer
2012 "Small is Beautiful: Native American Occupations at 36MG378, Montgomery County, Pennsylvania." Prepared for the Pennsylvania Department of Transportation, Engineering District 6-0, King of Prussia, Pennsylvania. Booklet summarizing excavation and analysis of ancestral Lenape campsite for the public. Published in PennDOT's Byways to the Past Series.

Wyatt, Andrew
2003 Early and Middle Woodland Settlement Data for the Susquehanna Basin. In "Foragers and Farmers of the Early and Middle Woodland Periods in Pennsylvania", edited by P. Raber and V. Cowin. Recent Research in Pennsylvania Archaeology Number 3. Pennsylvania Historical and Museum Commission, Harrisburg.

Professional Societies/Affiliations

- Society for American Archaeology
- Eastern States Archaeological Federation
- Society for Pennsylvania Archaeology

Chronology

- 2012 –present: URS Corporation
- 2012: Navarro & Wright Consulting Engineers, New Cumberland, PA
- 2001-2011: McCormick Taylor, Inc., Harrisburg, PA
- 2000: Department of Anthropology, Temple University, Philadelphia, PA
- 1993-1999: Bureau for Historic Preservation, Pennsylvania Historical and Museum Commission, Harrisburg, PA
- 1991–1993: 3D Environmental Services, Inc., Cincinnati, OH
- 1990: Department of Anthropology, University of Virginia, Charlottesville, VA
- 1989: Collamer & Associates, Inc., Albany, NY
- 1986-1988: Cultural Resource Management Services, State University of New York, Albany

Joel Dworsky

Graduate Archaeologist/GIS Specialist

Area of Expertise

- GIS Database Management
- Section 106 of the National Historic Preservation Act
- Phase I, II, & III Archaeological Surveys and Excavations
- Artifact Identification and
- Interpretation
- Background Project Research
- Human Osteology
- GPS Systems

Years of Experience

With URS: 2
With Other Firms: 7

Education

M.A./2010/ Anthropology, Archaeology/College of William and Mary

B.A./2005/Millersville University/History

Continuing Education

- OSHA 29 CFR 1910.120 HAZWOPER 40-Hour Certification Course (8-hour)
- 8-Hour Annual HAZWOPER Refresher Course (URS Corporation, 2013)
- Williams Pipeline Safety Training
- Shell Safety Training
- Consol Energy Safety Training
- PEC- Safe Gulf/ Safe Land USA Training

Mr. Dworsky joined URS Corporation in 2012 and has 9 years of experience in archaeology and cultural resources management. He has participated in the excavation of sites throughout the Mid-Atlantic Region, and Bermuda. He has previously served as the field and laboratory foreman/manager for Millersville University and oversaw the numerous Phase I, Phase II, and Phase III surveys. At Millersville University he constructed artifact databases, websites, oversaw artifact preservation and cleaning, and instructed student in field techniques and the fine points of field excavation. He also headed up the background research effort for that university conducting research throughout the tri-state area, Bermuda, the UK and Caribbean. As an archaeologist at URS, his responsibilities include fieldwork, in addition to his duties as a GIS specialist wherein he prepares maps, collects GPS data, manages the GIS databases of several projects and insures the accurate integration of field and laboratory data into a cohesive and comprehensive GIS database. Mr. Dworsky is the co-author of several technical reports and professional papers, and his experience encompasses historic and industrial archaeological investigations as well as human osteology.

Project Specific Experience

URS Corporation

Pennsylvania Turnpike Commission - Phase Ib Archaeological Survey for the PTC Turnpike Total Milepost 312 To 31. Co-authored and prepared the addendum report to the initial Phase Ib archaeological assessment which included the identification analysis of two sites in Chester County, PA, one prehistoric and the other a 19th century historic site.

Sunbury Transmission Line Project, Sunbury, Pennsylvania. GIS Analyst. Designed and help to implement a hovel testing strategy for the 33 miles of pipeline ROW that comprise the project APE. Managed and updated the GIS with data coming in from the field and generated new route recommendations based on that data. FERC compelled the section 106 survey of this area in advance of the construction of a gas pipeline proposed by UGI Company. The survey uncovered many prehistoric and historic sites many of which are awaiting Phase II investigation.

Bartram's Garden Monitoring Project. Graduate Archaeologist, Field Archaeologist, GIS analyst. Oversaw the mechanical stripping of areas adjacent to a known prehistoric site along the Schuylkill River in Philadelphia, PA. Discovered new components to the known site. Excavated, mapped and reported new findings in a report addendum.

Constitution Pipeline Project, New York and Pennsylvania. Field archaeologist and GIS specialist for the Phase I survey of a more than 200 mile stretch of northern PA and central NY. FERC conducted the Section 106 survey of this area in advance of the construction of a gas pipeline proposed by Williams Gas Company. The survey uncovered many prehistoric and historic sites many of which are awaiting Phase II investigation.

General Electric Hudson River Project, Fort Edward, New York. Field archaeologist and GIS specialist for the Phase I survey of the Hudson River in the advance of dredging by General Electric. This shore survey was conducted to insure no sites were adversely affected by potential slumping of the riverbank if undermined by dredging activity in the river channel. In addition to the Phase I work, a Phase II study was conducted at Fort Miller, a French and Indian War era fort, located near Lock 5 on the Hudson River. This site was first investigated during the Phase I survey and received further testing because of a proposed processing plant for the decontamination of dredged soils. This Phase II investigation revealed the remains of the builder's trench and posts that comprised two palisade walls, as well as several pit features that contained military artifacts, burnt timbers, and period ceramics. This site is of importance because it was a small provisioning fort for the larger forts upstream and no fort of its kind from this period has been studied. At the present it is unknown if the client will push for a Phase III data collection.

Archaeological Investigations of the I-95/Girard Ave. Improvements Project, Philadelphia, Pennsylvania. GIS Specialist. Study conducted for the Pennsylvania Department of Transportation, Engineering District 6-0. Created GIS generated maps of the ongoing Phase IB, II, and III archaeological investigations along a three-mile long portion of the Interstate 95 highway corridor. Responsibilities include creating maps for a variety of discovered sites, including portions of the former Aramingo Canal prism, the Dyottville Glass Works, multiple 18th and 19th century domestic historic sites, as well as a prehistoric Native American encampment.

Richard Grubb and Associates

Archaeological Investigations at French Town, New Jersey. Field Technician. The work was done for the ACOE and preceded the expansion of an existing sewage treatment plant adjacent to the Delaware River. This Phase II investigation consisted of two deep 2x2 meter test units in deep flood plain soil terminating nearly 2 meter below ground surface. One test unit revealed evidence of Early Archaic occupations in one of the deepest buried "A" horizons.

College of William and Mary

Archaeological Investigations at Whitehall/The John Trimmingham Site, St. Georges, Bermuda. Field Foreman/Teaching Assistant. Performed for the Bermuda National Trust, National Museum of Bermuda, and the St. George Foundation. The work was done as a Phase II investigation of some foundation deposits discovered during the resurfacing of a road in the historic downtown district of St. Georges. The subsequent Phase II testing project undertaken by the College of William and Mary revealed a partial foundation dating to the 17th century. Documentary research revealed the owner of the parcel as one John Trimmingham, a prominent member of colonial St. Georges. One of the most interesting discoveries was two fully articulated bovine carcasses that had been buried beneath a collapsed wall of the house. It turns out that these bovine had suffered from hoof and mouth and were unceremoniously slaughtered and the walls of a ruin push on top of them. This is the only know instance of a livestock burial ever found on the island.

Millersville University

Millersville University Atlantic World Project, Southampton Parish, Bermuda. Field foreman, research director, lab director. This work was done for the National Museum of Bermuda and the Bermuda National Trust as well as the DuPont Foundation. The project consisted of the Phase I & II survey of Dickinson Store site (c. 1730-1800), SN Bermuda, the Phase I survey of the Rectory site (c. 1760-present), SN, Bermuda and the Phase I survey of the Perot Site, Bermuda. The purpose of this project was to examine the homes and store houses of Bermudian merchants known to have ties with Philadelphia merchants. The goal was to seek out evidence of smuggled non-English materials at these sites and/or material links back to Philadelphia. This was part of a larger effort to examine colonial Atlantic trade both legal and illicit from all its aspects including: the nodes of production, distribution and terminal markets. These studies focused on the those nodes of distribution, namely merchant warehouses or slave quarters (enslaved mariners often carried on their own trade in illegal port, and their trade goods like plates, buttons, and bottles, tend to survive better archaeologically than the more perishable goods of their masters, i.e. sugar, flour, rum.) Archaeological evidence was provided for illicit trade with French and Spanish Caribbean possessions that previously was merely a matter of historical footnotes and not wholly quantifiable, these took the form of several types of French faience and Dutch wares, and glass that had no legal avenue into a British possession, save thorough privateering. These findings corroborated the documentary accounts of Bermudian recorded by various government officials both Bermudian and foreign. This research filled a glaring gap in the archaeology of 18th century transatlantic trade, and laid the groundwork for a subsequent Phase II research project.

Millersville University Lancaster Colonial Settlement Project, Lancaster PA. Field Foreman, Instructor, Lab Director. This was done on behalf of Millersville University and the DuPont Foundation. The purpose of this project was to demonstrate the importance of Lancaster County, PA as a culture hearth for the western settlement of the nation. To that end a variety of sites were investigated to illuminate the settlement history of Lancaster County. A series of three locations underwent Phase I survey.

The Mylin Gun shop, the alleged birth place of the Pennsylvania Long Rifle and the homestead of one of Lancaster original settlers, was the initial focus of the project. This survey tested the area surrounding a small building currently hailed as the Mylin gun shop. The survey demonstrated that despite the popular perception, the building was in reality an 18th century blacksmith shop and was not used for gunsmithing. The original homestead of Martin Mylin, the long rifles alleged creator and one of the first settlers in Lancaster, was not discovered during survey.

The second Phase I survey area covered a series of private farms and a Boy Scout camp located upstream of the confluence of the Big and Little Conestoga Rivers. This was the supposed location of James Logan trading post (Logan was William Penn's principal Indian agent). The survey revealed several areas of historic activity but nothing dating to that early 17th century period. The search zone was narrowed to just a few small acres, but due to lack of landowner permission the project proceeded no further.

The final location for Phase I survey, Elizabeth Furnace Iron Plantation, proved to be the most rewarding of the three Phase I surveys. The survey revealed the presence of more than 13 standing early and mid-18th century structures as well as a variety of subsurface features including a furnace race. This furnace race adjacent to the Huber House, c. 1742, became the focus of a Phase II and Phase III investigation which yielded a variety of sealed 18th century strata. The artifacts recovered during the Phase III data collection enabled the discussion of enculturation in the mid-18th century display a shift in immigrant identity from a mostly Germanic identity to a more Anglicized outlook, which was accompanied by a corresponding shift in the preference of material goods.

Subsequent Phase II & Phase III testing of a barracks and adjoining summer kitchen revealed a massive bone midden which housed the remains of the meals from the 75 Hessian prisoners of war that were housed and worked at the furnace after the battle of Trenton. This bone midden revealed the use of primarily communal/yeoman food ways (i.e. Stews, soups) and a mixed diet including all kind of meat from pig, cow, horse, and deer to poultry.

A Phase III investigation and GPR survey or the core grounds of Elizabeth Furnace Plantation revealed the existence of the remains of the 18th century blast furnace, its casting house floor and a subsurface stone arched furnace tail race. The Phase III investigation of the industrial core of Elizabeth Furnace provided insight into the production capacity and scale of industry of this particular iron furnace, and prompted the documentary investigation of its markets and investors. Both the documentary research and archaeological findings suggested that the furnace was producing for a foreign as well as domestic market. The search to understand the scope of this trade network led to Bermuda and the founding of the Millersville Atlantic World Project (See Above)

Professional Societies/Affiliates

Council for Northeast Historical Archaeology
Phi Kappa Phi (Honors Fraternity)

Presentations

"Pennsylvania Colonial Iron Production at Elizabeth Furnace: An Archaeological and Historical Analysis" Middle Atlantic Archaeological Conference. Virginia Beach, Virginia.

Papers

Dworsky, Joel G.
2011 Ghosts on the coast of paradise: Identifying and interpreting the ephemeral remains of Bermuda's 18th century shipyards. Master's Thesis: College of William and Mary, Williamsburg, VA.

Trussell, Timothy and Joel Dworsky.
2007 Deep-Well Excavation: An Archaeological Case Study. *Journal of Middle Atlantic Archaeology Volume 23: 61-72.*

Chronology

- 2012 – Present: URS Corporation
- 2010 – 2010: College of William and Mary
- 2010 – 2010: Richard Grubb and Associates
- 2005 – 2008: Millersville University

URS

Vanessa Zeoli, MHP

Architectural Historian

Area of Expertise

- Cultural Resource Management
- Architectural History Surveys
- Section 106 of the NHPA
- NEPA
- National Register of Historic Places Nominations
- HABS/HAER Documentation
- Historic Preservation Planning

Years of Experience

With URS: 10 months
With Other Firms: 12 years

Education

M.H.P./2007/University of Kentucky/Historic Preservation

Certificate in Historic Preservation/ Bucks County Community College/2005

B.A./1998/Millersville University/History

Continuing Education

- ArcGIS: Introduction, Rutgers University Seminar/2014
- FHWA Program Comment for Common Post-1945 Concrete and Steel Bridges, Webinar/2013
- New Jersey Historic Preservation Conference / 2004, 2011, 2013
- Long Island Railroad Safety Training/2012
- Pennsylvania's Byways to the Past Conference/2012
- Re-pointing Workshop Using Lime Putty Mortar, Pine Mountain, KY/2007
- Kentucky Preservation Conference/2006
- Penn DOT Section 106: Principles and Practice Workshop /2004

Overview

Ms. Zeoli joined URS in July 2013 and has 13 years of experience in historic preservation and cultural resources management throughout the United States. In her position as architectural historian, she has acted as cultural resource liaison between various clients and local, state, and federal review agencies. Ms. Zeoli has completed numerous documentation and regulatory compliance projects including Section 106 studies (including eligibility evaluations, effects assessments, MOAs), NEPA studies (EAs and EISs), historic architectural surveys, HABS/HAER documentation projects, National Register nominations, historic preservation design consultation, and Historic Tax Credit Applications. She has surveyed and evaluated historic properties, evaluated eligibility in accordance with National Register criteria, evaluated project effects, and developed agreement documents to resolve adverse effects. Ms. Zeoli has worked with a wide range of resources in varying settings that include: transportation resources (historic roads, bridges, railroads, and airports); industrial properties (mills, breweries, manufacturing plants); institutional buildings (museums, churches, auditoriums); agricultural properties (farmsteads, tenant houses, cemeteries, rural landscapes); and urban buildings (residential and commercial historic districts). She meets the Secretary of the Interior's Professional Qualification Standards for Architectural Historians [36 CFR 61].

Project Specific Experience

Natural Gas Pipeline Projects in Pennsylvania and New York: Architectural Historian. Prepared eight Section 106 studies for proposed pipeline projects throughout northern Pennsylvania and south and central New York in 2013 and 2014. Work included background research, architectural surveys, inventory forms, eligibility assessments, effects determinations, and coordination with the PA and NY SHPO.

Rochester Gas & Electric Corporation: Russell Station Demolition Project, Greece, New York: Architectural Historian and Principal Investigator. A Historic Resource Inventory Form documenting the history and construction chronology, as well as assessing the significance, integrity and eligibility of the resource. Work included primary and secondary research and intensive-level survey. The station was recommended "Not Eligible" and the NYSHPO concurred in November 2013.

Scotch Plains Baptist Church, Parsonage, and Cemetery National Register Nomination, Scotch Plains, New Jersey: Senior Architectural Historian and Principal Investigator. The NRHP nomination was completed as part of a mitigation effort for alterations to the Route 22 bridge in Scotch Plains Township. The work included primary and secondary research, field investigations, and completion of the NRHP nomination form. The property was listed in the National Register of Historic Places on June 14, 2013.

Chicago Transit Authority (CTA), Wilson Transfer Station Rehabilitation Project, City of Chicago, Illinois: Senior Architectural Historian. Project involved Section 106 compliance for rehabilitation of the historic Wilson Station and reconstruction of 1,200 feet of elevated rail line within the National Register-listed Uptown Square Historic District. The work included an architectural survey, eligibility evaluations, effects assessments, consulting party coordination, and preparation of a Memorandum of Agreement.

Historic Architectural Effects Assessment Report, Potomac Yard Metrorail Station, City of Alexandria, Virginia: Senior Architectural Historian. Project consists of construction of a new Metrorail station adjacent to the National Register-listed George Washington Memorial Parkway. The work consisted of Section 106 and NEPA studies in support of an Environmental Impact Statement. The project also involved extensive consultation efforts with the Virginia Department of Historic Resources, the National Park Service, and other consulting parties.

California High-Speed Train Project, California High-Speed Rail Authority (CAHSRA), Merced to Fresno, California: Architectural History Task Leader. Project involved the preparation of an Environmental Impact Report/Environmental Impact Statement for the design and construction of a high-speed passenger train system for a 60 mile section between Merced and Fresno. Compliance efforts under Section 106 and NEPA involved conducting background research, conducting field survey, compiling data, eligibility evaluations, effects assessments, developing treatment measures, and coordinating with local, state, and federal agencies. Ms. Zeoli was task leader, managing teams in New York and California and was the primary author of numerous technical reports in support of the EIR/EIS including Historic Properties Survey Report (HPSR), Historic Architectural Survey Report (HASR), Finding of Effects Report (FOE), and Built Environment Treatment Plan (BETP).

Chicago Transit Authority (CTA), North Red Line Station Improvements, City of Chicago, Illinois: Architectural Historian. Project involved a Section 106 assessment for the rehabilitation of 8 stations along the North Red Line elevated railroad in the City of Chicago. The work included background research, field survey, National Register of Historic Places eligibility evaluations, effects assessments, and submission of Historic Architectural Screening reports for submission to the Illinois Historic Preservation Agency (IHPA) for review and concurrence.

New Jersey Turnpike Interchange, 6-9 Widening, New Jersey Turnpike Authority (NJTA), Cranbury Township, New Jersey: Architectural Historian. Project involved producing historic signage marking the spot where the newly widened turnpike crosses the National Register-eligible Camden & Amboy Railroad Historic District. The work was completed in compliance with a NJDEP Freshwater Wetlands permit. Work included background research, drafting text for the sign and coordination with the NJSHPO and sign fabricator.

St. Joseph North Pier Inner Light (St. Joseph, MI), Green Bay Harbor Entrance Light (Green Bay, WI), and Grand Marais Light (Grand Marais, MN): Architectural Historian and Photographer. Project was undertaken as mitigation for the replacement of three historic Fresnel lenses with LED lights. Effort consisted of photographic documentation of the lighthouses and lanterns and archival preparation of prints in accordance with each State Historic Preservation Office requirements.

Columbia Pike Transit Initiative, Washington Metropolitan Transit Authority (WMATA), Fairfax County, Virginia: Architectural Historian. Project involved the completion of Section 106 studies to evaluated alternatives that included enhanced bus or streetcar service along a heavily developed commercial and residential corridor, with numerous historic resources. The work included background research, historic architectural survey, and the preparation of approximately 60 reconnaissance-level survey forms for the Virginia Department of Historic Resources.

Cultural Resources Survey: Proposed Shot Tower Metro Station Hardening, City of Baltimore, Maryland: Architectural Historian and Principal Investigator. Project consisted of a Cultural Resources Survey in accordance with Section 106 for the Maryland Transit Authority. Conducted background research, field survey, and prepared a report to documenting and evaluating historic architectural resources in the project area including the Jones Falls Conduit and a portion of the Union Railroad Historic District.

Millhurst Mill HABS Level III Recordation, Manalapan Township, Monmouth County, New Jersey: Senior Architectural Historian. Project involved HABS Level III Recordation of the National Register-eligible, late-nineteenth century flour and feed mill. The project was undertaken to mitigate the adverse effect of the proposed reconstruction of Bridge MN-10 and the rehabilitation of the Millhurst dam. Ms. Zeoli conducted primary and secondary historical research to prepare a detailed history of the site and photographic documentation designed to capture character-defining features of the mill, dam, millpond, and raceway.

St. Peter the Apostle Church Convent, City of New Brunswick, Middlesex County, New Jersey: Historic Preservation consultant for the adaptive reuse of the church convent as a student ministry center. The church and convent were listed on the National Register of Historic Places in 2005 and the subject of an historic preservation easement held by the New Jersey Historic Preservation Trust. Ms. Zeoli coordinated with the Trust and the project team (church, architects, construction manager, and contractors) to ensure compliance with the Secretary of the Interior's Standards for Rehabilitation.

Ralston Cider Mill, Mendham, Morris County, New Jersey: Architectural Historian and Principal Investigator. Project consisted of the preparation of an addendum to the Historic Preservation Plan conducted in anticipation of the reconstruction of the mill's early twentieth century cider distillery. The project also included an investigation of remnant mill equipment (pulley system) and comparative research to determine its previous function. Work consisted of primary and secondary research, comparative analysis, and documentation. The work was funded by the Trustees of the Ralston Cider Mill.

Springfield Avenue Bridge Replacement, Cranford Township, Union County, New Jersey: Architectural Historian. The work consisted of an Intensive-Level Architectural Survey and evaluation of historic architectural resources within the Area of Potential Effects for the proposed replacement of a historic bridge that was a contributor to three National Register-eligible historic districts. The work was completed in compliance with a NJDEP Freshwater Wetlands permit.

Woodford-Fishback-Venable Farm, Winchester, Clark County, Kentucky: Architectural Historian. Prepared the nomination of the early-nineteenth century Woodford-Fishback-Venable Farm to the National Register of Historic Places. Cultural resources on the property boundaries reflect how patterns of traditional diversified agriculture were adapted to natural features in the Inner Bluegrass region. Ms. Zeoli conducted primary and secondary research and prepared the nomination according to the National Register of Historic Places guidelines. The farm was listed on the National Register in July 2008.

Upper Reaches of Boone Creak Rural Historic District, National Register of Historic Places Nomination, Fayette and Clark Counties, KY: Architectural Historian. Project consisted of the preparation of a nomination of the Upper Reaches of Boone Creek Rural Historic District. The district is a 10,742 acre rural historic landscape in Central Kentucky that has been engaged in agricultural pursuits since the settlement period. Ms. Zeoli conducted primary and secondary research, surveyed and photographed the district, and published the nomination according to National Register of Historic Places guidelines. The district was listed in the National Register of Historic Places in July 2009.

Philadelphia Civic Center, HABS Level II Documentation, City of Philadelphia, Pennsylvania: Cultural Resource Specialist and Project Manager. Project consisted of a Level II HABS Documentation of the Philadelphia Civic Center before its demolition in 2005 and its replacement with the Perelman Center for

Advanced Medicine in 2008. Documentation included primary and secondary research, digital photography, recordation of historic features, and narrative description. Ms. Zeoli also assisted a professional photographer with large-format, HABS-quality photography of the building.

Adaptive Reuse of Memorial Hall, City of Philadelphia, Pennsylvania: Draftsman and Conservation Intern. Project consisted of the adaptive reuse of Memorial Hall for the Please Touch Museum. The museum was built in 1875 to serve as the art gallery for the Centennial International Exhibition in Fairmount Park in 1876. It is one of only two remaining buildings out of the over 200 buildings constructed for the Exposition fairgrounds. Ms. Zeoli worked with the preservation architect and architectural conservator to complete a detailed conditions assessment of historic features and prepare construction drawings in preparation for rehabilitation and adaptive reuse of Memorial Hall.

Professional Societies/Affiliates

- Vernacular Architecture Forum/2014
- Lambertville Historical Society/Board Member/2013-Present
- Boston Architectural College/Adjunct Instructor/2012-Present
- Bucks County Community College/Adjunct Instructor/2011-Present
- Bluegrass Trust for Historic Preservation/2006-Present
- Sigma Pi Kappa/Historic Preservation Honor Society/2005-Present
- National Trust for Historic Preservation/2005-Present

Chronology

- 2010–2013: AECOM, Trenton, NJ
- 2009–2010: Richard Grubb & Associates, Cranbury, NJ
- 2007–2009: Cultural Resource Consulting Group, Highland Park, NJ
- Summer 2007: Preservation Services and Technology Group, KY
- Summer 2006: Clark County/Winchester Heritage Commission, KY
- 2005–2007: University of Kentucky/ Historic Preservation Program
- 2001-2005: Bucks County Community College, Newtown, PA
- 2001-2005: Kise Straw & Kolodner, Philadelphia, PA
- 1994-1998: Millersville University, Millersville, PA

Geographic Experience

- New Jersey
- Pennsylvania
- New York
- Rhode Island
- Massachusetts
- Delaware
- Maryland
- Virginia
- Georgia
- Florida
- Kentucky
- Illinois
- Michigan
- Wisconsin
- California

URS

December 1, 2014

Ms. Nancy C. Dutton, Director/SHPO
NH Division of Historical Resources
P.O. Box 2043
Concord, NH 03302-2043
603-271-6435
ndutton@nhdhr.state.nh.us

RE: Request for Project Review
New Hampshire Capitol Corridor Rail and Transit Study
Concord, Merrimack County; Manchester and Nashua, Hillsborough County, NH

Dear Ms. Dutton:

Enclosed, please find a Request for Project Review (RPR) and supplemental documentation for the proposed New Hampshire Capitol Corridor Rail and Transit Study. The New Hampshire Department of Transportation (NHDOT) is working to evaluate a diverse set of rail and bus options for improving connectivity and passenger service between the major population centers of New Hampshire and metropolitan Boston. The Project will evaluate approximately 60-miles of existing railroad in New Hampshire that passes through Concord in Merrimack County and Manchester and Nashua in Hillsborough County, paralleling the Merrimack River the majority of the route.

It is anticipated that the Project will receive funds from the Federal Transportation Administration (FTA) and the Federal Railroad Administration (FRA). Federal licenses, permits, or approvals may also be required as part of this project. As a federally funded/licensed project, the Project is subject to review under Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR Part 800). To satisfy requirements under Section 106, URS has prepared and attached a Phase IA Archaeological Survey and a Reconnaissance-Level Historic Architectural Survey for your review.

If you have questions, please do not hesitate to contact me at 609-386-5444 or via e-mail at joel.dworsky@urs.com .

Yours truly,

Joel G. Dworsky, RPA
Senior Archaeologist / Geospatial Analyst

URS Corporation
Enclosure

Please mail 2 copies of the completed form and required material to:
Cultural Resources Staff
Bureau of Environment
NH Department of Transportation
7 Hazen Drive
Concord, NH 03302

DHR Use Only	
R&C #	______________
Log In Date	____ / ____ / ____
Response Date	____ / ____ / ____
Sent Date	____ / ____ / ____

Request for Project Review by the New Hampshire Division of Historical Resources for Transportation Projects

☒ This is a new submittal.
☐ This is additional information relating to DHR Review and Compliance (R&C) #:

GENERAL PROJECT INFORMATION

DOT Project Name & Number Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) - State Project Numbers 16317 and 63037-A

Brief Descriptive Project Title New Hampshire Capitol Corridor Rail and Transit Study

Project Location (see below)

City/Town Concord, Merrimack County; Manchester and Nashua, Hillsborough County

Lead Federal Agency and Contact *(if applicable)* Federal Railroad Administration (FRA)

Permit Type and Permit or Job Reference #

DOT Environmental Manager *(if applicable)* Ron Crickard

PROJECT SPONSOR INFORMATION

Project Sponsor Name New Hampshire Department of Transportation

Mailing Address 7 Hazen Drive Phone Number 603-352-2302

City Concord State NH Zip 03302 Email pherlihy@dot.state.nh.us

CONTACT PERSON TO RECEIVE RESPONSE

Name/Company Joel Dworsky

Mailing Address 434 High Street Phone Number 609-386-5444

City Burlington State NJ Zip 08016 Email joel.dworsky@urs.com

This form is updated periodically. Please download the current form at http://www.nh.gov/nhdhr/review. *Please refer to the Request for Project Review for Transportation Projects Instructions for direction on completing this form.* Submit 2 copies of this project review form for each project for which review is requested. Include 1 self-addressed stamped envelope to expedite review response. Project submissions will not be accepted via facsimile or e-mail. This form is required. Review request form must be complete for review to begin. Incomplete forms will be sent back to the applicant without comment. Please be aware that this form may only initiate consultation. For some projects, additional information will be needed to complete the Section 106 review. All items and supporting documentation submitted with a review request, including photographs and publications, will be retained by the DOT and the DHR as part of its review records. Items to be kept confidential should be clearly identified. For questions regarding the DHR review process and the DHR's role in it, please visit our website at: http://www.nh.gov/nhdhr/review or contact the R&C Specialist at christina.st.louis@dcr.nh.gov or 603.271.3558.

PROJECTS CANNOT BE PROCESSED WITHOUT THIS INFORMATION

Project Boundaries and Description

- ☒ Attach the relevant portion of a 7.5' USGS Map (photocopied or computer-generated) ***indicating the proposed area of potential effect (APE).*** *(See RPR for Transportation Projects Instructions and R&C FAQs for guidance. Note that the APE is subject to approval by lead federal agency and SHPO.)*
- ☒ Attach a detailed narrative description of the proposed project. *(see attached reports)*
- ☒ Attach current engineering plans with tax parcel, landscape, and building references, and areas of proposed excavation, if available.
- ☒ Attach photos of the project area/APE with photo key (overview of project location and area adjacent to project location, and specific areas of proposed impacts and disturbances.) *(Blank photo logs are available on the DHR website. Informative photo captions can be used in place of a photo log.)*
- ☒ A DHR file review must be conducted to identify properties within or adjacent to the APE. Provide file review results in **Table 1**. *(Blank table forms are available on the DHR website.)*
  File review conducted on 03/06/2014.*

  **The DHR recommends that all survey/National Register nomination forms and their Determination of Eligibility (green) sheets are copied for your use in project development.*

Architecture

Are there any buildings, structures (bridges, walls, culverts, etc.) objects, districts or landscapes within the APE? ☒ Yes ☐ No
If no, skip to Archaeology section. If yes, submit all of the following information:

- ☒ Attach completed **Table 2**. See Table 4-4, page 27
- ☒ Photographs of ***each*** resource or streetscape located within the APE. Add to the photo key and photo log noted above. (Digital photographs are accepted. All photographs must be clear, crisp and focused.)
- ☒ Copies of National Register boundary (listed *or* eligible) mapping, and add National Register boundaries for listed and eligible properties to the 7.5' USGS project map *(if applicable).*

Archaeology

Does the proposed undertaking involve ground-disturbing activity? ☐ Yes ☐ No
If yes, submit all of the following information:

- ☐ Description of current and previous land use and disturbances.
- ☐ Available information concerning known or suspected archaeological resources within the project area (such as cellar holes, wells, foundations, dams, etc.)

Please note that for many projects an architectural and/or archaeological survey or other additional information may be needed to complete the Section 106 process.

AGENCY COMMENT *This Space for DOT and Division of Historical Resources Use Only*

Sent to DHR; Authorized DOT Signature:__________________________ Date: _____________________

☐ Insufficient information to initiate review.

☐ Additional information is needed in order to complete review.

Comments:

If plans change or resources are discovered in the course of this project, you must contact the Division of Historical Resources as required by federal law and regulation.

Authorized DHR Signature:____ Date: ____________________

For supplemental information required as part of the Project Review Form (including Project Boundaries and Description, architectural background information, and archaeological background information), please see Appendix A: Reconnaissance-Level Historic Architectural Survey and Appendix B: Phase IA Archaeological Investigation

ATTACHMENT A

RECONNAISSANCE-LEVEL HISTORIC ARCHITECTURAL SURVEY

ATTACHMENT B

PHASE IA ARCHAEOLOGICAL INVESTIGATION

August 2014

Prepared for:

The New Hampshire Department of Transportation

Phase IA Archaeological Assessment: New Hampshire Capitol Corridor Rail and Transit Study

Hillsborough and Merrimack County, New Hampshire

Prepared by:

URS

Burlington, New Jersey

Phase IA Archaeological Assessment: New Hampshire Capitol Corridor Rail and Transit Study

Prepared for:
The New Hampshire Department of Transportation

Hillsborough and
Merrimack County, New Hampshire

Prepared by:
Joel Dworsky, RPA
Matthew Harris, RPA
and
Andrew Wyatt, RPA

URS
Burlington, New Jersey

August 2014

Abstract

URS Corporation (URS) conducted a Phase IA background data collection and archaeological sensitivity assessment of the proposed construction APEs for the New Hampshire Department of Transportation's Capitol Corridor Rail Transit Study. This report presents the results of a Phase IA sensitivity assessment and field reconnaissance of a project area, spanning the existing rail corridor from Lowell, Massachusetts, to Concord, New Hampshire. This report focuses on the section of the project area located in New Hampshire, contained within Hillsborough and Merrimack Counties, with specific attention paid to the APEs of proposed station and layover locations. All of these proposed APEs were assessed to determine their archaeological sensitivity, accomplished by reviewing the known archaeological resources that occur within six separate study areas in a 1-x-5-kilometer radius surrounding the proposed construction APEs. This effort was combined with a review of the pre-contact and historic contexts of the region and synthesized into determinations of archaeological potential for each study area.

URS assessed the archaeological sensitivity for the six major study areas encompassing the entirety of the proposed project APEs within New Hampshire. Overall, the pre-contact archaeological potential for the study areas remained consistently high, owing in large part to the proximity of the construction APEs to the Merrimack River. Determination of historical archaeological sensitivity varied from low to high potential. Proximity to areas of intensive settlement tended to increase the potential of encountering historic archaeological resources. Historical archaeological sensitivity is subdivided into groups by site function. Of the site types surveyed, the most likely resources to be encountered are related to industry, specifically mills. These resources were frequently situated along the river and its tributaries, from which they derived operational power and transportation. As the extant rail bed follows the course of the Merrimack River, the likelihood of encountering industry-related resources is high. Residential and transportation-related resources have the next highest potential, but such resources were largely confined to study areas near city centers. Farmsteads, while frequently present, were spatially more diffuse and located farther from the river, reducing the likelihood of encountering resources of this type.

URS performed a Phase IA field reconnaissance of the proposed construction APEs in March 2014. This reconnaissance concentrated on documenting the current state of the APEs and identifying any cultural resources that might have been present. The only cultural resource encountered during this reconnaissance was a complex of foundations within the Crown Street APE, in the area slated to become a parking facility. Overall, the APEs were largely contained within the boundaries of the existing rail bed. During the field reconnaissance, the subsurface archaeological potential of the soils within each APE was not investigated. Therefore, Phase IB archaeological survey should be conducted in areas of high or moderate historical and pre-contact archaeological sensitivity where ground-disturbing construction activities are planned. Should the proposed project move forward, URS recommends the following actions:

Concord: Stickney Avenue	High pre-contact and post-contact archaeological potential. URS recommends Phase IB archaeological survey. No further survey recommended in areas currently covered by pavement.

However, if pavement is removed, a Phase IB survey is recommended in these areas, as well.

Manchester: Spring Street	High pre-contact and post-contact archaeological potential. No further survey is recommended, as no ground-disturbing activities are planned. URS recommends a Phase IB survey for any areas where extant soil caps are removed in order to dig footings for the proposed rail platform.
Manchester: Granite Street	High pre-contact and post-contact archaeological potential. URS recommends a Phase IB survey for any areas where extant soil caps are removed in order to dig footings for the proposed rail platform.
Manchester: Granite Street South	High pre-contact and post-contact archaeological potential. No further survey is recommended, as no ground-disturbing activities are planned. If plans are altered to include ground disturbance, then a Phase IB survey is recommended.
Queen City Bridge Layover	High pre-contact and post-contact archaeological potential. No further survey is recommended, as no ground-disturbing activities are planned. If plans are altered to include ground disturbance, then a Phase IB survey is recommended.
Manchester: Cemetery	High pre-contact archaeological potential. Moderate to low post-contact archaeological potential. URS recommends Phase IB archaeological survey.
Manchester: Wastewater Treatment Facility	High pre-contact archaeological potential. Moderate to low post-contact archaeological potential. No further survey is recommended, as no ground-disturbing activities are planned. If plans are altered to include ground disturbance, then a Phase IB survey is necessary.
Manchester: MHT Airport-Ray Wieczorek Drive	High pre-contact archaeological potential. Low post-contact potential except for the high potential of encountering industrial historic resources. No further survey is recommended, as no ground-disturbing activities are planned and the construction APE has been previously surveyed during the construction of the Ray Wieczorek Bridge. If the APE is amended and the new plan calls for ground disturbance in areas not currently contained within the APE or the removal of existing soil caps within the APE, then URS recommends a Phase IB survey as the surrounding area has demonstrated pre-contact potential.

Nashua: Crown Street	High pre-contact and post-contact archaeological potential. URS recommends Phase IB archaeological survey in the area of the proposed parking facility. No further survey recommended in the area of the proposed station location, as it is currently covered by pavement or part of the extant rail bed.
Nashua: Spit Brook	High pre-contact and post-contact archaeological potential. The post-contact archaeological potential while generally low throughout the Nashua South Study Area is high at this location due to the documented presence of a former industrial facility in the proposed project area. 1. Station APE: No further survey recommended. 2. Layover APE: URS recommends Phase IB survey to assess the boundaries and significance of the identified Spit Brook Prehistoric Site. 3. Parking Area APE: Contingent on construction methodology and possibility of grading. If no ground-disturbing activities are planned, than no further survey is recommended. If ground disturbance is possible, than a Phase IB survey is recommended.
Nashua: Pheasant Lane Mall	High pre-contact archaeological potential and low post-contact archaeological potential. URS recommends Phase IB survey. Should construction call for the importation of fill instead of ground disturbance to construct the rail platform, survey will not be necessary. Phase IB is recommended prior to the construction of the proposed parking structure.

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1.0 Introduction

The Federal Railroad Administration (FRA), as the lead federal agency, the Federal Transit Administration, as a cooperating agency, and the New Hampshire Department of Transportation (NHDOT), as project sponsor, are proposing to evaluate the feasibility of developing new rail and transit services in the 73-mile corridor between Boston, Massachusetts, and Concord, New Hampshire (Figure 1). To satisfy requirements under the National Environmental Policy Act (NEPA) of 1969, as amended, NHDOT is preparing an environmental assessment (EA). The New Hampshire Capitol Corridor Rail and Transit Study is a federal undertaking and, as such, is also subject to review under Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, and the implementing regulations in 36 CFR Part 800. To initiate consultation under Section 106 among the FRA, FTA, NHDOT, and the New Hampshire Division of Historic Resources (NHDHR), URS has prepared this Phase IA archaeological assessment. The architectural and archaeological studies will also serve to supplement and inform the EA being completed as part of the NEPA process. The purpose of this reconnaissance-level archaeological survey is to record the presence or absence of previously identified and unidentified cultural resources within the area of potential effects (APE). The Phase IA archaeological assessment has been prepared in accordance with the guidelines set forth by the NHPA and the NHDHR.

1.1 Project Description

As noted above, New Hampshire Capitol Corridor Rail and Transit Study is defining and evaluating opportunities to address transportation needs and preferences that involve transit and rail options in the 73-mile corridor between Boston, Massachusetts, and Concord, New Hampshire. While Massachusetts Bay Transportation Authority (MBTA) commuter rail service currently operates between Boston and Lowell, there has not been passenger service north of Lowell since it was discontinued in 1967. A public-private partnership, supported by the state of New Hampshire, operates roughly 50 daily bus roundtrips within the corridor between New Hampshire and Boston; this service typically carries 1,800 passengers per day.

Increasing transportation demand and growing concerns about mobility, economic development, and quality of life have led the citizens and officials in New Hampshire and Massachusetts to explore options to improve transit service along the northern end of the Capitol Corridor. The NH Capitol Corridor Study is evaluating a diverse set of rail and bus options for improving connectivity in the Capitol Corridor by leveraging existing transportation infrastructure, including Pan Am Railway, Route 3, and I-93. The study, which will be completed in late 2014, will result in the recommendation of a preferred investment strategy that is responsive to local transportation need and the region's economic, social, financial, and environmental context, and that will be competitive for federal construction funding.

This report presents the results of a Phase IA reconnaissance of a project area spanning the existing rail corridor from Lowell, Massachusetts, to Concord, New Hampshire. This report focuses on the section of the project area located within New Hampshire contained within Hillsborough and Merrimack Counties. The project corridor is situated in the Merrimack River Valley and runs parallel to the aforesaid river for its entire course (see Figure 1). URS

Corporation (URS) conducted this Phase IA archaeological assessment under contract with NHDOT. Background research and field reconnaissance for the project was conducted throughout March and April 2014 by Joel Dworsky, Daniel Cassedy, and Andrew Wyatt, under the direction of Matthew Harris, Principal Investigator.

The Capitol Corridor project will ultimately involve the construction of 5 commuter rail stations and one layover location. Additionally, a total of total of 19.4 miles of railroad track modification (Table 1). Though only six sites will ultimately be selected for construction, this report considers 11 potential construction locations from which the final locations will be selected. While new track will be constructed during this project, all work will be limited to the confines of the existing railroad bed. This railroad bed originally was designed to accommodate a set of two parallel tracks, but in 1960, the secondary track was removed and the current rail line contains only one set of track. Given the ability of the existing rail bed to accommodate the additional rail, the bulk of the necessary rail modifications can be completed within the confines of the extant rail bed, so adjacent areas will not be impacted and need not be considered during this study. The proposed station/layover locations, on the other hand, will be new construction and, as such, are the principal focus for the Phase IA reconnaissance. These potential station/layover locations are situated in the towns of Concord, Manchester, and Nashua along the existing rail bed, which runs along the Merrimack River.

Table 1-1 Survey Locations: Potential Stations and Layovers

Site	Stations	Layovers
Concord: Stickney Avenue	X	X
Manchester: Spring Street	X	
Manchester: Granite Street	X	
Manchester: Granite Street South		X
Manchester: Queen City Bridge Layover		X
Manchester: Cemetery		X
Manchester: Wastewater Treatment Facility		X
Manchester: MHT Airport-Ray Wieczorek Drive	X	
Nashua: Crown Street	X	
Nashua: Spit Brook	X	X
Nashua: Pheasant Lane Mall	X	

The primary focus of this report is to present a synthesis of the prior research conducted near, along, and within the study corridor and from that analysis make recommendations on the necessity of further archaeological work. While the project corridor is linear and contained within the Merrimack Valley, it is not continuous. Track modifications and new station/layover locations are clustered near major town/cities and are separated by long expanses of unmodified track. In the areas between these proposed station and layover locations, the existing track will be replaced with modern rails to ensure the structural integrity and therefore safety of the rail line. The route of the track in these areas will not be altered, so there is no potential for adverse effect. For ease of discussion, the project corridor in New Hampshire has been divided into three principal study areas, each named for the largest town in proximity. The northernmost section, Concord, is located within the town of Concord in Merrimack County and centers on a single station location in the center of the city. The middle study area is the largest and falls within Hillsborough County. This study area bears the name of Manchester, which is the principal city in the area. This area contains six of the new station/layover locations, although many of the aforesaid locations occur outside the city center. The southernmost study area, Nashua, is located near the town of Nashua in Hillsborough County and contains three new station locations. Where it is necessary for mapping clarity, these three sections are divided into subsections. While these subsection divisions are used for mapping, they are not used for written descriptions of study areas unless otherwise specified (for section locations see Figure 1).

2.0 Environmental Background

2.1 Physiography, Drainage, Bedrock Geology, and Soils

The study areas are located in the New England Upland Section of the New England physiographic province (Fenneman 1938) and are drained by the Merrimack River. Major tributaries of the Merrimack River within or near the study areas include the Turkey, Soucook, Piscataquog, and Nashua Rivers. All project components are located within the Merrimack River Valley. Glacial outwash terraces and plains, stream terraces, and floodplains of the Merrimack River are the principal landforms.

Late to Early Devonian Concord Granite, composed primarily of gray two-mica granite, underlies Concord and the surrounding area. The primary bedrock mapping unit for Manchester is the Late Proterozoic Massabesic Gneiss Complex. This unit consists of pink biotite grantite intruded into gneissic and granulose metasedimentary and metavolcanic rocks. The area surrounding Nashua is underlain by the two-mica granite of northern and southeastern New Hampshire, which is of a similar age and composition as the Concord Granite. Both the Concord and two-mica granites were formed during the Acadian Orogeny, between circa 465 to 400 million years before present (B.P.) (Bennett et al. 2006). These bedrock units were scoured by the advance of the Laurentide ice sheet during the Wisconsinan glacial cycle and are variably exposed on the surface in uplands (Goldthwait et al. 1951:21–22).

Soil data for the project area was derived from the online Web Soil Survey (2014) and is summarized in
Table 2-1. Urban land is mapped at the Stickney Avenue Station (Concord), and at Spring Street Station, Granite Street Station, and the Wastewater Treatment Facility Layover (Manchester). The urban land mapping unit designates areas in which fill and/or impervious cover comprise more than 85% of the ground surface. In Nashua, Windsor-urban land complex soils are mapped at the Crown Street Station and in a portion of the Split Brook Station and Layover. This mapping unit includes both urban land and the potential for Windsor series soils, the latter of which formed in outwash deposits on glaciofluvial landforms or in aeolian deposits on dunes.

Soil mapping indicative of potentially less-disturbed conditions is present at the following facilities: Cemetery Layover (Manchester), Ray Wieczorek Drive Station (Manchester), Spit Brook Station and Layover (Nashua), and Pheasant Lane Mall Station (Nashua). The Cemetery Layover (Manchester) is predominantly mapped as Windsor loamy sands. This mapping unit is characterized as very deep and excessively well-drained soil formed in outwash deposits on glaciofluvial landforms or in aeolian deposits on dunes. A typical profile exhibits a loamy sand A or Ap horizon overlying a sequence of loamy sand to sand Bw horizons to a depth of approximately 0.64 meters. The lowermost Bw horizon overlies sand C horizon that can extend to 1.65 meters or more. The Cemetery Layover also contains a smaller area mapped as Rippowam fine sandy loam, a very deep, poorly drained soil developed in alluvium on floodplains. A typical profile includes a fine sandy loam Ap horizon overlying gleyed fine sandy loam to loamy sand B and C horizons. Depth to lateral accretion deposits is approximately 0.69 meters.

Table 2-1 - Principal Soil Types within the Proposed APEs

Project Facility	Mapping Unit Name	Depth and Drainage	Genesis and Location

Project Facility	Mapping Unit Name	Depth and Drainage	Genesis and Location
Stickney Avenue Station and Layover	Urban land (85% covered)	No data	No data
Spring Street Station and Platform (Disturbed by RR and other)	Urban land (85% covered)	No data	No data
Granite Street Station (Disturbed by RR and other)	Urban land (85% covered)	No data	No data
Cemetery Layover (Appears intact)	Windsor loamy sand	Very deep, excessively drained	Formed in outwash or aeolian deposits on Late Wisconsinan glaciofluvial landforms or dunes
	Rippowam fine sandy loam	Very deep, poorly drained	Formed in alluvium on floodplains (suggests that Windsor may be mis-mapped)
Wastewater Treatment Facility Layover (Strong potential for RR disturbance)	Urban land (85% covered)	No data	No data
MHT/Ray Wieczorek Drive Station (N. of bridge somewhat disturbed, S. of bridge looks intact w/ Pointer Club Brook confluence, But Dworsky says lots of Phase II work here)	Agawam fine sandy loam	Very deep, well drained	Formed in “water-deposited” materials on outwash plains and high stream terraces
	Ninigret very fine sandy loam	Very deep, moderately well drained	Formed in loamy over gravelly outwash on glaciofluvial landforms
Crown Street Station (Strong potential for factory-related disturbance)	Windsor-Urban land complex	Very deep, excessively drained	Formed in outwash or aeolian deposits on Late Wisconsinan glaciofluvial landforms or dunes
Spit Brook Station and Layover (poss. former Dow Chemical Site Site looks recently landscaped)	Windsor-Urban land complex	Very deep, excessively drained	Formed in outwash or aeolian deposits on Late Wisconsinan glaciofluvial landforms or dunes
	Occum fine sandy loam, high bottom	Very deep, well drained	Formed in recent alluvium on floodplains
	Pootatuck fine sandy loam	Very deep, moderately well drained	Formed in recent alluvium on floodplains
Pheasant Lane Mall Station (Strong potential for RR disturbance)	Suncook loamy fine sand	Very deep, excessively drained	Formed in recent alluvium on floodplains, subsoil consists of C horizons, may contain thin Ab horizons

The dominant soil mapping unit at the Ray Wieczorek Drive Station is Agawam fine sandy loam. This very deep, well-drained soil formed in water-deposited materials on outwash plains and high stream terraces. A typical profile displays a fine sandy loam Ap horizon overlying sandy loam Bw horizons to a depth of approximately 0.66 meters. The Bw horizons are underlain by structureless loamy fine sands to loamy sand C horizons that may include varying amounts of gravel. A smaller area of Ninigret very fine sandy loam is mapped in the southwestern corner of Ray Wieczorek Drive Station. This mapping unit is characterized as very deep, moderately well-drained, and formed in loamy deposits over gravelly outwash on glaciofluvial landforms. A typical profile is similar in most respects to Agawam; however, the depth to the C horizon is shallower in Ningret soils.

The majority of the Spit Brook Station and Layover (Nashua) is mapped as Windsor-urban land complex, discussed above. Smaller areas of Occum fine sandy loam, high bottom, and Pootatuck fine sandy loam are mapped in the southern portion of the proposed facility. Both mapping units are classified as very deep and well drained to moderately well drained, and formed in recent alluvium on floodplains. Profiles for the two mapping units are similar; however, Pootatuck soils tend to displayed features indicative of impeded drainage (e.g., iron masses) and can contain thin Ab horizons.

Soils at Pheasant Lane Mall Station are mapped as Suncook loamy fine sand. This mapping unit is characterized as a very deep and excessively drained soil formed in recent soils on floodplains. A typical profile consists of a loamy fine sand Ap overlying stacked fine to coarse sand C horizons to depths exceeding 1.65 meters. The mapping unit can sometimes contain thin buried A horizons.

2.2 Paleoenvironment

As glacial ice ablated in New Hampshire between circa 14,600 and 12,600 B.P. (Ridge 2003), thick till was emplaced on uplands, and three successively higher proglacial lakes occupied what would become the Merrimack River Valley (Lakes Tyngsboro, Merrimack, and Hooksett from south to north). Koteff et al. (1984) suggests that these lakes drained sometime after 13,000 B.P., and the southern margin of the Laurentide ice sheet retreated from the upper Merrimack drainage by circa 12,000 B.P. (Ridge 2003: Figure 3.7). During this interval, the ancestral Merrimack River began eroding and reworking the glaciolacustrine sediments and constructing a series of lower stream terraces. Aeolian deposition capped stream terrace and proglacial lake deposits in places (Koteff et al. 1984:391–392), a process that continued into the late Holocene based on Dincauze's (1976:10–11) interpretation of soil parent material at the Neville Site.

Low-growing tundra vegetation consisting of mosses, ferns, sedges, and grasses—along with dwarf birch and alder—colonized newly deglaciated landscapes. Pollen-based vegetation reconstructions for northern New England vary regarding the earliest trees to colonize tundra. Davis and Jacobson (1985) indicate open poplar woodland was present near Concord by 13,000 B.P. Davis (1981), however, suggests that spruce dominated the first patchy, open woodlands in southeastern and central New Hampshire between circa 12,700 and 11,800 B.P. In both reconstructions, open woodlands bordered tundra to the west and north. At the same time, a mixed woodland composed of poplar, spruce, and jack pine/red pine existed in the vicinity of Nashua. After 12,000 B.P., the mixed woodland had moved north and west, replacing open woodland in the vicinity of Concord, while more closed forests dominated by spruce (together with fir, birches, and poplar) had developed in southeastern New Hampshire (Davis and Jacobson 1985). Newby et al. (2005) have linked a retraction of spruce/fir forests to southern Maine and southeastern New Hampshire and expansion of tundra between circa 11,000 and 10,000 B.P. to the Younger Dryas climate episode, coinciding with the arrival of Paleoindians in northern New England.

As in the case of flora, faunal communities of the Late Glacial had no modern analogs. These communities were characterized by the association of a number of Late Pleistocene species that are either extinct (e.g., mammoth, mastodon) or regionally extirpated (e.g., caribou) with other species (e.g., deer, moose, black bear) that have persisted in the area into the modern period (Lundelius et al. 1983). Although there is no archaeological evidence in New England for Paleoindian exploitation of mammoth or mastodon, radiocarbon dates for these and other extinct species indicate that they were available to at least the earliest Paleoindian groups. Small fragments of calcined caribou bone have been recovered from the Whipple and Bull Brook Paleoindian sites (Spiess et al. 1998:226).

Rapid warming after the Younger Dryas fostered the arrival of oak, white pine, and maple into northern New England between 10,000 and 9,000 B.P. These species quickly replaced spruce and fir, resulting in a new composition of the closed forests of southeastern New Hampshire and southern Maine that came to be dominated by pine. Hemlock, beech, and birch followed between 9,000 and 8,000 B.P. The growing numbers and density of mast-producing species in early Holocene forests would have increased the carrying capacity of the environment, resulting in higher terrestrial game populations and diversified subsistence opportunities for Native American groups. Between 9,000 and 6,000 B.P., the center of pine abundance moved northwest, and forests composed of pine, birch, maple, beech, and hemlock became dominant. Other mast-bearing trees, hickory and chestnut, arrived in northern New England at 5,000 and 2,000 B.P., respectively (Davis 1981; Gaudreau 1988).

Early historic period vegetation patterns in the Northeast include a conifer-hardwood forest region in the northern sections, and deciduous forests in the southern portions. This modern ecotone extended from southern Maine west along the Massachusetts-New Hampshire border. Pollen records indicate that the ecotone between the two major zones was established in the early Holocene and became more pronounced between 8,000 and 6,000 B.P. While the ecotone was stable from the early Holocene, the species composition of the two forest zones continued to change throughout the late Holocene (Gaudreau 1988).

3.0 General Cultural and Historical Background

3.1 Pre-Contact Background

3.1.1 PALEOINDIAN PERIOD (CIRCA 11,500–9400 B.P.)

Although several sites south of New England (i.e., Meadowcroft, Cactus Hill, Miles Point) may represent pre-Paleoindian habitation sites, the earliest documented occupation of New England and the Maritimes dates to the Paleoindian period, from approximately 11,500 to 9600 B.P. Paleoindian sites are most commonly identified by the presence of distinctive fluted and unfluted laceolate projectile points. Other parts of the toolkit included formal flake tool types and large, bifacial cores. In the greater Northeast, Paleoindian toolkits are marked by a conspicuous use of high-quality cryptocrystalline lithic materials that often originate at considerable distances from their point of discard. The former characteristic is inferred to result from a need for durability over numerous episodes of intensive use at locations distant from sources (Goodyear 1989; Spiess et al. 1998:239–242), while the distances from sites to sources have been used to estimate maximum travel distances.

In a recent synthesis of Paleoindian data for New England and the Maritimes, Spiess et al. (1998: 235–239) proposed a series of five chronological phases for the period based on stylistic changes in projectile forms. The earliest two phases, Bull Brook and Vail-Debert, are roughly coeval. Bull Brook phase fluted points are relatively straight-sided with moderately deep basal concavities and flutes that exceed half the length of the point. Vail-Debert fluted points are generally larger and exhibit the same outline as Bull Brook points, but have deep basal concavities and shorter flutes. Dates for these phases range from circa 11,500 to 10,500 B.P. Fluted points of the following Michaud-Neponset phase are generally narrower and thinner than earlier fluted point styles, display flaring basal ears, and are often fluted to within 10 millimeters of the tip. Crowfield phase fluted points expand markedly from the base, reach maximum width near midpoint, and display long, often multiple flutes. Michaud-Neponset and Crowfield points both display shallow basal concavities compared to Bull Brook and Vail Debert points. Spiess et al. suggested that the Michaud-Neponset phase ranged from 10,310 to 10,070 B.P. The Nicholas phase is the final proposed Paleoindian phase. The Nicholas point is unfluted, small, thin, and expands at the base, similar to Crowfield points. Dates for this phase are few and range from circa 10,120 to 9400 B.P.

In terms of general settlement patterns for the region, Spiess et al. (1998:229–230) have noted that the majority of larger Paleoindian sites contain at least one discrete locus of stone tools and debitage measuring 4 to 8 meters in diameter that are separated by sterile space. The Bull Brook site exhibited 42 such loci, followed by Debert (11 loci), Vail and Michaud (eight loci each), Bull Brook II (six loci). The non-overlapping character of loci suggests that each represent short-term single occupations at each site. Subsistence data is sparse; however, faunal remains from several sites are limited to calcined medium to large mammal bone. Calcined caribou bone has been identified at the Whipple Site, calcined caribou and beaver bone are present at Bull Brook, and calcined caribou, Arctic fox and hare have been identified at the Udora Site in Ontario. Extremely small numbers of carbonized fruit and berry seeds have been recovered from the Michaud and Hedden Sites in Maine. Spiess et al. (1998:223–227) suggested that these data support a model of Paleoindian subsistence that is similar in its broad outlines to ethnographic examples from the subarctic region, featuring specialized caribou hunting in some seasons combined with general foraging at other times.

The Whipple Site, located on an outwash terrace above the Ashuelot River in the southwestern corner of the state, is the most extensively excavated Paleoindian site in New Hampshire (Curran 1984, 1994). The site was comprised of three small, spatially separated loci, all of which produced a wide variety of stone tools types, and two of which contained datable features. Curran assigned the site to the Bull Brook phase of Grimes et al. (1984) based on formal similarities between the Whipple fluted points and those from the Bull Brook Site. Conventional radiocarbon dates from Locus C ranged from 9820 ± 420 B.P. to 11, 430 ± 395 B.P. (Curran 1984:13); however, a weighted mean of three assays yields a date of 10,680±400 B.P. The site contained a large number of calcined cervid bones, three of which were identified as caribou. Speiss et al. (1998:241–242) suggested that the Whipple assemblage is dominated by Champlain Valley chert and appreciable amounts of Munsungun chert from northern Maine, with much lower utilization of more locally available Cheshire quartzite. Curran interpreted the loci as short-term occupations by small family or task groups, and suggests that the loci may not have been coeval based on differing patterns of raw material discard (1984:14–15).

Isolated fluted points and small Paleoindian components have been identified in the Merrimack River Valley. Dincauze (1976:118) reported a fluted point tip from a later context at the Neville Site, and Curran (1994:41–45) described a complete fluted point from potentially intact subsurface contexts at the nearby Smyth Site. Curran (1994:41–43) also discussed the Thornton’s Ferry Sites (27-HB-1, 27-HB-2), both of which are located on sandy glaciofulvial landforms within the former bed of glacial Lake Merrimack. Site 27-HB-2 yielded a single felsite fluted point base, jasper flake tools, and rhyolite debitage in subsoil deposits. At the time of Curran’s reporting, no clearly diagnostic Paleoindian artifacts had been recovered from 27-HB-1; however, chert flake tools and debitage on non-local material were recovered at depth in the subsoil below Middle Archaic types, which were deemed to be possibly Paleoindian. Additional excavation and analysis in 2001 allowed Boisvert and Bennett (2004) to make a convincing case based on stratigraphy, raw material types, and debitage attributes that the site’s lower component is Late Paleoindian in age.

3.1.2 Archaic Period (Circa 9400–2500 B.P.)

The Archaic period exhibits an increase in the density and horizontal dispersal of archaeological remains. It is characterized by a reliance on both animals and wild plant resources, which became increasingly stabilized and broad based over time. Group organization was presumed to still be fairly mobile, making use of seasonally available resources in different areas of the Southeast. Caldwell (1958) has termed the maximizing adaptation (scheduled hunter-forager) to the environment in the Eastern woodlands during the Archaic period “primary forest efficiency.” Group size gradually increased during this period, culminating in a fairly complex society in the Late Archaic.

The Early Archaic period (circa 9400–7000 B.P.) is marked by the end of the Pleistocene glacial climate and extinction of megafauna. To date, evidence of Early Archaic occupations is much more common in southeastern North America than in the Northeast. In addition, the southeastern sequence suggests a transition from Paleoindian to Early Archaic assemblages, which has not yet been demonstrated for the Northeast. Prior to 1970, there was virtually no evidence of any northeastern sites dating to the Early or Middle Archaic periods. In the last three decades, considerable information has been obtained to fill in that gap, but the picture is still incomplete. The period is characterized by greater diversity in projectile point forms and increasing reliance on diverse species of Holocene fauna, including white-tailed deer, anadromous fish, birds, and turtle (Petersen et al. 1986:9).

George Nicholas has been a frequent and vocal proponent of the idea that early Holocene occupations in the Northeast were much more abundant than was previously thought, and that they operated within an environment that was much more productive than originally described. He has identified former glacial lake basins as locations that are likely to have been established as resource-rich mosaics within a changing and somewhat unpredictable early Holocene landscape (Nicholas 1983, 1988).

Early Archaic projectile points have been found in relatively isolated contexts from the Lakes Region of New Hampshire to the lower coastal tributaries of northeastern Massachusetts (Bunker 1988:6). At least three Early Archaic components referable to Robinson's (1992) Gulf of Maine Archaic tradition are known for the Merrimack River Valley. The first to be excavated was the Weirs Beach Site, located at the outlet of Lake Winnipesauke (Bolian 1980; Maymon and Bolian 1992). The stratified Early Archaic component featured large amounts of quartz debitage, cores, steep-bite quartz endscrapers, and groundstone rods. Radiocarbon dates of 9155 ± 395 B.P. and 8985 ± 120 B.P. on wood charcoal from features placed the site in the Early Archaic subperiod. The Eddy Site (27-HB-0078), located on a stream terrace of the Merrimack River, was subjected to test excavations in 1985 in advance of topsoil mining (Bunker 1992). The site yielded a stratified sequence of Middle Archaic through Woodland occupations in the upper meter of alluvial deposits. Between approximately 1 meter and 1.77 meters below surface, four strata were encountered, each of which produced small quartz-dominated assemblages at the upper contacts of each stratum. Tools included unifaces, other flake tools, hammerstones, and one adze fragment. Quartz was the primary lithic material for cores and debitage. Radiocarbon dates on charcoal from 1.29 to 1.62 meters below surface range from 7830 ± 100 B.P. to 7595 ± 120 B.P. In 1993, excavations in the town of Merrimack by Louis Berger & Associates recovered an Early Archaic campsite at Site 27-HB-160 radiocarbon-dated at 8690 +80 B.P. (Carini 1994:IX-1). The site produced an assemblage of early-stage quartz debitage, chert bifacial reduction debris, unifacial tools, nuts, berries, and mammal bones. Neither site yielded projectile points; a minor role for bifaces and stone projectile points appears to be characteristic of pre-Neville complex Middle and Early Archaic occupations of the Gulf of Maine Archaic tradition (Robinson 1992:69).

The Middle Archaic, circa 7000–5000 B.P., is associated with warmer and drier climatic conditions. By this period, modern floral communities were established, characterized by mast-producing hardwoods. Rivers stabilized during this time and wetland and lake areas were reduced in size. Hunting continued to be important, and fish may have become a more predictable resource. There is evidence for shellfish exploitation during this period. Excavations at the Neville Site in Manchester documented the Neville stemmed point type dating to between

7800 and 7000 B.P., and the Stark stemmed point type dating between about 7600 and 6400 B.P. (Dincauze 1976). In addition, the Merrimack point type was identified as dating to the end of the Middle Archaic period, close to 6000 B.P. The Neville and Stark point types are similar in style and age to the Stanly and Morrow Mountain types that Coe (1964) defined earlier in the Southeast, but the Merrimack type appears to be more spatially restricted.

After publication of the Neville Site research, sites and isolated finds associated with these Middle Archaic complexes were increasingly recognized and reported throughout the Northeast. The Neville and Stark types have proved to be relatively common throughout New England. In the lower Merrimack River Valley, excavations at the Eddy Site revealed another substantial Middle Archaic occupation focused on riverine exploitation, and evidence for upland mast forest exploitation is documented at the Smolt Site (Kenyon 1983, 1992). Abundant evidence for lithic reduction activities comes from assemblages recovered from several Middle Archaic sites in the Lakes Region of central New Hampshire (Cassedy 1984; Starbuck 1983).

The accumulated data for the Middle Archaic period in the Northeast suggest that, during this period, the pre-contact inhabitants were forming themselves into distinct bands and settling into defined territories. These bands were establishing base camps and occupying a greater variety of special-purpose sites in a carefully planned seasonal round (Snow 1980:183). Evidence for the first use of coastal resources, such as shellfish beds, appeared during this period. Several new tool types were developed during this period, including woodworking tools, such as gouges and axes, and large groundstone semi-lunar knives, commonly known by the Eskimo name, “ulu.”

The Late Archaic period is generally dated circa 5000–2500 B.P. Prior to the 1960s, Late Archaic sites were virtually the only Archaic period sites recognized in the Northeast. William Ritchie’s work at sites like Lamoka Lake in New York had produced his seminal definition of an “Archaic” stage of culture in North American prehistory (Ritchie 1932, 1936), but no earlier complexes were known.

Throughout the Northeast, archaeologists now recognize the Late Archaic period as one in which the numbers and types of sites increased dramatically—what Snow (1980:187) described as the Late Archaic “florescence.” Unlike earlier time periods, anyone interpreting Late Archaic assemblages must contend with a sometimes confusing and complex array of data. Based on his work in New York, Ritchie (1994) recognized two major Late Archaic trajectories, the Lamoka and the Laurentian, which overlap in both time and space. Both trajectories are also represented in New England.

Although Ritchie believed Lamoka to be the oldest Late Archaic tradition, more recent research has documented that Laurentian manifestations appeared as early as the last centuries of the sixth millennium B.P. Initially, the Laurentian was subdivided into three phases—Vergennes, Brewerton, and Vosburg—based on projectile point morphology and, to some degree, chronology. These phases extend from about 5500 to 4300 B.P. (Funk 1988:36). Subsequently, the discovery of Otter Creek and Brewerton Side Notched projectile points dating to the fifth and early sixth millennia B.P. led Funk to posit a “Proto-Laurentian” assemblage composed of “broad side notched points with ground bases and notches generally resembling Otter Creek and Brewerton side notched points” (Funk 1988:29), along with “biface knives, a variety of unifacial end and side scrapers, and common forms of 'rough stone' tools such as hammerstones and pitted stones"(Funk 1991:9). Funk and others (Tuck 1977:37) suggested that the Proto-Laurentian assemblages are "closely allied with Middle Archaic complexes of the Southeast and Midwest, chiefly identified by Raddatz, Modoc Side Notched, Big Sandy, and other large, notched points similar to the Otter Creek type" (Funk 1991:9).

What Ritchie first defined as the Lamoka culture in the Finger Lakes region has been shown to be associated with a horizon of small, narrow-stemmed projectile points that extends across southern New England, and includes such types as the Sylvan and Wading River forms from the Hudson Valley and southeastern New York, as well as the Squibnocket complex from southern New England.

Following Tuck's (1978) definition of the Lamoka/Sylvan/Squibnocket complexes of central and southern New York and New England as the "Mast Forest Archaic," Snow (1980:226) proposed that we designate the Laurentian complex and related assemblages in northern New England and the St. Lawrence drainage as the "Lake Forest Archaic." As Snow described them, these two complexes coexisted, but each was more common within a particular geographic region. This scheme supposes that there was a "marginal belt of tension between the two coeval zones that persisted throughout the Late Archaic" (Snow 1980:227).

Site density increased relative to the preceding Middle Archaic, although there is no substantial shift in site location (Bunker 1988:11). The subsistence base of the Mast Forest tradition probably consisted of a generalized or diffuse adaptation (Dincauze 1974, 1975). Although white-tailed deer were a major source of food during the Mast Forest Archaic, these were supplemented by a broad range of vegetal foods, particularly nuts, and a broad range of finfish and shellfish resources. Evidence of technological innovations, such as weirs and nets, first appeared in the Late Archaic. Extensive salt marshes developed along the coast and at river mouths, providing a stable environment for increased exploitation of shellfish. Population of coastal areas appears to have increased dramatically at this time, particularly near the end of the Late Archaic period. Sites dating to the Late Archaic have been found throughout the Lakes Region and the Merrimack River drainage, as well as in the lower Androscoggin Valley. Carini (1994:IX-9) categorized these into "large base camps, small seasonal camps, and both large and small specialized resource procurement stations."

The end of the Archaic has also been commonly called the "Transitional," in reference to its presumed transitional status between the Archaic and Woodland periods. Since research continues to indicate that there is actually a great deal of cultural and biological continuity between the Archaic and the Woodland periods, Snow (1980:235) has suggested that the label "Terminal Archaic" is more appropriate.

As Snow defined it, the hallmark of the early part of the Terminal Archaic is the Susquehanna tradition of broad-stemmed projectile points and their associated assemblages. These points include several regional varieties, including the Genesee, Perkiomen, Snook Kill, and Susquehanna Broad types in New York. This Susquehanna tradition of broad-stemmed projectile points is analogous to Coe's (1964) Savannah River type from the southeastern United States. Characteristics of the Susquehanna tradition include a marked preference for a riverine adaptation and a predilection for the fine-grained lithic resources of the Piedmont province, including rhyolite, felsite, argillite, and slate (Dincauze 1975:27; Turnbaugh 1975:54).

The latter portion of the Terminal Archaic period is marked by the appearance of narrow, tapered Orient Fishtail projectile points. Named for the type locations at Orient Point on eastern Long Island, Orient Fishtail points tend to be found on Long Island, in the Hudson Valley, and in southern New England (Ritchie 1971).

A marked increase in ritualistic behavior is also a feature of the Terminal Archaic cultures. Red ochre cremation burials with an assortment of grave goods are common from sites of this period in northern Massachusetts, and a cremation burial containing a broad-bladed point was excavated from the Litchfield Site, southeast of the current project (Bunker 1988).

Another hallmark of the Terminal Archaic is the appearance of steatite (soapstone) cooking vessels toward the end of the Susquehanna tradition (which continued throughout the Orient tradition). The presence of these large steatite vessels suggests that "the people who made, traded, and used [them] had reached a point in the evolution of their settlement and subsistence systems where the use of heavy cooking vessels was advantageous" (Snow 1980:240). This implies that these people lived in more sedentary settlements, utilizing foodstuffs that required long processing with heat.

3.1.3 Woodland Period (Circa 2500–300 B.P.)

The Early Woodland period in much of the Northeast is represented by the Meadowood phase, with its distinctive, thin, side-notched projectile points and the first widespread appearance of ceramic vessels. This pottery, which has been given the type name Vinette I, appears on some Terminal Archaic sites, but did not become common until the Meadowood phase. The presence of pottery has long been one of the key defining attributes to separate sites of the Woodland period from those of the Archaic, in the absence of radiocarbon dates or chronologically distinctive stone artifacts. In addition to Meadowood projectile points, Adena, Rossville, and Lagoon points are also associated with this time period. Rossville and Lagoon points are particularly common on Early Woodland sites in the coastal areas of southern New England and Long Island Sound.

Early Woodland cultures in New England show considerable variation from the patterns seen in central and western New York. Sites in the latter regions show much greater participation in widespread trade networks that extended from the Gulf of Mexico to the Great Lakes. Exotic seashells, distinctive types of stone, and native metals like copper and lead moved between the far-flung reaches of the network. This trade network was also associated with an elaborate mortuary ceremonialism that included burying many of the exotic traded items in graves with the dead. The presumed core of this system was the Adena tradition of the Ohio River drainage, to which numerous elaborate sites with well-stocked graves have been attributed.

Adena/Middlesex-related burial sites have been found as far east as New England and the Maritime provinces, where they appear to be most common in the St. Lawrence and Connecticut River drainages. Cemetery sites near Lake Champlain and in New Brunswick have yielded a wide variety of objects associated with this complex, such as blocked-end smoking pipes, copper and shell ornaments, as well as stone tools from distant sources, such as Indiana, Ohio, Ontario, and Quebec.

Throughout the Northeast, Early Woodland habitation sites are generally less common than the cemetery site, which has skewed the picture of the pre-contact lifestyles for this period. Many Northeastern Early Woodland burial sites actually predate classic Adena in Ohio, and it is likely that the Early Woodland manifestations in this region represent a complex interplay of traditions. Early ceramic vessels tend to be thin and grit tempered. Settlement patterns, at least in the earliest portion of the Woodland period, exhibit little variation from preceding Archaic patterns (Kenyon and McDowell 1983:21).

By the time of the Middle Woodland period, significant changes in subsistence practices began to appear in much of eastern North America. The use of plant foods started to intensify, and the cultivation of domesticated plants spread into the region between 1500 and 1000 B.P. This was often accompanied by increased sedentism in the settlement pattern, as people began to live in larger congregations for longer periods of time. Northern New England appears to have been situated on the climatic and cultural margins of plant cultivation, and it is still not clear how extensive a role domesticated plants played in the late pre-contact subsistence strategy. Seasonal shifts in settlement and subsistence may have characterized much of eastern New England. Inhabitants may have alternated between coastal resources in the fall, winter, and spring, and interior resources during the summer months (Bourque 1973; Snow 1980:301). Settlements in the later Woodland appear to have been localized, and there is no evidence for long-distance trade until the arrival of Europeans (Snow 1980:319), with the possible exception of lithic raw material. A slow trend toward population nucleation and increased sedentism characterizes the Woodland period, especially near the coast and along estuary heads (Lavin 1988:110, 114).

Local quartz was commonly utilized for stone tools throughout the Woodland period, but non-local materials, such as jasper and chalcedony, were also used. The earliest Middle Woodland point types include Fox Creek and Jack’s Reef, and triangular Levanna points began to be used circa A.D. 800–1000. Near the end of the Late Woodland period, smaller Madison triangular points became common. At approximately the same time, the ceramic technology shifted from elongated, thick-walled vessels to globular, thin-walled vessels. The shoulders and collars of these vessels were often incised and appliquéd with elaborate decorations.

The late pre-contact and early contact period native inhabitants of northern New Hampshire belonged to the Algonkian culture, which encompassed much of the Northeast beyond the Iroquoian tribes of New York and the St. Lawrence River. European explorers made contact with the natives in the New Hampshire coastal region in the early seventeenth century. In the first few decades of the seventeenth century, European settlement of the coastal region began, and the diseases they brought with them decimated much of the native population. Most of the survivors of the waves of epidemics moved west and north, and were combined and absorbed with other refugee groups in Canada, western Massachusetts, and eastern New York.

3.2 Historic Background

3.2.1 CONCORD

King Charles I initially granted the territory that would become Concord, New Hampshire, to the Massachusetts Bay Colony in 1629 (Lyford 1903:95). However, the first settlement in the region did not occur until 1695, when Judge Samuel Sewell established a farm in the region under a grant from Governor John Endicott of Massachusetts. Unfortunately, the validity of the grant came into question as New Hampshire had become an independent colony in 1679 and also laid claim to the territory (Lyford 1903:99). Competing claims for the territory between Massachusetts and New Hampshire plagued the region though the end of the century. Additionally, a series of bloody wars with the Native American inhabitants of the region had raged along the frontier for much of the latter portion of the seventeenth century and well into the eighteenth century, which further frustrated settlement (Lyford 1903:101). Therefore, European settlers were not successful at establishing a foothold in the region that would become Concord until near the end of the first quarter of the eighteenth century.

In January 1725, the colony of Massachusetts Bay granted the parcel of land upon which Concord now stands as the Penacook Plantation (named after the Native American tribe that inhabited the region or had prior to the aforementioned wars), despite continuing conflicting claims from New Hampshire (Lyford 1903:96–106). Captain Ebenezer Eastman and his cohorts settled this new land grant; the resulting settlement grew quickly, establishing a small sawmill and gristmill along Mill Brook, which provided the materials and food the growing settlement needed (Lyford 1903:121, 125–126). Over the next decade, the settlement known as the Penacook Plantation grew substantially, and in January 1734, it was incorporated as a town to be known thereafter as Rumford (Lyford 1903: 136–137; Moore 1824:15). During the years to follow, the issue of the location of the boundary between New Hampshire and Massachusetts became hotly debated (Lyford 1903:152). Unable to come to an agreement among themselves, the two colonies set the dispute before the king, who redrew the boundary in 1740 (Lyford 1903:156). This new boundary line found the newly established Massachusetts township of Rumford cut off from Massachusetts and completely contained within the colony of New Hampshire (Lyford 1903:156–157). Boundary disputes soon arose between the town of Rumford and the New Hampshire town of Bow, located just to the south, whose charter from New Hampshire contained the same land given to Rumford by Massachusetts (Lyford 1903:156, 188–189). These bitter debates continued from 1749 all the way to 1771, when Rumford came to an agreement with the propitiators of Bow, in which they essentially repurchased the land they were living on (Lyford 1903:193, 215–216; Moore 1824:30). Despite the legal conflicts, in May 1765, Concord was created as a parish within Bow, though it was not until 1784 that the parish of Concord officially became a town (Lyford 1903:192, 222–223, 239; Bacon 1890:5; Moore 1824:44, 31–34).

The mid-eighteenth century saw a renewal of conflicts with the Native Americans and the French. Kings George's War, 1742–1749, pitted New England against the French colonies in nearby Canada (Lyford 1903:168). Men from the town of Rumford found themselves a part of the New Hampshire militia and engaged in numerous campaigns, including the siege at Louisburg (Lyford 1903:168–169). During this period, the town of Rumford established a

Garrison and erected fortifications to defend against attacks from the French and their native allies (Moore 1824:21). In 1746, a small force of Native Americans from St. Francis, Canada, attacked the town, resulting in the deaths of five citizens of Rumford (Lyford 1903:175–177; Moore 1824:23–25). Over the following years of the conflict, citizens of Rumford were constantly anxious about attack and had to be ever vigilant of assault, even while pursuing the most mundane agricultural chore, as enemies of the Crown were constantly moving through the region raiding or laying in ambush (Lyford 1903:182; Moore 1824:20, 27). Mercifully, peace came in 1748 with the Peace of Aix-la-Chapelle, and life in Rumford resumed a more normal pace (Lyford 1903:183). The peace in the colonies was short lived, however. In 1754, aggression between Britain and France renewed in the colonies, leading to the conflict that would become known as the French and Indian War (Lyford 1903:222). Once again, the people of Rumford had to look over their shoulders for fear of attack (Lyford 1903: 226). Throughout the ensuing conflict, armies and raiders from both sides roamed across Pennsylvania, New York, New England, and Canada; Rumford, being situated on the frontier, was always under threat (Lyford 1903:222–237).

In the latter half of the eighteenth century, Concord became a prosperous agrarian town. In 1790, the General Court removed to Concord because it was centrally located within the state. Some 18 years later, in 1808, it was officially selected to be the new capital of the state (Bacon 1890:6; Heald 2007:32). The moving of the capital to Concord brought new people, money and opportunities to the community. In order to better connect the new capital to the rest of the state, a plethora of new roads were devised. In 1794, the first stage line was established, with connections down to Boston (Lyford 1903:833). Six new turnpikes chartered between 1796 and 1809 conveyed people directly to Concord (Lyford 1903:833). However, the situation of the town above a series of large waterfalls in the Merrimack River prevented it from shipping large amounts of freight downstream to profitable markets like Boston. These navigational impediments isolated Concord and stifled the growth of industry. However, in 1807, Samuel Blodgett completed a canal lock around Amoskeag Falls to the south; he opened up the Merrimack River for Concord, eventually connecting them to the newly established Middlesex Canal (Mower 1991; Lyford 1903:834). Blodgett’s lock around Amoskeag Falls opened Concord up to river commerce with towns all the way down to Boston. When the first regular freight ship made its way up through the newly completed Middlesex Canal to Concord in June 1815, everything changed, as there were suddenly more economic opportunities and markets available (Bacon 1890:6; Mower 1991; Lyford 1903:836). The growing city of Boston required raw material that the frontier towns along the Merrimack, including Concord, could provide. Timber, foodstuffs, and building materials like granite were shipped downstream from Concord through the canals to Boston. In return, finished goods and exotic foodstuffs flowed back up river to Concord (Lyford 1903:836–837).

With the arrival of the Boston-Concord Railroad in the region in 1842, the future of Concord was again altered (Bacon 1890:6; Bouton 1875:17; Lyford 1903:838). The town was now just a two-hour ride away from Boston (Bacon 1890:27). This advance meant that people and goods could be moved even faster than they could by boat through the canals, which could at the time take up to a week to get to Boston (Bouton 1875:9). This eventually spelled the end of the Middlesex Canal, which ceased operation in 1851 (Mower 1991). As an increasing number of rail connections were made to Concord with the additions of the Concord and Montréal (1869) and

Northern Railroads, its importance as a transportation hub grew and the markets for its economic output drastically expanded (Heald 2007:25). As Concord became a major railroad hub, the various rail lines that passed through the towns set up rail yards, depots, and maintenance facilities, adding yet another type of commercial activity to the Concord economy (Bacon 1890:27). These rail facilities hastened the growth of local foundries, casting houses, and machine shops that produced parts and tools for the railroad (Bacon 1890:68). All of this growth caused the citizens of Concord to incorporate themselves as a city in 1853 (Bouton 1875:17). In the late nineteenth century, Concord—already a major railroad depot—became a stopover on the way to the summer getaways in the White Mountains, which the newly consolidated rail lines of the Boston-Maine had made even more accessible to earnest vacationers (Heald 2007: 25, 32).

In the first half of the nineteenth century, dozens of hotels and taverns emerged in downtown Concord, catering to the throngs of businessmen, travelers, diplomats, and politicians that now frequented the town. These establishments first emerged with the coming of the stage lines, but continued to service patrons throughout the nineteenth century (Lyford 1903:853–865). One such hotel was the Eagle Hotel, which began life in 1827 as the Eagle Coffee House, but was subsequently enlarged in 1832. This site was the scene of many balls and social events, and often plays were preformed within its halls for the entertainment of the community (Lyford 1903:861). Sadly, the Eagle Coffee House burned in 1851 (Lyford 1903:862). The Eagle Hotel rose from its ashes and was completed in 1852. This new hotel successfully catered to visitors to Concord throughout the nineteenth century and was expanded in 1890 (Eagle Investment Trust 1970; Lyford 1903:862). The Eagle Hotel continued to operate as a lodging house for travelers to Concord until 1961, when it closed for good (Eagle Investment Trust 1970).

During the course of the nineteenth century, Concord established a wide variety of industries. Several large cotton mill complexes were erected, including the Haley Manufacturing Company, Holden Manufacturing Company, and the Concord Manufacturing Company (Bacon 1890: 27; Bouton 1875:11–12). However, Concord's economy was not centered on cotton production. During this century, Concord was best known as the producers of fine coaches and wagons, starting with Abbot & Downing Company. Abbot & Downing Company produced all manner of coaches and wagons that were utilized on the east coast, but also produced the stage coaches operated by Wells Fargo on the western frontier. Additional companies—like Concord Coach, Concord Carriage Company, Concord Harness, and Concord Axle—all soon followed and flourished in Concord, making it a key location in the horse-drawn transportation industry (Bacon 1890: 27). Leather work became important to the economy, and in 1872, the Page Belting Company moved its operations to Concord (Bacon 1890:26; Bouton 1875:13). The New England Granite Company found its home in Concord and from there distributed its stone throughout the northeast, where it has found its way into countless buildings across the country (Bacon 1890:27; Bouton 1875:13). Furniture making became a large portion of the economy in the nineteenth century (Bacon 1890: 27). Even the production of musical instruments became important to the economy when the Prescott Organ Company established itself in Concord (Bacon 1890:27; Bouton 1875:13). While other industrial towns in New Hampshire were focusing on cotton, Concord took a more diversified approach, and while cotton played a role, it was far from the dominant industry.

At the start of the twentieth century, Concord's economy began to change once more. The cotton production industry—a facet of Concord's economy—failed after World War I as the cotton industry moved to the South, eliminating the transportation cost for raw materials. The cost of importing raw material to the mills for northern manufactures was exorbitant compared to its ready availability in the South. Southern mills could therefore produce the same product for considerably less than their northern counterparts. Confronted with the new economic reality, northern mills could no longer compete (Singleton 1997:132). Many of the cotton mills in Concord closed during this first quarter of the twentieth century. As the automobile came to replace the horse-drawn wagon and stage coach, those industries too faltered and passed into history.

During this time, Concord began to lean more heavily upon the railroad as the cornerstone of their economy, a dependence that had begun in earnest near the close of the nineteenth century. Industries like granite quarrying remained unaffected and persist to this day. The twentieth century also saw the introduction of the insurance industry to Concord, which remains a major part of its modern economy (New Hampshire Employment Security 2013). As the automobile came to prominence, replacing the rail lines as the dominant method of personal transportation, those industries associated with the railroads atrophied and disappeared. This could have been detrimental to Concord's economy, but even as these railroad-associated manufacturing industries were vanishing, new industrial manufacturing concerns began moving in to take their place. In the 1960s, the Sprague Electric Company began creating semi-conductors for use in electronics in Concord, creating a new industrial opportunity and establishing a foothold for Concord in the newly developing electronics industry (Lojek 2007:205). While the insurance and electronics industry remain important to Concord today, they have been eclipsed by economic opportunities in the government, education, retail, and healthcare industries that have become the driving force of the Concord economy in the twenty-first century (New Hampshire Employment Security 2013).

3.2.2 MANCHESTER

The initial influx of European settlers into the region that would become Manchester came via settlers following the extant Native American trails north through the Merrimack Valley from Massachusetts, traveling as far north as Amoskeag Falls, the site of well-known and long-used native fishing grounds. During the late seventeenth century, the first wave of Euro-American settlers were drawn to the area around Amoskeag Falls by the promise of rich fishing grounds. They soon discovered that the Merrimack River's plentiful floodplains and upland terraces offered further agricultural opportunities. The resulting settlement of the region occurred as the area was divided into farmsteads, resulting in the first real permanent settlements in the area around the dawn of the eighteenth century (Willey 1895). As settlement of the area grew, entrepreneuring settlers also availed themselves of the numerous streams and creeks feeding into the Merrimack River to power small mills. In fact, the region was so rich in resources, it became the subject of numerous land disputes between settlers and the Crown, the local Penacook Native Americans, as well as other colonies, like Massachusetts—all of whom debated ownership though much of the later portion of the seventeenth century and throughout the first half of the eighteenth century (Anonymous 1875; Blood 1948:35; Browne 1901:7).

The area that became Manchester was initially dubbed Nutfield because of the great forests of chestnut trees that blanket the eastern bank of the Merrimack River (Hazlett 1915; Willey 1896). It was not until 1722, however, that the area received an official land grant from the provincial governor of New Hampshire, who renamed the region Londonderry. This grant was secured by a collective of 16 Scottish families who had arrived in the region as early as 1719 (Anonymous 1961; Browne 1901; Hazlett 1915; Bunker 1997:7). This same year, John Goffe, Jr., and members of his extended family established a settlement near the place where the Cohas Brook joins the Merrimack (Clarke 1875; Potter 1856). An additional wave of English settlers populated the area to the north near Amoskeag Falls (Clarke 1875). The expanse of land between the Cohas Brook and Amoskeag Falls was principally used for grazing cattle and was known as Derry's Field. In 1751, a new town charter was established in this location, and this former pasture land became the town of Derryfield, the forerunner of Manchester City.

During this early period of settlement, the economy of the area was firmly settled around agriculture. However, as settlement increased in the early part of the eighteenth century, the demand for timber and grain processing grew. This new need triggered the creation of a string of saw and gristmills along the Cohas Brook, the fast-flowing waters of which provided ample waterpower for the mill operations. These milling ventures were spearheaded by settlers like Ephraim Hildreth (circa 1735) and John Goffe (circa 1749) (Potter 1856:657–658; Bunker 1997:9). As these mills grew in importance, roads along the Merrimack River and Cohas Brook were established to help facilitate the flow of finished goods to the community. Additionally, a ferry was established near the mouth of the Cohas Brook, enabling the speedy transfer of goods and people across the Merrimac to the neighboring community of Bedford. This increased mobility opened up larger markets for the mill goods and inspired others to invest in industry. At the dawn of the nineteenth century, the fledgling Middlesex Canal was beginning to provide cheap, efficient river traffic down the Merrimack River to Boston, but the great Amoskeag Falls remained an impediment. In 1807, as discussed above, the visionary Samuel Blodgett removed this final hurdle when he opened the Amoskeag Canal, the first canal lock around Amoskeag Falls (Mower 1991). These infrastructure improvements led to the creation of large industrial mills in Derryfield. In 1809, Benjamin Pritchard, Robert Stevens, and Ephraim David established a cotton spinning mill along the western bank of the Merrimack, near Amoskeag Falls (Potter 1856:545). Additional mills soon followed along the eastern bank. After a rocky start, the Amoskeag Cotton Woolen Manufacturing Company (the company started by Pritchard and his associates) changed hands in 1831 and became known as the Amoskeag Manufacturing Company, which quickly improved, diversified, and modernized operations.

In 1810, around the same time as the first mills were being established along the Merrimack, Derryfield was rechristened Manchester after the first industrial town in England, whose model of industrial prosperity the residents of Derryfield (like Samuel Blodgett) hoped to emulate (Potter 1856:543). As the mills grew, they attracted more people to work in them, mostly from French Canada to the north, and the need for housing boomed. In a few short years following the chartering of the new Amoskeag Manufacturing Company, the town of Manchester had been utterly transformed. The company had created a new wing dam around the falls, increasing its power output, and after purchasing most of the eastern shore near the falls, had built two new canals capable of handling increased river traffic (Potter 1856:551–552). In 1838, a new mill corporation, the Stark Mills, established the first cotton mill building on the east bank of the

Merrimack (Potter 1856:565). The mill was a success and its initial building, Stark Mill No. 1, was expanded in 1843. Eventually a second building was added, Stark Mill No. 2, in 1847.

This rapid expansion of Manchester's industry drew even more people to work in the mills, so in 1839, the Amoskeag Manufacturing Company took it upon themselves to create a company town surrounding the mills and centered on the newly created Elm Street, which was to serve as the new main road for the town (Potter 1856:593). This town was situated on the eastern bank of the Merrimack to the east of the canals. Its placement necessitated a means across the river for the workers to access the mills. Thus, in 1840, the Granite Street Bridge was built. It remained a toll bridge until 1847, when Granite Street was laid out as a public highway (Potter 1856:711). As industry and settlement in the area continued to grow, so too did Manchester. By 1846, the town of Manchester had grown into a city and was incorporated as such in June of that year (Potter 1856:629).

In 1815, the completion of the Middlesex Canal system opened the river for barge traffic between Concord and Lowell, Massachusetts. Until its abandonment in 1851, the canal linked the Derryfield area with commercial centers, such as Nashua and the industrial towns of northern Massachusetts, greatly increasing its export capacity and expanding the regional market (Mower 1991). While the canals were increasing the mobility of freight, newly constructed roads were enhancing the mobility of people. The 1805 charter of the Middlesex Turnpike, which largely paralleled the canal system along the Merrimack, provided road access all the way down to Boston. After a contentious debate over its creation, the people of Manchester finally agreed to the establishment of the Mammoth Road, a stage line that ran daily stages between Concord and Boston (Willey 1896: 66–67). However, with the establishment of the Concord and Montreal Railroad in 1842, these roads lost all importance and quickly vanished into obscurity (Willey 1896; Mower 1991). This initial railway was so successful that additional railways like the Manchester and Lawrence Railroad (now known as Boston and Maine Railroad) were established just seven years later. The coming of the railway provided fast and efficient transportation of goods and people to metropolitan cities like Boston. These railways proved too efficient for many of the other forms of transportation, completely overshadowing the established roads and canals (Mower 1991).

The combination of efficient transportation and a strong manufacturing base saw the city of Manchester flourish throughout the nineteenth century and into the first quarter of the twentieth century. In the latter half of the nineteenth century, the Amoskeag Manufacturing Company diversified from textiles to railroad engines, fire trucks, and weapons manufacture with the addition of the Amoskeag Foundry. The 1920s saw the beginning of an economic downturn in response to the end of World War I. During this period, the cotton industry had begun moving to the South. The cost of importing raw material to the mills for northern manufactures was exorbitant compared to those in the South, who had a ready supply on their doorsteps. Southern mills could therefore produce the same product for considerably less than their northern counterparts; as a result, they flooded the market, driving down prices (Hareven and Langenbach 1995:302). Demand for fabric and linens plummeted and the northern mills began to suffer (Singleton 1997:132; Hareven and Langenbach 1995:302). Confronted with the new economic reality, many northern mills could no longer compete and folded (Hareven and Langenbach 1995:336). To combat the falling profits, the owners of the Amoskeag Manufacturing Company cut the wages and increased the hours of their employees, an action which led to massive labor strikes (Hareven and Langenbach 1995:336). These events undermined not just management-labor relations, but also alienated customers, further exacerbating the problem. With the stock market crash in 1929, the labor tensions were further enflamed, leading to violent strikes in 1933 and 1934. In the wake of these difficulties, the mills began a gradual decline, and in 1935–1936, the Amoskeag Manufacturing Company, once the heart of the city, went bankrupt and was shuttered.

After the demise of the mills in Manchester, their industrial buildings were carved up and occupied by smaller manufacturing concerns throughout much of the twentieth century. In the second part of the twentieth century, the abandoned mills became the home of electronics manufactures, metal-working facilities, plastics manufacturers, and machine builders, helping to restore the industrial base of Manchester. Today, old mill buildings still remain a key feature of the landscape, but are now home to small businesses, hospitals, universities, and restaurants that provide economic opportunity for the residents of Manchester City.

3.2.3 NASHUA

The story of Nashua, New Hampshire, is weirdly also partly the story of Dunstable, Massachusetts. This may seem like an odd assertion, until it is acknowledged that during the earliest period of European settlement in the region, the section of New Hampshire in question was at the time considered to be Massachusetts, as the colony of New Hampshire had yet to be conceived. Early forays into the region were largely limited to ventures designed to carry on trade with the native populations of the Merrimack Valley. One such venture occurred in 1665 and was executed by John Cromwell, a fur trader who established a trading post along the Merrimac near a small falls. This experiment did not endure and was subsequently abandoned (Fox 1846:21). In 1673, the land where Nashua now lies was part of a 200-square-mile land grant made to Edward Tyng (Fox 1846:16–17). Tyng established the town of Dunstable (named after his native town of Dunstable, England) near the confluence of the Merrimack and Nashua Rivers (the site of modern-day Nashua City).

Starting in 1675, the region was the scene of a bloody conflict between the native peoples of New England and European settlers (Fox 1846:28). This conflict, which would become known as King Philips War (King Philip was the European name given to Metacomet, the Grand Sachem of the Wampanoag), raged for three years. During the conflict, Metacomet and his allies destroyed neighboring settlements, including the towns of Chelmsford and Groton, which were contained within the same 200-square-mile grant (Fox 1846:28; Peters 2006:8). The Penacook tribe of the Merrimack Valley had sided with Metacomet initially, but made a separate peace with the colonists. By this point, the conflict had greatly reduced their numbers and lost them a great deal of territory, and many fled to Canada (Fox 1846:21). While the discord had caused many of the Dunstable colonists to flee, the cessation of fighting in 1678 prompted many to return, and the town grew once more (Fox 1846:37). This resurgence was short lived. Due to competing land claims between the colonial powers in Europe—namely Britain and France—and native populations in the Americas, the region was the stage for an additional two wars: King William's War and Queen Anne's War. (In the Americas, both groups had their native allies, though the French garnered more support from native populations in New England). During the late seventeenth and early eighteenth centuries, Dunstable was a frontier town on the frontlines of these conflicts and was frequently garrisoned (Fox 1846:65–68, 82, 103). While the citizens of Dunstable occasionally fell victim to the ravages of such conflicts, the town itself miraculously survived, unlike other similar settlements that were continually attacked and destroyed (Fox 1846:65). Still, the constant fighting and fear of Indian attack caused the settlement of the area to stagnate until the beginning of the eighteenth century (Fox 1846:68).

During the latter portion of the seventeenth century and into the early part of the eighteenth century, many land disputes between competing charters and land grants occurred between the established colony of Massachusetts and the newly formed colony of New Hampshire. For much of this time, both colonies laid claim to the town of Dunstable and its surrounding territory, part of the original Tyng grant. This debate continued for well over 50 years—until 1741, when the boundary between the two rival colonies was settled (Stearns 1986:v; Fox 1846:147; Peters 2006:8). This decision split the original Tyng grant in half, with the northern portion and town of Dunstable going to New Hampshire, and the southern portion of Dunstable going to Massachusetts (Fox 1846:147; Peters 2006:8). It was during this time that Massachusetts created the municipality of Tyngsborough out of part of the southern portion of their new territory. Thus, this boundary settlement led to the creation of Dunstable and Tyngsborough in Massachusetts and the town of Dunstable in New Hampshire, which was formally incorporated in 1746 (Fox 1846:150).

The second half of the eighteenth century saw two additional wars: the French and Indian War and the American Revolution. Men from New Hampshire participated in these conflicts, but the fighting occurred elsewhere (Fox 1846:159–168). The first quarter of the nineteenth century saw the continued growth of Dunstable; the population had rapidly expanded throughout the eighteenth century and was now close to 900 people (Fox 1846: 193). It was during this period that Dunstable established its first post office, got its first stage line (Amherst-Boston), and established several taverns (Fox 1846: 193). By 1804, the town had been connected to Boston via the newly opened Middlesex Canal. This new connection stimulated the fledgling economy of Dustable (Fox 1846:196). The variety of industries in the town expanded; new saw and gristmills were built, as well as additional stores and taverns to handle the new flow of goods and travelers brought to the area via the canal (Fox 1846:198).

The dawn of the nineteenth century, however, brought big changes to the area. In 1802, the Middlesex Canal came through the area, connecting Dunstable to Boston via river and enabling the bulk exchange of goods. Suddenly, subsistence agriculture was not the only way to make a living. The growing city of Boston required raw material that the frontier towns along the Merrimack, including Dunstable, could provide. Timber, foodstuffs, and building materials flowed down to Boston from Dunstable, and finished goods flowed back up river to Dunstable. The local economy diversified rapidly, as new business ventures emerged to fill the demand for new goods. The town grew and the economy expanded from a local to regional scale. Then, in 1821, in Lowell, Massachusetts, a large cotton mill was established and brought great prosperity to the town. Seeing the success of the operations at Lowell, an environmental setting similar to that of Dunstable, investors began to plan a similar enterprise (Fox 1846:198). The result of this planning was the Nashua Manufacturing Company, established in 1823 by Daniel Abbot and other investors from Dunstable (Steinberg 2004:80; Fox 1846:199; Peters 2006:13; Charlton

1856:309). Though not an instant success, the Nashua Manufacturing Company persevered and undertook to harness as much waterpower as they could to provide for the future operations of their mills. The result was the Nashua Power Canal, essentially a giant mill race, which carried high-velocity water three miles downstream from Mine Falls, providing the torrent of waterpower needed to operate the ever-expanding mills (Steinberg 2004:78, 81; Fox 1846:200).

The Indian Head Company, another milling operation, opened downstream in 1826, taking full advantage of the improved waterpower from the Nashua Manufacturing Company (Steinberg 2004:81; Fox 1846:200; Charlton 1856:309). This corporation was short-lived and was bought out by investors from Boston just two years later. These investors, known as the Boston Associates, poured capital into the Indian Head Mill, revitalizing and modernizing it. The result was a new company known as the Jackson Manufacturing Company (Steinberg 2004:82, Fox 1846:205).

After a rocky start, the Nashua Manufacturing Company found its feet, and by 1836 had built and was operating three large cotton mills (Peters 2006:12; Steinberg 2004:80). These new mills created employment opportunities that drew people to Dunstable. This influx of workers drastically increased the population of the town, which by 1830 numbered 2,417 persons (Fox 1846:206). The draw of the mills was strong; as they expanded, so did the town. In the seven years between 1830 and 1837, the population nearly tripled (Fox 1846:207). To meet the needs of their workforce, the companies set about planning a town for their workers surrounding the mills, complete with housing, schools, and churches (Peters 2006:59). This neighborhood became known as Nashua Village (Fox 1846:202–203). Having developed a new identity as an industrial town, the citizens of Dunstable elected on the eve of 1837 to rename the town Nashua, a name that has persisted ever since (Fox 1846:209; Peters 2006:8).

By the 1830s, Nashua was a booming industrial town where new advances were readily embraced. In 1836, the town embraced a new advance in transportation technology, the railroad; by 1838, it had completed its first line connecting it to Lowell, Massachusetts (Fox 1846:207; Wallace and Mausolf 2001:19). The success of this rail line prompted the establishment of five more rail connections, making Nashua an important transportation hub (Fox 1846:208; Peters 2006:75; Charlton 1856:311-312). The coming of the rail lines had signed the death warrant of the Middlesex Canal, which could not compete with the speed of the railroads (Mower 1991; Wallace and Mausolf 2001:19). By the mid-1850s, the canals had been abandoned (Mower 1991). The success of the railroads opened up even more markets to the already bustling industries in Nashua and created new industrial opportunities. The industries of Nashua diversified again, and while still largely dependent on cotton mills, the city also began to work in iron, paper, leather, and machinery (Fox 1846:210–212, 214; Charlton 1856:309). Nashua also developed industries that serviced the railroads, including foundries and repair yards (Wallace and Mausolf 2001:26).

Nashua became not only an industrial powerhouse, but a crucial economic hub. Despite its growth and prosperity, the town of Nashua continued to have boundary problems. In 1842, the north section of the town, situated above the Nashua River, broke away and formed a new town called Nashville as a result of a disagreement over the placement of the town hall (Fox 1846:213; Peters 2006:8; Charlton 1856:309). The hurt feelings and division persisted for 11 years, until the two "towns" buried the hatchet and joined together to form the city of Nashua. The charter for the city was created in 1853 (Steinberg 2004:216; Peters 2006:8).

The growth of Nashua had prompted many waves of immigration throughout the nineteenth century. The initial immigrants were Irish and French-Canadians (Québécois) who flooded to the area in search of work prior to the Civil War (Trustees of the Hunt Memorial Building 1999; Federal Writers Project of the Works Progress Administration for the State of New Hampshire 1938:75–76). Wars and social upheaval in Europe during the second half of the nineteenth century prompted a second wave of immigration. During this time, the established Irish and French-Canadian ethnic communities were joined by waves of mass immigration from the Mediterranean and Eastern Europe (Trustees of the Hunt Memorial Building 1999; Federal Writers Project of the Works Progress Administration for the State of New Hampshire 1938:76). Mill towns like Nashua became much more ethnically diverse, as the waves of immigration enriched the local cultural/ethnic tapestry and new ethnic neighborhoods were established. These new communities included people from Greece, Lithuania, Italy, Poland, Hungary, Austria, Germany, Bohemia, and Russia (Federal Writers Project of the Works Progress Administration for the State of New Hampshire 1938:76). These immigrants brought with them their traditions, customs, and food.

During the nineteenth century, other mills had established themselves along the Merrimack in Nashua. However, the Nashua Manufacturing Company outperformed them all, and eventually came to purchase some of its smaller rivals, like the Jackson Company, Indian Head Mills, Tremont Mills, and Suffolk Mills. These acquisitions further expanded the company colossus, firmly ensconcing it as the core of the economy in Nashua. The 1920s saw the beginning of an economic downturn in response to the end of World War I. As discussed in the above section on Manchester's history, the cotton industry had begun moving to the South during this period. The South's ready supply of cotton eliminated the costs of shipping raw material to the north. While producing the same product for considerably less, Southern mills could flood the market and drive down prices (Hareven and Langenbach 1995:302). Confronted with a significant drop in the demand for fabric and linens, and the new economic reality that went with it, many northern mills closed (Singleton 1997:132; Hareven and Langenbach 1995:302, 336). Remarkably, the Nashua Manufacturing Company persisted through World War II, likely due to its more diversified business model. However, the company was purchased by Textron, Inc., in 1945, and only two years later, the mills of the Nashua Manufacturing Company were shuttered (Chomsky 2008:104).

The period following the closing of the mills in Nashua was dark, but mercifully short lived. With one of the primary employers in the city suddenly gone, unemployment was rampant for a few years. The Nashua New Hampshire Foundation purchased the abandoned mills from Textron in 1953 and attempted to attract new industries to the area (Chomsky 2008:104). Luckily for the city of Nashua, their existing infrastructure and available workforce was attractive to burgeoning new industries, including electronics, plastic manufacture, paper production, as well as electric and steel industries (O'Connell 2013:218). Perhaps the most important new industry, however, arrived in 1952. In that year, Sanders Associates moved into the vacant Jackson mill complex (Trustees of the Hunt Memorial Building 1999). This circuit board manufacturer emerged as an important player in the Cold War defense economy and became integral to the development of the defense industry, space program, and early computer industry (O'Connell 2013:218). Eventually, the Sanders Associates became part of Lockheed Martin, and eventually part of BAE Systems Electronics & Integrated Solutions. As these new industries renewed the city's economy and provided more economics opportunities, the city continued to grow. With the popularization of the automobile in the postwar era, a number of suburbs emerged around Nashua. These new settlements in turn provided new economic opportunities in the form of retail outlets to and shopping centers that further diversified and bolstered the city's economy (Trustees of the Hunt Memorial Building 1999; O'Connell 2013:218). Additionally, the construction of major highways over the second half of the twentieth century once again provided economic opportunities that were just a short commute away, and drew Nashua closer to other neighboring cities like Lowell and Boston once more (O'Connell 2013:217–218). These areas had also been undergoing similar transitions and had developed similar electronics and computer-based industries. Today, Nashua is a powerful player in the nation's northeast electronics industry, as part of the greater Boston high-tech corridor.

Chapter 4

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5.0 Phase IA Field Reconnaissance

5.1 Concord

5.1.1 Stickney Ave

URS conducted the Phase IA field reconnaissance for the proposed Stickney Avenue train station and parking area in Concord on March 24, 2014. Stickney Avenue is a small street that parallels I-293 and dead ends at a bus depot opposite a small neighborhood. The proposed work at this location consists of the creation of an at-grade train platform and an adjacent parking area, largely situated within an extant NHDOT office facility and its associated support buildings and garages. The entire proposed APE was pedestrian surveyed and photo-documented. The remainder of the APE is situated along an extant railroad line and its associated bed, located immediately to the west of the NHDOT parking lot (Figure 24). Field reconnaissance revealed that the majority of the proposed parking facility exists within an area that is already paved and used for parking, but is currently gated and not open to the public. Within this gated parking area are several maintenance buildings associated with the main NHDOT office complex, situated along the western edge of Stickney Avenue, facing I-293 (Figure 25, Figure 26, Figure 27, Figure 28, Figure 29, and Figure 30). As macadam capped the soil in this area, it was impossible to visually inspect the area for signs of cultural material. The area of the proposed train station, along the western edge of the extant parking lot, poses a similar impediment to visual reconnaissance. The proposed APE for the train station is situated within an extant railroad bed and, as such, is capped by a thick layer of bluestone gravel that has raised the ground surface in the area by several feet. As the bluestone railroad bed blankets the majority of the APE, it was impossible to see any soils and ascertain the condition of the subsurface stratigraphy (Figure 31, Figure 32, and Figure 33). However, in a narrow corridor between the fence to the parking lot and the railroad bed, there is a narrow strip of exposed soil that also functions as a power line right of way (ROW) (Figure 34and Figure 35). Examination of this soil demonstrated that it is riddled with debris and appears to be fill soil. This soil was likely imported or moved to the site during the construction/grading for the adjacent railroad bed or during the construction of the power line ROW.

5.2 Manchester

5.2.1 Spring Street Station

URS conducted the Phase IA field reconnaissance for the proposed Spring Street train station in Manchester on March 24, 2014. The proposed station is oriented parallel to Canal Street in downtown Manchester and is bounded to the south by Spring Street and to the north by Dow Street (Figure 36). The proposed APE is located in the former industrial heart of Manchester, which in recent years has been adaptively reused and transformed into a college campus and a network of commercial outlets and dining establishments. Field reconnaissance revealed that within the APE, immediately to the west of the extant rail bed, is situated a large parking area built to service the University of New Hampshire, which has taken up residence in the plethora of nineteenth-century mill buildings that line the Merrimack in downtown Manchester. Opposite the proposed platform on the eastern side of Canal Street is a large public parking garage, and to the southeast of the Spring Street rail crossing is another large public parking facility (Figure 37 and Figure 38). The APE of the proposed rail platform in this area is situated between the extant university parking area to the west and Canal Street to the east. The bulk of the APE is situated inside an existing rail bed comprised of several feet of highly compacted crushed stone ballast that has raised the ground level by several feet. The rail bed runs underneath the Bridge Street overpass, which towers nearly 50 feet above the location (Figure 39 and Figure 40). To the east of the rail bed is an overgrown gravel-lined drainage ditch, which is the only unpaved surface within the APE or its adjacent area (Figure 41). Attempts to illicit information about the soil profile of the APE through examination of the soil in the drainage ditch was hindered by a layer of gravel and fill, which prevented the collection of any deep samples.

5.2.2 Granite Street Station

URS conducted the Phase IA field reconnaissance for the proposed Granite Street train station in Manchester on March 24, 2014. This proposed station area is bounded to the north by Granite Street, to the east by Canal Street, to the west by Bedford Street, and to the south by a large industrial complex; it consists of a small at-grade platform and an associated parking area (Figure 42). Field reconnaissance failed to reveal any evidence of archaeological resources in this area. The APE is divided east-west by the existing rail line. To the northeast of the Granite Street and Canal Street intersection, there is an extant parking garage that is hoped to provide parking for the proposed station (Figure 43). The existing rail line and its railroad bed spans the entire distance between Bedford Street to the west and the existing parking lots and structures situated to the east of the tracks (Figure 44, Figure 45, Figure 46, and Figure 47). The proposed station platform is to be situated within the existing railroad bed, butting up against existing structures like the adjacent bank, and making use of existing public parking areas (Figure 44, Figure 45, and Figure 46). The APE in this area is comprised of several paved parking lots and the existing railroad bed, all of which have capped the buried soils and prevented examination of them for evidence of cultural material. As a result, it was not possible to ascertain the nature of the buried substrata in this location and assess the archaeological sensitivity of those soils.

5.2.3 Granite Street Layover

URS conducted the Phase IA field reconnaissance for the proposed Granite Street rail siding in Manchester on March 24, 2014. The Granite Street Layover is a proposed location for overnight train storage and maintenance. It is located to the south of Granite Street, along South Commercial Street and Riverwalk Way, which define the western edge of the APE (Figure 48). Field reconnaissance failed to reveal any evidence of archaeological resources in this area. Field reconnaissance revealed that a steep change in elevation marks the eastern edge of the APE (Figure 49 and Figure 50). In most cases, this change in elevation corresponds with the start of back parking lots belonging to businesses located along Elm Street. A minor league baseball stadium is situated to the northwest of the northern extent of the proposed APE (Figure 51). The entire APE for this siding is covered in a thick layer of crushed stone ballast, which creates a long level rail bed (Figure 52, Figure 53, Figure 54, Figure 55, Figure 56, Figure 57, and Figure 58). This rail bed extends all the way to the eastern edge of the APE. The surface of the APE is marked by rail lines, both used and disused. This area was once a large railroad siding and is still used for that purpose on occasion (Figure 59). Although overgrown in some areas, the entire ground surface of the APE is comprised of crushed stone ballast, which renders the soils of the APE inaccessible and prevented the assessment of its archaeological integrity and sensitivity (Figure 54).

5.2.4 Cemetery Layover

URS conducted the Phase IA field reconnaissance for the proposed Cemetery Layover in Manchester on March 24, 2014. The Cemetery Layover is a proposed location for overnight train storage and maintenance located along the eastern bank of Merrimack River, opposite Carthagina Island (Figure 60 and Figure 61). Field reconnaissance was conducted along the proposed layover, which has been designed to parallel the existing run of track within the existing rail bed. While at present only one track exists on the rail bed, there is evidence in the form of old rail ties that indicates that the rail bed once supported a secondary rail line. The terrain that comprises the APE in this area is long and flat, bounded to the east by forested floodplain that a quarter mile to the east climbs sharply up toward Pine Grove Cemetery. The western edge of the APE is bounded by a small access road that runs along the edge of the Merrimack River. Vestiges of the history of the railroad lined the extant rail bed in the form of telegraph poles, some of which remain standing. The ground within the APE is almost entirely comprised of extant railroad bed that is a raised and graded run of compacted crushed stone ballast (Figure 62, Figure 63, Figure 64, and Figure 65). The crushed stone ballast of the rail bed prevents the examination of the soil directly within the APE, but some inferences can be drawn from the surrounding areas. The soils to the east toward the cemetery are heavily waterlogged and are predominantly a wetland habitat (Figure 66). While outside the APE, the soil to the west of the rail line between the access road and the river does appear to have integrity and is consistent with the silty loam expected in a river floodplain (Figure 67). It should be noted that the presence of Carthagina Island near this location has increased the flow of the river and carved steep banks to the eastern edge of the Merrimack. As a result, there is a substantial drop between the edge of the bank and the surface of the river. What the effect of this erosion has had on buried cultural resources in the floodplain is unknown.

5.2.5 Queen City Bridge Layover

URS conducted the Phase IA field reconnaissance for the proposed Granite Street rail siding in Manchester between March and July of 2014. The Queen City Bridge Layover is a proposed location for overnight train storage and maintenance. It is located immediately to the North of the Brown Ave. Wastewater Treatment Plant and to the south of the proposed Granite Street Layover (Figure 68). The southern portion of the APE runs beneath the Queen City Bridge and the APE is bounded to the north by the remains of a former rail yard to the west by the Merrimack River, and to the east by the current main line railroad. Field reconnaissance revealed evidence of a former structure, recently demolished, within the proposed APE along the eastern edge of the APE paralleling the railroad tracks. The demolition debris however appears to be modern in origin dating to the latter half of the 20th century. The ground surface in the area is largely flat having been graded in the past in association with the former structure (Figure 69). The majority of the APE is comprised of pavement, concrete and crushed stone ballast. In the area where the former structure was located lays a debris and fill-dirt pile which is somewhat grown over. To the west a thin ribbon of trees separates the APE from the Merrimack River. As the soil in the area is all covered by extant caps it was not possible to examine the soils in this area.

5.2.6 *Wastewater Treatment Plant Layover*

URS conducted the Phase IA field reconnaissance for the proposed Wastewater Treatment Plant Layover in Manchester on March 24, 2014. The Wastewater Treatment Plant Layover is designed to be used for overnight train storage and maintenance, and is located near its namesake, the Manchester Wastewater Treatment Plant at 300 Winston Street. The plan is to construct four rail sidings to be used as layovers and a small maintenance building (Figure 70 and Figure 71). Field reconnaissance failed to reveal any evidence of archaeological resources in this area. The proposed construction area was pedestrian surveyed and photographed. This effort demonstrated that, with the exception of the proposed maintenance building, the APE is largely confined to the extant railroad corridor and railroad bed that exists between the wastewater treatment plant, which defines the western edge of the APE, and the series of modern industrial warehouses that define the eastern edge (Figure 72 and Figure 73). The APE is bounded to the north by the NH 101 overpass and is split into a northern and southern section by the Winston Road rail crossing, which enables emergency access to the wastewater treatment plant (Figure 74, Figure 75, and Figure 76). The entire APE, therefore, is comprised of a long, straight gravel rail bed defined by high security fences along its eastern and western edge. The entirety of the APE is blanketed in a thick layer of compacted crushed stone ballast and thus the soil within the APE was unavailable for examination (Figure 72, Figure 73, Figure 74, Figure 75, Figure 76, and Figure 77). The edge of the railroad bed was lined along its western flank by a series of disused telegraph poles that once serviced the rail line (Figure 77). These telegraph poles are the only visible cultural resource extant within the APE.

5.2.7 *MHT Airport-Ray Wieczorek Drive Station*

URS conducted the Phase IA field reconnaissance for the proposed MHT Airport-Ray Wieczorek Drive station in Manchester on March 24, 2014. This station location is situated to provide commuter rail access to the Manchester-Boston Regional Airport, located to the northwest on the eastern bank of the Merrimack River. The proposed APE for this station is situated along the western bank of the Merrimack, adjacent to and underneath the Ray Wieczorek Drive Bridge across the Merrimack. The central portion of the station platform is slated to be placed underneath the newly constructed bridge, with a parking area along its northern flank (Figure 78). The majority of the proposed station falls within the existing railroad bed that extends more than 2 meters on either side of the existing track. This railroad bed is made of a raised berm of compacted crushed stone ballast several feet thick (Figure 79 and Figure 80). Due to the substantial nature of the railroad bed, it proved impossible to examine the soils that lay beneath, so its archaeological sensitivity and integrity remain undetermined. The area close to the bridge, which was constructed in 2013, is highly disturbed and the visible soils are a mix of fills and gravel (Figure 80). The area to the east of the track, which separates the railroad corridor from the Merrimack River, appears to be undisturbed floodplain that may retain integrity, but this area falls outside the project APE, so it was not examined.

5.3 Nashua

5.3.1 CROWN STREET

URS conducted the Phase IA field reconnaissance for the proposed Crown Street station in Nashua on March 24, 2014. This station location is situated to provide rail access to downtown Nashua. It is located along the western bank of the Merrimack River, just to the south of where the Nashua River joins the Merrimack. The construction plan calls for the construction of an at-grade platform and an expansive parking lot to the southwest of the existing track (Figure 81). The proposed platform location occupies a strip of railroad bed that sits in front of a disused warehouse building that lies just to the northwest of the Pan America rail yard. The APE for the platform location is oriented northwest to southeast, following the existing railroad bed. While wide and substantial within the APE, the rail bed fans out opposite the southern half of the abandoned warehouse and becomes even wider as it merges into the rail yard located immediately to the south (Figure 82 and Figure 83).

The portion of the APE designated as potential parking appears at first glance to be flat and level, although lower in elevation than the railroad bed. In some places, the ground surface appears to have been graded and paved already; upon closer examination, the reason for this becomes clear. The area has been leveled in the past because the entirety of the proposed parking facility is the basement/ground floor of a large industrial structure/s no longer standing here. Standing in the grassy field to the southwest of the train track, it becomes clear that the western section of the proposed parking area is a full story deeper in elevation relative to the eastern section, which indicates that the eastern section (the grassy area nearest the tracks) was likely a basement. This impression is reinforced by the vestiges of the walls remaining around the perimeter (Figure 84). The western portion of the APE, which comprises the upper section of the foundation complex, shows evidence of structural subdivisions for rooms that appear as concrete curbs or lines in the paved surface (Figure 85, Figure 86, and Figure 87). In addition to the structural subdivisions visible via examination of the exposed concrete floor, the ghost marks of the demolished structures can be seen on the extant wall of the adjacent building, which at one time they abutted (Figure 88, Figure 89, Figure 90, Figure 91, and Figure 92). Much of the lower eastern area has been overgrown with grass and weeds, but the accumulation of plant life appears to be quite shallow, as attempts to probe the soil were met with concrete or other solid surfaces less than 3 inches below current ground surface. Through the center of this lower foundation, there appears to be a long linear depression that in some locations is revealed to be a concrete channel of unknown usage (Figure 93). The area covered by the lower foundation depression is nearly a football field’s length and the upper section perhaps three quarters of that dimension.

Included within the APE are three buildings, two of which appear historic in nature and to have been contemporaneous with the observed foundations. The southernmost structure is a large warehouse that is longer than the aforementioned foundation. This structure was originally two stories made of brick, but at some point it was expanded and a third cinder block story added (Figure 92); this can be seen in the profile of its south wall, which is clearly visible from the lower portion of the foundation complex. The northernmost building is a three-story brick building that currently serves as an office for Armstrong Kitchen Cabinets (Figure 94 and Figure 88). The building appears to have been contemporaneous with the now-demolished structure and the warehouse to the south, and its southern façade once formed part of the wall of the now-demolished building (Figure 89). The third building, which adjoins the aforementioned Armstrong headquarters, is of more modern construction and functions as a showroom for the kitchen cabinet retailer.

While foundations were plentiful at this location, observable soil was not. All of the surveyed area was both inside and outside of the foundations, with either paved with macadam or comprised of concrete. As a result of the preponderance of paved surfaces, it was not possible to successfully probe the soil and gain understanding in regard to the subsurface archaeological potential of the APE.

5.3.2 SPIT BROOK STATION AND SIDING

URS conducted the Phase IA field reconnaissance for the proposed Spit Brook Station and railroad siding in Nashua on March 24, 2014. This station location is situated to provide commuter rail access to the residents of South Nashua. There are three components to this proposed construction within the APE: a platform, an expansive parking area, and a rail siding for overnight train storage (Figure 95 and Figure 96). The platform has been designed to fit within the confines of the existing railroad bed; however, the parking area and rail layover locations utilize the large swath of flat land that until recently was home to a Dow Chemical plant. Part of this area is still undergoing mitigation and remediation. The project APE at Spit Brook is situated along the western bank of the Merrimack River, opposite the Green Meadow Golf Club, which occupies the river's eastern bank.

The proposed station platform is situated within the confines of the existing rail bed, which at this location is quite wide, as it once supported several spurs that serviced the Dow Chemical facility (Figure 97). The railroad bed is comprised of highly compacted crushed stone ballast that sits atop a raised berm. The rail bed extends several meters on either side of the extant track. Due to the presence of the crushed stone ballast rail bed, it was not possible to observe the soils in the area of the proposed platform. Similarly, the area slated to function as a rail siding was inaccessible because it fell within the hazmat exclusion zone for the remediation site (Figure 98 and Figure 99).

The proposed parking area for the Spit Brook Station encompasses a large open field that was once part of the Dow Chemical facility. The area was highly overgrown, but was pedestrian surveyed. While no walls or structures were encountered, there was evidence of the previous use in the form of debris piles. The area is exceedingly flat and traversed by a well-worn gravel road that leads to the exclusion zone located in the northern portion of the property (Figure 100). This northern area is surrounded by a large security fence and was unavailable for visual inspection, due to safety concerns about contamination from the site's previous use (see Figure 99). Because of the potential for soil contamination throughout the area, the soil was not probed, so its subsurface archaeological potential and integrity remain unknown.

5.3.3 Pheasant Lane Mall

URS conducted the Phase IA field reconnaissance for the proposed Pheasant Lane Mall Station and Parking Area in Nashua on March 24, 2014. This station location is situated to provide commuter rail access to the residents of South Nashua. The project APE in this location is comprised of the footprint of the station platform, within the existing rail bed, and a multi-story parking facility at a location that is currently an overflow parking lot (Figure 101). The station platform location is situated within the railroad bed of the existing rail line, which is bordered to the east by the Merrimack River and to the west by the parking lot for the Pheasant Lane Mall, specifically the lots for Sears and Macy's (Figure 102). The southern boundary of the APE is the Massachusetts/New Hampshire border. The area of the proposed platform is contained within the extant railroad bed, which at this location is a wide corridor of highly compacted crushed stone ballast that at present is separated from the mall parking lot by a chain-link fence (Figure 103 and Figure 104). While a meter or so of green space exists between the edge of the rail bed and the fence, this area was inaccessible, and so archaeological potential of the soil was not ascertained. A meter of green space also exists between the parking lot and the railroad ROW fence, is lined with stands of recently planted trees, and serves as a power line corridor with transmission poles located at 100-foot intervals paralleling the railroad bed (Figure 103 and Figure 104). The soil in this narrow available area appears to be imported fill soil contemporaneous with the construction of the mall parking lot.

The proposed parking structure for the rail station is located within the center of a raised parking area along the eastern side of the Sears department store (Figure 105). This southern boundary of the APE—and thus the southern extent of the structure—is the Massachusetts/New Hampshire border. As this area is already paved, it was impossible to examine the soil in this location. The elevated parking area for the Sears store appears to have been created by importing fill and grading the area into a raised parking lot. This conclusion is supported through observation of fill soils along the slope that formed the eastern edge of the parking lot. This eastern edge area was examined because it was the only location not capped by pavement.

6.0 Conclusions and Recommendations

6.1 Concord

6.1.1 Stickney Ave

The literature review conducted for the Concord-North Study Area did not indicate any identified archaeological sites within the proposed Stickney Avenue APE. Similarly, the visual reconnaissance of the proposed APE for the train station and parking facility revealed no direct evidence of archaeological deposits. The majority of the APE was buried beneath extant caps. The proposed parking area is already covered by macadam and functions as a parking area, so the soil in this area is not visible. This pavement does not exclude the possibility that there may be buried cultural materials within the APE, but their presence or absence cannot be readily verified without removing pavement. Beneath the macadam cap, this paved area has the potential to contain culturally sensitive soils, as historic maps have demonstrated this area was once host to several railroad-associated structures. The area immediately along the existing tracks, the extant railroad bed, also has the potential to contain intact cultural resources, provided such resources escaped destruction during the grading for the construction of the railroad bed. If such resources exist, they too are now relatively protected from disturbance beneath a thick layer of compacted crushed stone ballast.

The proposed rail platform and track locations (as detailed in Figure 24) deviate substantially from the existing rail bed, continuing more or less straight across the back of the NHDOT property on a north-south axis. This area is at present quite overgrown and functions as a power line corridor. While initial inspection of the soils indicates that the soils in this area are comprised of fill, the depth of that fill soil was not determined. URS recommends that any grading or major ground-disturbing activities—such as rail bed construction, platform construction, power line pole installation, etc.—taking place outside the current rail bed be preceded by a Phase IB archaeological survey. This survey will illuminate the archaeological potential of the impacted soil and determine if the construction activity will constitute an adverse effect to significant buried cultural resources. Within the already paved ground surface of the APE, URS sees no need for further testing, as the potentially cultural soil lies beneath a protective cap. However, if ground-disturbing activities (like the construction of new buildings) occur within an already paved area, URS recommends a Phase IB survey to assess the potential for intact and buried soils below the existing paving.

6.2 Manchester

6.2.1 Spring Street Station

The literature review conducted for the Manchester-Downtown Study Area did not indicate any previously identified archaeological sites within the bounds of the Spring Street Station APE. Visual reconnaissance of the proposed APE for the Spring Street Station also failed to reveal any direct evidence of buried cultural materials. The majority of the soil within the APE was buried beneath extant caps of crushed stone ballast that comprise the extant railroad bed. The project area is confined to a straight run of railroad bed that parallels Canal Street and is bounded to the south by Spring Street and to the north by Dow Street. While it is possible that cultural resources may exist beneath the rail bed, the construction plan calls for adding additional fill and pouring a concrete platform on top of the existing rail bed. This approach would eliminate subsurface ground disturbance, and any cultural resources existing underneath a protective railroad bed cap will remain protected by additional caps. In this case, construction of additional soil caps will further shield any cultural materials existing beneath the rail bed at this location, protecting them from disturbance and erosion. The area between the rail bed and Canal Street that is at present a drainage ditch is of some concern. If subsurface work requires moving this drainage channel to (or recreating it in) a new location, URS recommends that a qualified archaeologist monitor this ground-disturbing activity to ensure that no buried cultural materials are adversely affected during the work. The current plan, however, does not appear to impact this existing drainage channel, and visual inspection of this area showed it to be comprised of fill soils and gravel. If construction does not necessitate the creation of a new drainage system for this location, then no further survey is recommended. If future construction plans propose ground-disturbing activities—such as the excavation of platform footings or utility trenches that would remove or go below existing soil caps, like the crushed stone ballast of the extant rail bed—URS recommends a Phase IB survey to identify the presence or absence of significant archaeological material in these areas.

6.2.2 Granite Street Station

The literature review conducted for the Manchester-Downtown Study Area did not indicate any previously identified archaeological sites within the bounds of the Granite Street Station APE. Visual reconnaissance of the proposed APE for the Granite Street Station did not yield any indication of buried cultural materials. The majority of the APE was buried beneath extant caps comprised of either pavement or compacted crushed stone ballast. The proposed platform location is situated within an extant rail bed that is a thick layer of compacted crushed stone ballast, which in this case is at or slightly below grade. While it is possible that cultural resources may exist beneath the rail bed, the construction plan calls for adding additional fill and pouring a concrete platform on top of the existing rail bed to form a platform. This approach would eliminate subsurface ground disturbance and any cultural resources existing underneath a protective railroad bed cap will remain undisturbed. The platform location is surrounded on all sides by paved surfaces and buildings, so there is no exposed soil to test. The construction of a rail platform at this location would require the removal of extant soil caps and the digging of a footing for the rail platform. As this proposed construction involves the removal of extant soil caps, URS recommends that qualified archaeologists perform a Phase IB survey prior to the commencement of construction. However, if construction can be altered so that the existing soil caps remain in place, then URS recommends no additional survey.

6.2.3 Granite Street Layover

The literature review conducted for the Manchester-Downtown Study Area did not indicate any previously identified archaeological sites within the bounds of the Granite Street Layover APE. The visual reconnaissance of the proposed APE for the Granite Street Layover also revealed no direct evidence of buried cultural materials. The entirety of the APE was buried beneath extant caps comprised of either macadam or compacted crushed stone ballast. The rail sidings at this location are in some cases already in place, as remnants of a former rail yard at this location that still receives occasional use. No subsurface work at this location should be necessary, as the area has already been graded and modified for the proposed used. The APE is under a blanket of thick and compacted crushed stone ballast lined with in-use and disused rail sidings. Construction in this area should consist of little more than the clearing of scrub brush, the removal of debris, and track repair. None of the aforesaid activities have subsurface impacts. If construction proceeds as planned, URS recommends no additional survey. However, should the construction plan be modified to include sound barriers along the boundary of Riverwalk Drive to lessen noise disturbance to the condominiums situated down slope from the siding, then URS would recommend that a Phase IB testing of the barrier wall locations be undertaken, given the archaeological sensitivity of the Merrimack River floodplain.

6.2.4 Queen City Bridge Layover

The literature review conducted for the Manchester-Downtown Study Area did not indicate any previously identified archaeological sites within the bounds of the Queen City Bridge Layover APE. The visual reconnaissance of the proposed APE for the Queen City Bridge Layover revealed some evidence of modern cultural materials. The majority of the APE was buried beneath extant caps comprised of either Macadam, concrete or compacted crushed stone ballast. The rail layover proposed at this location intrudes upon the remains of a former rail yard which comprises much of the northern end of this project APE. The southern ¾ of the APE is comprised of macadam parking area and the slab concrete remains of a former industrial building. There is a large pile of construction/demolition debris and fill soil sitting atop of the former building location. Debris in the area appears to date the former structure to the later portion of the 20th century, rendering it NRHP ineligible and exempting it from the need for additional archaeological survey. An aerial photograph palimpsest analysis of that area shows that a between 1947 and 1952 a cluster of small buildings occupied the central portion of the APE (Nationwide Environmental Title Research 2014). These structures may be remnants of the Swifts Slaughter Works which is depicted in that location on the D.H. Hurd and Co. Map of 1892. However, a 1965 aerial photograph of the project APE shows that the same area has been cleared and graded, leaving no evidence of these earlier structures (Nationwide Environmental Title Research 2014). However, by 2003 the area has once more been built upon and is the site of a small building which parallels the tracks to the east and is connected to another larger building structure on the opposite side of the tracks via a raised causeway (Nationwide Environmental Title Research 2014). The entire area surrounding the structure back to the existing rail yard area has been by this time covered in macadam. At present there is no trace of this building present on the 2003 aerial photograph except for overgrown dirt pile and scatter of modern demolition debris. This aerial photograph palimpsest analysis reveals that both the macadam and the visible traces of a historic building date to between 1965 and 2003 rendering them too modern to be NRHP eligible and are therefore they need not be considered as cultural resources. The aerial photograph palimpsest analysis of the area at no point shows evidence of the W. Smith house depicted on the Hurd map of 1892, a structure which clips the northwest corner of the APE. A similar palimpsest analysis of historic USGS quad maps from 1905-1985 shows a structure in the location of the W. Smith House up until the grading episode shown in the aerial photographs (Nationwide Environmental Title Research 2014). The last topographic map to show any indication of a structure at this location is dated 1950 (Nationwide

Environmental Title Research 2014). The USGS maps show nothing on the site between 1950 and 1985 indicating that once graded, between the years 1950-1965, the area containing the APE remained vacant until the mid-1980's when the large structure, shown to be associated with the structure on the opposite side of the tracks in the 2003 aerial photograph, was constructed. The now demolished building within the APE was built sometime between 1985 and 2003. It was subsequently demolished between 2003 and 2014. The grading episode of the 1950-1960's appears to have eliminated the archaeological evidence of the earlier structures depicted on the D.H. Hurd map of 1892, and subsequent introduction of soil caps like pavement, concrete and crushed stone ballast have covered the area making investigation of any potential surviving evidence of these earlier structures impractical. Whether or not evidence of these earlier late-19th and early-20th century structures remain beneath the extant soil caps is largely irrelevant. To proceed with construction there is no need for subsurface work because it has already been graded during its previous occupation which has more or less prepared the area for its proposed use as a layover. As no grading is necessary there is no reason that the existing soil caps (i.e. macadam, concrete and crushed stone ballast) will not remain in place, capping any potentially undisturbed soils that might lie beneath. Importation of new crushed stone ballast material to create a bed for the proposed rail layovers at this location can be accomplished without removal of the soil caps and disruption of the soil beneath. This additional cap of crushed stone ballast should further protect any potential resources that might exist at this location. If construction proceeds in this manner, then URS recommends no additional survey. However, should the construction plan be modified to include substantial grading that would necessitated the removal of existing soil caps, then URS would recommend that a Phase IB testing of be undertaken, given the archaeological sensitivity of the Merrimack River floodplain.

6.2.5 Cemetery Layover

The literature review conducted for the Manchester-South Study Area did not indicate any previously identified archaeological sites within the bounds of the Cemetery Layover APE. Visual reconnaissance of the proposed APE for the Cemetery Layover revealed no direct evidence of archaeological deposits. The majority of the APE is buried beneath an extant cap of crushed stone ballast that comprises the railroad bed. The current construction plan for this layover calls for the realignment of the main line, the reestablishing of a secondary set of tracks along the main line, and the construction of an additional rail siding. There is sufficient space for this within the extant rail bed to move the main line and establish two sidings, but the additional two new rail sidings along the eastern side of the track will require an expansion of the rail bed. While few subsurface impacts are anticipated within the majority of the APE footprint that falls within the extant rail bed, the expansion of the rail bed and construction of an access road and maintenance station could have an adverse effect. The terrain to the east of the extant rail bed is a sprawling wetland at a foot of a large hill. The construction of additional rail bed for sidings at this location has the potential for environmental and cultural impacts. The proposed location of an access road from Crescent Road also passes through a sensitive area, as it crosses a small stream. If the existing access road running along the riverbank between the tracks and the water were to be altered or widened to accommodate construction on the rail line, this too could have an adverse effect. Should plans to construct the layover at this location move forward, URS recommends a Phase IB survey of the APE to determine the impact that any construction activity might have on potential buried archaeological resources. The potential for pre-contact materials here is high, given the location in a floodplain of the Merrimack, its proximity to the rich resources offered by the adjacent wetland, and the opportunities for riverine exploitation afforded by the presence of Carthagina Island, which creates a narrow channel along the bank paralleling the track and may have attracted pre-contact peoples. As a result of these factors, the area along the bank and to the west of the track must be considered archaeologically sensitive, and any construction activities that would impact this area would require testing to determine if there is an adverse effect to cultural resources.

6.2.6 Wastewater Treatment Plant Layover

The literature review conducted for the Manchester-South Study Area did not indicate any previously identified archaeological sites within the bounds of the Wastewater Treatment Plant Layover APE. Visual reconnaissance of the proposed APE for the Water Treatment Plant Siding revealed no direct evidence of buried cultural materials, largely due to the fact that the entirety of the APE is contained within an extant rail bed and, as a result, all of the soils lie beneath a thick layer of compacted crushed stone ballast. The proposed construction of the rail siding at this location will not entail any subsurface impacts, and the existing crushed stone ballast caps will remain intact. As there is no threat of soil disturbance, there is no potential for adverse impact on buried archaeological resources posed by the construction of the rail layovers. However, the construction of the small maintenance shed near the rail crossing at this location has the potential to entail subsurface impacts. If this proves to be the case, then a Phase IB survey limited to the area of the maintenance building should be undertaken. If construction of the maintenance shed does not entail subsurface disturbance, then URS recommends that no further survey is necessary at this location.

6.2.7 MHT Airport-Ray Wieczorek Drive Station

Visual reconnaissance of the proposed APE for the MHT Airport-Ray Wieczorek Drive Station revealed no surface indication of archaeological sites. While no surface evidence of archaeological deposits was visible, it is important to note that Site 27-HB-211 is mapped within the MHT Airport-Ray Wieczorek Drive APE, and was identified and evaluated through subsurface testing during the cultural resource survey for the recently constructed Raymond Wieczorek Drive Bridge (Goodby 2000, 2001, 2005). The site was characterized as a low-density artifact scatter representing ephemeral occupations during the Late Archaic, Middle Woodland, and Late Woodland periods. Based on Phase II studies, the investigated portion of the site was recommended to be not eligible for listing in the NRHP (Goodby 2005). Nevertheless, the presence of such a resource in such close proximity to the proposed APE for this project demonstrates the subsurface pre-contact archaeological potential of the area. The visual reconnaissance of the APE that was conducted found that the majority of the APE is contained within an extant rail bed and, as a result, its soils are capped by a thick layer of compacted crushed stone ballast. The proposed construction at this location calls for the addition of an at-grade rail platform that would be confined to the existing rail bed. As no soil outside of the rail bed would be disturbed during the construction of the platform, there is no potential for effects to archaeological sites. The proposed parking area and shuttle turnaround are to be placed within the footprint of the Ray Wieczorek Drive Bridge, recently constructed in 2013. As previously described, the area to the east of the APE was the subject of Phase I and II archaeological investigations prior to bridge construction; Site 27-HB-211 was identified and investigated during this work. As the MHT Airport-Ray Wieczorek Drive Station APE lies just to the west of this surveyed area, it is possible that portions of Site 27-HB-211 may extend into the current APE (Figure 106). Because current plans involve construction of an at-grade rail crossing with no associated excavation, URS recommends that no further archaeological investigations are necessary within the APE. However, if detailed project plans include the excavation of footings and trenches for utilities that extend beyond the existing rail bed crushed stone ballast or require its removal, exposing potentially undisturbed soils, a Phase IB survey should be undertaken to determine whether a portion of Site 27-HB-211 is present in the APE.

6.3 Nashua

6.3.1 CROWN STREET

The literature review conducted for the Crown Street Study Area did not indicate any previously identified archaeological sites within the bounds of the Crown Street Station and Parking Area APE. The visual reconnaissance for the proposed rail platform at the Crown Street station in downtown Nashua revealed that the location of the proposed station is situated within an extant railroad bed comprised of crushed stone ballast. The soil in this area was capped by this crushed stone ballast rail bed and, thus, no evidence of buried cultural resources was evident within the footprint of the proposed rail platform. The proposed construction of an at-grade rail platform at this location will not disturb any buried soils that are capped by the rail bed. Since no soil will be disturbed during the construction of the platform, URS recommends that no further cultural survey is necessary within the footprint of the proposed platform.

While no previously identified sites exist within the Crown Street APE, visual reconnaissance of the APE for the Crown Street Station parking facility in downtown Nashua revealed direct evidence of cultural resources. Two-thirds of the area slated for parking is comprised of the archaeological remains of former industrial buildings, the foundations and floors of which were clearly visible during visual reconnaissance. The proposed construction for the parking area calls for the grading of the area. At present, the APE is comprised of a complex of foundations and two historic buildings that appear to be contemporaneous with the archaeological foundations. The proposed construction in this area has the potential to adversely affect this historic foundation complex. In order to determine significance of the observable archaeological resources, URS recommends that a Phase IB survey be completed at this location. Such a survey would provide the necessary data to assess the significance of the site. Historic research described in a previous section demonstrates that this area has a long industrial history spanning much of the nineteenth and twentieth centuries. The recommended Phase IB cultural resource survey will assess the potential of this site to contribute to the understanding of the industrial development of Nashua.

6.3.2 SPIT BROOK STATION AND LAYOVER

The literature review conducted for the South Nashua Study Area revealed the presence of Site 27-HB-354, the Spit Brook Site, within the bounds of the Spit Brook Station and Layover APE. Visual reconnaissance of the proposed APE for the Spit Brook Station and Layover in South

Nashua, however, revealed no evidence of archaeological materials within the footprint of the proposed rail platform. The proposed rail platform is entirely situated within the extent of an existing railroad bed. No soils were visible in this area, and any potentially significant cultural deposits that might exist beneath the rail bed have been capped by a thick layer of highly compacted crushed stone ballast. The rail bed within the footprint of the proposed platform is quite wide, having previously included sidings that serviced the now-demolished Dow Chemical facility that once stood to the west of the rail line. There is no adverse effect posed by the construction of the station platform, as construction activities will not disturb any soils. URS recommends that no further archaeological survey is necessary in this portion of the Spit Brook APE.

The proposed location of the rail sidings that would make up the Spit Brook Layover to the north of the proposed platform is also in close proximity to Site 27-HB-354, the Spit Brook Site. This site is potentially very significant and has already yielded a substantial assemblage that shows this area was occupied from the Middle Archaic to the Late Woodland, a span of nearly 8,000 years. Visual reconnaissance of this area was not possible, due to its current location within the exclusion zone for the cleanup of the former Dow Chemical plant that occupied the area from the 1970s through to the early twenty-first century. Given the potential of the area to contain significant archaeological deposits, URS recommends that this area be subjected to Phase IB archaeology survey prior to the construction of the layover sidings at this location.

The proposed location of the Spit Brook Station parking area involves paving a large area of land that once housed the Dow Chemical facility. As noted above, the facility has been demolished and the foundations of the former structures are not readily identifiable, but presumably still exist. Historic maps like the 1892 Hurd map entitled *Nashua, Hillsborough Co.* indicates that this location was also the site of the "Little Station," which survived for nearly 50 years. The pedestrian survey of the area revealed trace deposits of demolition debris, but failed to identify any structures associated with either the Dow Chemical occupation or the earlier train station. As the proposed parking area is located within the floodplain of the Merrimack River—which has demonstrable potential to contain buried pre-contact cultural resources, as well as historic resources associated with the site's industrial and transportation/commercial past—URS recommends that additional Phase IB archaeological survey be conducted to ascertain the impact of the proposed construction on any surviving cultural resources. However, if grading of the lot is accomplished by importing a soil cap (like a bed of gravel), there would be negligible impact to any potential subsurface resources, as the cap would protect any such resources from future disturbance. In this case, URS sees no need for further survey of the area.

6.3.3 Pheasant Lane Mall

The literature review conducted for the South Nashua Study Area did not reveal the presence of a previously identified archaeological site within the bounds of the Pheasant Lane Mall Station APE. Visual reconnaissance of the proposed APE for the Pheasant Lane Mall Station in South Nashua revealed no evidence of archaeological materials within the footprint of the proposed rail platform. The entire length of the proposed rail platform was visually examined and no structures or features were apparent. The majority of the platform APE is contained within the existing railroad bed, which is a raised berm of highly compacted crushed stone ballast cobbles.

However, there is a narrow corridor of seemingly undisturbed soil that runs to the west of the rail bed, between the tracks and the fence that separates the rail line from the Pheasant Lane Mall parking lot. This corridor is at most 2 meters wide, but runs parallel to the railroad bed for the entire length of the platform. The APE for the platform is located quite close to the Merrimack River and is certainly within its floodplain, so the potential for the soil to contain cultural resources is high, especially if it has not been disturbed. Therefore, if the construction of the station platform necessitates any soil disturbance within this corridor, then URS recommends that a Phase IB archaeological survey be undertaken to determine the presence or absence of archaeological deposits and determine if the proposed construction will pose any adverse effect to buried archaeological resources. However, if the proposed construction involves importing soil to raise the grade of the land to the height of the extant railroad bed, and no extant soil is disturbed, then URS sees no need for further testing in this location.

The proposed parking structure for the Pheasant Lane Mall station is situated within an area that is at present an at-grade parking lot for the Sears department store. The soil in this area is obscured by macadam and it was impossible to determine the archaeological sensitivity of the soils during visual reconnaissance. The proposed construction in the area calls for the construction of a multi-level parking structure that will necessitate the excavation of a foundation for the structure. If the proposed parking structure is built, URS recommends that construction be proceeded by a Phase IB survey to determine the presence or absence of significant archaeological deposits within the APE.

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8.0 Appendix A

Figures

Figure 3 - Stickney Avenue Station and Layover APE overlain on an 1875 bird's eye view map by H.H. Bailey & Co.

Figure 4 - Stickney Avenue Station and Layover APE overlain on an 1892 map drafted by D.H. Hurd & Co.

Figures

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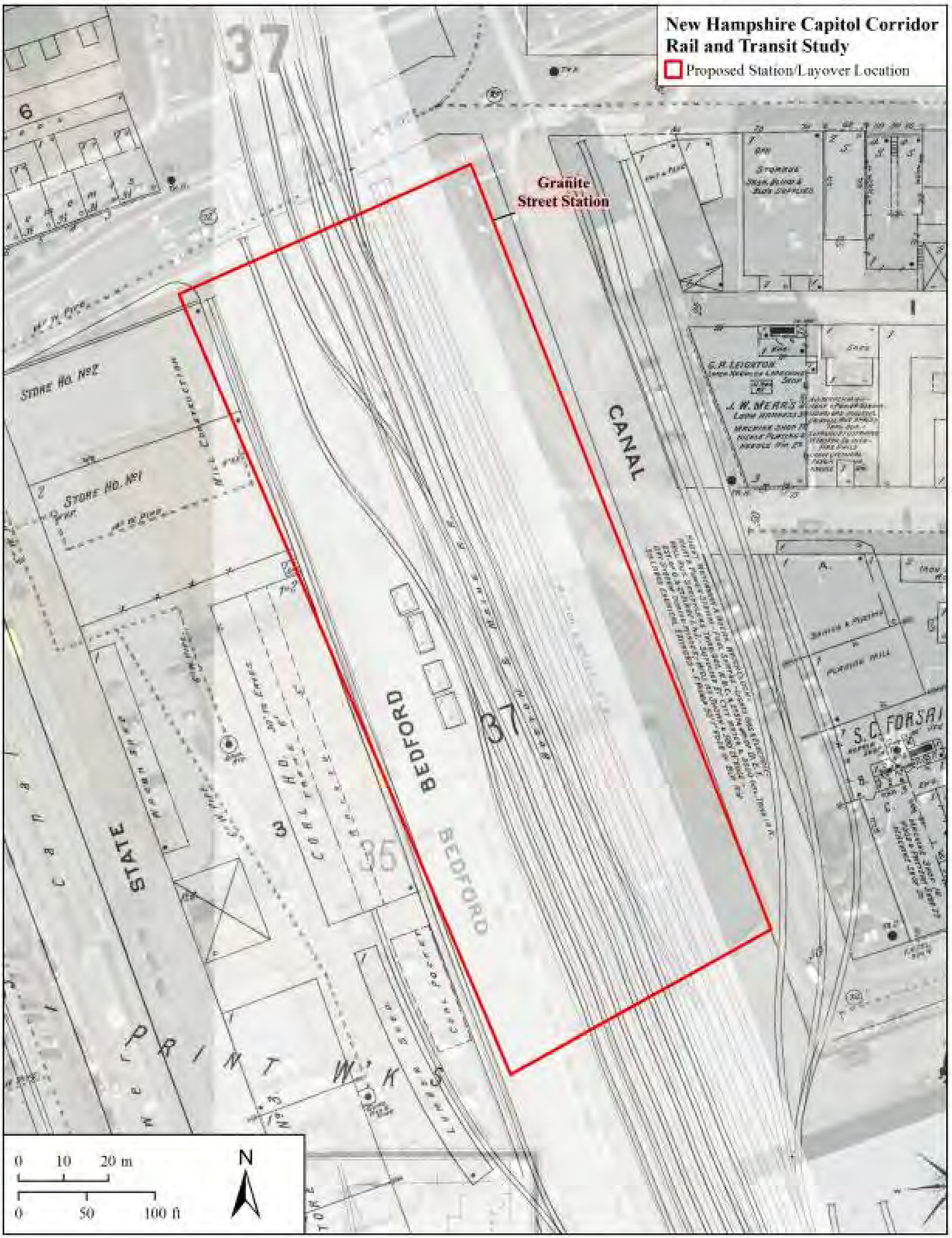

Figure 9 - The Granite Street Station APE overlain on a Sanborn Map, c. 1897.

Figure 10 - The Granite Street Station APE overlain on a Sanborn Map, c. 1891.

Figure 11 - The Granite Street Station APE overlain on an A.M Chapman map of Manchester, c. 1850.

Figure 12 - The Granite Street Layover APE overlain on a Sanborn Map, c. 1891.

Figures

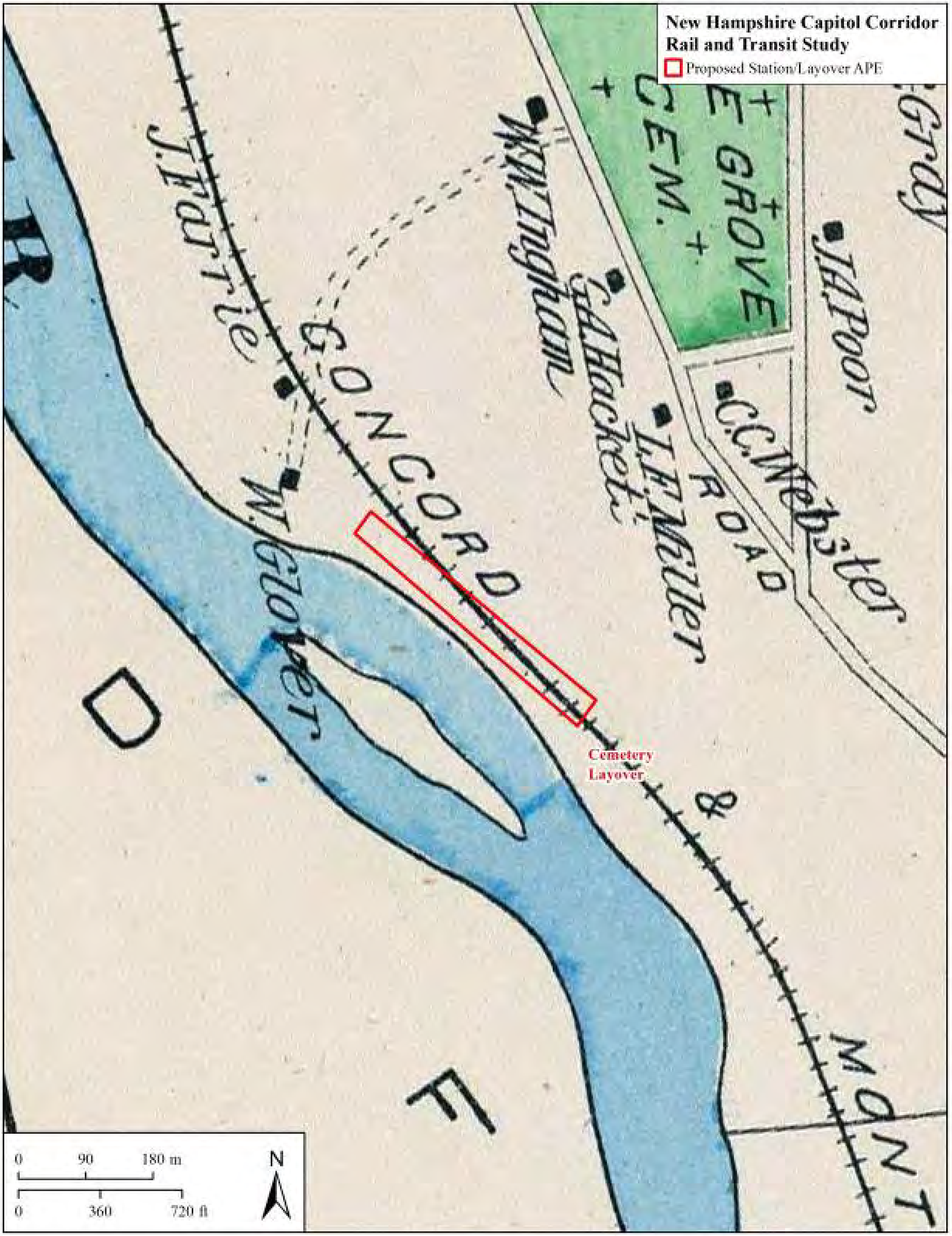

Figure 15 - The Cemetery Layover APE overlain on a D.H. Hurd & Co. map of Manchester, c. 1892.

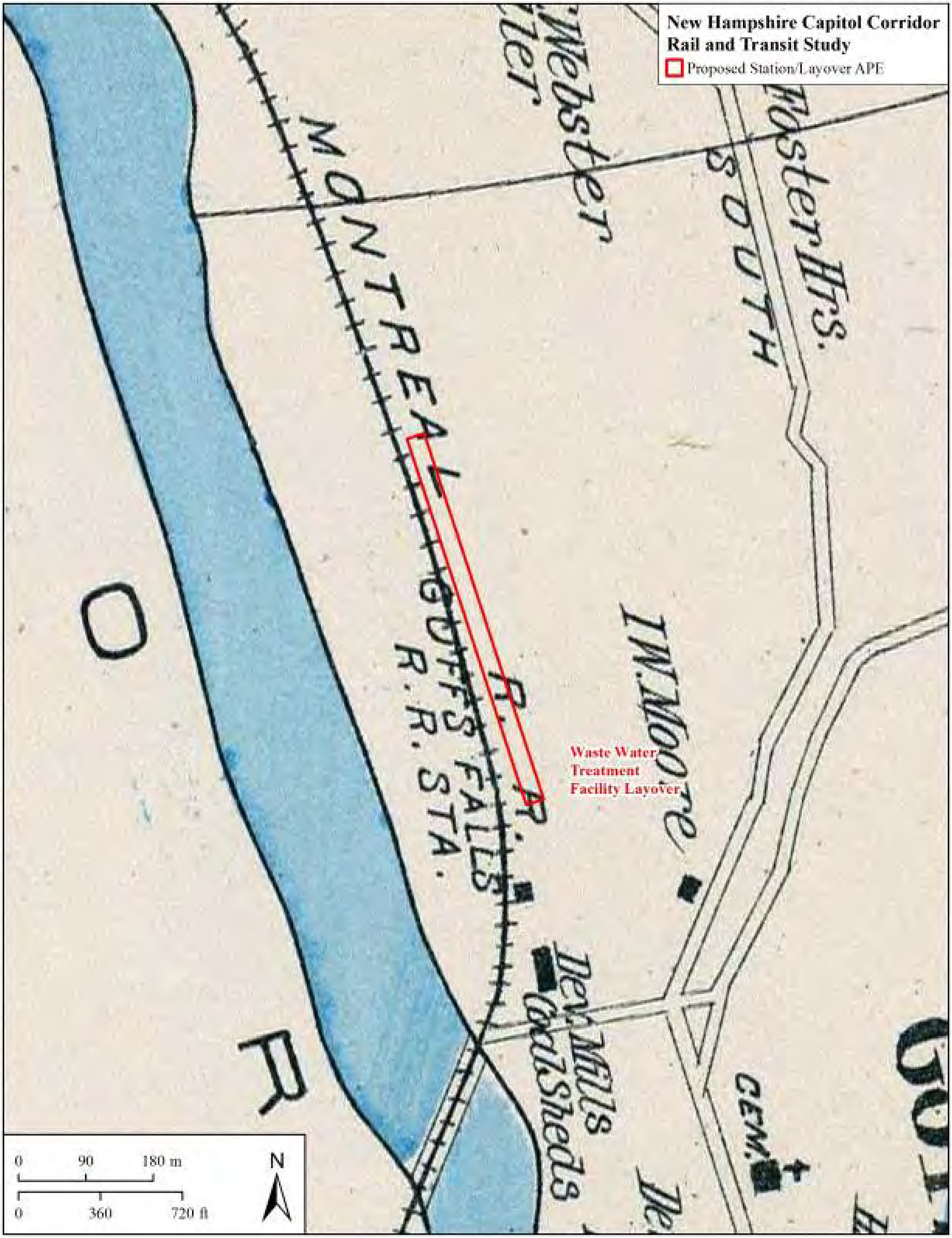

Figure 16 - The Wastewater Treatment Facility Layover APE overlain on a D.H. Hurd & Co. map of Manchester, c. 1892.

Figure 23 - The Spit Brook Station APE overlying an 1892 Hurd Map, entitled *Nashua, Hillsborough Co*.

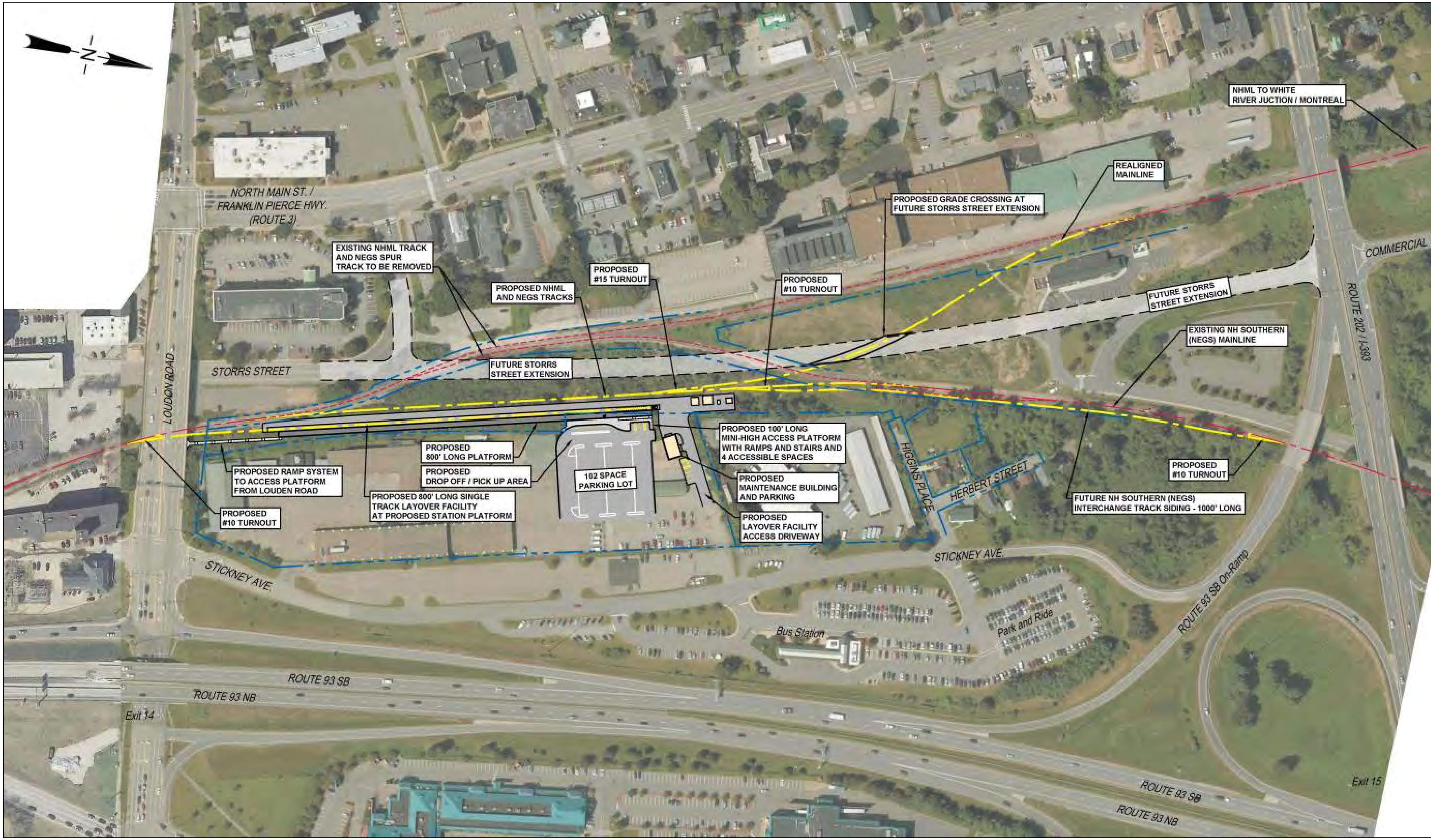

Figure 24 - Plan drawing of the proposed Stickney Avenue Station.

Figure 25 - Disused NH DOT garage, view facing west.

Figure 26 - View south toward a former NH DOT headquarters.

Figure 27 - View of NH DOT garage facing north.

Figure 28- View north of NH DOT garage.

Figure 29 - View southwest across the paved lot, at present serving as the parking/maintenance area for the NHDOT.

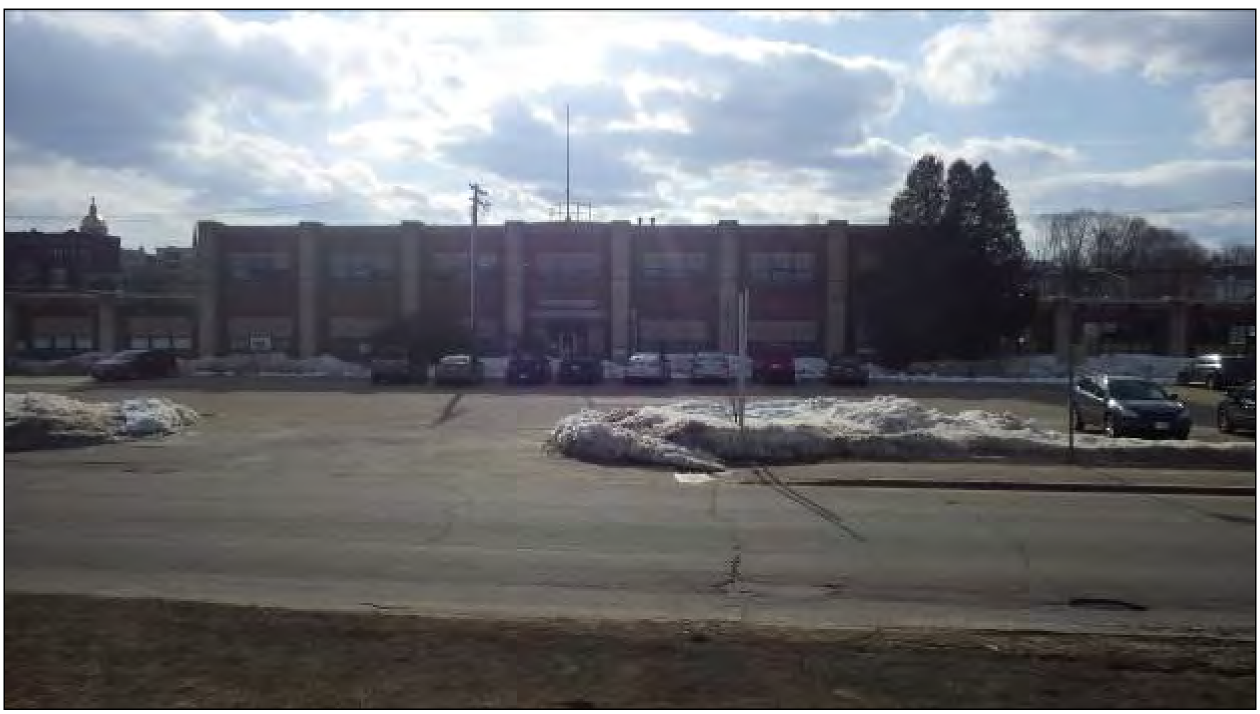

Figure 30 - View of the NHDOT office building on Stickney Avenue. The building faces I-293, and train tracks run behind the structure. Note Stickney Avenue in the foreground.


Figure 31 - View south along a disused rail line at the proposed Stickney Avenue Station.


Figure 32 - View north of a disused rail line within the APE of the Stickney Ave Station.

Figure 33 - View south of a disused rail line. The bridge in the background is Loudon Avenue.

Figure 34 - View of the APE, facing north.

Figure 35- View of the APE, facing northeast.

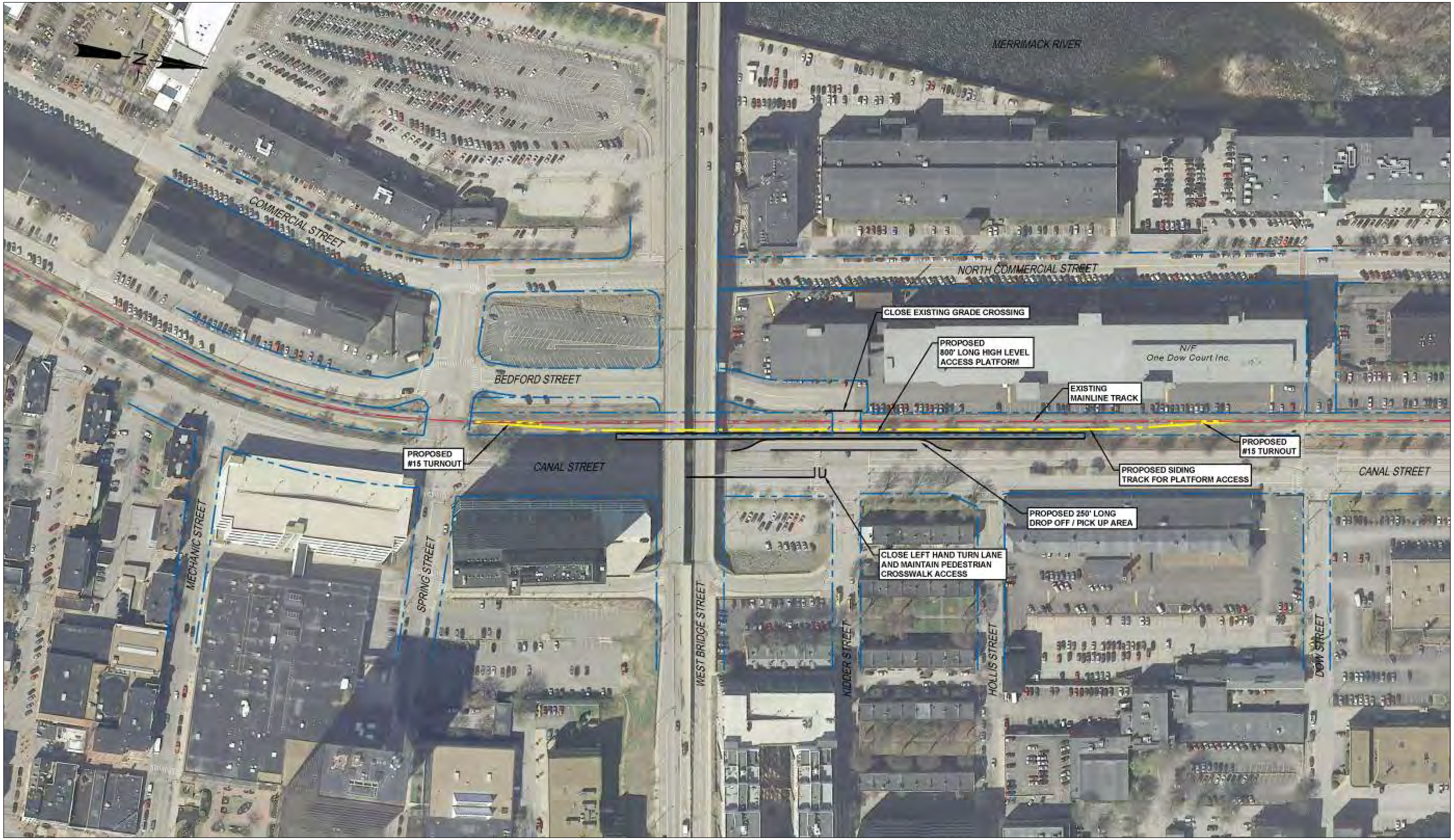

Figure 36 - Plan drawing of the proposed Spring Street Station platform.

Figure 37 - View of the parking structure opposite the Spring Street end of the proposed station.

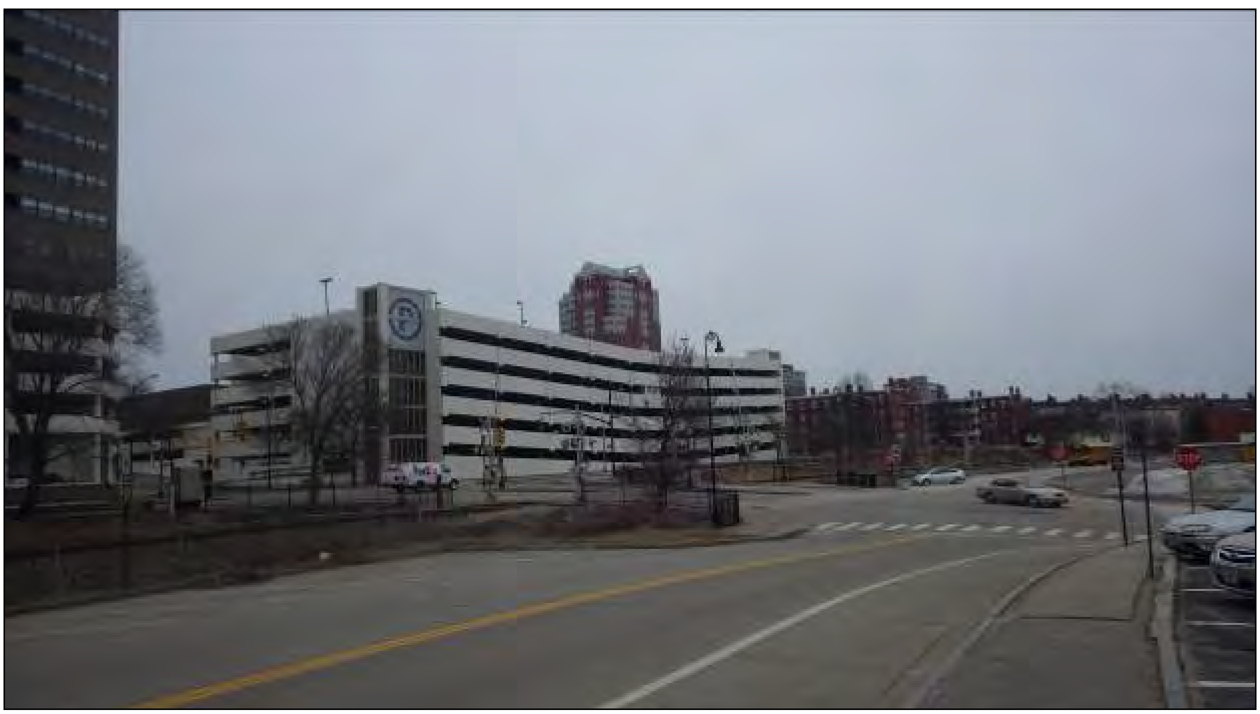

Figure 38 - Public parking structure to the southeast of the Spring Street Rail Crossing. The proposed station is situated along the left of the frame.

Figure 39 - Spring Street Station APE facing north. The right of frame shows a drainage ditch that separates the rail bed from Canal Street. In the background is the Bridge Street overpass, under which part of the proposed platform will reside.

Figure 40 - Looking south from the Dow Street Rail crossing at the end of the Spring Street Station APE. In the background is the Bridge Street overpass, to the right is the parking area, and to the left is the drainage ditch that separates Canal Street from the railroad bed.

Figure 41 - Spring Street Station APE facing south. In the center of frame is a drainage ditch that separates Canal Street and the railroad bed. In the right of frame is a large public parking structure. The Bridge Street overpass is in the background.

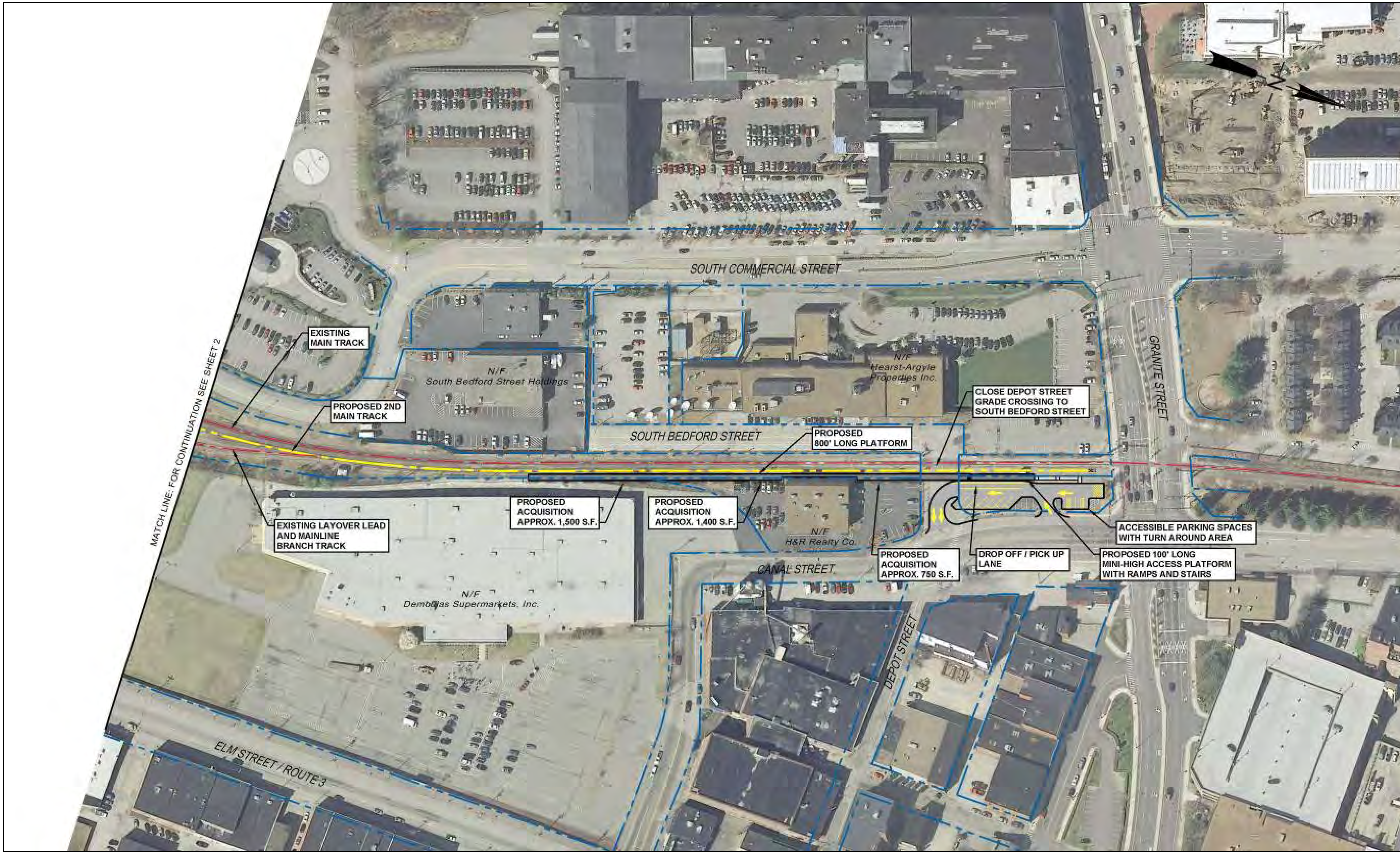

Figure 42 - Engineering plan for the Granite Street Station.

Figure 43 - View to the northeast from the intersection of Granite Street and Canal Street, showing the location of an extant parking structure.

Figure 44 - View north from the Granite Street APE. This area is narrow, being bordered to the east by a newly constructed bank.

Figure 45 - View north from above the Granite Street road crossing.

Figure 46 - View of the Granite Street Station APE, facing south from the Depot Street railroad crossing.

Figure 47 - View north from above the Granite Street road crossing.

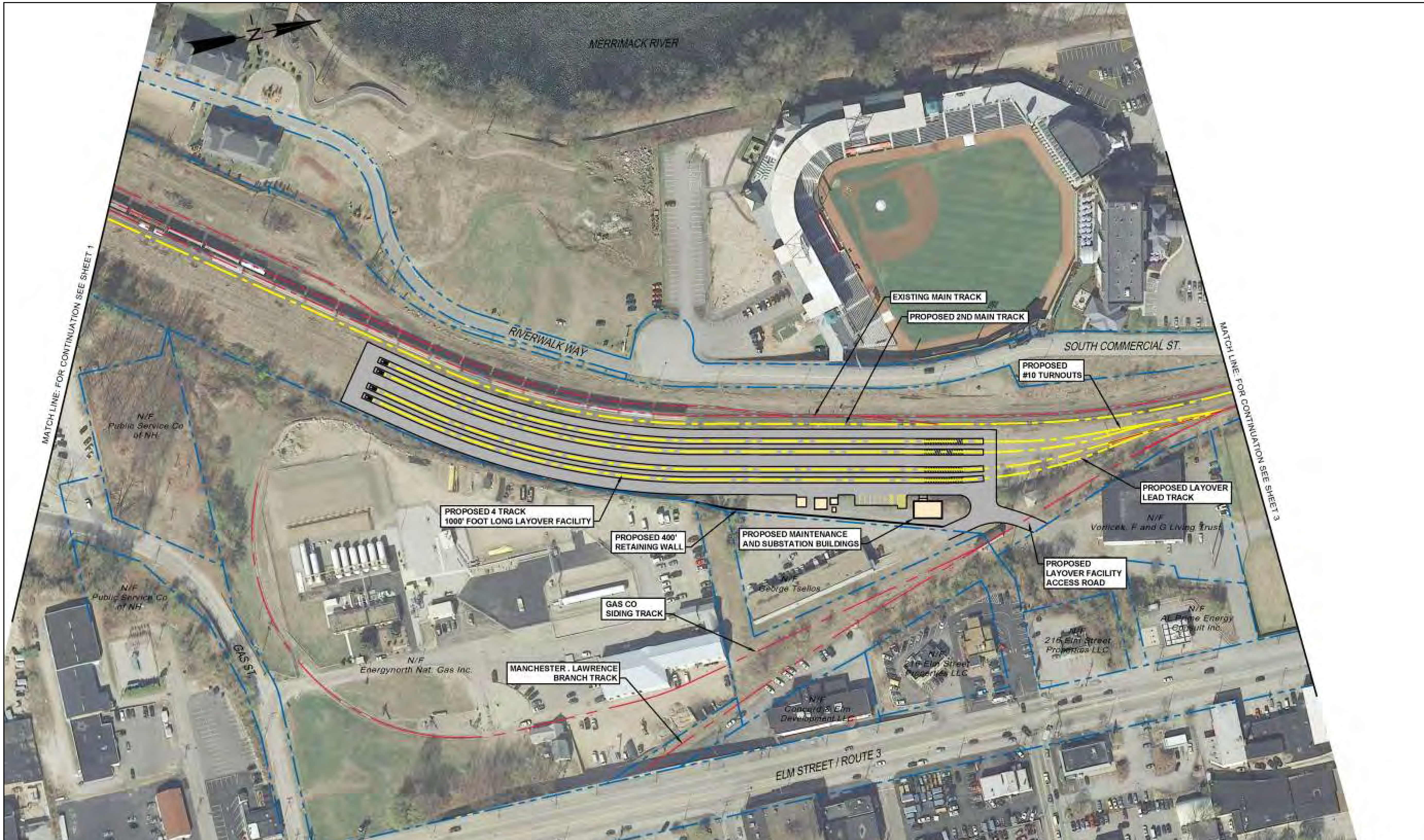

Figure 48 - Engineering Plan for the Granite Street Layover.

Figure 49 - View south along the eastern edge of the old rail yard. The left edge of frame shows the rise in elevation that marks the end of the APE.

Figure 50 - View facing east across the APE showing the rise in terrain at the eastern edge of the APE. The frame is taken from South Commercial Street, facing toward Gas Street.

Figure 51 - Ballpark to the northwest of the Granite Street Siding APE.

Figure 52 - View of the southern end of the old rail yard, facing south.

Figure 53 - A pile of old railroad ties located in the middle of the old rail yard.

Figure 54 - View facing north, showing the width of the old rail yard where the proposed Granite Street siding is situated.

Figure 55 - View of the proposed Granite Street siding, facing south. The whole area is a former railroad siding, completely graded and covered in crushed stone ballast.


Figure 56 - View of the proposed Granite Street siding, facing south.

Figure 57 - View of the proposed Granite Street siding, facing southwest.

Figure 58 - Disused railroad siding along the eastern edge of the old rail yard, view facing south.

Figure 59 – View of a train parked inside the APE near the beginning of Riverwalk Way. The view is taken facing south from South Commercial Street, near the southern Ballpark parking lot.

Figure 60 - Engineering plan for the Cemetery Layover location, pg. 1.

Figure 61 - Engineering plan for the Cemetery Layover location, pg. 2.

Figure 62 - View south from the northwestern edge of the APE, part of extant railroad bed.

Figure 63 - View of the proposed railroad siding, facing north.

Figure 64 - View of the proposed Cemetery Siding, facing north.

Figure 65 - View of the proposed Cemetery Siding, facing South.

Figure 66 - View of the proposed siding, facing east toward the forested wetlands downslope from Pine Grove Cemetery.

Figure 67 - Proposed Cemetery Layover, facing west toward the Merrimack River. Carthagina Island is in the background. The flat area just past the first line of trees is a dirt access road.

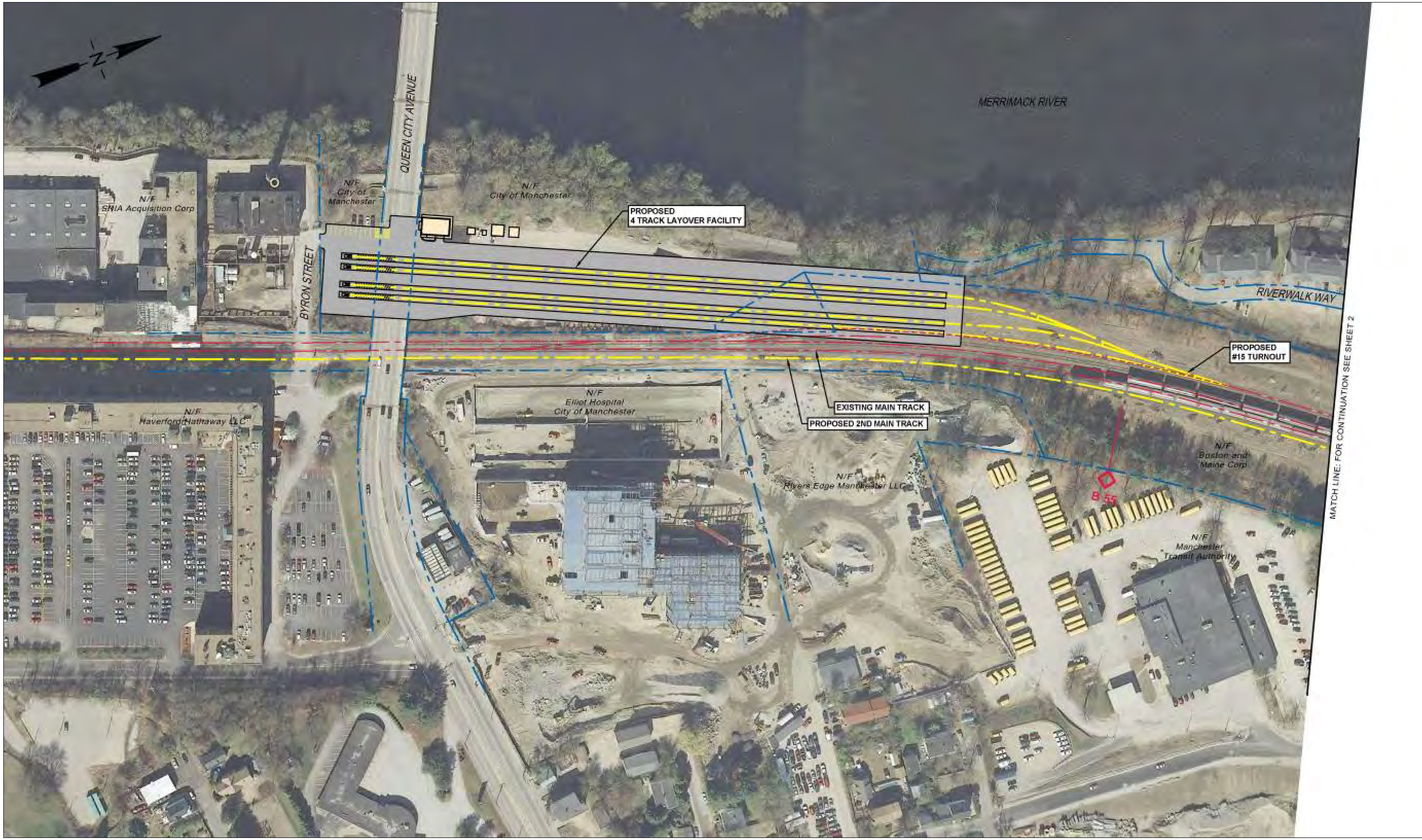

Figure 68 - Engineering plan for the proposed Queen City Bridge Layover.

Figure 69 - View of the Queen City Bridge Layover APE, facing north.

Figure 70 - Engineering plan for the Wastewater Treatment Plant Layover, pg. 1.

Figure 71 - Engineering plan for the Wastewater Treatment Plant Layover, pg. 2.

Figure 72 - View of the wide existing railroad bed, facing south. The Wastewater Treatment Plant is located along the right of frame.

Figure 73 - Wastewater Treatment Plant Layover APE, facing north. The Wastewater Treatment Plant is located in the left of frame and a warehouse complex is located in the right of frame.

Figure 74 – Wastewater Treatment Plant Layover APE, facing north. The Winston Road rail crossing is in the center of frame, just before the start of the large blue warehouse in the right side background.

Figure 75 - The northern half of the Wastewater Treatment Plant APE, facing north. The NH 101 overpass is in the background.


Figure 76 - Northern half of the Wastewater Treatment Plant APE, facing south.

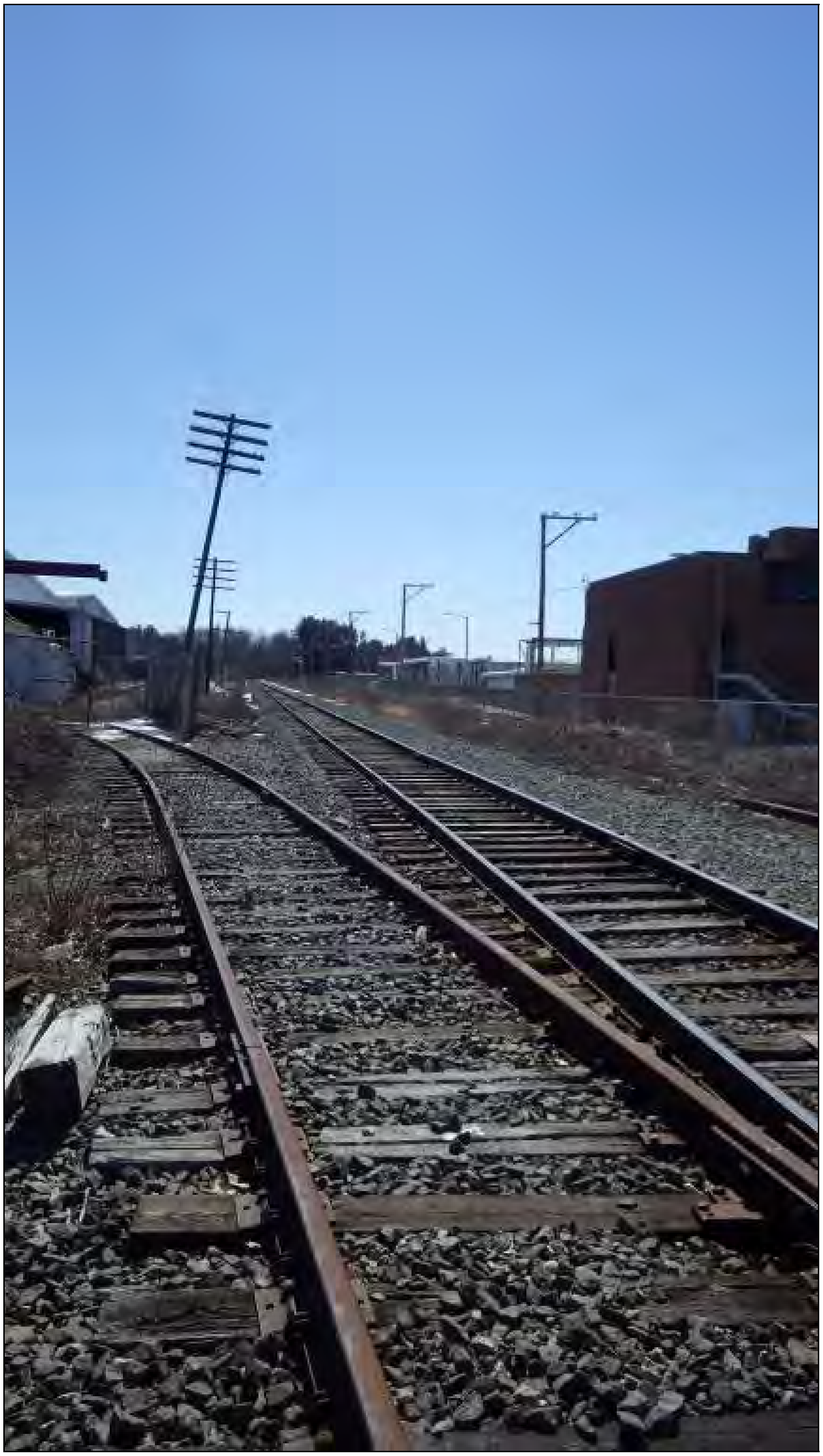

Figure 77 - Wastewater Treatment Plant layover APE, facing south. The left of frame is disused rail siding, as well as a row of disused telegraph poles.

Figure 78 - Engineering plan for the MTH: Ray Wieczorek Drive Station and parking area.

Figure 79 - MHT: Ray Wieczorek Drive Bridge Station APE, facing north toward the Ray Wieczorek Drive Bridge. The right-hand side of frame is a continuation of the railroad bed.

Figure 80 – MHT: Ray Wieczorek Drive Bridge Station APE, looking south under the bridge. The APE is comprised of the railroad bed and the area to the left of frame was disturbed by the recent bridge construction.

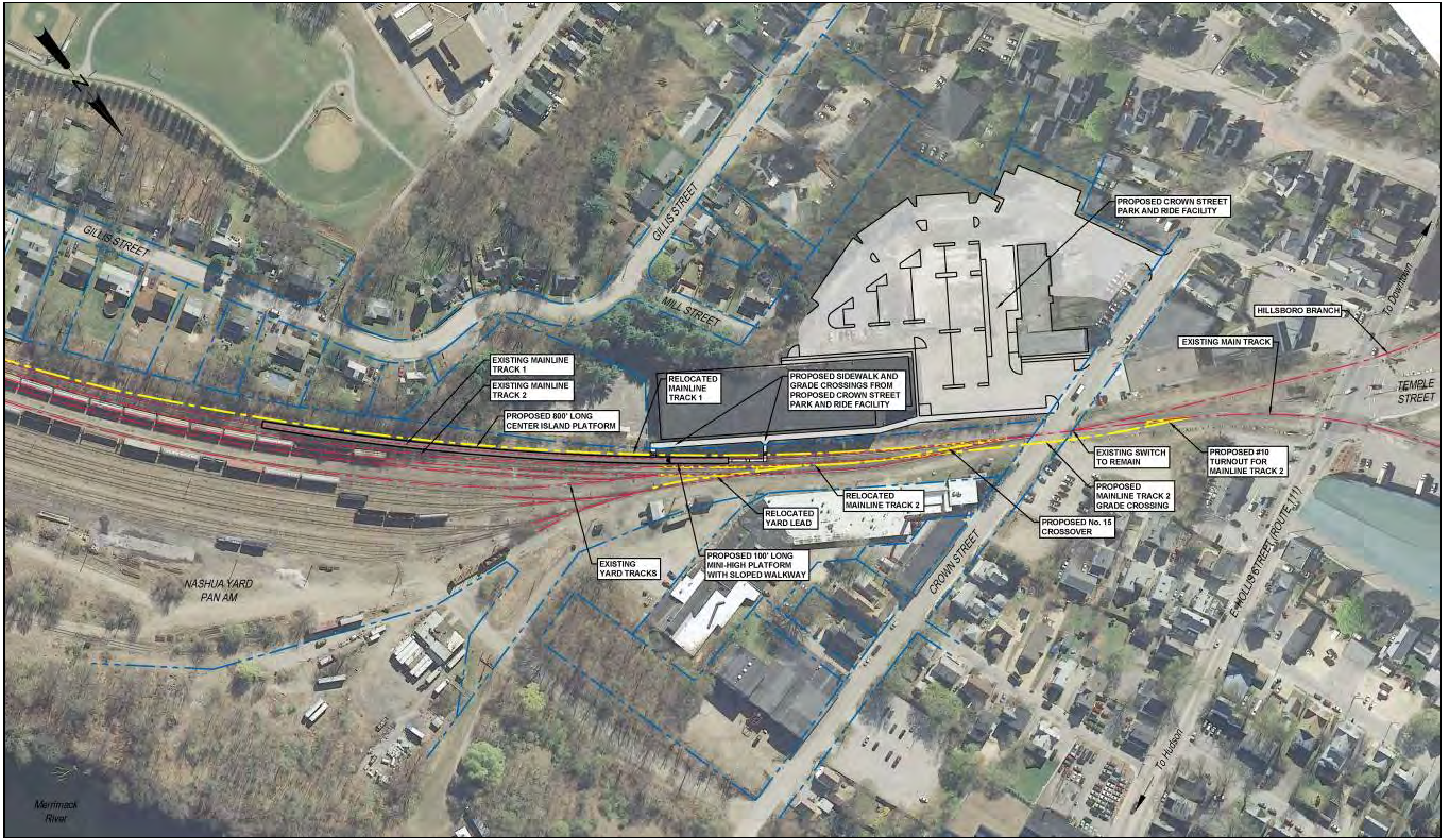

Figure 81 - Engineering plan for the Crown Street Station and parking facility.

Figure 82 – Crown Street Station APE facing the location of the proposed station from the opposite side of the tracks. A disused warehouse occupies the right of frame and the far background contains the Pan America rail yard.

Figure 83 – The location of Crown Street Station platform, facing south. The platform location is a road bed made of crushed stone ballast.

Figure 84 - Stone foundation paralleling tracks that formed the north wall of a demolished structure, facing southeast.

Figure 85 - Western foundation wall situated in the upper section of the proposed Crown Street parking area, facing south.

Figure 86 - Eastern wall of a large structure in the upper area of the proposed Crown Street parking area, facing south.

Figure 87 - View facing northeast toward the rail line. This photograph was taken from the floor of an old factory building, the upper foundation of the foundation complex.

Figure 88 - East wall of an old building, facing northwest.

Figure 89 - South wall of an old building, facing northwest toward Crown Street. Ghost marks of the demolished building are visible on the south façade of the Armstrong building.

Figure 90 - View from the center of the proposed Crown Street parking area, facing south.

Figure 91 - North wall of an old factory building, now destroyed and acting as an alcove, facing southeast. In the left of frame is a berm of soil and debris along the western edge of the large demolished building.


Figure 92 - North wall of an old manufacturing/warehouse building. A modern cinderblock story was added on top of the original brick two-level warehouse.


Figure 93 - A drainage ditch in the middle of an old building foundation, facing south.

Figure 94 - Front of a structure to the west of rail line on Crown Street, facing southeast.

Figure 95 - Engineering plan for the proposed Spit Brook Station, pg. 1.

Figure 96 - Engineering plan for the proposed Spit Brook Station, pg. 2.

Figure 97 - The Spit Brook Station APE, facing north. Rail sidings that once serviced the Dow Chemical facility can be seen in the left of frame.

Figure 98 - A disused rail siding leading into the exclusion zone where the proposed Spit Brook Layover is situated, facing north.

Figure 99 - The exclusion zone in the western part of the Spit Brook APE, near the site of the proposed layover.

Figure 100 - The site of the Spit Book Station parking area.

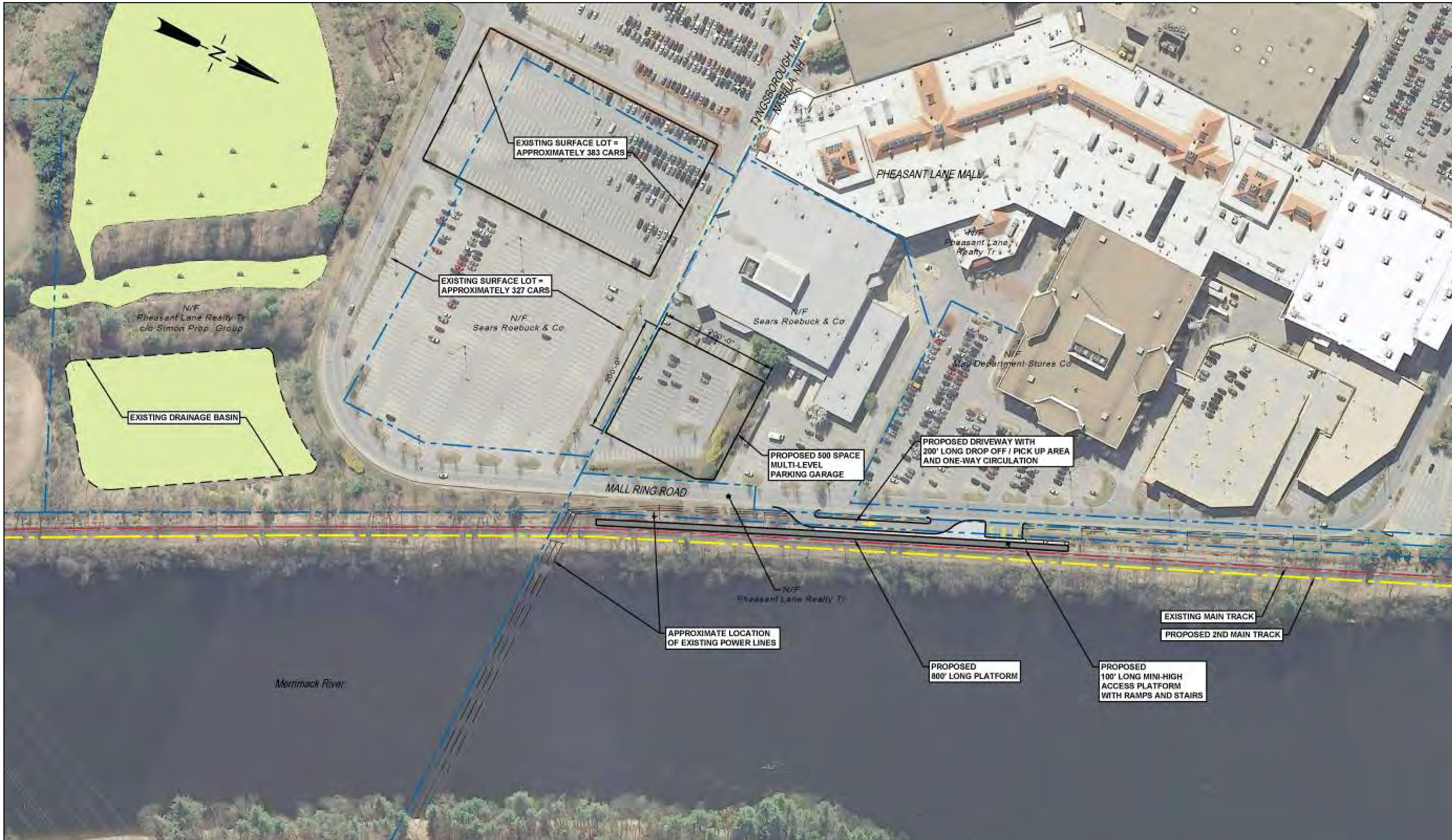

Figure 101 - Engineering plan for the Pheasant Lane Mall Station and parking area.

Figure 102 - Pheasant Lane Mall Station APE, looking toward the loading area for the Sears department store, facing west. Macy's is visible in the background along the right of the frame.

Figure 103 - Pheasant Lane Mall Station APE, facing north. The trees along the right of frame are all landscaped and have been recently planted and parallel a power line ROW.

Figure 104 - Pheasant Lane Mall Station APE, facing south toward the Massachusetts. The trees in the right of frame are all landscaped and have been recently planted; they parallel the track and the extant power line ROW.

Figure 105 - Location of the Pheasant Lane Mall Station parking structure. This location is currently overflow-parking for Sears.

Figure 106 - The MHT Airport Ray Wieczorek Drive APE, showing the details of a previous survey and the boundary of Site 27-HB-211.

9.0 Appendix B

Professional Qualifications

Matthew Harris, RPA

Senior Archaeologist/Principal Geospatial Analyst

Areas of Expertise

- Prehistoric Archaeology
- Geographic Information Systems (GIS)
- Spatial Analysis / Statistical Analysis and Modeling
- Geoarcheology & Geomorphology
- Section 106 of the National Historic Preservation Act
- Archaeological Surveys and Excavations

Years of Experience

With URS: 3 Years
With Other Firms: 12 Years

Education

B.A./2000/Kutztown University/Anthropology
M.A./2007/Temple University/Anthropology

Continuing Education

- National Park Service - American Battlefield Protection Program Training /2010
- Temple University- 3-D Visualization using ArcGIS & Sketchup, April 2008
- CADD / GIS Technology Center -Spatial Data Standard (SDSFIE) workshop, November 2005
- SRI Foundation - Section 106 Principles and Practice, October 2004

Overview

Mr. Harris has fifteen years of experience in archaeological investigations and the application of Geographic Information Systems (GIS) to cultural resources projects throughout the eastern United States. Along with a strong background in traditional archaeological methods and training in the fields of Geology and Geomorphology, Mr. Harris's primary specialization is in the field of GIS and database management. Mr. Harris approaches all scales of cultural resources investigations with the knowledge of GIS methods and statistical analysis to address complex spatial problems, develop new insights, or manage large and intricate datasets. The combination of a diverse academic background and applied fieldwork in archaeology and geoarcaheology, along with years of GIS theory and practice have endowed Matthew with the flexibility to efficiently and effectively apply spatial technology to all aspects of archaeology and heritage management. Work experience in State Historic Preservation Office (SHPO) compliance archeology, client side cultural resource management firms, and academia, has led to Mr. Harris developing a multi-perspective approach to cultural resources management and experience in the best practices for implementing appropriate computer technology and advanced archeological methods into projects of all sizes and scopes. Mr. Harris has undertaken or directed research, excavation, and mitigation responsibilities at more than 60 archaeological sites throughout the eastern United States, and has supervised over 55 projects focused on applying GIS, database management, predictive/ sensitivity modeling, and spatial analysis to cultural resources. His field experience encompasses prehistoric, contact, historic, urban, and geoarchaeological investigations and is the primary or co-author of over 35 technical reports and 35 professional research papers.

Examples of Project Experience

Phase I and II Archaeological Evaluation for the Constitution Pipeline Susquehanna County, PA to Schoharie County, NY. Co-Principal Investigator for a Phase I and II archaeological evaluation for an approximately 110 mile pipeline project. The Phase I effort of this project documented over 200 newly discovered archaeological sites. Phase II excavation were conducted on approximately 15 sites.

Phase Ia Archaeological Assessment for the Capital Corridor Rail Project, Boston, MA to Concord, NH. Principal Investigator for a Phase Ia archaeological assessment for Environmental Assessment of an approximately 75 mile commuter rail project. Connecting Boston, MA to Concord, NH this project includes the addition of a second track on existing bed, as well as, up to ten new stations and train layover facilities. The project winds though the Merrimack River Valley.

Phase IB Archaeological Survey for Rt 100Bridge Replacement, Waitsfield, Vermont. Principal Investigator for a Phase Ib archaeological survey of the Rt-100 bridge replacement over the Mad River. Conducted for VTrans, this project assessed the sensitivity and tested for the presence of archaeological sites within the bridge replacement area of potential effect.

Phase IB Archaeological Survey for I-89 Bridge Replacement and Jersey Barrier Storage Area, Milton, Vermont. Principal Investigator for a Phase Ib archaeological survey of the I-89 bridge replacement over the Lamoille River and for a Jersey barrier storage area Conducted for VTrans, these projects assessed the sensitivity and tested for the presence of archaeological sites within the bridge replacement and storage area project areas.

Environmental Assessment for Obstruction to 14 CFR Part 77 Surfaces and Airport Layout Plan for Bay Bridge Airport, Queen Anne's County, Delaware. Principal Investigator overseeing the implementation of Section 106 and 4(f) Cultural Resources compliance for the Environmental Assessment at the Bay Bridge Airport.

National Register Nomination for Weir Farm National Historic Site (WEFA), National Park Service. Prepared an updated National Register Nomination for the Weir Farm NHS. Through site visits, archival data, and primary research this nomination sought to express the significance of this rural Connecticut property through the eyes of the well-known landscape painter, J. Alden Weir, and his often visiting contemporaries. Further, this nomination took a critical look at how the topography, landscape, and natural setting of the property played in integral role in defining the lands relationship with people in historic, as well as, prehistoric times.

Archaeological Overview and Assessment for Eisenhower National Historic Site (EISE), National Park Service. This effort documented the depth of cultural resources investigations, artifact collections, archaeological sites locations, and archaeological potential of the 690-acre Eisenhower NHS (EISE) in Gettysburg, Pennsylvania. Through the use of the parks resources, documents, and collections, along with site visits and archaeological site conditions assessment, the creation of an Overview and Assessment gives the park a valuable tool for the management of cultural resources and planning. Additionally, the use of the Archeological Sites Management Information System (ASMIS) as a framework for site evaluations and treatments helps the NPS as a whole in monitoring and managing their vast numbers of archaeological assets.

National Register Determination of Eligibility Documentation for Canarsie Pier, Plumb Beach, and Gateway Marina Properties in the Gateway National Recreation Area (GATE), National Park Service. Determination of Eligibility (DOE) documents, consisting primarily of narrative descriptions and statements of significance, were developed for each of these properties within the large Jamaica Bay Unit of the Gateway NRA (GATE). Based on historic research, archival documents from the NPS and other agencies, and field views, the significance of these properties were assessed from the pre-contact past to their twentieth century origins as recreational facilities. The DOE findings, presented to NPS staff and reviewed by the NY SHPO, assisted GATE in managing their resources and planning future undertakings.

Phase I/II/III Archaeological Survey and Mitigation. SCI/Graterford Prison Expansion. Montgomery County, Pennsylvania. Principal Investigator for Phase I survey, Phase II evaluations, and Phase III mitigation of 150-acre parcel slated for the development of a new maximum security prison in Montgomery County, Pennsylvania. As a sub-contractor to Hill International, a survey consisting of over 2000 shovel test units and 90-acres of pedestrian survey documented 14 archaeological sites. Phase II evaluations were conducted on three sites, and Phase III mitigation on one. The results of excavation, statistical comparison, and spatial analysis from this mitigation have helped to redefine the knowledge of Early Woodland settlement patterns in southeastern Pennsylvania and contributed greatly to the argument for NR eligibility of upland plow-disturbed sites across the region.

Princeton Revolutionary War Battlefield Mapping Project and KOCOA Analysis. Princeton, New Jersey. Directed the GIS-based KOCOA battlefield analysis for the Revolutionary War battle at Princeton for an American Battlefield Protection Program grant administered by the National Park Service and Princeton Battlefield Society. The KOCOA analysis used a combination of primary and secondary sources, the model of "Inherent military probability", and the analysis of physical and cultural geography, historic maps, and line-of-sight / viewshed analysis. The resulting report was cited as the keystone study on this battlefield and a breakthrough example of the coordination of historians, archaeologists, and GIS technology.

Visual Effects Evaluation, Atlantic Coast United States, Minerals Management Service. Principal Investigator overseeing the GIS and Database oriented collection, standardization, evaluation, and compilation of over 12,000 historic resources within a study area that included the entire length of the east coast of the United States from Maine to Florida. Contracted by the U.S. Mineral Management Service (MMS), this project was scoped to identify, record, and evaluate every recorded historic structure, archaeology site, and traditional cultural property along an area identified as one-quarter-mile inland from the east coast of the U.S. Each resource was mapped and attributed, then evaluated based on its maritime setting and view to the sea. A sample of this database was field checked, verified, and photographs of views to and from the sea were taken and included with in the database. The intent of this project was to provide a base line of cultural resources data for the MMS's evaluation of wind and gas project proposals on the Outer Continental Shelf (OCS) of the east coast.

Statistical Characterization and Spatial Analysis of Prehistoric Archeology Sites in Leipsic and St. Jones Watersheds. Delaware Air Park, Phase III, Sussex County, Delaware. Directed the spatial analysis of over 250 archaeological sites within the Leipsic and St. Jones watersheds in Sussex County Delaware as part of the mitigation of the Delaware Airpark sites. This analysis included the GIS-based study of numerous environmental attributes and spatial location of sites across distinct environmental zones to determine how site location differed by place and time period.

GIS-Based Digitization of Archeological Survey Reports and Database Creation, Louisiana Historic Preservation Office, Baton Rouge. Army Corp of Engineers. Directed the collection, processing, and compilation of study area location and description from 3500+cultural resources reports from the Louisiana State Historic Preservation Office, Baton Rouge, Louisiana. Contracted through the U.S. Army Corp of Engineers, the end product of this effort was the creation of GIS files to be used by the SHPO to replace their paper maps as the primary tool for recording CR survey locations. Further, these GIS files will be a central feature in the SHPO's online GIS and CR system.

Phase Ia history, prehistory, and geomorphology of the Independence Mall Visitor Center, Philadelphia, Pennsylvania. Directed the research of prehistoric potential and GIS-based sensitivity analysis for the National Park Service's documentation of the Independence Mall Visitors Center. A central product in this evaluation was the creation of an 1810 topographic map of Philadelphia derived from archival measurements and the study area specific analysis of documented land disturbances to create a model of subsurface integrity. This model and these methods can be extended to any location in Center City, Philadelphia.

Great Swamp National Wildlife Refuge, Cultural Resource Overview, Morris County, New Jersey. Principal Investigator for background research, context development, GIS based sensitivity analysis, and evaluation of historic and prehistoric resources within the Great Swamp National Wildlife Refuge (GSNWR). Contracted by the U.S.Fish and Wildlife Service, this study was a synthesis of all known literature on cultural resources and environmental background within the GSNWR. Outcomes included the cataloging and standardization of records for all known cultural resources, the development of a Pleistocene / Holocene geologic history, and the assessment of historic and prehistoric site sensitivity based on cultural and geologic frameworks.

Phase I/II/III Archeological Mitigation of Raritan Landing, Stadium Expansion Area, Raritan Landing, New Jersey. Co-Field Director for Phase I through III investigations at the site of the Rutger's University Stadium expansion at Raritan Landing, New Jersey. The field investigation resulted it he mitigation of three 18th-century archaeological sites including a residence with attached store, tavern, and warehouse. Accompanying the field component was the GIS-based analysis of property records and cadastral maps and a 3D reconstruction of the evaluation of John Van Tine residence and commercial space.

Site Location Sensitivity Model, Documentary Research and Artifact Analysis: Late Woodland sites in the Brandywine Valley. Chester and Delaware counties, Pennsylvania. Co-Principal investigator for grant funded investigation into the use of "predictive models" and geophysical techniques on Late Woodland prehistoric sites in three watersheds in Pennsylvania. This ongoing project included the verification of and standardization of attributes for recorded Late Woodland sites, the application of geophysical methods to known site locations, and the creation and evaluation of "predictive models" for the locating of yet discovered Late Woodland sites in each watershed.

Phase IB survey and Phase II archeological evaluation at former Koppers Newport Superfund site. New Castle County, Delaware. Principal Investigator for Phase I and II field investigations at the Former Koppers Superfund site. This project encompassed the direction of a crew of 20 professional archaeologists, the excavation of 2200+ shovel test units, 1200+ marsh cores, 200-meters of excavation units, the logistics of multiple crews spread across 240-acres of defense secondary growth and tidal marsh, and the coordination of archaeology with environmental crews. Personal Protective Equipment (PPE) was based on an extended Level D with the use of coated and uncoated Tyvek® coveralls, chemical resistant and puncture resistant boots, double layer Nitrile gloves, duct-taped openings, and heat suppression gear. The Phase I survey resulted in 21 distinct archaeological components and the Phase II evaluations were conducted on 15 distinct components with a result of eight being determined eligible.

Ground Penetrating Radar Survey, Coring, and Subterranean Video Surveillance. Eastern State Penitentiary Historic Site, Philadelphia, Pennsylvania. Co-Principal Investigator for exploratory survey to locate 1945 escape tunnel from Eastern State Penitentiary using Ground Penetrating Radar (GPR), coring, and subterranean video equipment. Based on historic records and photographs the yard above the possible location of the escape tunnel was subjected to GPR and two locations were chosen to be cored to intersect the tunnel, While the first location hit a collapsed portion of the tunnel, the second location broke into the intact tunnel at a depth of 12-feet below the surface. The core hole was enlarged and a tether controlled robotic video-enabled rover was used to navigate the tunnel and record video. This video, as well as video from the surface, were used to create a documentary film about the prison escape of 1945.

3D Laser Scanning and 3D Computer Modeling. Washington's Headquarters, Valley Forge National Historic Site. Valley Forge, Pennsylvania. Co-Principal Investigator in for the excavation and documentation of 18th and 19th century industrial archaeological remains at Washington's Headquarters in Valley Forge National Historic Park. Contracted by the National Park Service, this project consisted of excavation and coring to located buried architectural remains, 3D laser scanning of architectural remains eroding into Valley Creek, and the 3D reconstruction of the 19th century paper mill based on historic research and archaeological findings.

GIS-based Prehistoric and Historic Sensitivity Models, U.S. Highway 113, Sussex and Kent Counties, Delaware. Directed the creation of a GIS-based prehistoric and historic site sensitivity model for a 200-square mile study area in Sussex and Kent County Delaware for the Delaware Department of Transportation. Used historic maps, environmental and cultural attributes to analyze the location of known archaeological sites and extrapolate those locations into unsurveyed regions to assess the sensitivity for archaeological remains.

GIS-based Cultural Resources Survey, U.S. Highway 113, Sussex and Kent Counties, Delaware. Principal Investigator of GIS and Database oriented data collection for spatial and architectural information on over 3500 standing historic structures in Sussex and Kent Counties Delaware. This database included the collection and digitization of archival data on 2000+

standing historic structures from the Delaware State Historic Preservation Office and the compilation of spatial and attribute data from 1500+ standing structures recorded through numerous field surveys.

Papers and Presentations

Harris, Matthew D.
2012 "Refining the Concept of 'Emergence' in the Modeling of Archaeological Phenomena." 77th Annual Meeting, Society for American Archaeology, Memphis, Tennessee.

Selig, Robert A., Matthew D. Harris, and Wade P. Catts
2011 "Archaeology, Computer Technology and the Battle of Princeton as a Cross-Cultural, Trans-Atlantic Encounter" 82th Annual Meeting, Society for Pennsylvania Archaeology. ICAHM Annual Meeting and First International Symposium, UNESCO 17th General Assembly, Paris, France.

Harris, Matthew D.
2011 "A Needle in the Upland Lithic Scatter Haystack of Southeastern Pennsylvania: 36MG0443 at Graterford Prison" 82th Annual Meeting, Society for Pennsylvania Archaeology.

Harris, Matthew D.
2011 "Archaic through Early Historic Archaeology at Pottsgrove Manor, Montgomery County, Pennsylvania" 82th Annual Meeting, Society for Pennsylvania Archaeology.

Cottrell, Elizabeth and Matthew D. Harris
2011 "Archaeology and Public Interpretation at Pottsgrove Manor, Montgomery County, Pennsylvania" 82th Annual Meeting, Society for Pennsylvania Archaeology.

Harris, Matthew D.
2011 "A Reconsideration of Glacial Event Timing, Sediments, Climate Change and Human Habitation in the Great Swamp National Wildlife Refuge, Morris County, New Jersey". 40th Annual Meeting of the Middle Atlantic Archaeological Conference, Ocean City, Maryland.

Harris, Matthew D.
2011 "Geospatial Technology and Battle Field Interpretation". Invited speaker, Revelations on the Battle of Princeton symposium, sponsored by Princeton Battlefield Society and the Crossroads for the American Revolution Association.

Harris, Matthew D.
2010 "Old Maps and New Computer Systems: Investigating Dock Creek — A Lost Waterway from Philadelphia's Colonial Past". Pennsylvania Archaeology Month Symposium sponsored by Independence National Historical Park and the Philadelphia Archaeological Forum.

Means, Bernard K. and Matthew D. Harris

2010 "Won't Someone Please Think of the Children? The National Youth Administration and Archaeology in Pennsylvania During the New Deal." 81st Annual Meeting, Society for Pennsylvania Archaeology.

Harris, Matthew D.
2009 "GIS and Spatially Enabled Thinking". Invited Speaker, Temple University, First Annual GIS Day Symposium.

Harris, Matthew D.
2009 "When Stones Speak: Telling the Story of Pottsgrove Manor's Prehistoric Past", Invited Speaker, Pottsgrove Manor Historic Site, Pottsgrove, PA.

Harris, Matthew D.
2009 "Environmental Archaeology: Reconstructing Past Environments", Session organizer and moderator. Statewide Conference on Heritage. Harrisburg, Pennsylvania.

Yamin, Rebecca, Grace Ziesing, and Matthew D. Harris
2009 "On the Road to Raritan Landing", Archaeological Society of New Jersey meeting, March.

Harris, Matthew D.
2009 "Applying a Neutral Agent Based Model of Lithic Material Procurement to the Middle Atlantic Region, United States" Computer Applications and Quantitative Methods in Archaeology International Conference. Williamsburg, Virginia.

Harris, Matthew D.
2007 "Archaeology, Politics, and Preservation: Visualizing the Historic Landscape at Valley Forge Through Archaeology and 3D Modeling" American Planners Association Annual Meeting. Philadelphia, Pennsylvania.

Harris, Matthew D.
2007 "The Schuylkill River Valley's Woodland Connections to the Middle Atlantic Region" 36th Annual Meeting of the Middle Atlantic Archaeological Conference. Virginia Beach, Virginia.

Harris, Matthew D.
2006 "The Development of Prehistoric and Historic Sensitivity Models for Transportation System Planning in Delaware" 35th Annual Meeting of the Middle Atlantic Archaeological Conference. Virginia Beach, Virginia.

Harris, Matthew D.
2005 "Prehistoric Inhabitants of Upper Providence, Pennsylvania" Bicentennial Celebration of Upper Providence Township. Upper Providence, Pennsylvania.

Harris, Matthew D.

2005 “Cooperation and Negotiation: Local Government and the Public Working Together for Preservation” 76th Annual Meeting, Society for Pennsylvania Archaeology.

Harris, Matthew D.
2004 “Prehistoric Inhabitants of the SC Lock 60 Area” Discussion and Q/A at the Schuylkill Canal Association Canal Day Celebration, Mont Clare, Pennsylvania.

Harris, Matthew D. and William J. Chadwick
2004 “Building a GIS-based Cultural Resource Properties Data Base for DelDOT, Why?” Delaware GIS Conference 2004: Geospatial Barn Raising.

Harris, Matthew D. and Joseph Baker
2004 “A Gap in Time: Context, Geoarchaeology, Archaeology, and Resource Management at the South Mountain Battlefield.” 69th Annual Meeting, Society for American Archaeology, Montreal, Quebec.

Siegel, Pete, Robert Kingsley, and Matthew D. Harris
2004 “Dynamic Dualism: A Structural Analysis of Circular Communities.” 69th Annual Meeting, Society for American Archaeology, Montreal, Quebec.

Harris, Matthew D.
2003 “Characterizing and Analyzing the Distribution of Middle Woodland Sites in the Schuylkill River Valley, Southeastern PA — or — ‘Sites are where you find them’” 70th Annual Meeting, Eastern States Archaeological Federation, Mt. Laurel, New Jersey.

Harris, Matthew D.
2003 “Typology in Context.” 68th Annual Meeting, Society for American Archaeology, Milwaukee, Wisconsin.

Harris, Matthew D.
2002 “Release the Hounds: The Fox Creek Phase in the Schuylkill River Valley of Pennsylvania.” 69th Annual Meeting, Eastern States Archaeological Federation, Mt. Laurel, New Jersey.

Herbstritt, James T. and Matthew D. Harris
2002 “Late Woodland House Types of the Susquehanna’s West Branch Valley: A New View.” 69th Annual Meeting, Eastern States Archaeological Federation, Mt. Laurel, New Jersey.

Herbstritt, James T. and Matthew D. Harris
2002 “The Long and The Short of it: A Different View of Late Woodland House Types of the Susquehanna’s West Branch Valley.” 73rd Annual Meeting, Society for Pennsylvania Archaeology.

Harris, Matthew D. and William J. Chadwick

2001 "The Use of GIS and Spatial Analysis in Predicting Archaeological Sites in the Lehigh Valley, Berks County, Pennsylvania." 72nd Annual Meeting, Society for Pennsylvania Archaeology.

Harris, Matthew D. and William J. Chadwick
2001 "Predicting the Spatial Distribution of Prehistoric Sites as Related to Water Resources Using GIS Analysis, In the Lehigh Valley, Pennsylvania." Geologic Society of North America, Northeast Section Annual Meeting.

Harris, Matthew D.
2001 "GIS and Archaeology." Invited speaker at Society for Pennsylvania Archaeology, Chapter 14, Meeting.

Professional Societies/Affiliations

Computer Applications and Quantitative Methods in Archaeology
Eastern States Archeological Federation
Gamma Phi Upsilon – International Honor Society of Geographers
Philadelphia Archaeological Forum
Society for American Archaeology
Society for American Archaeology - Geoarchaeology Interest Group
Society of Pennsylvania Archaeology
Society of Pennsylvania Archaeology - Chapter 14
The Middle Atlantic Archaeological Conference

Chronology

2011 – Present	URS Corporation
2004 – 2011	John Milner Associates, Philadelphia, PA
2000 – 2002	Commonwealth Archaeology Program, Bureau for Historic Preservation, Pennsylvania Historic and Museum Commission, Harrisburg, PA
1998 – 2000	Kittatinny Archaeological Research and KCI, Inc.

Joel Dworsky, RPA

Graduate Archaeologist/GIS Specialist

Area of Expertise

- GIS Database Management
- Section 106 of the National Historic Preservation Act
- Phase I, II, & III Archaeological Surveys and Excavations
- Artifact Identification and Interpretation
- Background Project Research
- Human Osteology
- GPS Systems

Years of Experience

With URS: 2
With Other Firms: 7

Education

M.A./2010/ Anthropology, Archaeology/College of William and Mary

B.A./2005/Millersville University/History

Continuing Education

- OSHA 29 CFR 1910.120 HAZWOPER 40-Hour Certification Course (8-hour)
- 8-Hour Annual HAZWOPER Refresher Course (URS Corporation, 2013)
- Williams Pipeline Safety Training
- Shell Safety Training
- Consol Energy Safety Training
- PEC- Safe Gulf/ Safe Land USA Training

Mr. Dworsky joined URS Corporation in 2012 and has 9 years of experience in archaeology and cultural resources management. He has participated in the excavation of sites throughout the Mid-Atlantic Region, and Bermuda. He has previously served as the field and laboratory foreman/manager for Millersville University and oversaw the numerous Phase I, Phase II, and Phase III surveys. At Millersville University he constructed artifact databases, websites, oversaw artifact preservation and cleaning, and instructed student in field techniques and the fine points of field excavation. He also headed up the background research effort for that university conducting research throughout the tri-state area, Bermuda, the UK and Caribbean. As an archaeologist at URS, his responsibilities include fieldwork, in addition to his duties as a GIS specialist wherein he prepares maps, collects GPS data, manages the GIS databases of several projects and ensures the accurate integration of field and laboratory data into a cohesive and comprehensive GIS database. Mr. Dworsky is the co-author of several technical reports and professional papers, and his experience encompasses historic and industrial archaeological investigations as well as human osteology.

Project Specific Experience

URS Corporation

Capitol Corridor Rail Transit Study- Phase 1a assessment of a rail transportation corridor for and proposed commuter rail station locations performed on behalf of the NHDOT and MASS DOT. Drafted report containing archaeological and historical background and archaeological sensitivity assessments for a roughly 70 mile project corridor as well as recommendations about the need for future cultural resource work.

New Jersey American Water Raritan-Millstone Flood Wall Control Project – Phase 1a Archaeological Survey. Principal Author of Phase Ia report. Conducted archaeological/historical background research, literature survey and field reconnaissance to assess the potential impact of the proposed modification and expansion the flood control walls at New Jersey American Water's wastewater treatment plant located at the confluence of the Millstone and Raritan Rivers in Somerset County, NJ.

Pennsylvania Turnpike Commission - Phase Ib Archaeological Survey for the PTC Turnpike Total Milepost 312 To 31. Co-authored and prepared the addendum report to the initial Phase Ib archaeological assessment which included the identification analysis of two sites in Chester County, PA, one prehistoric and the other a 19th century historic site.

Sunbury Transmission Line Project, Sunbury, Pennsylvania. GIS Analyst. Designed and help to implement a hovel testing strategy for the 33 miles of pipeline ROW that comprise the project APE. Managed and updated the GIS with data coming in from the field and generated new route recommendations based on that data. FERC compelled the section 106 survey of this area in advance of the construction of a gas pipeline proposed by UGI Company. The survey uncovered many prehistoric and historic sites many of which are awaiting Phase II investigation.

Bartram's Garden Monitoring Project. Graduate Archaeologist, Field Archaeologist, GIS analyst. Oversaw the mechanical stripping of areas adjacent to a known prehistoric site along the Schuylkill River in Philadelphia, PA. Discovered new components to the known site. Excavated, mapped and reported new findings in a report addendum.

Constitution Pipeline Project, New York and Pennsylvania. Field archaeologist and GIS specialist for the Phase I survey of a more than 200 mile stretch of northern PA and central NY. FERC conducted the Section 106 survey of this area in advance of the construction of a gas pipeline proposed by Williams Gas Company. The survey uncovered many prehistoric and historic sites many of which are awaiting Phase II investigation.

General Electric Hudson River Project, Fort Edward, New York. Field archaeologist and GIS specialist for the Phase I survey of the Hudson River in the advance of dredging by General Electric. This shore survey was conducted to ensure no sites were adversely affected by potential slumping of the riverbank if undermined by dredging activity in the river channel. In addition to the Phase I work, a Phase II study was conducted at Fort Miller, a French and Indian War era fort, located near Lock 5 on the Hudson River. This site was first investigated during the Phase I survey and received further testing because of a proposed processing plant for the decontamination of dredged soils. This Phase II investigation revealed the remains of the builder's trench and posts that comprised two palisade walls, as well as several pit features that contained military artifacts, burnt timbers, and period ceramics. This site is of importance because it was a small provisioning fort for the larger forts upstream and no fort of its kind from this period has been studied. At the present it is unknown if the client will push for a Phase III data collection.

Archaeological Investigations of the I-95/Girard Ave. Improvements Project, Philadelphia, Pennsylvania. GIS Specialist. Study conducted for the Pennsylvania Department of Transportation, Engineering District 6-0. Created GIS generated maps of the ongoing Phase IB, II, and III archaeological investigations along a three-mile long portion of the Interstate 95 highway corridor. Responsibilities include creating maps for a variety of discovered sites, including portions of the former Aramingo Canal prism, the Dyottville Glass Works, multiple

18th and 19th century domestic historic sites, as well as a prehistoric Native American encampment.

Richard Grubb and Associates

Archaeological Investigations at French Town, New Jersey. Field Technician. The work was done for the ACOE and preceded the expansion of an existing sewage treatment plant adjacent to the Delaware River. This Phase II investigation consisted of two deep 2x2 meter test units in deep flood plain soil terminating nearly 2 meter below ground surface. One test unit revealed evidence of Early Archaic occupations in one of the deepest buried "A" horizons.

College of William and Mary

Archaeological Investigations at Whitehall/The John Trimmingham Site, St. Georges, Bermuda. Field Foreman/Teaching Assistant. Performed for the Bermuda National Trust, National Museum of Bermuda, and the St. George Foundation. The work was done as a Phase II investigation of some foundation deposits discovered during the resurfacing of a road in the historic downtown district of St. Georges. The subsequent Phase II testing project undertaken by the College of William and Mary revealed a partial foundation dating to the 17th century. Documentary research revealed the owner of the parcel as one John Trimmingham, a prominent member of colonial St. Georges. One of the most interesting discoveries was two fully articulated bovine carcasses that had been buried beneath a collapsed wall of the house. It turns out that these bovine had suffered from hoof and mouth and were unceremoniously slaughtered and the walls of a ruin push on top of them. This is the only know instance of a livestock burial ever found on the island.

Millersville University

Millersville University Atlantic World Project, Southampton Parish, Bermuda. Field foreman, research director, lab director. This work was done for the National Museum of Bermuda and the Bermuda National Trust as well as the DuPont Foundation. The project consisted of the Phase I & II survey of Dickinson Store site (c. 1730-1800), SN Bermuda, the Phase I survey of the Rectory site (c. 1760-present), SN, Bermuda and the Phase I survey of the Perot Site, Bermuda. The purpose of this project was to examine the homes and store houses of Bermudian merchants known to have ties with Philadelphia merchants. The goal was to seek out evidence of smuggled non-English materials at these sites and/or material links back to Philadelphia. This was part of a larger effort to examine colonial Atlantic trade both legal and illicit from all its aspects including: the nodes of production, distribution and terminal markets. These studies focused on the those nodes of distribution, namely merchant warehouses or slave quarters (enslaved mariners often carried on their own trade in illegal port, and their trade goods like plates, buttons, and bottles, tend to survive better archaeologically than the more perishable goods of their masters, i.e. sugar, flour, rum.) Archaeological evidence was provided for illicit trade with French and Spanish Caribbean possessions that previously was merely a matter of historical footnotes and not wholly quantifiable, these took the form of several types of French faience and Dutch wares, and glass that had no legal avenue into a British possession, save thorough privateering. These findings corroborated the documentary accounts of Bermudian recorded by various government officials both Bermudian and foreign. This research filled a glaring gap in the archaeology of 18th century transatlantic trade, and laid the groundwork for a subsequent Phase II research project.

Millersville University Lancaster Colonial Settlement Project, Lancaster PA. Field Foreman, Instructor, Lab Director. This was done on behalf of Millersville University and the DuPont Foundation. The purpose of this project was to demonstrate the importance of Lancaster County, PA as a culture hearth for the western settlement of the nation. To that end a variety of sites were investigated to illuminate the settlement history of Lancaster County. A series of three locations underwent Phase I survey.

The Mylin Gun shop, the alleged birth place of the Pennsylvania Long Rifle and the homestead of one of Lancaster original settlers, was the initial focus of the project. This survey tested the area surrounding a small building currently hailed as the Mylin gun shop. The survey demonstrated that despite the popular perception, the building was in reality an 18th century blacksmith shop and was not used for gunsmithing. The original homestead of Martin Mylin, the long rifles alleged creator and one of the first settlers in Lancaster, was not discovered during survey.

The second Phase I survey area covered a series of private farms and a Boy Scout camp located upstream of the confluence of the Big and Little Conestoga Rivers. This was the supposed location of James Logan trading post (Logan was William Penn’s principal Indian agent). The survey revealed several areas of historic activity but nothing dating to that early 17th century period. The search zone was narrowed to just a few small acres, but due to lack of landowner permission the project proceeded no further.

The final location for Phase I survey, Elizabeth Furnace Iron Plantation, proved to be the most rewarding of the three Phase I surveys. The survey revealed the presence of more than 13 standing early and mid-18th century structures as well as a variety of subsurface features including a furnace race. This furnace race adjacent to the Huber House, c. 1742, became the focus of a Phase II and Phase III investigation which yielded a variety of sealed 18th century strata. The artifacts recovered during the Phase III data collection enabled the discussion of enculturation in the mid-18th century display a shift in immigrant identity from a mostly Germanic identity to a more Anglicized outlook, which was accompanied by a corresponding shift in the preference of material goods.

Subsequent Phase II & Phase III testing of a barracks and adjoining summer kitchen revealed a massive bone midden which housed the remains of the meals from the 75 Hessian prisoners of war that were housed and worked at the furnace after the battle of Trenton. This bone midden revealed the use of primarily communal/yeoman food ways (i.e. Stews, soups) and a mixed diet including all kind of meat from pig, cow, horse, and deer to poultry.

A Phase III investigation and GPR survey or the core grounds of Elizabeth Furnace Plantation revealed the existence of the remains of the 18th century blast furnace, its casting house floor and a sub-surface stone arched furnace tail race. The Phase III investigation of the industrial core of Elizabeth Furnace provided insight into the production capacity and scale of industry of this particular iron furnace, and prompted the documentary investigation of its markets and investors. Both the documentary research and archaeological findings suggested that the furnace was producing for a foreign as well as domestic market. The search to understand the scope of this trade network led to Bermuda and the founding of the Millersville Atlantic World Project (See Above)

Professional Societies/Affiliates

Council for Northeast Historical Archaeology
Phi Kappa Phi (Honors Fraternity)

Presentations

"Pennsylvania Colonial Iron Production at Elizabeth Furnace: An Archaeological and Historical Analysis" Middle Atlantic Archaeological Conference. Virginia Beach, Virginia.

Papers

Dworsky, Joel G.
2011 *Ghosts on the coast of paradise: Identifying and interpreting the ephemeral remains of Bermuda's 18th century shipyards.* Master's Thesis: College of William and Mary, Williamsburg, VA.

Trussell, Timothy and Joel Dworsky.
2007 Deep-Well Excavation: An Archaeological Case Study. *Journal of Middle Atlantic Archaeology* Volume 23:61-72.

Chronology

2012 – Present: URS Corporation
2010 – 2010: College of William and Mary
2010 – 2010: Richard Grubb and Associates
2005 – 2008: Millersville University

Vanessa Zeoli, MHP

Architectural Historian

Area of Expertise

- Cultural Resource Management
- Architectural History Surveys
- Section 106 of the NHPA
- NEPA
- National Register of Historic Places Nominations
- HABS/HAER Documentation
- Historic Preservation Planning

Years of Experience

With URS: 10 months
With Other Firms: 12 years

Education

M.H.P./2007/University of Kentucky/Historic Preservation

Certificate in Historic Preservation/ Bucks County Community College/2005

B.A./1998/Millersville University/History

Continuing Education

- ArcGIS: Introduction, Rutgers University Seminar/2014
- FHWA Program Comment for Common Post-1945 Concrete and Steel Bridges, Webinar/2013
- New Jersey Historic Preservation Conference / 2004, 2011, 2013
- Long Island Railroad Safety Training/2012
- Pennsylvania's Byways to the Past Conference/2012
- Re-pointing Workshop Using Lime Putty Mortar, Pine Mountain, KY/2007
- Kentucky Preservation Conference/2006
- Penn DOT Section 106: Principles and Practice Workshop /2004

Ms. Zeoli joined URS in July 2013 and has 13 years of experience in historic preservation and cultural resources management throughout the United States. In her position as architectural historian, she has acted as cultural resource liaison between various clients and local, state, and federal review agencies. Ms. Zeoli has completed numerous documentation and regulatory compliance projects including Section 106 studies (including eligibility evaluations, effects assessments, MOAs), NEPA studies (EAs and EISs), historic architectural surveys, HABS/HAER documentation projects, National Register nominations, historic preservation design consultation, and Historic Tax Credit Applications. She has surveyed and evaluated historic properties, evaluated eligibility in accordance with National Register criteria, evaluated project effects, and developed agreement documents to resolve adverse effects. Ms. Zeoli has worked with a wide range of resources in varying settings that include: transportation resources (historic roads, bridges, railroads, and airports); industrial properties (mills, breweries, manufacturing plants); institutional buildings (museums, churches, auditoriums); agricultural properties (farmsteads, tenant houses, cemeteries, rural landscapes); and urban buildings (residential and commercial historic districts). She meets the Secretary of the Interior's Professional Qualification Standards for Architectural Historians [36 CFR 61].

Project Specific Experience

Natural Gas Pipeline Projects in Pennsylvania and New York: Architectural Historian. Prepared eight Section 106 studies for proposed pipeline projects throughout northern Pennsylvania and south and central New York in 2013 and 2014. Work included background research, architectural surveys, inventory forms, eligibility assessments, effects determinations, and coordination with the PA and NY SHPO.

Rochester Gas & Electric Corporation: Russell Station Demolition Project, Greece, New York: Architectural Historian and Principal Investigator. A Historic Resource Inventory Form documenting the history and construction chronology, as well as assessing the significance, integrity and eligibility of the resource. Work included primary and secondary research and intensive-level survey. The station was recommended “Not Eligible” and the NYSHPO concurred in November 2013.

Scotch Plains Baptist Church, Parsonage, and Cemetery National Register Nomination, Scotch Plains, New Jersey: Senior Architectural Historian and Principal Investigator. The NRHP nomination was completed as part of a mitigation effort for alterations to the Route 22 bridge in Scotch Plains Township. The work included primary and secondary research, field investigations, and completion of the NRHP nomination form. The property was listed in the National Register of Historic Places on June 14, 2013.

Chicago Transit Authority (CTA), Wilson Transfer Station Rehabilitation Project, City of Chicago, Illinois: Senior Architectural Historian. Project involved Section 106 compliance for rehabilitation of the historic Wilson Station and reconstruction of 1,200 feet of elevated rail line within the National Register-listed Uptown Square Historic District. The work included an architectural survey, eligibility evaluations, effects assessments, consulting party coordination, and preparation of a Memorandum of Agreement.

Historic Architectural Effects Assessment Report, Potomac Yard Metrorail Station, City of Alexandria, Virginia: Senior Architectural Historian. Project consists of construction of a new Metrorail station adjacent to the National Register-listed George Washington Memorial Parkway. The work consisted of Section 106 and NEPA studies in support of an Environmental Impact Statement. The project also involved extensive consultation efforts with the Virginia Department of Historic Resources, the National Park Service, and other consulting parties.

California High-Speed Train Project, California High-Speed Rail Authority (CAHSRA), Merced to Fresno, California: Architectural History Task Leader. Project involved the preparation of an Environmental Impact Report/Environmental Impact Statement for the design and construction of a high-speed passenger train system for a 60 mile section between Merced and Fresno. Compliance efforts under Section 106 and NEPA involved conducting background research, conducting field survey, compiling data, eligibility evaluations, effects assessments, developing treatment measures, and coordinating with local, state, and federal agencies. Ms. Zeoli was task leader, managing teams in New York and California and was the primary author of numerous technical reports in support of the EIR/EIS including Historic Properties Survey Report (HPSR), Historic Architectural Survey Report (HASR), Finding of Effects Report (FOE), and Built Environment Treatment Plan (BETP).

Chicago Transit Authority (CTA), North Red Line Station Improvements, City of Chicago, Illinois: Architectural Historian. Project involved a Section 106 assessment for the rehabilitation of 8 stations along the North Red Line elevated railroad in the City of Chicago. The work included background research, field survey, National Register of Historic Places eligibility evaluations, effects assessments, and submission of Historic Architectural Screening reports for submission to the Illinois Historic Preservation Agency (IHPA) for review and concurrence.

New Jersey Turnpike Interchange, 6-9 Widening, New Jersey Turnpike Authority (NJTA), Cranbury Township, New Jersey: Architectural Historian. Project involved producing historic signage marking the spot where the newly widened turnpike crosses the National Register-eligible Camden & Amboy Railroad Historic District. The work was completed in compliance with a NJDEP Freshwater Wetlands permit. Work included background research, drafting text for the sign and coordination with the NJSHPO and sign fabricator.

St. Joseph North Pier Inner Light (St. Joseph, MI), Green Bay Harbor Entrance Light (Green Bay, WI), and Grand Marais Light (Grand Marais, MN): Architectural Historian and Photographer. Project was undertaken as mitigation for the replacement of three historic Fresnel lenses with LED lights. Effort consisted of photographic documentation of the lighthouses and lanterns and archival preparation of prints in accordance with each State Historic Preservation Office requirements.

Columbia Pike Transit Initiative, Washington Metropolitan Transit Authority (WMATA), Fairfax County, Virginia: Architectural Historian. Project involved the completion of Section 106 studies to evaluated alternatives that included enhanced bus or streetcar service along a heavily developed commercial and residential corridor, with numerous historic resources. The work included background research, historic architectural survey, and the preparation of approximately 60 reconnaissance-level survey forms for the Virginia Department of Historic Resources.

Cultural Resources Survey: Proposed Shot Tower Metro Station Hardening, City of Baltimore, Maryland: Architectural Historian and Principal Investigator. Project consisted of a Cultural Resources Survey in accordance with Section 106 for the Maryland Transit Authority. Conducted background research, field survey, and prepared a report to documenting and evaluating historic architectural resources in the project area including the Jones Falls Conduit and a portion of the Union Railroad Historic District.

Millhurst Mill HABS Level III Recordation, Manalapan Township, Monmouth County, New Jersey: Senior Architectural Historian. Project involved HABS Level III Recordation of the National Register-eligible, late-nineteenth century flour and feed mill. The project was undertaken to mitigate the adverse effect of the proposed reconstruction of Bridge MN-10 and the rehabilitation of the Millhurst dam. Ms. Zeoli conducted primary and secondary historical research to prepare a detailed history of the site and photographic documentation designed to capture character-defining features of the mill, dam, millpond, and raceway.

St. Peter the Apostle Church Convent, City of New Brunswick, Middlesex County, New Jersey: Historic Preservation consultant for the adaptive reuse of the church convent as a student ministry center. The church and convent were listed on the National Register of Historic Places in 2005 and the subject of an historic preservation easement held by the New Jersey Historic Preservation Trust. Ms. Zeoli coordinated with the Trust and the project team (church, architects, construction manager, and contractors) to ensure compliance with the Secretary of the Interior's Standards for Rehabilitation.

Springfield Avenue Bridge Replacement, Cranford Township, Union County, New Jersey: Architectural Historian. The work consisted of an Intensive-Level Architectural Survey and evaluation of historic architectural resources within the Area of Potential Effects for the proposed replacement of a historic bridge that was a contributor to three National Register-eligible historic districts. The work was completed in compliance with a NJDEP Freshwater Wetlands permit.

Woodford-Fishback-Venable Farm, Winchester, Clark County, Kentucky: Architectural Historian. Prepared the nomination of the early-nineteenth century Woodford-Fishback-Venable Farm to the National Register of Historic Places. Cultural resources on the property boundaries reflect how patterns of traditional diversified agriculture were adapted to natural features in the Inner Bluegrass region. Ms. Zeoli conducted primary and secondary research and prepared the nomination according to the National Register of Historic Places guidelines. The farm was listed on the National Register in July 2008.

Upper Reaches of Boone Creak Rural Historic District, National Register of Historic Places Nomination, Fayette and Clark Counties, KY: Architectural Historian. Project consisted of the preparation of a nomination of the Upper Reaches of Boone Creek Rural Historic District. The district is a 10,742 acre rural historic landscape in Central Kentucky that has been engaged in agricultural pursuits since the settlement period. Ms. Zeoli conducted primary and secondary research, surveyed and photographed the district, and published the nomination according to National Register of Historic Places guidelines. The district was listed in the National Register of Historic Places in July 2009.

Philadelphia Civic Center, HABS Level II Documentation, City of Philadelphia, Pennsylvania: Cultural Resource Specialist and Project Manager. Project consisted of a Level II HABS Documentation of the Philadelphia Civic Center before its demolition in 2005 and its replacement with the Perelman Center for Advanced Medicine in 2008. Documentation included primary and secondary research, digital photography, recordation of historic features, and narrative description. Ms. Zeoli also assisted a professional photographer with large-format, HABS-quality photography of the building.

Adaptive Reuse of Memorial Hall, City of Philadelphia, Pennsylvania: Draftsman and Conservation Intern. Project consisted of the adaptive reuse of Memorial Hall for the Please Touch Museum. The museum was built in 1875 to serve as the art gallery for the Centennial International Exhibition in Fairmount Park in 1876. It is one of only two remaining buildings out of the over 200 buildings constructed for the Exposition fairgrounds. Ms. Zeoli worked with the preservation architect and architectural conservator to complete a detailed conditions assessment of historic features and prepare construction drawings in preparation for rehabilitation and adaptive reuse of Memorial Hall.

Professional Societies/Affiliates

Vernacular Architecture Forum/2014
Lambertville Historical Society/Board Member/2013-Present
Boston Architectural College/Adjunct Instructor/2012-Present
Bucks County Community College/Adjunct Instructor/2011-Present
Bluegrass Trust for Historic Preservation/2006-Present
Sigma Pi Kappa/Historic Preservation Honor Society/2005-Present
National Trust for Historic Preservation/2005-Present

Chronology

2010–2013: AECOM, Trenton, NJ
2009–2010: Richard Grubb & Associates, Cranbury, NJ
2007–2009: Cultural Resource Consulting Group, Highland Park, NJ
Summer 2007: Preservation Services and Technology Group, KY
Summer 2006: Clark County/Winchester Heritage Commission, KY
2005–2007: University of Kentucky/ Historic Preservation Program
2001-2005: Bucks County Community College, Newtown, PA
2001-2005: Kise Straw & Kolodner, Philadelphia, PA
1994-1998: Millersville University, Millersville, PA

Geographic Experience

New Jersey
Pennsylvania
New York
Rhode Island
Massachusetts
Delaware
Maryland
Virginia
Georgia
Florida
Kentucky
Illinois
Michigan
Wisconsin
California

Andrew Wyatt, RPA
Senior Archaeologist

Area of Expertise
Archaeology of Historic And Prehistoric Native Americans
Section 106 of the National Historic Preservation Act
Archaeological Surveys and Excavations
Lithic and Ceramic Analysis
Geomorphology
Technical Report Production
Historic Contexts
Public Involvement

Years of Experience

With URS: 2 Years
With Other Firms: 24 Years

Education
B.A./1988/State University of New York at Albany/Anthropology & Mediterranean Archaeology
M.A./2007/Temple University/Anthropology

Continuing Education
SRI Foundation -Section 106 Principles and Practice, February 2003

Overview
Mr. Wyatt has 26 years of experience in archaeological investigations and Section 106 of the National Historic Preservation Act in the Middle Atlantic and northeastern United States. Andrew possesses a strong background in archaeological field and laboratory methods along with extensive training and experience in lithic and ceramic analysis and geomorphology. His primary specialization is the study of Native American groups through archaeology and ethnohistory. Although the majority of his work has been focused in Pennsylvania, he been has directed field surveys, artifact analysis, and written technical reports for projects in Delaware, New York, Maryland, Ohio, and Virginia. His current responsibilities include project management, project scoping, proposal, workplan, and technical report preparation. Mr. Wyatt worked at the Pennsylvania State Historic Preservation Office as an archaeological reviewer, gaining a comprehensive understanding of agency coordination under Section 106 as well as the cultural resource management needs and responsibilities of federal and state agencies, private entities, and the public. He is the author or co-author of more than 70 technical reports, 25 professional papers, several peer-reviewed publications, as well as numerous presentations and materials for the general public.

Examples of Project Experience

Phase IB Archaeological Investigation, Northeast Pocono Reliability Project, PPL Electric Utilities, Northeastern PA: Co-Principal Investigator for a 64-mile electric transmission line right of way and two 100+ acre substations. Tasks include logistical coordination of staff, supervision of fieldwork, report preparation, and SHPO consultation. Identified nine historic Euro-American sites and one Native American archaeological site. Worked with client to avoid those which were potentially eligible for listing on the National Register of Historic Places (NRHP).

Phase I Archaeological Investigation, Clarion Area Wastewater System Upgrade, Pennsylvania-American Water Company, Clarion and Strattanville Boroughs, Clarion and Monroe Townships, Clarion County, PA: Principal Investigator, report author for identification-level survey of eight miles of collection line and wastewater treatment plant upgrade.

Phase IB Archaeological Investigation, Rochester Area Reliability Project, Rochester Gas & Electric, Monroe County, NY: Principal Investigator for a 24-mile electric transmission line right of way. Tasks include SHPO consultation, logistical coordination of staff, supervision of fieldwork, and report preparation. Identified two historic Euro-American sites and three Native American archaeological sites. Worked with client to avoid those which were potentially eligible for listing on the National Register of Historic Places (NRHP).

Phase I Archaeological Archaeological Investigation, MF-42 Gas Line Replacement Project, Rochester Gas & Electric, Monroe County, NY: Principal Investigator for a 1.5 mile natural gas line replacement. Tasks included SHPO consultation, development of costs and scope, logistical coordination of staff, supervision of fieldwork, report preparation. Assisted client by performing investigation within an expedited construction schedule.

Phase I Archaeological Investigations, Cabot Oil and Gas Company, Meshoppen Creek Impoundment, Lemon Township, Wyoming County, PA: Principal Investigator for identification-level survey of a proposed 30-acre freshwater impoundment. Tasks include development of costs and scope, logistical coordination of staff, supervision of fieldwork, report preparation, and SHPO consultation.

Phase I and Limited Phase II Archaeological Investigations, Angelina Gathering Company, N Gathering Line Modifications, Stevens Township, Bradford County, PA: Principal Investigator for identification-level survey and archaeological site boundary definition within natural gas pipeline corridor. Assisted client in avoiding a potentially NRHP-eligible archaeological site within an expedited construction schedule through close coordination with SHPO.

Phase I Archaeological Surveys, Marcellus Shale Gas Development Projects, Williams Field Services Company, Angelina Gathering Company, CONE Gathering, LLC, SWEPI, Northeastern and Western, PA: Served as Principal Investigator for multiple Phase I identification-level surveys in northcentral Pennsylvania. Tasks include development of costs and scope, logistical coordination of staff, supervision of fieldwork, report preparation and SHPO coordination. Projects are ongoing and accomplished under fast-paced timelines for fieldwork and reporting.

Phase I Archaeological Surveys, Marcellus Shale Gas Development Projects, Talisman Energy USA, Bradford, Tioga, and Susquehanna Counties, PA: Served as Principal Investigator, author or co-author of technical reports for Phase I identification-level surveys in northcentral Pennsylvania.

Phase I/II/III Archaeological Studies at the Lemoyne Site, Norfolk Southern Railway Company, Borough of Lemoyne, and the National Park Service, Cumberland County, PA: Principal Investigator and Field Director for identification, excavation and analysis of an early 17th century A.D. Susquehannock village. Primary technical report author for all phases of investigation and coordinator of an interdisciplinary team of faunal and paleobotanical specialists for Phase III mitigation studies. This project was conducted in advance of new rail line construction by Norfolk Southern on park property owned by the Borough of Lemoyne, with

Section 106 oversight by the National Park Service. The investigation resulted in a new perspective on Susquehannock village relocation, chronology, and agricultural practices. Mr. Wyatt also directed public involvement efforts which included site tours, presentations geared toward all ages, and a published booklet explaining the site's importance.

Phase I/II/III Archaeological Studies, S.R. 0056 Transportation Improvement Project, PennDOT and FHWA, Bedford County, PA: Report co-author, primary artifact analyst for three prehistoric Native American quarry-related sites. Developed research strategy and coordinated the work of geologists to chemically characterize local cherts.

Phase II/III Archaeological Studies, PennDOT and FHWA, Schantz Road Realignment, Lehigh County, PA: Principal Investigator and Field Director of Phase III fieldwork on an early Federal period Pennsylvania German farmstead that also contained significant prehistoric Native American occupations. Managed in-house artifact analysis as well as multidisciplinary team of paleobotanical and lithic use-wear specialists.

Phase III Archaeological Studies, PennDOT and FHWA, Route 309 Connector Project, Bucks & Montgomery Counties, PA: . Primary report author and artifact analyst for Phase III mitigation of a prehistoric Native American site with a strong Late Woodland component. Managed an interdisciplinary team of paleobotanical, lithic use-wear, and protein residue specialists to interpret a short-term ancestral Lenape campsite. Co-produced a booklet for the public detailing archaeological investigations done for the transportation project and its importance for understanding Lenape prehistory.

Phase III Archaeological Studies, PennDOT and FHWA, SR 147 Climbing Lane, Northumberland County, PA: Co-Principal Investigator, primary artifact analyst and technical report author for Phase III mitigation of stratified, multicomponent Native American site on the Susquehanna River floodplain. Managed an interdisciplinary team of pedological, paleobotanical, lithic use-wear, and protein residue analysts. This investigation uncovered rarely-seen evidence for hunter-gatherer storage behavior circa 3500 B.C., and prompted a re-evaluation of Late Archaic settlement patterns in the central Susquehanna River drainage. Project results were widely disseminated through professional papers and presentations for local residents.

Selected Professional Papers and Presentations

Wyatt, Andrew
2012 "Reconsidering Susquehannock Settlement Patterns, Excavations at the Lemoyne Site, Cumberland County, Pennsylvania." Paper presented at the Pennsylvania Archaeological Council Symposium "Recent Research on the Susquehannocks" as part of the 83rd Annual Meeting of the Society for Pennsylvania Archaeology, Clarion, Pennsylvania.

Andrew Wyatt and Barbara J. Shaffer
2010 "Small is Beautiful: Data Recovery Excavations at a Multi-Component Native American Campsite in Montgomery County, Pennsylvania." Poster presented at the 90th Annual Meeting of the Transportation Research Board, Washington, D.C.

Wyatt, Andrew
2009 "Early Seventeenth Century Susquehannock Settlement Patterns Reconsidered: Results from the Lemoyne Borough Memorial Park Site, Cumberland County, Pennsylvania." Paper presented at the 76th Annual Meeting of the Eastern States Archaeological Federation, Johnstown, Pennsylvania.

Wyatt, Andrew
2009 "Final Excavation Results from the Lemoyne Borough Memorial Park Site (36Cu194): A Washington Boro Stage Susquehannock Site in Cumberland County, Pennsylvania." Paper presented at the 80th Annual Meeting of the Society for Pennsylvania Archaeology, Harrisburg, Pennsylvania.

Wyatt, Andrew
2008 "Preliminary Excavation Results from the Lemoyne Borough Memorial Park Site (36Cu194): A Washington Boro Stage Susquehannock Site in Cumberland County, Pennsylvania." Paper presented at the Statewide Conference on Heritage, Harrisburg, Pennsylvania.

Andrew Wyatt, Barbara J. Shaffer, and Joseph S. Hollinger
2008 "Norfolk Southern Rail Connector Project, Lemoyne Borough, Cumberland County, Pennsylvania." Poster presented at the 87th Annual Meeting of the Transportation Research Board, Washington, D.C.

Burns, Jonathan A. and Andrew Wyatt
2007 "Rockshelters as Persistent Places: The View from Camelback." Paper presented at the 78th Annual Meeting of the Society for Pennsylvania Archaeology, Allentown, Pennsylvania.

Andrew Wyatt and Robert Eiswert
2006 "Late Archaic Occupation at the Raker I Site, Northumberland County, Pennsylvania: Implications for Settlement Models in the Central Susquehanna Drainage." Paper presented at the 77th Annual Meeting of the Society for Pennsylvania Archaeology, Washington, Pennsylvania.

Andrew Wyatt and Barbara J. Shaffer
2006 "Archaeological Investigations at the Raker I Site: A Stratified Late Archaic and Late Woodland Site Along the Susquehanna River, Northumberland County, Pennsylvania." Poster presented at the 85th Annual Meeting of the Transportation Research Board, Washington, D.C.

Wyatt, Andrew
2005 "Late Archaic Occupation at the Raker I Site, Northumberland County, Pennsylvania." Paper presented to the Northumberland County Historical Society, Sunbury,Pennsylvania.

Wyatt, Andrew
2004 "Water From A Deeper Well: An Analysis of Final Cordage Twist Direction on Woodland Pottery from the Central and Northern Susquehanna Drainage." Paper presented at the75th Annual Meeting of the Society for Pennsylvania, Clarion, Pennsylvania

Wyatt, Andrew, Francine Arnold, and Barbara Shaffer
2003 "Prehistoric Lithic Reduction Sequencing and Historic Farm Life at the Snook Farm Site (36BD217) and other Sites in Bedford County." Paper presented at the74th Annual Meeting of the Society for Pennsylvania, State College, Pennsylvania

Wyatt, Andrew
2002 "Prehistoric Lithic Workshop Sites on Chestnut Ridge in Bedford County, Pennsylvania." Paper presented at the73rd Annual Meeting of the Society for Pennsylvania, Greensburg, Pennsylvania

Wyatt, Andrew
1998 "A Context for the Significance of the Harding Flats Site." Paper presented at the 65th Annual Meeting of the Eastern States Archaeological Federation, Wilkes-Barre, Pennsylvania.

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Professional Societies/Affiliations

Society for American Archaeology
Eastern States Archaeological Federation
Society for Pennsylvania Archaeology

Chronology

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2000	Department of Anthropology, Temple University, Philadelphia, PA
1993-1999	Bureau for Historic Preservation, Pennsylvania Historical and Museum Commission, Harrisburg, PA
1991 – 1993	3D Environmental Services, Inc., Cincinnati, OH
1990	Department of Anthropology, University of Virginia, Charlottesville, VA
1989	Collamer & Associates, Inc., Albany, NY
1986-1988	Cultural Resource Management Services, State University of New York, Albany

August 2014

Prepared for:

The New Hampshire Department of Transportation

Reconnaissance-Level Historic Architectural Survey for the New Hampshire Capitol Corridor Rail and Transit Study

Concord, Merrimack County; Manchester and Nashua, Hillsborough County

Prepared by:

URS

Burlington, New Jersey

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APPENDICES

1.0 Introduction

The Federal Railroad Administration (FRA) as the lead federal agency, the Federal Transit Administration as a cooperating agency, and the New Hampshire Department of Transportation (NHDOT) as the project sponsor, are proposing to evaluate the feasibility of developing new rail and transit services in the 73-mile corridor between Boston, Massachusetts and Concord, New Hampshire (**Figure 1**). To satisfy requirements under the National Environmental Policy Act (NEPA) of 1969, as amended, NHDOT is preparing an Environmental Assessment (EA). The New Hampshire Capitol Corridor Rail and Transit Study (the Project) is a federal undertaking and as such, is also subject to review under Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, and the implementing regulations, 36 CFR Part 800. To initiate consultation under Section 106 among the FRA, FTA, NHDOT, and the New Hampshire Division of Historic Resources (NHDHR), URS has prepared this this Reconnaissance-Level Historic Architectural Survey, a Request for Project Review (RPR), and a Phase IA Archaeological Survey. The architectural and archaeological studies will also serve to supplement and inform the Environmental Assessment being completed as part of the NEPA process. The purpose of this Reconnaissance-Level Historic Architectural Survey is to record the presence or absence of previously identified and unidentified cultural resources within the Area of Potential Effect (APE). This study is part of the initial stage of the Project to evaluate existing conditions of the Project area. The RPR, Phase IA Archaeological Survey, and Reconnaissance-Level Historic Architectural Survey were all prepared in accordance with the guidelines set forth by the NHPA and the NHDHR.

1.1 Project Description

New Hampshire Capitol Corridor Rail and Transit Study is defining and evaluating opportunities to address transportation needs and preferences that involve transit and rail options in the 73-mile corridor between Boston, MA and Concord, NH. While Massachusetts Bay Transportation Authority (MBTA) commuter rail service currently operates between Boston and Lowell, there has not been passenger service north of Lowell since it was discontinued in 1967. A public-private partnership, supported by the State of New Hampshire, operates roughly 50 daily bus roundtrips within the corridor between New Hampshire and Boston; this service typically carries 1,800 passengers per day.

Increasing transportation demand and growing concerns about mobility, economic development and quality of life have led the citizens and officials in New Hampshire and Massachusetts to explore options to improve transit service along the northern end of the Capitol Corridor. The NH Capitol Corridor Study is evaluating a diverse set of rail and bus options for improving connectivity in the Capitol Corridor by leveraging existing transportation infrastructure, including Pan Am Railway, Route 3, and I-93. The study, which will be completed in late 2014, will result in the recommendation of a preferred investment strategy that is responsive to local transportation need and the region’s economic, social, financial, and environmental context and that will be competitive for federal construction funding.

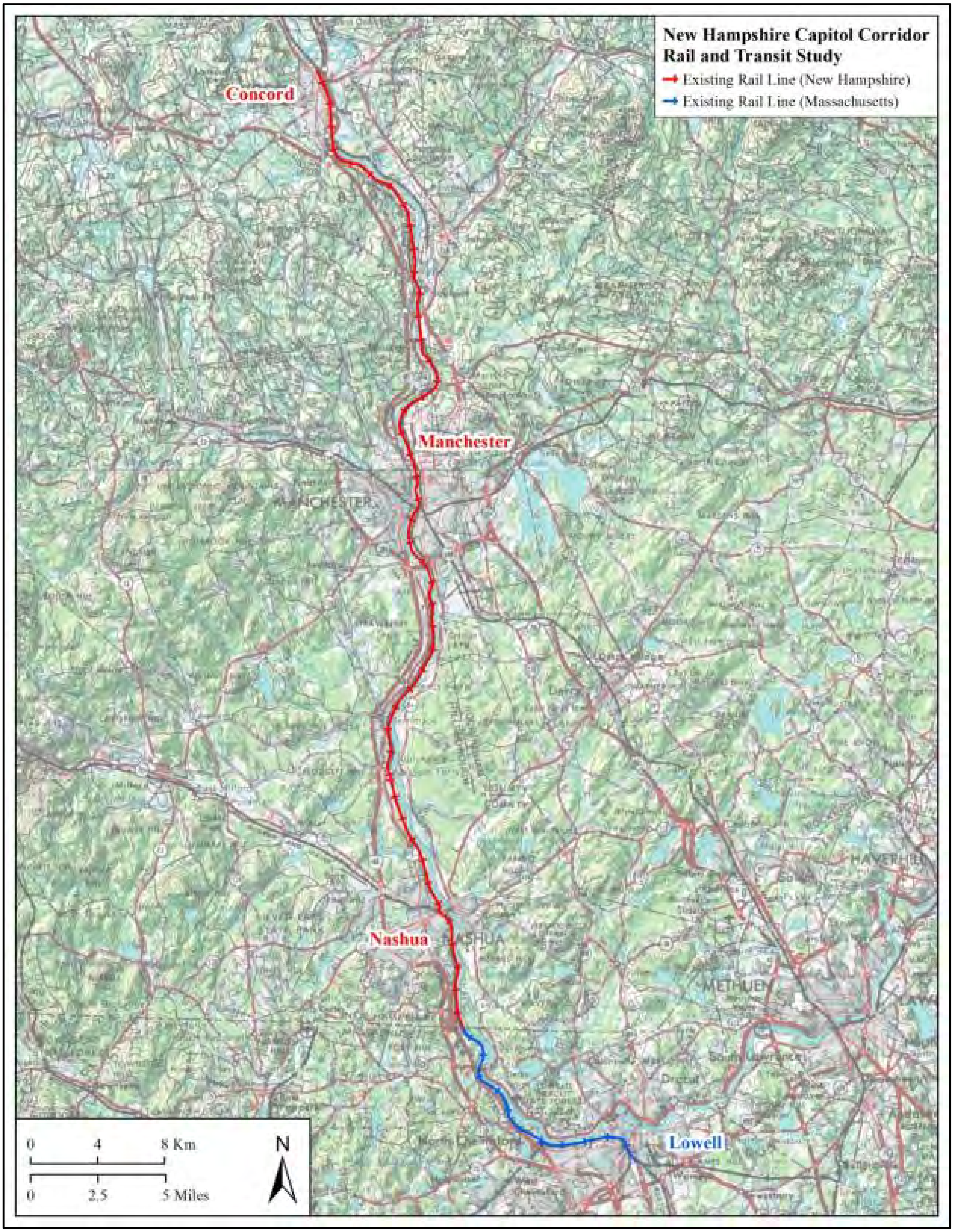

Figure 1. Project Location Map (USGS)

1.1.1 Proposed Station and Layover Facilities

During this preliminary evaluation phase, seven potential station and six layover alternatives are being explored between Concord and Nashua. Of those, five station locations and one layover facility location will be selected for the final design. Station facilities would generally consist of 800-foot open platforms that would be constructed within the existing railroad right-of-way (ROW); 100-foot access platforms with ramps and stairs; a maintenance building; parking lots to accommodate commuters; street striping for new drop-off/pick-up traffic; grade crossings; and new tracks for platform access and turnouts. Layover facilities would generally consist of a maintenance and substation building; additional tracks for the layover area; retaining walls; and access roads. In addition to the station and layover facilities, a second track would be added to certain portions of the existing ROW along the 73-mile stretch. Below is list of station and layover facility alternatives. For detailed project plans see **Appendix A** and for photographs of the Project area, see Photos 1-23 in **Appendix B**.

Station Facilities
There are seven potential locations for station facilities (See Photos 1-23):

- Stickney Avenue Station in Concord
- Spring Street Station in Manchester
- Granite Street Station in Manchester
- Ray Wieczorek Drive Station in Bedford
- Crown Street Station in Nashua
- Spit Brook Station in Nashua
- Pheasant Lane Mall Station in Nashua

Layover Facilities
There are six potential locations for layover facilities:

- Stickney Avenue Layover Facility in Concord
- Granite Street Layover Facility in Manchester
- Cemetery Layover Facility in Manchester
- Manchester Layover Facility
- Water Treatment Plant Layover Facility in Manchester
- Spit Brook Road in Nashua

2.0 Methodology

The purpose of this study is to gather information about previously documented historic architectural resources and to assess the potential for the APE to contain historic architectural resources not previously documented. The study consisted of three primary tasks:

1. Background research
2. Field visit
3. Data analysis and report preparation

2.1 Background Research

Prior to the field visit, background research was conducted at the New Hampshire Division of Historical Resources (NHDHR) on March 6, 2014 to determine if there were any cultural resources in the project area that were listed in or eligible for listing in the National Register of Historic Places (NRHP). Information was also gathered on resources that were inventoried and documented in NHDHR's files, but may not have been evaluated for NRHP eligibility. Information gathered during the visit to NHDHR included NRHP nominations, inventory forms, and any reports of cultural resource investigations that were conducted in the Project area.

Local historic preservation organizations were also consulted to gather information about locally designated or recognized historic architectural resources that might inform the study. This search included the Concord Heritage Commission, Manchester Heritage Commission, and the Nashua Historic District Commission.

The NRHP website was consulted to gather additional information about previously documented resources in the project area. Additional online research was conducted to historical maps, atlases, aerial photographs, city property records, as well as secondary source materials like local and regional histories, in order to establish a historic context. Information gathered during background research was used to guide the development of the APE and the field investigation.

Historic maps gathered during the background research phase were used to help guide the identification effort and build the historic context. By comparing historic maps with historic and current aerials, it was possible to trace the development of the built environment within the Project area and determine change over time.

2.2 Field Visit

After a review of the background research, a field visit was conducted of the project area March 25-29, 2014. The field visit consisted of a windshield and pedestrian survey to assess the general conditions of the built environment in the project area and capture digital photographs of previously documented resources and previously undocumented historic architectural resources that are over 50 years of age. Historic architectural resources are defined as aboveground buildings, structures, objects, districts, or landscapes. The purpose of this study is not intended to definitively identify and document every historic aboveground resource in the APE; rather, it inventories any previously documented historic properties that are listed in or eligible for listing in the SRHP and NRHP and indicates the likelihood that previously undocumented aboveground resources exist. Section 4.0 presents the results of the field survey.

2.3 Definition of the Area of Potential Effect

The Area of Potential Effect (APE) encompasses all areas where construction activities could directly or indirectly impact significant historic properties (See Figure 2). The APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist" (36 CFR §800.16[d], amended 2004).

The APE includes all areas affected by the end result of the improvements as well as during the construction of the project. Development of the APE took into consideration potential visual effects, auditory effects, direct and indirect effects, beneficial as well as adverse effects, physical effects, and changes in the way the land or historic properties are used.

The APE for the Project includes the limits-of-disturbance (LOD) at the proposed station and layover facility locations, as well as those sections of the railroad right-of-way (ROW) where a second track would be added. This area is the direct APE. The APE also includes 500-foot buffer surrounding the proposed station and layover facility locations to account for resources that may be visually or contextually affected by the Project. This area is the indirect APE. Definition of the APE took into consideration the location and appearance of the existing railroad line; the character and condition of the built environment; and the qualities of the natural environment. The indirect APE was confined to a relatively small area surrounding the LOD based on the limited nature of the construction work associated with the Project. As currently designed, it is not anticipated that the Project would incur a visual impact to historic properties, but since the project is in the early stages of design, a wider net was cast (the 500-foot indirect APE) to account for any later design changes. As discussed in **Section 1.1** and shown in **Appendix A**, the Project would include open platforms with ramps and stairs for access, track construction/realignment/turn-outs, maintenance and substation buildings, and road striping for parking lots and new turning lanes.

Since the proposed second track would be added within an existing ROW that already contains a track, no indirect APE was necessary along the alignment; therefore, the APE in those areas is confined only to the ROW. See **Appendix C** for detailed maps of the APE.

The APE was developed based upon the preliminary project plans, renderings, and a field visit. If project plans are modified from those included in this study, the APE will have to be adjusted accordingly and additional research and survey will be necessary to evaluate previously unsurveyed areas and the effects of the project on any significant historic architectural resources.

2.4 Consulting Parties and Public Participation

As part of the Section 106 process, a number of parties could have a consultative role in a project considered an undertaking. These parties can include State and Tribal Historic Preservation Officers (SHPOs and THPOs), Indian tribes, representatives of local governments, applicants for federal assistance, permits, licenses and other approvals, property owners, and certain individuals and organizations who have demonstrated an interest in the undertaking. These parties are invited to provide input on the four steps of the Section 106 process: identifying historic properties in the APE, assessing the project's potential to affect such properties, seeking ways to avoid, minimize or mitigate any adverse effects to historic properties, and resolving adverse effects, as necessary.

While coordination with consulting and interested parties has not been initiated, URS has begun to compile a draft list of potential organizations and individuals that may have an interest in the project. Those parties include:

- New Hampshire Historical Society
- New Hampshire Preservation Alliance
- Historic New England
- Concord Historical Society
- Concord Heritage Commission
- Manchester Historic Association
- Manchester Heritage Commission
- Friends of Stark Park
- Nashua Historical Society
- Nashua Historic District Commission
- Property Owners

3.0 Historic Context

3.1 City of Concord

The territory that would become Concord, New Hampshire was initially granted to the Massachusetts Bay Colony in 1629 by King Charles I (Lyford 1903:95). However, the first settlement in the region did not occur until 1695, when Judge Samuel Sewell established a farm in the region under a grant from Governor John Endicott of Massachusetts. Unfortunately, the validity of the grant came into question when New Hampshire became an independent colony in 1679 and also laid claim to the territory (Lyford 1903:99). Competing claims for the territory between Massachusetts and New Hampshire plagued the region though the end of the 17th century. Additionally, a series of bloody wars with the Native American inhabitants of the region had raged along the frontier for much of the latter portion of the 17th century and well into the 18th century which further frustrated settlement (Lyford 1903:101). As a result, European settlers were not successful at establishing a foothold in the region (that would later become Concord) until near the end of the first quarter of the 18th century. In January of 1725, the colony of Massachusetts Bay granted the parcel of land upon which Concord now stands as the Penacook Planation (named after the Native American tribe that inhabited the region prior to the aforementioned wars) despite continuing conflicting claims from New Hampshire (Lyford, 1903:96-106). This new land grant was settled by Captain Ebenezer Eastman and his cohorts, and the resulting settlement grew quickly by establishing a small saw and grist mill along Mill Brook which provided the materials and food the growing settlement needed (Lyford 1903:121, 125-126). Over the next decade, the settlement known as the Penacook Plantation grew substantially and in January of 1733-4 it was incorporated as Rumford (Lyford 1903: 136-137; Moore 1825:15). During the years to follow, boundary location issues between New Hampshire and Massachusetts became hotly debated (Lyford 1930:152). Unable to come to an agreement, the two colonies set the dispute before the king who redrew the boundary in 1740 (Lyford, 1930:156). This new boundary line found the newly established town of Rumford cut off from Massachusetts and completely contained within the colony of New Hampshire (Lyford 1930:156-157). Boundary disputes soon arose between Rumford and the New Hampshire town of Bow (located just to the south) whose charter from New Hampshire contained the same land given to Rumford by Massachusetts (Lyford 1930:156, 188-189). These bitter debates continue from 1749 to 1771 when they came to an agreement with the propitiators of Bow in which they essentially repurchased the land upon which they were living (Lyford 1930:193, 215-216; Moore, 1825:30). Despite the legal conflicts, in May of 1765, Concord was created as a parish within Bow, New Hampshire. It was not until 1784 that the parish of Concord officially became a town (Lyford 1930:192, 222-223, 239; Bacon, 1890:5; Moore, 1825:44, 31-34).

The mid-18th century saw a renewal of conflicts with the Native Americans and the French. King George’s War in 1742-1749, pitted New England against the French colonies in nearby Canada (Lyford 1930:168). Men from the town of Rumford found themselves a part of the New Hampshire Militia and engaged in numerous campaigns including the siege at Louisburg (Lyford 1930:168-169). During this period, the town of Rumford established a Garrison and erected fortifications to defend against attacks from the French and their native allies (Moore 1825:21). In 1746, the town was attack by a small force of Native Americans from St. Francis, Canada, which resulted in the deaths of five citizens of Rumford (Lyford 1930:175-177; Moore 1825:23-25). Over the ensuing years, citizens of Rumford were constantly anxious about attack and had to be ever vigilant of assault, even while pursuing the most mundane agricultural chore. Enemies of the Crown were constantly moving through the region raiding or laying in ambush (Lyford 1930:182; Moore 1825:20, 27). Mercifully, the Peace of Aix-la-Chapelle came in 1748 and with it, life in Rumford resumed a more normal pace (Lyford 1930:183). The peace in the colonies was short lived however; conflicts between Britain and France were renewed in the colonies in 1754 during the French and Indian War (Lyford 1930:222). Once again the people of Rumford had to look over their shoulders for fear of attack (Lyford 1930: 226). Throughout the ensuing conflict, armies and raiders from both sides roamed across Pennsylvania, New York, New England; Canada and Rumford, being situated on the frontier, was always under threat (Lyford 1930:222-237).

In the latter half of the 18th century, Concord became a prosperous agrarian town. In 1790, the General Court removed to Concord because it was centrally located within the state. Some 18 years later in 1808, it was officially selected to be the new capital of the state (Bacon 1890:6; Heald 2007:32). Moving the capitol to Concord brought new people, money, and opportunities to the community. In order to better connect the new capitol to the rest of the state, a plethora of new roads were devised. In 1794, the first stage line was established with connections to Boston (Lyford 1903:833). Six new turnpikes chartered between 1796 and 1809 conveyed people directly to Concord (Lyford 1903:833). Despite the new developments in land transportation, Concord was unable to ship large amounts of freight downstream to profitable markets like Boston because of the series of large waterfalls situated south of the city on the Merrimack River. These navigational impediments isolated Concord and stifled the growth of industry prior to the 19th century; however, in 1807 Samuel Blodget constructed a canal lock around the Amoskeag Falls and to the south, opening up the Merrimack River to Concord and eventually connecting them to the newly established Middlesex Canal (Mower 1991; Lyford 1903:834). Blodget's lock finally connected Concord with Boston. When the first regular freight ship made its way up through the newly completed Middlesex canal to Concord in June of 1815, new economic opportunities and markets were immediately available (Bacon 1890:6; Mower 1991; Lyford 1903:836). The growing City of Boston required raw materials which the frontier towns along the Merrimack, including Concord, could provide. Timber, foodstuffs, and building materials like granite were shipped downstream from Concord through the canals to Boston and in return, finished goods and exotic foodstuffs flowed back up river to Concord (Lyford 1903:836-837).

With the arrival of the Boston-Concord railroad in 1842, the future of Concord was again altered (Bacon 1890:6; Bouton 1875:17; Lyford 1903:838). By rail, the town was only a two hour ride away from Boston as opposed to the week it previously took through the canals (Bacon 1890:27; Bouton 1875:9). The railroad eventually spelled the end of the Middlesex Canal which ceased operation in 1851 (Mower 1991; See **Figure 2**). As an increasing number of rail connections were made to Concord with the additions of the Concord & Montréal (1869) and Northern Railroads, the City's importance as a transportation hub grew and its economic output drastically expanded (Heald 2007:25). As Concord became a major railroad hub, the various rail lines that passed through the towns set up rail yards, depots, and maintenance facilities adding yet another type of commercial activity to the Concord economy (Bacon 1890:27). These rail facilities hastened the growth of local foundries, casting houses, and machine shops that produced parts and tools for the railroad (Bacon, 1890:68). All of this growth caused the citizens of Concord to incorporate themselves as a city in 1853 (Bouton 1875:17). In the late 19th century, Concord, already a major railroad depot, became a stopover on the way to the summer getaways in the White Mountains, which the newly consolidated rail lines of the Boston-Maine had made even more accessible to earnest vacationers (Heald 2007: 25, 32; see **Figure 3**).

Figure 2. 1851 Walling & Merrill map of Concord, NH showing the project location

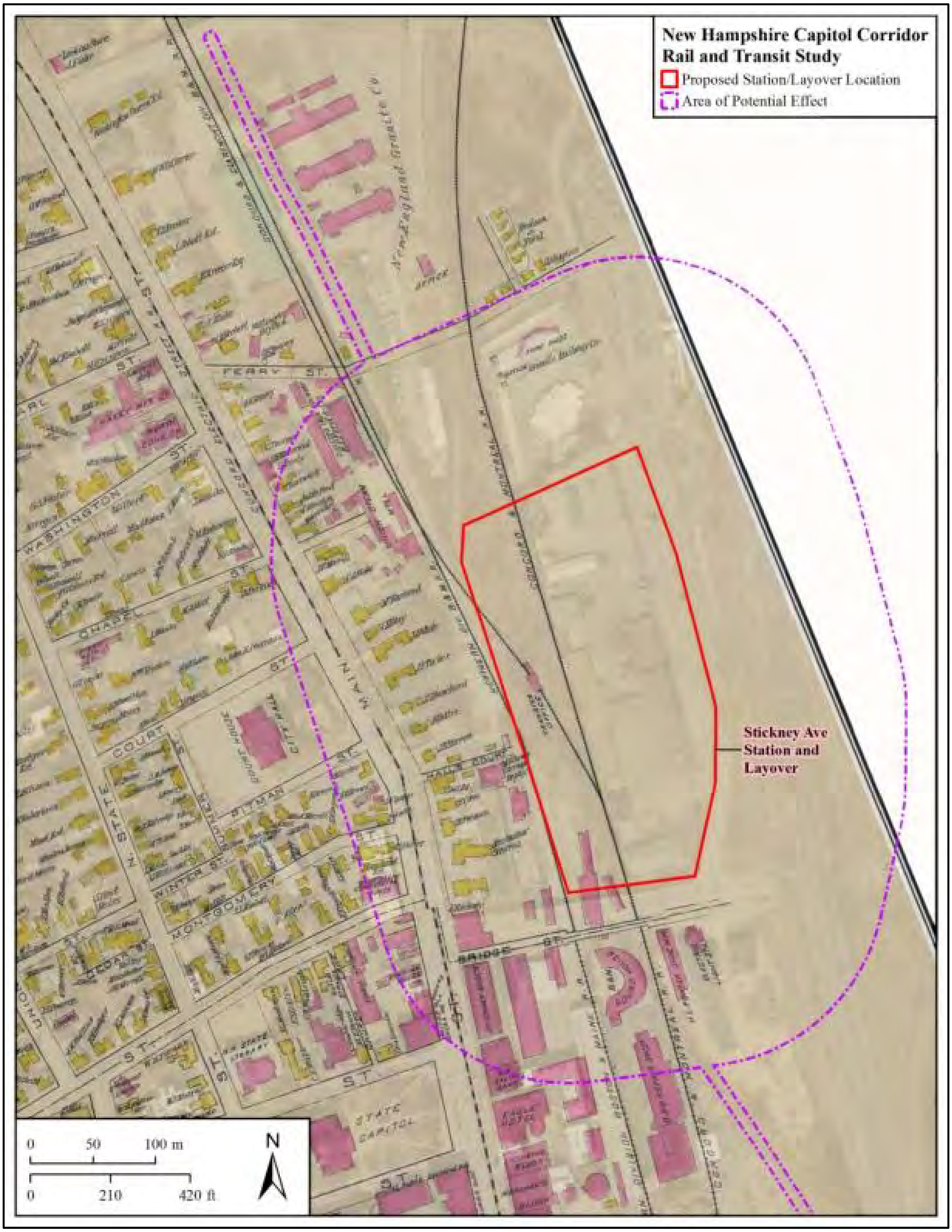

Figure 3. 1892 D.H. Dunn map of Concord overlaid on a 2011 Google Earth aerial image, NH showing the project location

In the first half of the 19th century, dozens of hotels and taverns emerged in downtown Concord catering to the throngs of businessmen, travelers, diplomats, and politicians that frequented the town.
These establishments first emerged with the coming of the stage lines, but continued to service patrons throughout the 19th century (Lyford 1903:853-865). One such establishment was the Eagle Coffee House, constructed in 1827. The Eagle Coffee House was the scene of many balls and social events and often, plays were preformed within its halls for the entertainment of the community (Lyford 1903:861). But in 1851, the Eagle Coffee House burned. The following year, the Eagle Hotel was built. The Eagle Hotel successfully catered to visitors throughout the 19th century and because of its strategic location across from the State House, it was an important gathering place for politicians and a center for political activity in Concord (Eagle Investment Trust 1970; Lyford 1903:862). In 1890, the pitched roof was removed and a third story added. The Eagle Hotel continued to operate as a lodging house for travelers to Concord until 1961 (Eagle Investment Trust 1970). The Eagle Hotel was listed on the NRHP in 1978 and is located in the indirect APE for the Project.

During the course of the 19th century, Concord established a wide variety of industries. Most notable was the city's production of fine coaches and wagons. The Abbot-Downing Company produced all manner of coaches and wagons that were utilized on the East Coast, but also produced the stage coaches operated by Wells-Fargo on the western frontier. Additional companies like Concord Coach, Concord Carriage Company, Concord Harness, and Concord Axle, all soon followed and flourished in Concord making it a key location in the horse-drawn transportation industry (Bacon 1890: 27). In addition to coaches, cotton and textile manufacturing were big business. Several large cotton mill complexes were erected including the Haley Manufacturing Company, Holden Manufacturing Company and the Concord Manufacturing Company (Bacon 1890: 27; Bouton 1875:11-12). Leather work became important to the economy and in 1872, the Page Belting Company moved its operations to Concord (Bacon 1890:26; Bouton 1875:13). The New England Granite Company found its home in Concord where it distributed stone throughout the country for the construction of countless buildings (Bacon 1890:27; Bouton 1875:13). Other important industries established in Concord was the furniture making business and the production of musical instruments (Bacon 1890: 27). The Prescott Organ Company established itself in Concord in the 1830s and continued to make organs and melodeons into the 1890s when it began producing pianos (Bacon 1890:27; Bouton 1875:13). The company only continued to produce pianos until the first quarter of the 20th century before it went out of business.

At the start of the 20th century, Concord's economy began to change once more. Concord's cotton production industry tanked after WWI when the cotton industry moved south to eliminate the transportation costs for raw materials. Southern mills could produce the same product for considerably less than their northern counterparts and confronted with the new economic reality, northern mills could no longer compete (Singleton 1997:132). Many of the cotton mills in Concord closed during the first quarter of the 20th century as well. As the automobile came to replace the horse drawn wagon and stage coach, that industry also faltered and passed into history. During this time, Concord began to lean more heavily upon the railroad as the cornerstone of their economy; a dependence that had begun in earnest near the close of the 19th century. Unlike other industries, granite quarrying continued to thrive at the turn of the 20th century and still persists to this day. The 20th century also saw the introduction of the insurance industry to Concord, which remains a major part of its modern economy (NHES 2013). In the 1960's the Sprague Electric Company began creating semi-conductors for use in electronics in Concord creating a new industrial opportunity and establishing a foothold for Concord in the newly developing electronics industry (Lojek 2007:205). While the insurance and electronics industry remain important to Concord today they have been eclipsed by economic opportunities in the government, education, retail, and healthcare industries which have become the driving force of the Concord economy in the 21st century (NHES 2013).

3.2 City of Manchester

The initial influx of European settlers into the region that would become Manchester came from Massachusetts via the extant Indian trails north through the Merrimack Valley. Some continued north as far north as Amoskeag Falls, the site of well-known and long used Indian fishing grounds. During the late 17th century the first wave of Euro-American settlers were drawn to the area around the Amoskeag falls by the promise of rich fishing grounds. They soon discovered that the Merrimack River's plentiful floodplains and upland terraces offered further agricultural opportunities. The resulting settlement of the region occurred as the area was divided into farmsteads that resulted in the first real permanent settlements in the area around the dawn of the 18th century (Willey 1895). As the population grew, entrepreneurial settlers began to utilize the numerous streams and creeks feeding into the Merrimack River to power small mills. In fact, the region was so rich in resources that it became the subject of numerous land disputes between settlers, the Crown, the local Penacook Native Americans, and other colonies like Massachusetts; all of whom debated ownership through much of the late 17th century and the first half of the 18th century (Anonymous 1875; Blood 1948:35; Browne 1901:7).

The area that became Manchester was initially dubbed Nutfield because of the great forests of chestnut trees which blanket the eastern bank of the Merrimack River (Hazlett 1915; Willey 1896). It was not until 1722 however, that the area received an official land grant from the Provincial Governor of New Hampshire who renamed the region Londonderry. This grant was secured by a collective of 16 Scottish families who arrived in the region as early as 1719 (Anonymous 1961; Browne 1901; Hazlett 1915; Bunker 1997). That same year, John Goffe, Jr. and members of his extended family, established a settlement near where the Cohas Brook joins the Merrimack (Clarke 1875; Potter 1856). An additional wave of English settlers settled the area to the north near the Amoskeag Falls (Clarke 1875). The expanse of landed between the Cohas Brook and the Amoskeag Falls was principally used for grazing cattle and was called Derry's Field. In 1751, a new town charter was established in this location and this former pasture land became the town of Derryfield, the forerunner of Manchester.

During this early period of settlement, the economy of the area was agricultural; however, as settlement increased in the early part of the 18th century, the demand for timber and grain processing increased. This demand triggered the creation of a string of saw and grist mills along the Cohas Brook, whose fast flowing waters provided ample water power for the mill operations. These milling ventures were spearheaded by settlers like Ephraim Hildreth (1735) and John

Goffe (1749) (Potter 1856:658; Bunker 1997). As these mills grew in importance, roads along the Merrimack River and Cohas Brook were established to help facilitate the flow of finished goods to the community. In addition to the road improvements, a ferry was established near the mouth of the Cohas Brook enabling the speedy transfer of goods and people across the Merrimack to the neighboring community of Bedford. This increased mobility, opened up larger markets for goods, and inspired others to invest in industry. At the dawn of the 19th century, the fledgling Middlesex Canal was beginning to provide cheap and efficient transportation on the Merrimack River to Boston, but the great Amoskeag Falls remained an impediment. In 1807, the visionary Samuel Blodgett removed this final hurdle when he opened the Amoskeag Canal, the first canal lock around the Amoskeag Falls (Mower 1991). These infrastructure improvements led to the creation of large industrial mills in Derryfield. In 1809, Benjamin Pritchard, Robert Stevens, and Ephraim David established a cotton spinning mill along the western bank of the Merrimack near Amoskeag Falls (Potter, 1856:545). Additional mills soon followed on the eastern bank. After a rocky start, the Amoskeag Cotton Woolen Manufacturing Company (the company started by Pritchard and his associates), changed hands in 1831 and became known as just the Amoskeag Manufacturing Company. Soon after it was established, the operation quickly improved, diversified, and modernized operations.

In 1810, around the same time as the first mills were being establish along the Merrimack, Derryfield was renamed Manchester after the first industrial town in England, a model city of industrial prosperity that the residents of Derryfield hoped to emulate (Potter, 1856:543). As the mills grew, they attracted more people to work in them, mostly from French Canada to the north, and the need for housing boomed. In a few short years following the chartering of the new Amoskeag Manufacturing Company, the town of Manchester had been utterly transformed. The company had created a new wing dam around the falls increasing its power output, and after purchasing most of the eastern shore near the falls, the company built two new canals capable of handling increased river traffic (Potter, 1856:551-552). In 1838, a new mill corporation, the Stark Mills, established the first cotton mill building on the east bank of the Merrimack (Potter 1856:565). The mill was a success and its initial building, Stark Mill No. 1, was expanded in 1843. The eventually added a second building, Stark Mill No. 2 in 1847.

This rapid expansion of Manchester's industry drew even more people to work in the mills, so in 1839 the Amoskeag Manufacturing Company created a company town surrounding the mills and centered on the newly created Elm Street, which was to serve as the new main road for the company town (Potter 1856:593). The town was situated on the eastern bank of the Merrimack River on the east side of the canals. The placement of the town on the east side of the river necessitated a means by which the workers could access those mills on the west side of the river, and as a result, the Granite Street Bridge was built in 1840. It remained a toll bridge until 1847 when Granite Street was laid out as a public highway (Potter 1856:711). As industry and settlement in the area continued to grow so too did Manchester. By 1846, the town of Manchester had grown into a city and was incorporated in June of that year (Potter 1856:629).

In 1815, the completion of the Middlesex Canal system opened the river for barge traffic between Concord and Lowell, Massachusetts. Until its abandonment in 1851, the canal linked the Derryfield area with commercial centers such as Nashua and the industrial towns of northern

Massachusetts, greatly increasing its export capacity and expanding the regional markets (Mower, 1991). While the canals were increasing the mobility of freight, newly constructed roads were enhancing the mobility of people. The 1805 charter of the Middlesex Turnpike, which largely paralleled the canal system along the Merrimack, provided road access all the way down to Boston. After a contentious debate over its creation the people of Manchester finally agreed to establish the Mammoth Road; a stage line which ran daily trips between Concord and Boston (Willey 1896: 66-67). Despite their momentary success, these roads lost all importance and quickly vanished into obscurity with the establishment of the Concord and Montreal Railroad in 1842 (Willey 1896; Mower 1991). The railway was so successful that additional railways like the Manchester and Lawrence Railroad (now known as Boston and Maine Railroad), were established just seven years later. The coming of the railway provided fast and efficient transportation of goods and people to metropolitan cities like Boston. The railroad proved to be too efficient, completely overshadowing the established roads and canals (Mower 1991).

The combination of efficient transportation and a strong manufacturing made the City of Manchester flourish throughout the 19th century and into the first quarter of the 20th century (See **Figure 4**). In the latter half of the 19th century, the Amoskeag Manufacturing Company diversified from textiles to railroad engines, fire trucks, and weapons manufacture with the addition of the Amoskeag Foundry. The 1920's saw the beginning of an economic downturn in response to the end of WWI. Like Concord, Manchester suffered from the relocation of the cotton industry to the south. As a result, the demand for fabric and linens plummeted and the northern mills began to suffer, many going out of business (Singleton, 1997:132; Hareven and Langenbach 1995:302; Hareven and Langenbach 1995:336). To combat the falling profits, the owners of the Amoskeag Manufacturing Company were forced to cut the wages and increase the hours of their employees, an action which led to massive labor strikes (Hareven and Langenbach 1995:336). These events undermined not just management-labor relations, but also alienated customers, further exacerbating the problem. With the stock market crash in 1929, labor tensions were further enflamed, which led to violent strikes in 1933 and 1934. In the wake of these difficulties, the mill began a gradual decline until in 1935-1936, the Amoskeag Manufacturing Company, once the heart of the city, went bankrupt and was shuttered.

After the demise of the mills in Manchester, the industrial buildings of the Amoskeag Manufacturing Company were carved up and occupied by smaller manufacturing concerns throughout much of the 20th century. In the second part of the 20th century, the abandoned mills became the home of electronics manufacturers, metal working facilities, plastics manufacturers, and machine builders, all of which helped to restore the industrial base of Manchester. Today the old Amoskeag mill buildings still remain a key feature of downtown Manchester, but are now home to small businesses, hospitals, universities, and restaurants which provide economic opportunity for the residents of Manchester. The Amoskeag Millyard Historic District was determined eligible for listing in the NRHP in 2000 and the Amoskeag Corporations Housing District (Districts A, B, C, and D) were listed in the NRHP in 1982. Both districts fall within the direct APE for the Project.

3.3 City of Nashua

The story of Nashua is also partly the story of Dunstable, Massachusetts. It may seem odd that the histories of two towns in neighboring states are so closely related, but during the earliest period of European settlement, the colony of New Hampshire had not yet been conceived and both towns were part of Massachusetts. Early forays of the Massachusetts settlers into the New Hampshire region were opportunities to trade with the native populations of the Merrimack Valley. One such venture occurred in 1665 and was executed by John Cromwell, a fur trader who established a trading post along the Merrimack River near a small falls. This experiment did not endure and was subsequently abandoned (Fox 1846:21). In 1673, the land where Nashua now lies was part of a 200 square mile land grant made to Edward Tyng (Fox 1846:16-17). Tyng established the town of Dunstable, named after his native town of Dunstable, England, near the confluence of the Merrimack and Nashua Rivers (the site of modern day Nashua).

Figure 4. 1892 D.H. Dunn map of Manchester, NH showing the project location

Starting in 1675, the region was the scene of a bloody conflict between the native peoples of New England and European settlers (Fox 1846:28). This conflict, which would become known as King Philips War (the European name given to Metacomet the Grand Sachem of the Wampanoag), raged for three years. During the conflict, neighboring settlements were destroyed by Metacomet and his allies including the towns of Chelmsford and Groton which were contained within the same 200 sq. mile grant (Fox 1846:28; Peters 2006:8). The Penacook tribe of the Merrimack Valley had sided with Metacomet initially, but made a separate peace with the colonists, but it was too little too late, as the conflict had greatly reduced their numbers and lost them a great deal of territory and many fled to Canada (Fox 1846:21). While the conflict had caused many of the Dunstable colonists to flee, the cessation of the conflict in 1678 prompted many to return and the town grew once more (Fox 1846:37). This resurgence was short lived. Due to competing land claims between the colonial powers in Europe, namely Britain and France, and native populations in the Americas, the region was the stage for an additional two wars: King William's War and Queen Anne's War. In the Americas both groups had their native allies, though the French garnered more support from native populations in New England. Because Dunstable was a frontier town during the late 17th and early 18th centuries, it was on the front lines of these conflicts and as a result, was frequently garrisoned (Fox 1846:65-68, 82, 103). While the citizens of Dunstable occasionally fell victim to the ravages of conflict, the town itself miraculously survived, unlike other similar settlements which were continually attacked and destroyed (Fox 1846:65). Still, the constant fighting and fear of Indian attack caused the settlement of the area to stagnate until the beginning of the 18th century (Fox 1846:68).

During the latter portion of the 17th century and into the early part of the 18th century, many land disputes between competing charters and land grants occurred between the established colony of Massachusetts and the newly formed colony of New Hampshire. For much of this time both colonies laid claim to the town of Dunstable and its surrounding territory, part of the original Tyng grant. This debate continued for well over 50 years until in 1741, the boundary between the two rival colonies was settled (Stearns 1986:v; Fox 1846:147; Peters 2006:8). The original Tyng grant was split in half: the northern portion of the grant went to the town of Dunstable in New Hampshire, while the southern went to Massachusetts (Fox 1846:147; Peters 2006:8). It was during this time that Massachusetts created the municipality of Tyngsborough out of part of the southern portion of their new territory. Dunstable New Hampshire was formally incorporated in 1746 (Fox 1846:150).

The second half of the 18th century saw two additional wars: the French and Indian War and the American Revolution. Men from New Hampshire participated in these conflicts, but the fighting occurred elsewhere (Fox 1846:159-168). Dunstable continued to grow during the first quarter of the 19th century, whose population had grown to approximately 900 persons (Fox 1846: 193). It was during this period that Dunstable established its first post office, got its first stage line (Amherst-Boston), and established several taverns (Fox 1846: 193). By 1804, the town had been connected to Boston via the newly open Middlesex Canal. This new connection stimulated the fledgling economy of Dustable (Fox 1846:196). The variety of industries in the town expanded to include new saw and gristmills, as well as additional stores and taverns to accommodate the new flow of goods and travelers attracted to the area by the canal (Fox 1846:198).

The dawn of the 19th century brought big changes the area. In 1802, the Middlesex Canal was constructed connecting Dunstable to Boston by river and enabling the bulk exchange of goods. Suddenly, subsistence agriculture was not the only way to make a living. The growing city of Boston required raw material which towns along the Merrimack River like Dunstable could provide. Timber, foodstuffs, and building materials were sent down to Boston from Dunstable and finished goods were transported back up river to Dunstable. The local economy diversified rapidly as new business ventures emerged to fill the demand for new goods. The town grew and the economy expanded from a local to regional scale. Then in 1821, a large cotton mill was established in Lowell, Massachusetts, which brought great prosperity to the town. Dunstable entrepreneurs and investors were enticed by the success of the operations at the Lowell textile mills and decided to execute a similar enterprise in their city (Fox 1846:198). The result was the Nashua Manufacturing Company established in 1823 by Daniel Abbot and other investors from Dunstable (Steinberg 2004:80; Fox 1846:199; Peters 2006:13; Charlton 1856:309). Though not an instant success, the Nashua Manufacturing Company persevered and pursued ways to harness as much water power as they could to provide for the future operations of their mills. The result was the Nashua Power Canal, essentially a giant mill race, which carried high velocity water three miles downstream from Mine Falls (Steinberg 2004:78, 81; Fox 1846:200). After a rocky start, the Nashua Manufacturing Company found its feet, and by 1836, had built and was operating three large cotton mills (Peters 2006:12; Steinberg 2004:80). The Indian Head Company, another milling operation, opened downstream in 1826 taking full advantage of the improved water power made by the Nashua Manufacturing Company (Steinberg 2004:81; Fox 1846:200; Charlton 1856:309). The Indian Head Company was short-lived and was bought out by investors from Boston just two years later. The new investors, known as the Boston Associates, poured capital into the Indian Head mill to revitalize and modernize it and the result was a new company called as the Jackson Manufacturing Company (Steinberg 2004:82; Fox 1846:205). These new mills created employment opportunities which drew people to Dunstable and drastically increased the population of the town, which by 1830 numbered 2,417 persons (Fox 1846:206). In the seven years between 1830 and 1837 alone, the population nearly tripled (Fox 1846:207). To meet the needs of their workforce, the companies set about planning a town for their workers surrounding the mills, complete with housing, schools, and churches (Peters 2006:59). This neighborhood became known as Nashua Village (Fox 1846:202-203). Having developed a new identity as an industrial town the citizens of Dunstable elected one the eve of 1837 to rename the town to Nashua, a name that has persisted ever since (Fox 1846:209; Peters 2006:8).

By the 1830s, Nashua was a booming industrial town where new advances were readily embraced. In 1836, the town embraced a new advance in transportation technology, the railroad, and by 1838 had completed its first line connecting it to Lowell, Massachusetts (Fox 1846:207; Wallace and Mausolf 2001:19). The success of this rail line prompted the establishment of five other rail connections, making Nashua an important transportation hub (Fox 1846:208; Peters 2006:75; Charlton 1856:311-312). The coming of the railroad made the Middlesex Canal obsolete, because it could not compete with the speed of the iron horse (Mower 1991; Wallace and Mausolf 2001:19). By the mid-1850s, the canals had been abandoned completely (Mower 1991). The success of the railroads opened up even more markets to the already bustling industries in Nashua and created new industrial opportunities. The industries of Nashua diversified again, and while still largely dependent on cotton mills the city also began to work in iron, paper, and leather (Fox 1846:210-212,214; Charlton 1856:309). Nashua also developed industries that serviced the railroads including foundries and repair yards (Wallace and Mausolf 2001:26). Nashua not only became an industrial powerhouse, but also a crucial economic hub.

Despite its growth and prosperity, the town of Nashua continued to have boundary disputes. As the result of a dispute over the location of the town hall, the north section of Nashua (situated above the Nashua River), broke away and formed a new town called Nashville in 1842 (Fox 1846:213; Peters 2006:8; Charlton 1856:309). Bad blood between the towns persisted for eleven years until before the two towns reunited to form the City of Nashua. The charter for the city was created in 1853 (Steinberg 2004:216; Peters 2006:8).

The growth of Nashua prompted many waves of immigration throughout the 19th century. The initial immigrants were Irish and French-Canadians (Quebec) who flooded to the area in search of work prior to the Civil War (Trustees of the Hunt Memorial Building 1999; Federal Writers' Project of the Works Progress Administration for the State of New Hampshire 1938:75-76). Wars and social upheaval in Europe during the second half of the 19th century prompted a second wave of immigration during the latter half of the 19th century. During that time, the established Irish and French-Canadian ethnic communities were joined by waves of mass immigration from the Mediterranean and Eastern Europe (Trustees of the Hunt Memorial Building 1999; Federal Writers' Project of the Works Progress Administration for the State of New Hampshire 1938:76). Mill towns like Nashua became much more ethnically diverse as the waves of immigration enriched the social ethnic tapestry. These new communities included people from Greece, Lithuania, Italy, Poland, Hungary, Austria, Germany, Bohemia, and Russia (Federal Writers' Project of the Works Progress Administration for the State of New Hampshire 1938:76). These immigrants brought with them their traditions, customs, and food.

During the 19th century, other mills established themselves along the Merrimack in Nashua (See **Figure 5**). The Nashua Manufacturing Company out performed them all, and eventually purchased some of its smaller rivals like the Jackson Company, Indian Head Mills, the Tremont Mills, and the Suffolk Mills. These acquisitions further expanded the company, firmly ensconcing it as the core of the economy in Nashua. Like most other American cities, Nashua fell victim to the economic downturn following the end of World War I. As Concord and Manchester experience, the cotton industry in Nashua moved south and cotton manufactories and cotton mills closed. Remarkably the Nashua Manufacturing Company persisted through World War II, likely due to its more diversified business model. However, in 1945, the company was purchased by Textron Inc. and only two years later the Nashua Manufacturing Company was closed (Chomsky 2008:104).

The period following the closing of the mills in Nashua was dark, but mercifully short lived. With one of the primary employers in the city suddenly gone, unemployment was rampant for a few years. The Nashua, New Hampshire Foundation purchased the abandoned mills from Textron in 1953 and attempted to attract new industries to the area (Chomsky 2008:104). Luckily for the City of Nashua, their existing infrastructure and available workforce was attractive to burgeoning new industries, including electronics, plastic manufacturing, paper production, as well as the electric and steel industries (O'Connell 2013:218).

Perhaps the most important new industry however, arrived in 1952 when Sanders Associates moved into the vacant Jackson mill complex (Trustees of the Hunt Memorial Building 1999). This circuit board manufacturer emerged as an important player in the Cold War defense economy and became integral to the development of the defense industry, space program, and early computer industry (O'Connell 2013:218). Eventually Sanders Associates became part of Lockheed Martin and later, part of BAE Systems Electronics and Integrated Solutions. As these new industries renewed the city's economy and provided more economic opportunities, the city continued to grow. Today Nashua is a powerful player in the nation's northeast electronics industry as part of the Greater Boston high-tech corridor.

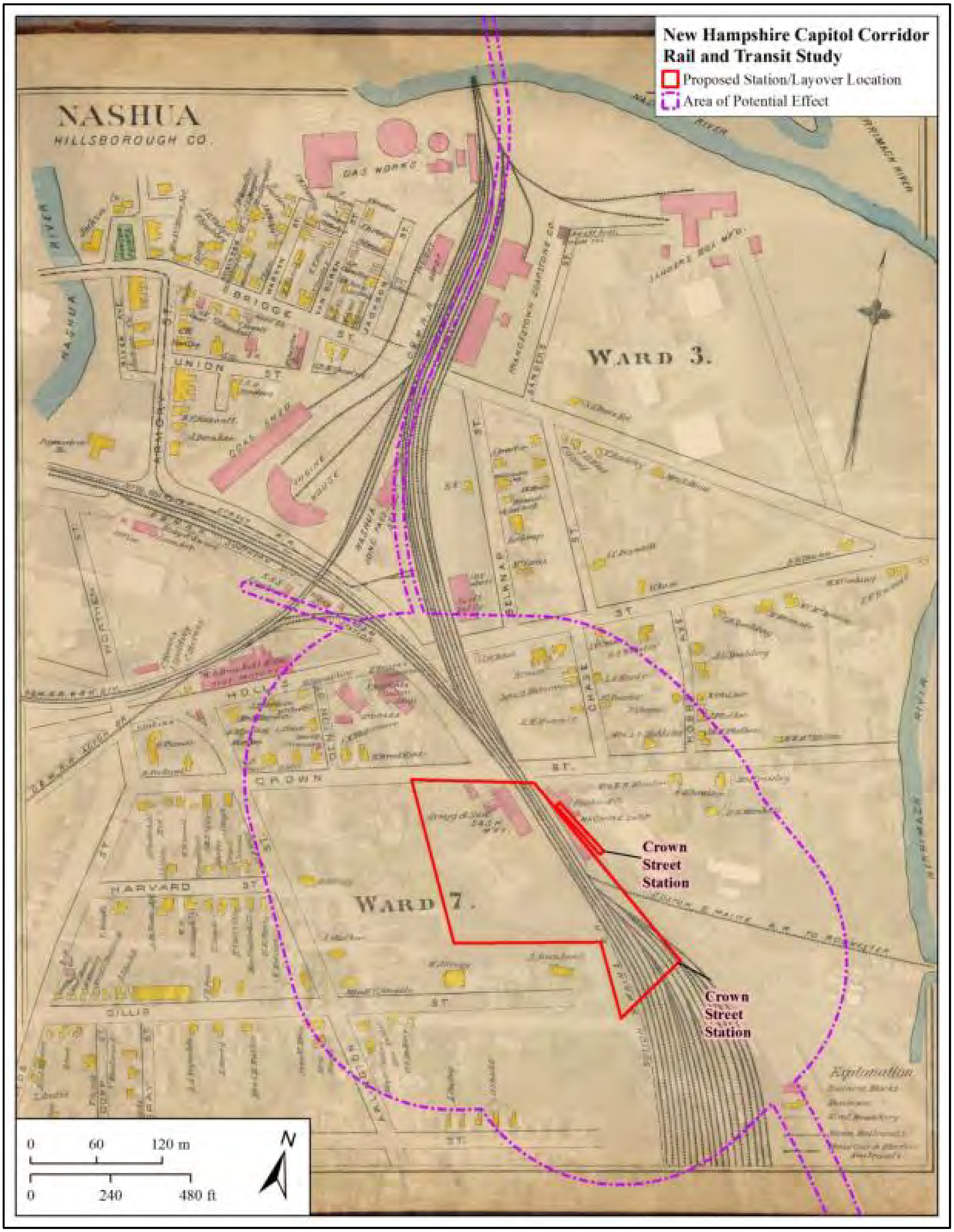

Figure 5. 1892 D.H. Dunn map of Nashua overlaid on a 2011 Google Earth aerial image, NH showing the project location

With the popularization of the automobile in the post-World War II era, a number of suburbs emerged around Nashua. These new settlements provided new economic opportunities in the form of retail outlets and shopping centers which further diversified and bolstered the city's economy (Trustees of the Hunt Memorial Building 1999; O'Connell 2013:218). In addition, the construction of major highways over the second half of the 20th century provided economic opportunities that were just a short commute away, and shortened the distance between Nashua and neighboring cities like Lowell and Boston (O'Connell, 2013:217-218).

4.0 Survey Results

4.1 NRHP-Listed and Eligible Properties in the APE

Background research at the NHDHR determined that there are 16 resources in the APE that are listed in or eligible for listing in the NRHP. Of those 16, two resources fall within the direct APE for the Project. For a more detailed description of the resources, see **Table 4-1** and the photographs in **Appendix B**. See also the Resource Location Maps in **Appendix C**.

- NRHP-eligible Eagle Square Historic District in Concord
- NRHP-eligible Amoskeag Millyard Historic District in Manchester

Fourteen resources fall within the view shed of the Project, or the indirect APE. For a more detailed description of the resources, see **Table 4-2** and the subsequent photographs. See also the Resource Location Maps in **Appendix C**.

Information gathered during the research phase also indicated that there are three resources in the APE that were determined to be Not Eligible for listing in the NRHP by the NHDHR. Those resources are listed in more detail in **Table 4-3**. Three resources that were issued a Determination of Eligibility (DOE) by the NRHP in the 1970s and 1980s have been demolished. See **Table 4-4** for details on those resources.

4.2 Locally Designated Landmarks in the APE

As part of the identification process, background research also included a review of information kept by local organizations that are likely to have knowledge of, or concerns with, historic properties in the APE. All three of the major cities within the APE, Concord, Manchester, and Nashua have local committees/commissions that identify, evaluate, and protect local properties with historic and architectural significance. Below is a discussion of the landmark programs, the local landmarks in each city, and the extent of each organization's jurisdiction over those properties.

4.2.1 Concord Heritage Commission

The Concord Heritage Commission is an advisory board that provides guidance to the City Council, the Planning Board, the City's Architectural Design Review Committee, and other boards on the use and protection of historic, cultural, and aesthetic resources in the City of Concord. Chief among their duties and responsibilities is to review and approve applications proposing to alter buildings and settings within the locally designated and NRHP-listed Concord Historic District. This district is located approximately 1000-feet north of the APE. Since it is not within the APE, coordination with the Concord Heritage Commission under this regulation is not required. The City of Concord has no other locally designated and protected landmarks.

Table 4-1. NRHP-Listed or Eligible Properties in the Direct APE

Map No.*	Inventory No.	Name	Address	City	Built Date	NRHP/SR Status	Status Date	Nearest Project Facility	Proximity to Project Area	Photo No.
1	65003810	Eagle Square Historic District (ESHD)	Bounded by N. Main St., Bridge St., Storrs St., on the s. by property lines along the s. side of Eagle Furniture Bldg.	Concord	19^{th}-20^{th} centuries	DOE*	3-10-1980	New track; Stickney Avenue Station/Layover	Within (new track area);	25-28
5-6	Not found	Amoskeag Millyard Historic District	Bounded on the north by Amoskeag Street, on the east by Canal Street, on the south by Line Drive and on the west by the Merrimack River	Manchester	19^{th} and 20^{th} centuries	NRHP-eligible	2000	Granite Street Station and Spring Street Station	Within	34-36

*Resource Location Maps located in Appendix C

Table 4-2. NRHP-Listed or Eligible Properties in the Indirect APE

Map No.	Inventory No.	Name	Address	City	Built Date	NRHP/SR Status	Status Date	Nearest Project Facility	Proximity to Project Area	Photo No.
1	19800228	Merrimack County Bank	214 N. Main Street	Concord	1826	NRHP Listed	2-28-1980	Stickney Avenue Station and Layover	415 feet northwest	25
1	19780920	Eagle Hotel	110 N. Main Street	Concord	1851; 1872, 1890	NRHP Listed (individually) ; Contributing to the NRHP-Listed DCHD; Contributing	9-20-1978 (I) 6-09-2000 (DCHD) 3-10-1980 (ESHD)	Stickney Avenue Station and Layover; New Track	500 ft. southwest	26

Map No.	Inventory No.	Name	Address	City	Built Date	NRHP/SR Status	Status Date	Nearest Project Facility	Proximity to Project Area	Photo No.
						to the NRHP-eligible ESHD				
1	20000609	Downtown Concord Historic District (DCHD)	Bounded by Center St., Loudon Rd., Storrs St., Hills Ave., S. State, Green, School, Capitol, and Park Sts.	Concord	19^{th}-20^{th} centuries	NRHP Listed	6-09-2000	Stickney Avenue Station/Layover; New Track	130 feet southwest	26-29
2	CON0288	Concord Gas Light Co. Gasholder House	Gas Street	Concord	1888	NRHP-eligible	5-9-2012	Track	Adjacent	30
2	CON0063	French-Thompson House	10 Water Street	Concord	c. 1819	NRHP-eligible	11-10-1980	Track	Adjacent	31
3	00001038	Robie's Country Store	8 Riverside St.	Hooksett	1887	NRHP Listed	8-31-2000	Track	Adjacent	32
4	20060614	Stark Park	Bounded by N. River Rd., Park Ave., and Merrimack River	Manchester	1892	NRHP Listed	6-14-2006	Track	Adjacent	33
5	MAN1144	Jefferson Mill	670 North Commercial Street	Manchester	1886	Individually NRHP-eligible and contributing to the NRHP-eligible	7-3-1996	Spring Street Station	320 feet west	34

Map No.	Inventory No.	Name	Address	City	Built Date	NRHP/SR Status	Status Date	Nearest Project Facility	Proximity to Project Area	Photo No.
						Amoskeag Millyard Historic District				
5	MAN1059	Amoskeag Machine Shop	400 Commercial Street	Manchester	1880; 1890	Individually NRHP-eligible and contributing to the NRHP-eligible Amoskeag Millyard Historic District	5-19-1999	Spring Street Station	350 feet southwest	36
5	19821112	District C Amoskeag Corp. Housing District TR	Roughly bounded by N. Hampshire Lane, Hollis, Canal, and Bridge Sts.	Manchester	1881	NRHP Listed	11-12-1982	Spring Street Station	90 feet east	37-38
5	19821112	District B Amoskeag Corp. Housing District TR	Roughly bounded by Canal, Mechanic, Franklin, and Pleasant Sts.	Manchester	Mid-to-late 19th century	NRHP-Listed	11-12-1982	Track	Adjacent	39
5	19821112	District A Amoskeag Corp. Housing District TR	Bounded by Pleasant, State, Granite, and Bedford Sts.	Manchester	1845-1852	NRHP Listed	11-12-1982	Granite Street Station	125 feet north	40-41
5	65003848	R.G. Sullivan 7-20-4 Cigar Factory &	175 Canal St.	Manchester	1874	DOE	07-31-1980	Granite Street Station	450 feet north	42

Map No.	Inventory No.	Name	Address	City	Built Date	NRHP/SR Status	Status Date	Nearest Project Facility	Proximity to Project Area	Photo No.
		Annex								
10	NAS0207	---	7 Crown Street	Nashua	c. 1900	Contributes to the SR-eligible Crown Hill Historic District	7-8-2009	Crown Street Station	425 feet west	43

*DOE: Determination of Eligibility issued by the Secretary of the Interior; all other eligibility determinations made by NHDHR

Table 4-3. Properties in the APE that were Determined Not Eligible for Listing in the NRHP

Map No	Inventory No.	Name	Address	Town/City	Built Date	NRHP/SR Status	Status Date
10	NAS0009	---	2 Chase Street	Nashua	c. 1870	Not Eligible	2-10-1999
10	NAS0039	---	4 Chase Street	Nashua	c. 1890	Not Eligible	7-2-1997
10	NAS0065	---	5 Denton Street	Nashua	c. 1890	Not Eligible	6-23-1993

Table 4-4. Historic Properties in the APE that were Demolished

Inventory No.	Name	Address	Town/City	NRHP/SR Status	Status Date
MAN0172	Monadnock Building	1140-1160 Elm Street	Manchester	DOE	7-17-1979
65007913	Notre Dame Bridge	Over Merrimack River	Manchester	DOE	01-07-1988
65003781 65003796	Commercial Building District	Located at four corners of Elm St./Bridge St. intersection	Manchester	DOE	10-26-1976 11-10-1980

The Commission helped to establish the Demolition Review Ordinance, which requires the Demolition Review Committee (a subcommittee of the commission) to review demolition requests for historic buildings, assess the building's significance (if any), and explore possible alternatives should a significant structure be threatened. All buildings within the City are subject to this ordinance if they are 1) greater than 500 square feet; 2) older than 50 years; and 3) visible from the public right-of-way. Since no buildings are proposed for demolition as part of the Project, coordination with the Concord Heritage Commission is not required under this ordinance.

4.2.2 MANCHESTER HERITAGE COMMISSION

The Manchester Heritage Commission is a stewardship organization that provides other City boards and commissions, as well as local agencies and the NHDHR, advice on cultural resources within the City of Manchester. The Commission also has the power to review and approve all building permit and demolition applications within the Amoskeag Housing Historic District and the Amoskeag Millyard Historic District. The locally-designated Amoskeag Housing Historic District has the same boundaries as the NRHP-listed District B; the NRHP-listed Districts, A, C, and D are not part of the local district. The locally designated and the NRHP-eligible Amoskeag Millyard Historic District share the same boundaries (**Figure 6**). Because construction of the Spring Street Station would introduce a new structure to the Amoskeag Millyard Historic District and would require a building permit, coordination with the Manchester Heritage Commission will be required as part of the Project.

4.2.3 NASHUA HISTORIC DISTRICT COMMISSION

The Historic District Commission in the City of Nashua is responsible for the review and approval of all building permit applications for properties within the locally-designated Nashua Historic District. The Commission also provides input to other City boards on the historic significance of properties outside the limits of the historic district. The Nashua Historic District is not within the APE for the Project; therefore, coordination with the Nashua Historic District Commission under this regulation is not required. The City of Concord has no other locally designated and protected landmarks.

4.3 Resources in the APE Not Previously Surveyed

Prior to and following the site visit, additional online research was conducted to identify any architectural resources over 50 years of age in the APE that were not previously surveyed or documented. Sources that were most informative were historic and current aerial images available on Historic Aerials (www.historicaerials.com), Google Earth, and Bing Maps. The Historic Aerials website maintains images of Concord from 1951, 1965, 1967, and 2003; Manchester from 1947, 1951, 1952, 1965, and 2003; and Nashua from 1947, 1952, 1963, 1965, and 2003. Google Earth maintains aerial images from the 1990s, 2000s, and 2010s. By reviewing aerial images from the 1950s-60s and comparing them with current images, it was possible to locate buildings that may be over 50 years of age in the APE. Photographs available via Google

Earth Street View and Bing's Bird's-Eye-View provided an initial view of the buildings in the Project area that aided with identification in the field.

Figure 6. Manchester Heritage Commission map of local landmarks and NRHP properties

4.3.1 *RESOURCES NOT PREVIOUSLY SURVEYED IN THE DIRECT APE*

The reconnaissance survey found that there are approximately 12 previously unidentified properties that may be over 50 years of age or older within the direct APE. By virtue of their age, properties that are over 50 years of age are considered potentially eligible for listing in the NRHP and have the potential to be effected by the undertaking. The 12 resources range in age from the late-19th century to the mid-20th century and ranges in construction material from frame and brick to steel. Resource types include a railroad line, warehouses, storage facilities, office buildings, and bridges. Seven of the 12 resources fall within the APE for the Stickney Avenue Station and Layover Facility and two resources fall within the APE for the Crown Street Station. The railroad line itself, part of the Boston & Maine Railroad, passes through the direct APE for every station and layover facility option. Two railroad bridges associated with the Boston & Main Railroad line fall within the direct APE for the Project. See Photos 3-24 for images of the railroad. The other See **Table 4-5** below for a list of properties over 50 years of age that have not been previously surveyed.

Table 4-5. Resources over 50 Years of Age in the direct APE

URS Survey No.	Name/Address	Block/Lot	City	Project Component	Resource Type	Built Date	Photo No.
C-1	Boston & Maine Railroad	----	ALL	ALL	Railroad line	c. 1840	1-24
C-2	11 Stickney Avenue	46A-2-1	Concord	Stickney Avenue Station and Layover Facility	Storage or warehouse	c. 1940	44
C-3	11 Stickney Avenue	46A-2-1	Concord	Stickney Avenue Station and Layover Facility	Garage	c. 1940	44
C-4	11 Stickney Avenue	46A-2-1	Concord	Stickney Avenue Station and Layover Facility	garage	c. 1940	----
C-5	New Hampshire Highway Dept. 11 Stickney Avenue	46A-2-1	Concord	Stickney Avenue Station and Layover Facility	Office building	c. 1940	44-46
C-6	11 Stickney Avenue	46A-2-1	Concord	Stickney Avenue Station and Layover Facility	warehouse	c. 1960	47
C-7	11 Stickney Avenue	46A-2-1	Concord	Stickney Avenue Station and Layover Facility	storage	c. 1960	47
C-8	11 Stickney Avenue	46A-2-1	Concord	Stickney Avenue Station and Layover Facility	storage	c. 1955	47
N-9	25 Crown Street	25-1	Nashua	Crown Street Station	Office or showroom	c. 1890	48-49
N-10	25 Crown Street	25-1	Nashua	Crown Street Station	storage	c. 1964	49
B-11	Hooksett Railroad Bridge	----	Hooksett	None (Within ROW, but no work proposed for this area)	Baldwin Truss bridge	c. 1930	50
B-12	Goffs Falls Railroad Bridge	----	Manchester	None (Within ROW, but no work proposed for this area)	Baldwin Truss bridge	c. 1930	51

The **Stickney Avenue Station and Layover Facility** alternative is situated in the center of Concord, close to the commercial center of the downtown and on the north side of Loudon Road. The parcel (the direct APE) contains frame industrial buildings and a brick office building that were constructed by the New Hampshire Highway Department in the 1940s. All the buildings appear to be in use and are in fair condition; the railroad is not in use and is in poor condition. In total, the direct APE contains approximately seven buildings and one linear resource (the Boston and Maine Railroad) over 50 years of age. For overview shots of these resources, see Photos 1-4 and 44-47 in **Appendix B**.

The **Crown Street Station** alternative in Nashua is situated southeast of downtown Nashua, approximately ¼-mile west of the Merrimack River. The LOD is bounded by Crown Street on the north, the railroad on the east, Gillis Street on the south and the rear yards of houses fronting Arlington Street on the west. The parcel contains three brick industrial buildings. One brick building fronts Crown Street, dates from c. 1890, and was built as part of the Gregg & Son Sash Manufactory (Hurd 1892; See **Figure 5** and N-9 in **Table 4-5**). Attached to the southwest corner of this building is another brick industrial building constructed c. 1964 (NETR 1963; 1965; See N-10 in **Table 4-5**). The third building on the lot, a long, one-story brick building, was built between 1965 and 1978 (NETR 1965; 1978). For overview shots of these resources, see Photos 48-49 in **Appendix B**.

Except for the Boston & Maine Railroad, the direct APE for the following station and layover facility alternatives contain no other resources over 50 years of age. For overview shots of these resources, see Photos 1-24 in **Appendix B**.

- Spring Street Station
- Granite Street Station
- Granite Street Layover Facility
- Manchester Layover Facility (Queen City Bridge)
- Cemetery Layover Facility
- Water Treatment Layover Facility
- Ray Wieczorek Drive Station
- Spit Brook Road Layover Facility
- Pheasant Lane Mall Station

In addition to the resources listed above, two railroad bridges fall within the direct APE for the railroad ROW: the Hooksett Railroad Bridge and the Goffs Falls Railroad Bridge. Both bridges were constructed in the early 20th century of steel and are of the Baltimore Truss type. These bridges are located along the alignment, but no track work is proposed for these bridges. See Photos 50-51 in **Appendix B**.

4.3.2 Resources Not Previously Surveyed in the Indirect APE

In addition to the previously unidentified properties within the direct APE, there are approximately 45 resources within the indirect APE (500-foot visual buffer). But given the limited nature of the project and the low potential for visual impacts, only a general description of those resources is provided below. Streetscape photos capturing these resources and the overall setting of the station and layover locations are included in **Appendix B**.

The built environment within the indirect APE for the **Stickney Avenue Station and Layover Facility** alternative in Concord consists of late-19th and early-to-late 20th century industrial, commercial, institutional, and residential properties. A large part of the indirect APE is situated on the north side of Loudon Road and contains late-19th and early 20th century frame residential buildings that have been converted to commercial buildings; mid-20th century brick industrial buildings; and early 21st century commercial buildings. On the south side of Loudon Road is the historic commercial downtown of Concord and largely consists of late 19th century commercial and industrial buildings. The majority of industrial, commercial, and institutional buildings are constructed of masonry (the majority of them in brick), one or more stories in height, and have flat roofs. Residential properties are mostly concentrated on the east side of N. Main Street (north of Loudon Road) and are frame constructed, 2-3 stories in height, have gable or hipped roofs. The majority of the buildings in the APE on the south side of Loudon Road have been previously identified as part of the NRHP-listed Downtown Concord Historic District and the NRHP-eligible Eagle Square Historic District (See Table 4-1), except for two late-19th century brick industrial buildings that flank Bridge Street. In total, the indirect APE contains approximately eleven buildings that are over 50 years of age. For overview shots of these buildings, see Photos 52-53 in **Appendix B**.

The indirect APE for the proposed **Spring Street Station** alternative in Manchester consists of long, brick industrial buildings that were constructed between 1890 and 1920; range in height from one to four stories; and have gabled roofs. All buildings on the west side of Canal Street have been previously surveyed as part of the NRHP-eligible Amoskeag Millyard Historic District. In total, there are approximately four brick industrial buildings that are located on the east side of Canal Street that are over 50 years of age and have not been previously surveyed. For overview shots of these buildings, see Photos 54-56 in **Appendix B**.

The indirect APE for the proposed **Granite Street Station** alternative in Manchester consists of late 19th century mill buildings and associated worker housing for the Amoskeag Corporation in the north and west portion of the APE; late-20th century industrial buildings in the central and southern portion; and late 19th and early 20th century industrial and commercial buildings in the east portion of the APE. The eastern portion contains the majority of buildings over 50 years of age that have not been previously surveyed. In total, there are approximately 17 resources in the indirect APE for the Granite Street Station. See Photos 57-58 in **Appendix B.**

The indirect APE for the proposed **Granite Street Layover Facility** alternative in Manchester consists of mid-and late-20th century masonry industrial and commercial buildings. Several buildings appear to be associated with the railroad, but the majority flank Elm Street (Route 3) in the east portion of the APE. Though the buildings are 50 years of age (historic aerials indicate they were construction between 1952 and 1965), most of them have been extremely altered and are unrecognizable as historic buildings. Regardless, there are approximately five buildings over 50 years of age in the indirect APE. See Photo 59 in **Appendix B.**

The indirect APE for the proposed **Manchester Layover Facility (Queen City Bridge)** alternative consists of early 20th century industrial and commercial buildings. The buildings are masonry (brick and poured concrete), that range in height from two to four stories, and have flat roofs. Window sashes have been replaced in all the buildings. There are approximately four buildings over 50 years of age on the south side of the Queen City Bridge. See Photos 60-61 in **Appendix B.**

The indirect APE for the proposed **Cemetery Layover Facility** alternative in Manchester contains woodland and the Merrimack River on the east. There are no resources over 50 years of age in the indirect APE. See Photos 12-13 in **Appendix B.**

The indirect APE for the proposed **Water Treatment Layover Facility** alternative in Manchester contains the wastewater treatment facility buildings (constructed in the 1970s) on the west; late-20th century warehouses on the north and west; and a residential area to the southeast that contains buildings constructed in the early and late 20th century. This treatment plant and railroad line is shielded from the view of the residential neighborhood by a vegetative buffer of trees between the two areas. Approximately three residences that are over 50 years of age fall within the indirect APE. See Photo 62 in **Appendix B.**

The indirect APE for the proposed **Ray Wieczorek Drive Station** alternative in Bedford contains woodland on the south and a former open lot on the north used by a neighboring gas company. There are no resources over 50 years of age in the indirect APE. See Photos 16-17 in **Appendix B.**

The indirect APE for the proposed **Crown Street Station** alternative in Nashua is largely late 19th and early 20th century residential buildings, but also contains industrial buildings from the same periods. Industrial buildings are long brick buildings between one and three stories with flat roofs and are concentrated around the railroad line. A dense collection of dwellings line Arlington Street in the western portion of the indirect APE and at cross streets like Gillis and Bowers Street in the southwest. Chase Street and Hobbs Avenue in the northeast of the APE also contain similar residences. The dwellings are largely frame constructed; 2 ½-stories in height; side hall plan with front or cross gable roofs, and brick chimneys. All appear to have been altered in some way; common changes being replacement windows, siding, and enclosed porches. The station site and railroad line is shielded from the view of the residential neighborhood by a vegetative buffer of trees between the two areas. Approximately 30 resources in the indirect APE are over 50 years of age. See Photos 63-64 in **Appendix B.**

The indirect APE for the proposed **Spit Brook Station** alternative in Nashua contains late-20th and early 21st century commercial and industrial buildings on the north, west, and south, and the Merrimack River on the east. There are no resources over 50 years of age in the indirect APE. See Photos 21-22 in **Appendix B.**

The indirect APE for the proposed **Pheasant Lane Mall Station** alternative contains the Pheasant Lane Mall (built 1986) on the west and the Merrimack River on the east. There are no resources over 50 years of age in the indirect APE. See Photo 65 in **Appendix B.**

5.0 Conclusions and Recommendations

Background research and the field visit found that there are two previously identified historic properties within the **direct APE**: the Eagle Square Historic District and the Amoskeag Millyard Historic District (See **Table 5-1**). The improvement proposed within the Eagle Square Historic District is the addition of a second track, which would pass between an open parking lot and a former industrial building (c. 1890). Improvements proposed within the Amoskeag Millyard Historic District include construction of the Spring Street Station alternative. If chosen, this station alternative (including platform and accompanying features) would be constructed within the district and immediately adjacent to one of the contributing mill buildings. The proposed station would also be located adjacent to the NRHP-listed District B of the Amoskeag Corporation Housing District.

It was also determined that there are 14 previously identified historic properties within the **indirect APE**. See Table 5-1 below, photographs in Appendix B, and resource location maps in Appendix C for additional information on previously identified resources in the APE.

Table 5-1. Previously Identified Historic Properties in the APE

Map No.	Name/Address	City	NRHP/SR Status	Location in APE
1	Eagle Square Historic District (ESHD)	Concord	DOE	Direct
5-6	Amoskeag Millyard Historic District	Concord	Eligible	Direct
1	Merrimack County Bank	Concord	Listed	Indirect
1	Eagle Hotel	Concord	Listed (individually); Contributes to the Listed DCHD; Contributes to the NRHP-eligible ESHD	Indirect
1	Downtown Concord Historic District (DCHD)	Concord	Listed	Indirect
2	Concord Gas Light Co. Gasholder House	Hooksett	Eligible	Indirect
2	French-Thompson House	Manchester	Eligible	Indirect
3	Robie's Country Store	Manchester	Listed	Indirect
4	Stark Park	Manchester	Listed	Indirect
5	Jefferson Mill	Manchester	Individually eligible; Contributes to the eligible Amoskeag Millyard HD	Indirect
5	Amoskeag Machine Shop	Manchester	Individually eligible; Contributes to the eligible Amoskeag Millyard HD	Indirect
5	District C: Amoskeag Corp. Housing District TR	Manchester	NRHP Listed	Indirect
5	District B: Amoskeag Corp. Housing District TR	Manchester	NRHP-Listed	Indirect
5	District A: Amoskeag Corp. Housing District TR	Nashua	Listed	Indirect
5	R.G. Sullivan 7-20-4 Cigar Factory & Annex	Concord	DOE	Indirect
10	7 Crown Street	Concord	Contributes to the SR-eligible Crown Hill Historic District	Indirect

Background research and the field visit also found that there are 12 resources over 50 years of age within the **direct APE** that have not been previously surveyed. See Table 4-5 below, photographs in Appendix B, and Resource Location Maps in Appendix C for additional information.

Table 5-2. Resources over 50 Years of Age in the direct APE

URS Survey No.	Name/Address	City	Resource Type	Built Date
C-1	Boston & Maine Railroad	ALL	Railroad line	c. 1840
C-2	11 Stickney Avenue	Concord	Storage or warehouse	c. 1940
C-3	11 Stickney Avenue	Concord	Garage	c. 1940
C-4	11 Stickney Avenue	Concord	garage	c. 1940
C-5	New Hampshire Highway Dept 11 Stickney Avenue	Concord	Office building	c. 1940
C-6	11 Stickney Avenue	Concord	warehouse	c. 1960
C-7	11 Stickney Avenue	Concord	storage	c. 1960
C-8	11 Stickney Avenue	Concord	storage	c. 1955
N-9	25 Crown Street	Nashua	Office or showroom	c. 1890
N-10	25 Crown Street	Nashua	storage	c. 1964
B-11	Hooksett Railroad Bridge	Hooksett	Baldwin Truss bridge	c. 1930
B-12	Goffs Falls Railroad Bridge	Manchester	Baldwin Truss bridge	c. 1930

It was also determined that there are approximately 45 resources over 50 years of age within the **indirect APE** that have not been previously surveyed. Those resources are characterized in **Section 4.3.2.**

Given the limited work proposed for the Project, it is recommended that additional investigations be confined to the direct APE, as long as Project plans do not change from those provided in this report. If Project plans change, the APE may need to be redefined and additional investigations may have to be conducted in order to determine any potential effects on historic properties.

Based on the information currently available, it is recommended that an intensive-level historic architectural survey be conducted to determine whether or not the resources listed in Table 5-2 are eligible for listing in the NRHP.

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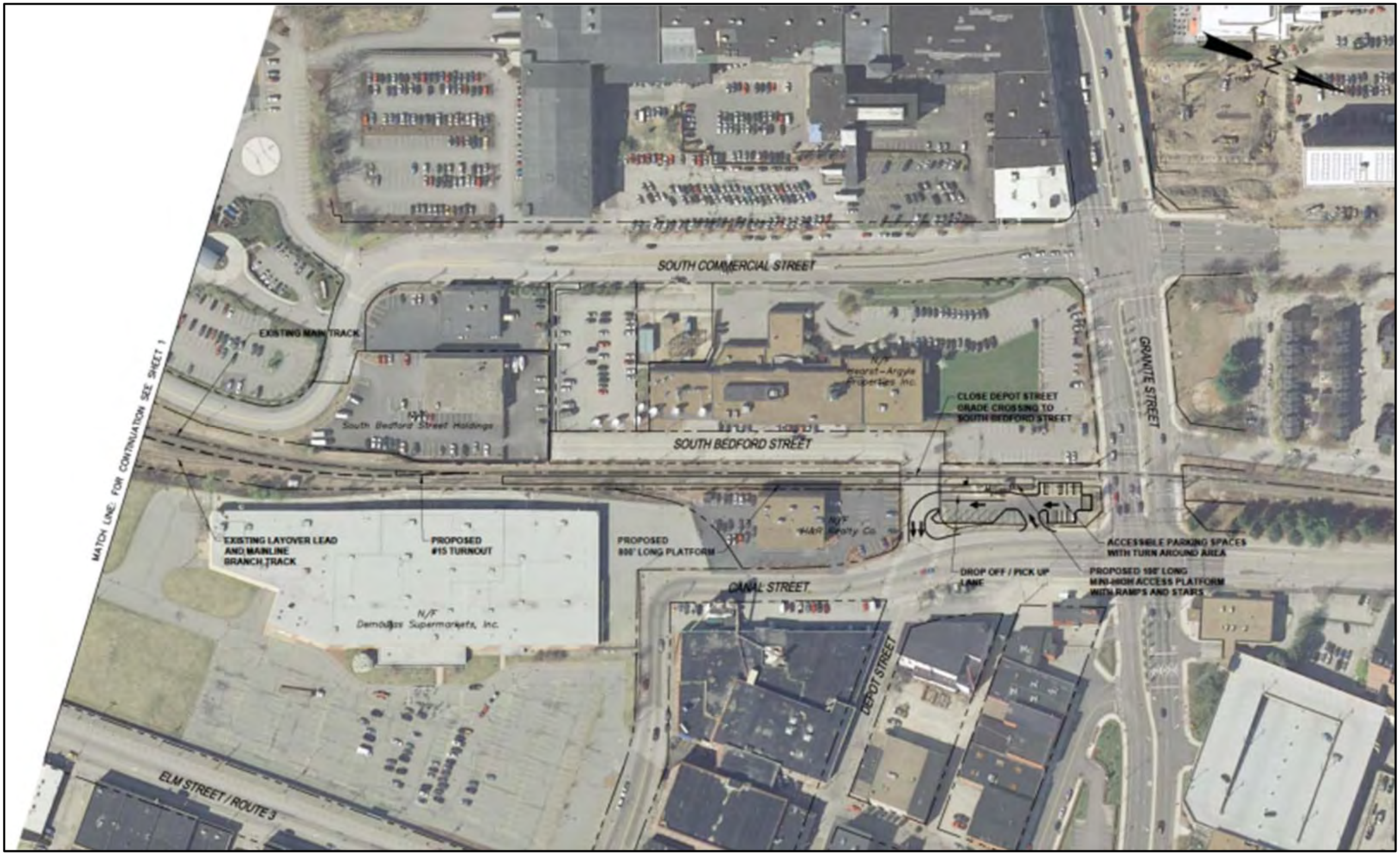
7.0 APPENDIX A

Project Plans

Map 1
Stickney Avenue Station and Layover Facility
City of Concord
(NHDOT 2014)

Map 2
Spring Street Station Facility
City of Manchester
(NHDOT 2014)



Map 3
Granite Street Station Facility
City of Manchester
(NHDOT 2014)

Map 4
Manchester Layover Facility (Queen City Bridge)
City of Manchester
(NHDOT 2014)

Map 5
Granite Street Layover Facility
City of Manchester
(NHDOT 2014)

Map 6a
Cemetery Layover Facility
City of Manchester
(NHDOT 2014)

Map 6b
Cemetery Layover Facility
City of Manchester
(NHDOT 2014)

Map 7a
Wastewater Treatment Plant Layover Facility
City of Manchester
(NHDOT 2014)

MAP 7b
Wastewater Treatment Plant Layover Facility
City of Manchester
(NHDOT 2014)

Map 8
Ray Wieczorek Drive Station Facility
Town of Bedford
(NHDOT 2014)

Map 9
Crown Street Station Facility
City of Nashua
(NHDOT 2014)

Map 10
Spit Brook Station and Layover Facility
City of Nashua
(NHDOT 2014)

Map 11
Pheasant Lane Mall Station Facility
City of Nashua
(NHDOT 2014)

8.0 APPENDIX B

Photographs

Photo 1. Proposed Stickney Avenue station location; view north showing existing buildings on parcel (Google Earth, August 2011)

Photo 2. Proposed Stickney Avenue station location; view south showing existing buildings on parcel (Google Earth, August 2011)

Photo 3. Proposed Stickney Avenue platform location; view south along rail line from Storrs Street

Photo 4. Proposed Stickney Avenue platform location; view south along the right-of-way from Storrs Street toward the Loudon Road bridge

Photo 5. Proposed Spring Street station location; view north along the east side of the right-of-way toward the W. Bridge Street bridge

Photo 6. Proposed Spring Street station location; view south from Kidder Street toward the W. Bridge Street bridge

Photo 7. Proposed Granite Street station location; view north along the right-of-way from (near) Auburn Street

Photo 8. Proposed Granite Street station location; view south along the right-of-way from Depot Street

Photo 9. Proposed Granite Street layover location; view north from the south end of the limits of disturbance

Photo 10. Proposed Granite Street layover location; view south along the right-of-way from the north end of the limits of disturbance

Photo 11. Proposed Manchester Layover Facility location; view north on property.


Photo 12. Proposed Cemetery layover location; view north along the right-of-way

Photo 13. Proposed Cemetery layover location; view south along the right-of-way

Photo 14. Proposed Wastewater Treatment Plant layover location; view north along the right-of-way from the middle of the limits of disturbance

Photo 15. Proposed Wastewater Treatment Plant layover location; view south along the right-of-way from Winston Street

Photo 16. Proposed Ray Wieczorek Drive station location; view north along the right-of-way from the south side of the Ray Wieczorek Drive bridge

Photo 17. Proposed Ray Wieczorek Drive station location; view south along the right-of-way from the north side of the Ray Wieczorek Drive bridge

Photo 18. Proposed Crown Street station location; view south from Crown Street toward the limits of disturbance (Google Earth, August 2011)

Photo 19. Proposed Crown Street station location; view west on Crown Street toward the area proposed for the Park and Ride Facility (Google Earth, August 2011)

Photo 20. Proposed Crown Street station location; view northwest from the northeast side of the right-of-way toward the proposed facility area

Photo 21. Proposed Spit Brook station/layover location; view north from Spit Brook Road

Photo 22. Proposed Spit Brook station/layover location; view north along the right-of-way from Spit Brook Road

Photo 23. Proposed Pheasant Lane Mall station location; view north along the right-of-way from the Pheasant Lane Mall parking lot

Photo 24. Proposed Pheasant Lane Mall station location; view north along the right-of-way from the Pheasant Lane Mall parking lot

Photo 25. Merrimack County Bank, Concord (NRHP-Listed); view east From N. Main Street (Photo credit: Wikipedia)

Photo 26. Eagle Hotel, Concord (NRHP Listed); view east from N. Main Street

Photo 27. View southeast from the intersection of Centre Street and N. Main Street showing the Downtown Concord Historic District (NRHP Listed), including the contributing Stickney's North Block (far left) and Stickney's Block (center). These buildings are also a part of the NRHP-eligible Eagle Square Historic District.

Photo 28. Dow Building (right) and Dow Block (left); view south from Loudon Road. Both buildings are contributing resources to the NRHP-listed DCHD and NRHP-eligible ESHD

Photo 29. Contributing building to the NRHP-eligible ESHD; view south from Loudon Road and Bridge Street

Photo 30. NRHP-eligible Gasholder House, Concord Gas Co. (Photo credit: Gary Samson 1982)

Photo 31. French-Thompson House, Concord (NRHP-eligible); view west from Water Street (Photo credit: Google Earth August 2011)

Photo 32. Robie's Country Store, Hooksett, NH (NRHP Listed); view southeast from Riverside Street (Photo credit: Wikipedia)

Photo 33. Stark Park in Manchester (NRHP Listed); view south from an internal park road

Photo 34. Amoskeag Millyard Historic District in Manchester (NRHP-eligible); view south on N. Commercial Street showing the Jefferson Mill (right), MAN1144.

Photo 35. Amoskeag Millyard Historic District in Manchester (NRHP-eligible); showing the building immediately adjacent to the proposed station. View northwest from Canal Street and Hollis Street

Photo 36. Amoskeag Millyard Historic District in Manchester (NRHP-eligible); view north on Commercial Street showing the Amoskeag Machine Shop (MAN1059)

Photo 37. District C of the Amoskeag Corporation Housing District in Manchester (NRHP-listed); view southwest from Hollis Street

Photo 38. District C of the Amoskeag Corporation Housing District in Manchester (NRHP-listed); view northeast from West Bridge Street and Charles Street

Photo 39. District B of the Amoskeag Corporation Housing District in Manchester (NRHP-listed); view northeast from Canal and Middle Streets (Photo credit: Google Earth August 2011)

Photo 40. District A of the Amoskeag Corporation Housing District in Manchester (NRHP-listed); view northwest from Bedford Street

Photo 41. District A of the Amoskeag Corporation Housing District in Manchester (NRHP-listed); view west from Bedford Street and Newell Street

Photo 42. R.G. Sullivan 7-20-4 Cigar Factory in Manchester (DOE); view east from Canal Street

Photo 43. 7 Crown Street in Nashua, a contributing resource to the Hill Historic District (SR-eligible); view south from Crown Street (Photo credit: Google Earth, August 2011)

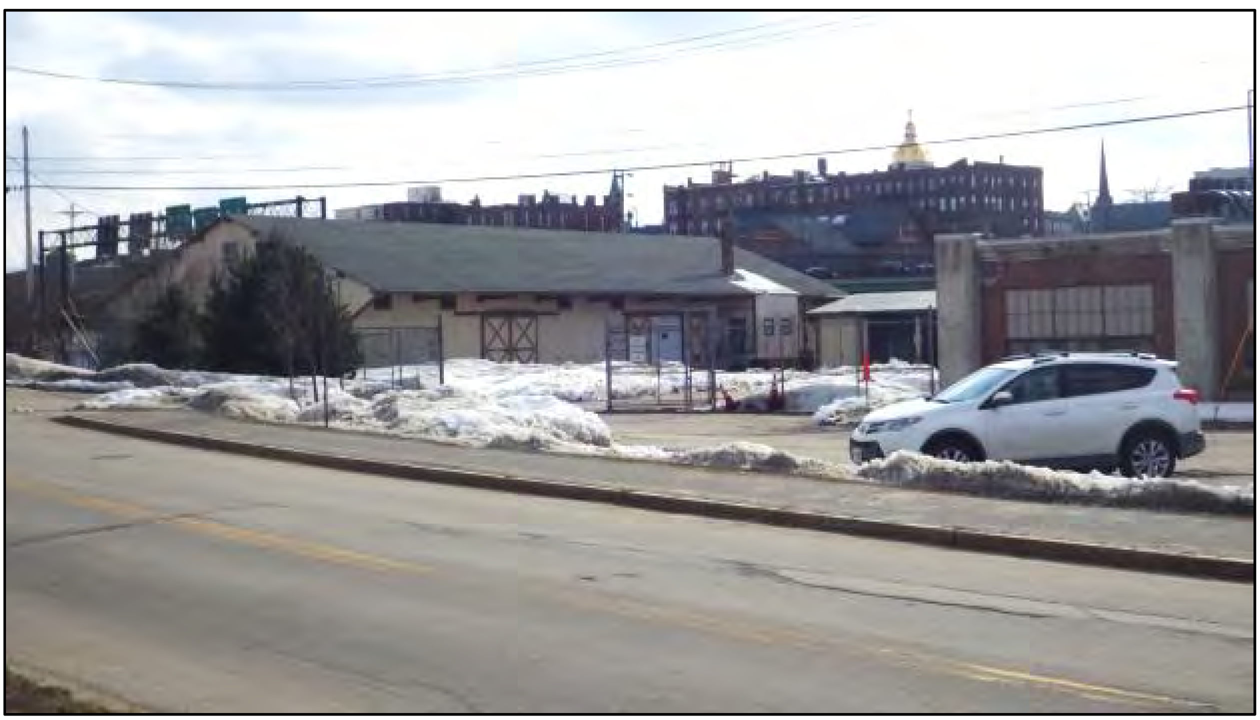


Photo 44. C-2 (left), C-3 (center), C-5 (right) in the Direct APE for Stickney Avenue Station and Layover Facility, view southwest from Stickney Avenue

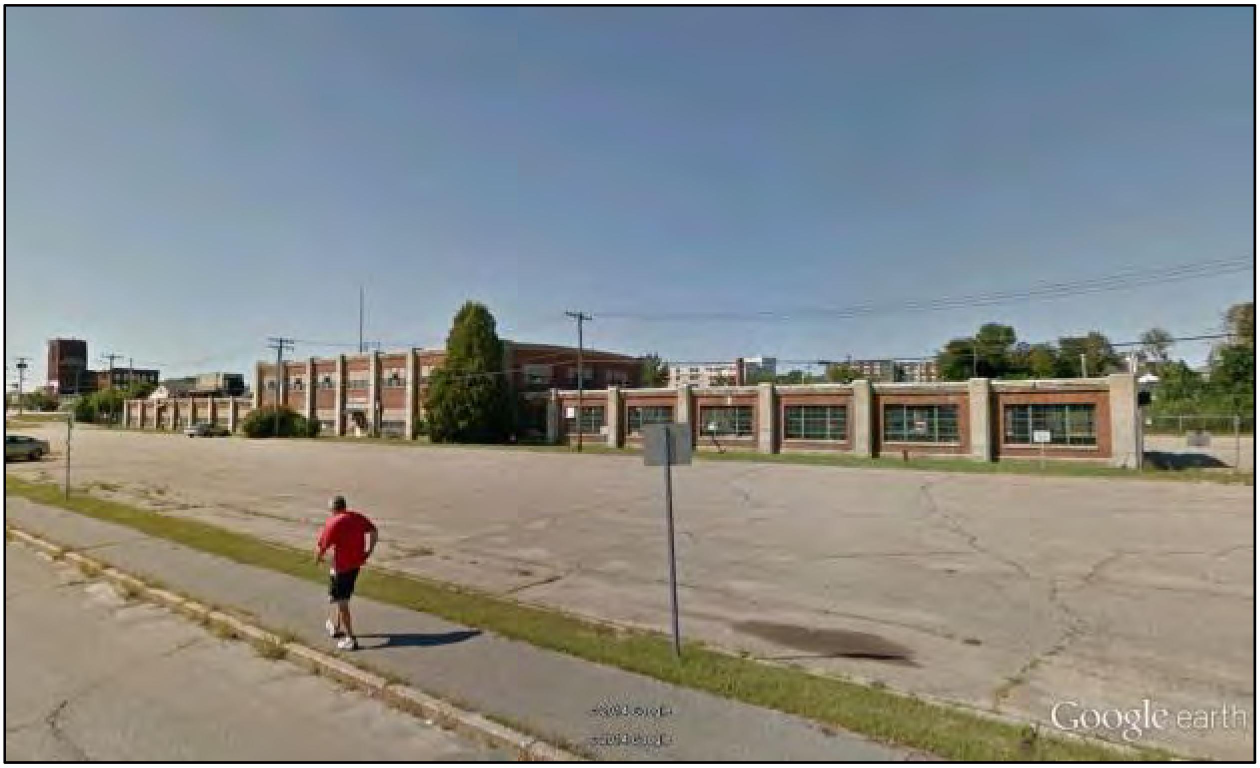


Photo 45. C-5 in the Direct APE for Stickney Avenue Station and Layover Facility; view southwest from Stickney Avenue (Google Earth August 2011)

Photo 46. Rear of C-5 in the Direct APE for Stickney Avenue Station and Layover Facility; view southwest from driveway

Photo 47. C-6 (left), C-7 (center), and C-8 (right) in the Direct APE for Stickney Avenue Station and Layover Facility; view west from driveway (Google Earth August 2011)

Photo 48. N-9 (right) in the Direct APE for Crown Street Station; view south from Crown Street.

Photo 49. N-9 (left) and N-10 (right) in the Direct APE for Crown Street Station; view south from Crown Street (Google Earth August 2011)

Photo 50. Hooksett Railroad Bridge (B-11); view southeast from the Main Street bridge (Google Earth August 2011)

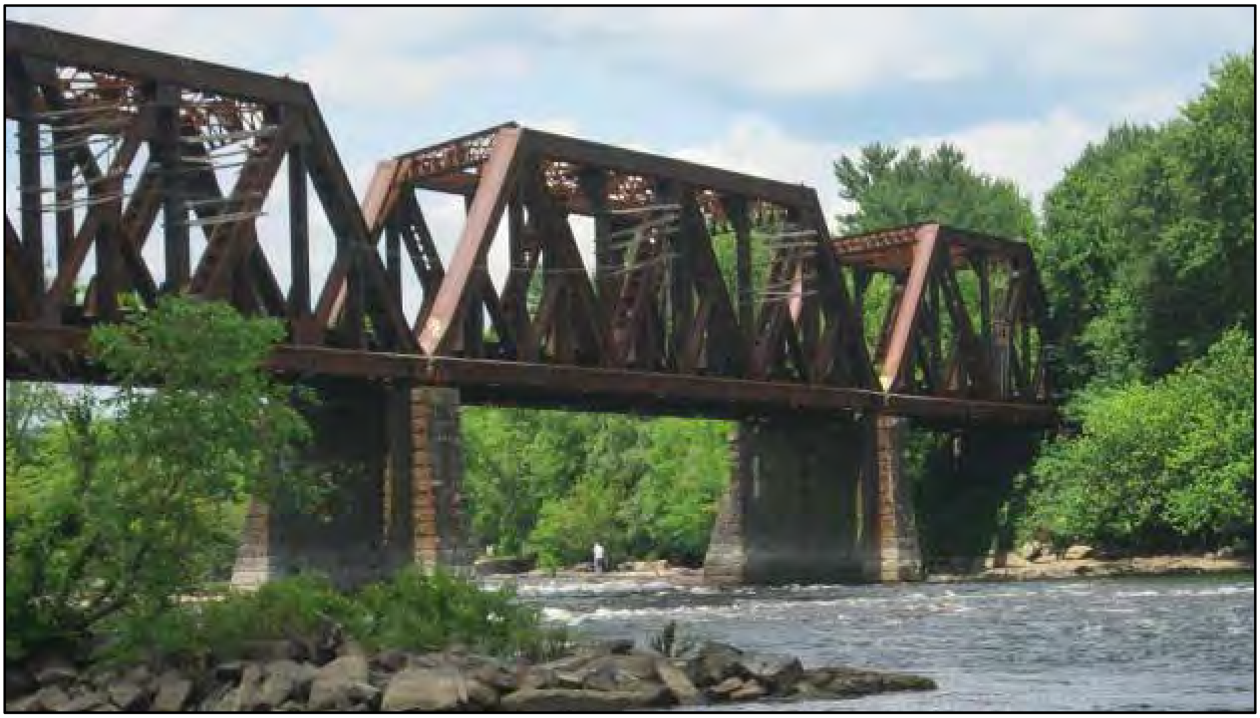


Photo 51. Goffs Falls Railroad Bridge (B-12); view south from the northern shore (http://kayakthemerrimack.blogspot.com/)

Photo 52. Indirect APE for Stickney Avenue Station; view northeast on N. Main Street showing residential properties (Google Earth August 2011)

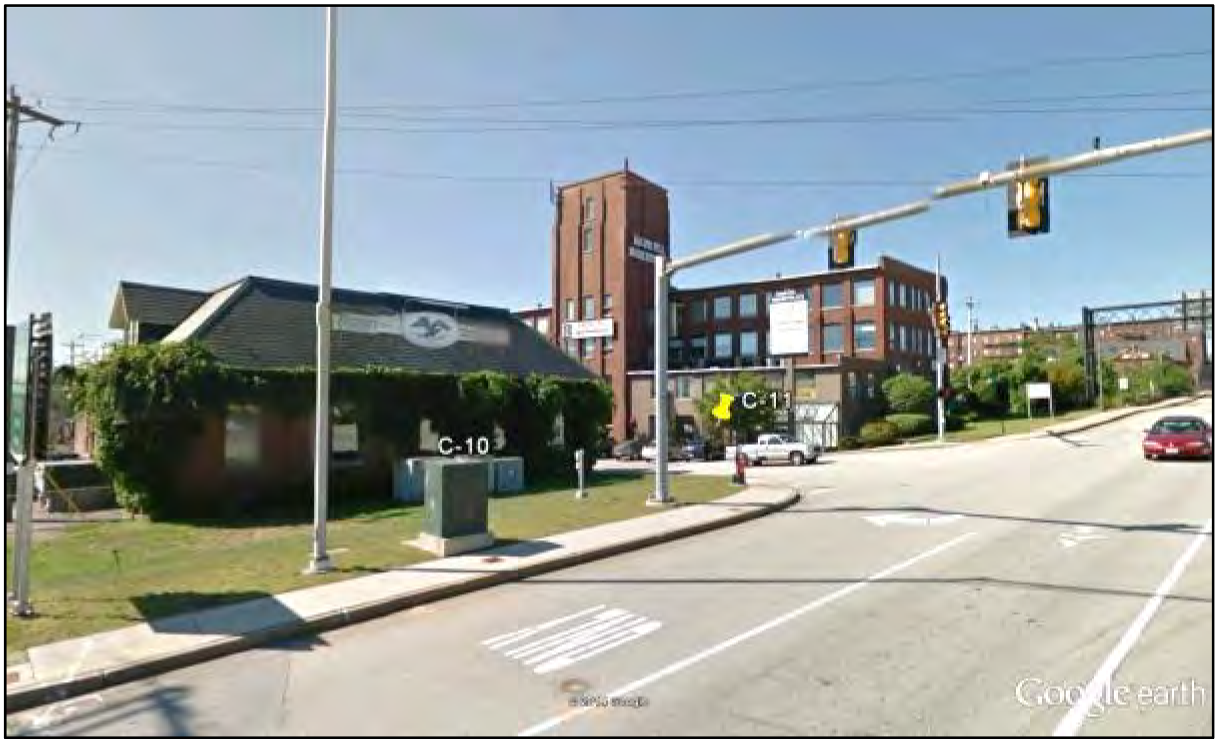


Photo 53. Indirect APE for Stickney Avenue Station, view southwest from Loudon Road showing two late 19th century industrial properties (Google Earth August 2011)

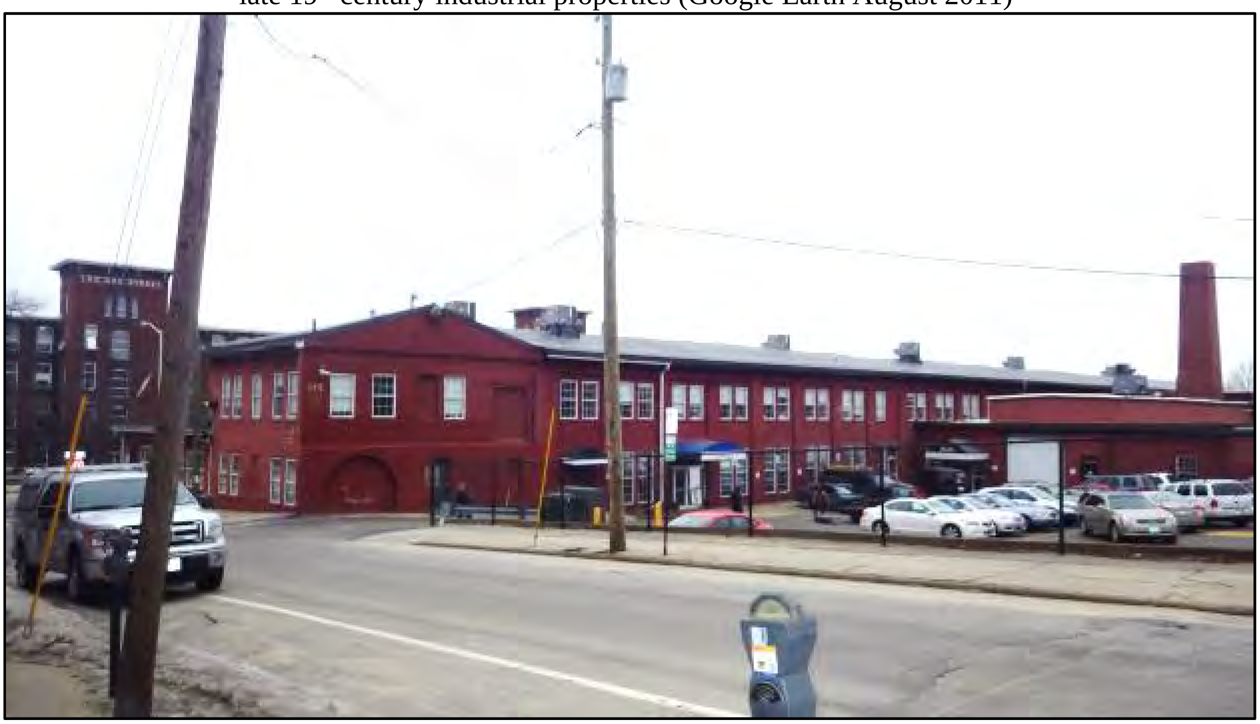


Photo 54. Indirect APE for Spring Street Station, view northwest from Hollis Street showing a late 19th century industrial building

Photo 55. Indirect APE for Spring Street Station, view east on Hollis Street showing a late 19th century industrial building

Photo 56. Indirect APE for Spring Street Station, view northwest on Dow Street showing an early 20th century industrial building (Google Earth August 2011)

Photo 57. Indirect APE for Granite Street Station, view north on Canal Street showing late 19th century commercial buildings (Google Earth August 2011)

Photo 58. Indirect APE for Granite Street Station, view north on W. Auburn Street showing late 19th century industrial buildings (Google Earth August 2011)

Photo 59. Indirect APE for Granite Street Layover Facility, view east (in southeast portion of APE) showing five buildings over 50 years of age (Bing Maps)

Photo 60. Indirect APE for Manchester Layover Facility, view west (on the south side of Queen City Bridge) showing two buildings over 50 years of age (Bing Maps)

Photo 61. Indirect APE for Manchester Layover Facility, view east (on the south side of the Queen City Bridge) showing two buildings over 50 years of age (Bing Maps)

Photo 62. Indirect APE for Water Treatment Plant Layover Facility, view north (in southeast portion of APE) showing residential area containing buildings over 50 years of age (Bing Maps)

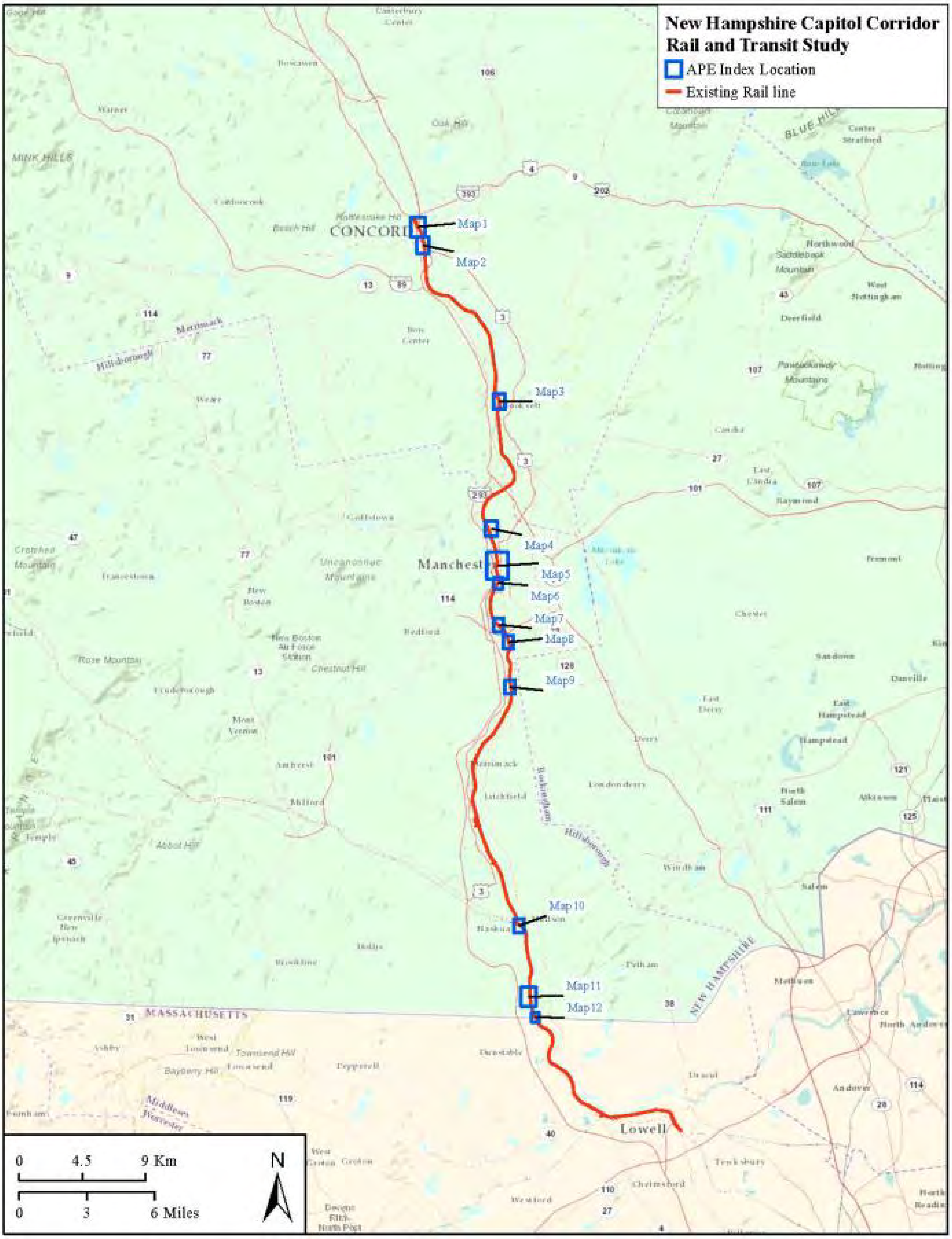
Photo 63. Indirect APE for the Crown Street Station in Nashua; view south on Arlington Street from Crown Street showing residential buildings

Photo 64. Indirect APE for the Crown Street Station in Nashua; view west on Crown Street from Colburn Street showing buildings

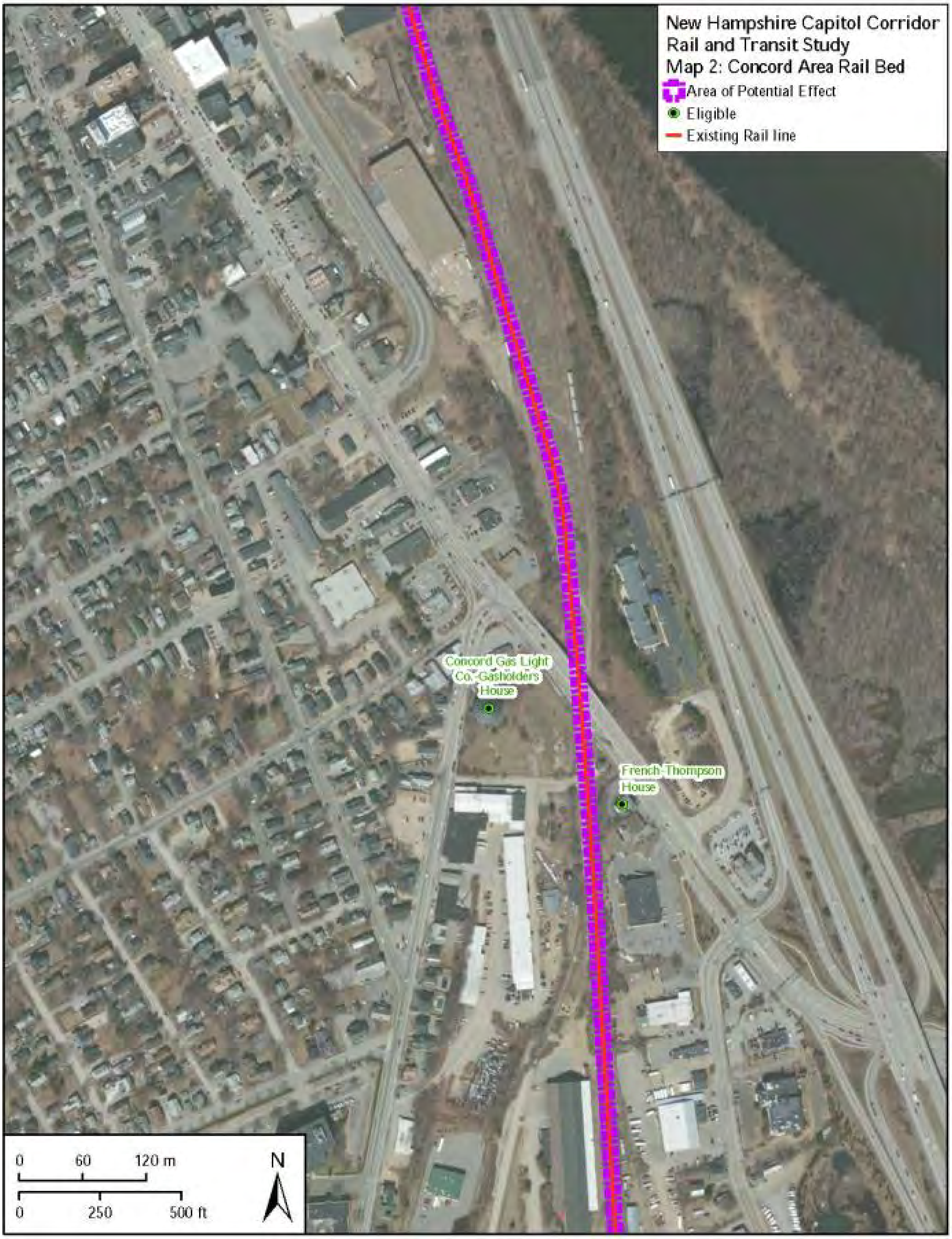
Photo 65. Indirect APE for the Pheasant Lane Mall Station in Nashua; view north showing the Pheasant Lane Mall

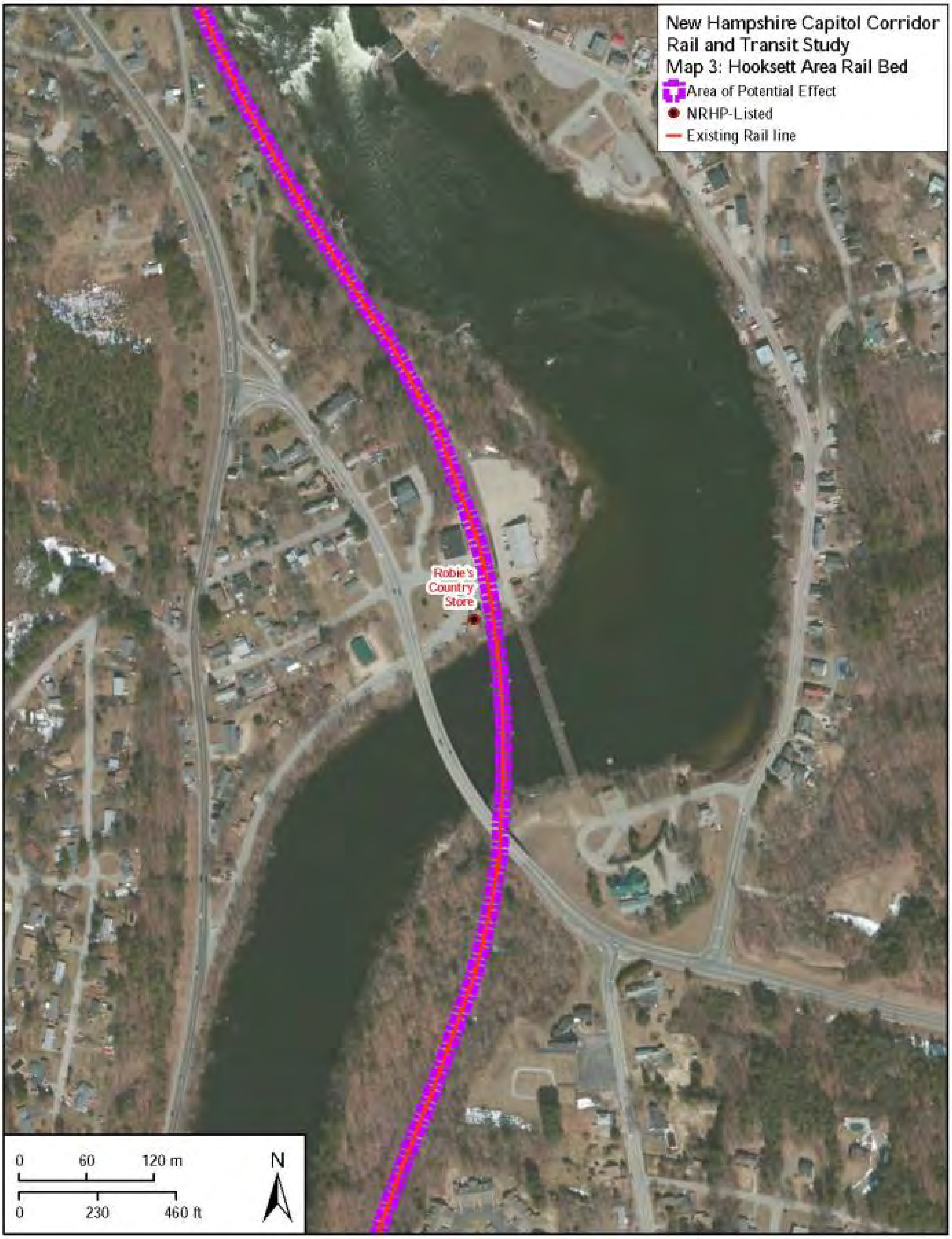
9.0 APPENDIX C

Resource Location Maps

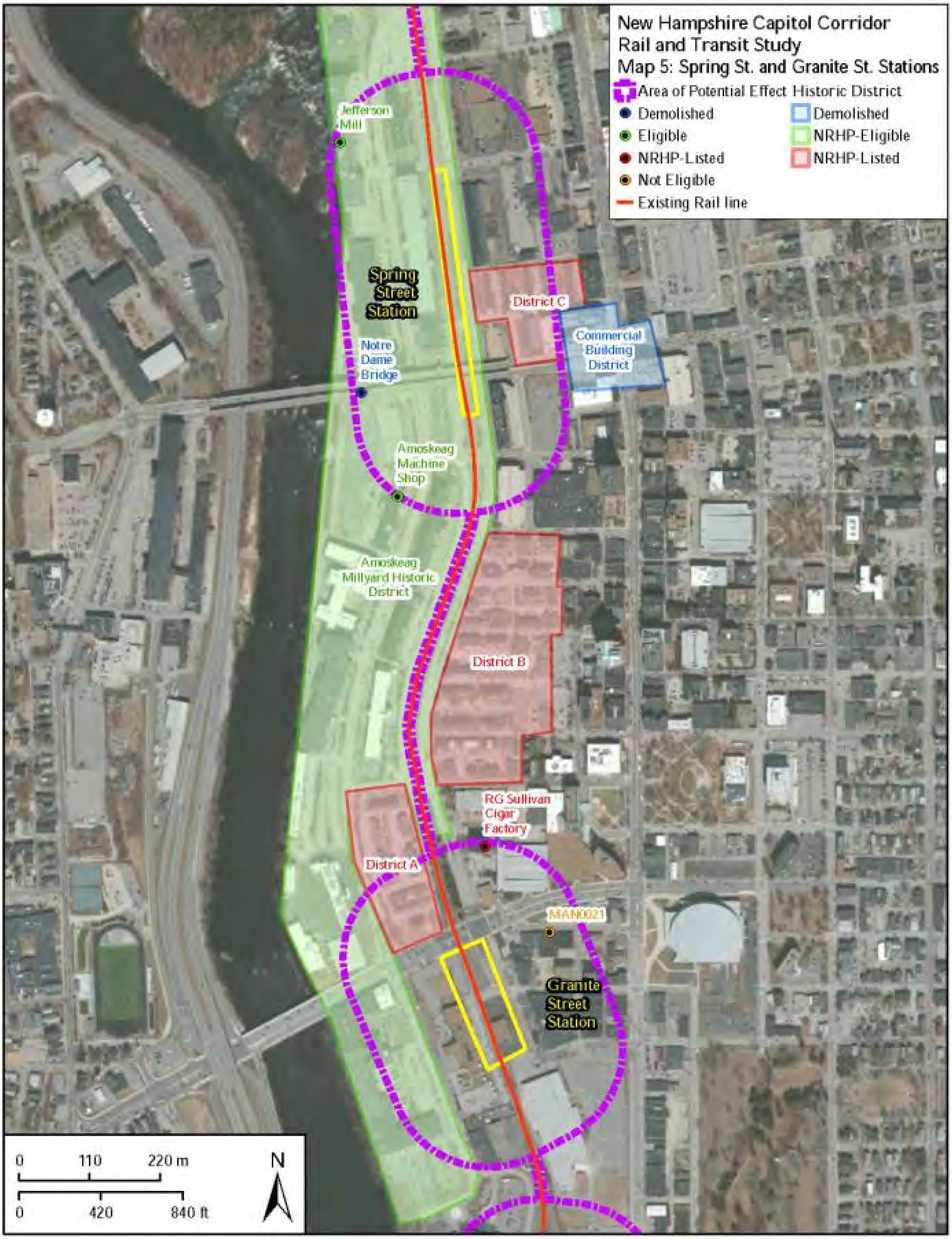

New Hampshire Capitol Corridor Rail and Transit Study
APE Index Location
Existing Rail line
Map1
Map2
Map3
Map4
Map5
Map6
Map7
Map8
Map9
Map 10
Map11
Map12
CONCORD
Manchester
Lowell
MASSACHUSETTS
NEW HAMPSHIRE
0
4.5
9 Km
0
3
6 Miles
N


New Hampshire Capitol Corridor
Rail and Transit Study
Map 1: Stickney Ave Station and Layover
Area of Potential Effect
Historic District
NRHP-Listed
Existing Rail line
NRHP-Eligible
NRHP-Listed
Merrimack County Bank
Stickney Ave Station and Layover
CON0203
CON0201
CON0204
Eagle Square Historic District
Eagle Hotel
Concord Civic District
Downtown Concord HD
0
75
150 m
0
300
600 ft
N


New Hampshire Capitol Corridor
Rail and Transit Study
Map 2: Concord Area Rail Bed
Area of Potential Effect
Eligible
Existing Rail line
Concord Gas Light Co. Gasholders House
French-Thompson House
0 60 120 m
0 250 500 ft
N


New Hampshire Capitol Corridor
Rail and Transit Study
Map 3: Hooksett Area Rail Bed
Area of Potential Effect
NRHP-Listed
Existing Rail line
Robie's Country Store
0 60 120 m
0 230 460 ft
N


New Hampshire Capitol Corridor
Rail and Transit Study
Map 4: Northern Manchester Rail Bed
Area of Potential Effect Historic District
Existing Rail line
NRHP-Listed
Stark
Park
0
60
120 m
0
230
460 ft
N


New Hampshire Capitol Corridor
Rail and Transit Study
Map 5: Spring St. and Granite St. Stations
Area of Potential Effect
Historic District
Demolished
Eligible
NRHP-Listed
Not Eligible
Existing Rail line
Demolished
NRHP-Eligible
NRHP-Listed
Jefferson Mill
Spring Street Station
District C
Commercial Building District
Notre Dame Bridge
Amoskeag Machine Shop
Amoskeag Millyard Historic District
District B
RG Sullivan Cigar Factory
District A
MAN0021
Granite Street Station
0 110 220 m
0 420 840 ft
N


New Hampshire Capitol Corridor
Rail and Transit Study
Map 6: Granite Street Layover
Area of Potential Effect
Historic District
Existing Rail line
NRHP-Eligible
Amoskeag Millyard Historic District
Granite Street Layover
0 40 80 m
0 175 350 ft
N


New Hampshire Capitol Corridor
Rail and Transit Study
Map 7: Cemetery Layover
Area of Potential Effect
Existing Rail line
Cemetery
Layover
0
50
100 m
0
210
420 ft
N


New Hampshire Capitol Corridor
Rail and Transit Study
Map 8: Waste Water Treatment Facility Layover
Area of Potential Effect
Existing Rail line
Waste Water
Treatment
Facility Layover
0
50
100 m
0
210
420 ft
N


New Hampshire Capitol Corridor
Rail and Transit Study
Map 9: MHT: Ray Wieczorek Drive Station
Area of Potential Effect
Existing Rail line
0
50
100 m
0
210
420 ft
N


New Hampshire Capitol Corridor Rail and Transit Study
Map 10: Crown Street Station
Area of Potential Effect
Eligible
Not Eligible
Existing Rail line
NAS0009
NAS0039
NAS0065
Crown Street Station
7 Crown Street
0
50
100 m
0
210
420 ft
N

New Hampshire Capitol Corridor
Rail and Transit Study
Map 11: Spit Brook Station and Layover
Area of Potential Effect
Existing Rail line
Spit Brook
Station &
Layover
0
80
160 m
0
300
600 ft
N


New Hampshire Capitol Corridor
Rail and Transit Study
Map 12: Pheasant Lane Mall Station
Area of Potential Effect
Existing Rail line
Pheasant
Lane Mall
Station
0
30
60 m
0
140
280 ft
N

10.0 APPENDIX D

Professional Qualifications

Vanessa Zeoli, MHP

Architectural Historian

Area of Expertise

Cultural Resource Management
Architectural History Surveys
Section 106 of the NHPA
NEPA
National Register of Historic Places Nominations
HABS/HAER Documentation
Historic Preservation Planning

Years of Experience

With URS: 10 months
With Other Firms: 12 years

Education

M.H.P./2007/University of Kentucky/Historic Preservation

Certificate in Historic Preservation/ Bucks County Community College/2005

B.A./1998/Millersville University/History

Continuing Education

ArcGIS: Introduction, Rutgers University Seminar/2014

FHWA Program Comment for Common Post-1945 Concrete and Steel Bridges, Webinar/2013

New Jersey Historic Preservation Conference / 2004, 2011, 2013

Long Island Railroad Safety Training/2012

Pennsylvania's Byways to the Past Conference/2012

Re-pointing Workshop Using Lime Putty Mortar, Pine Mountain, KY/2007

Kentucky Preservation Conference/2006

Penn DOT Section 106: Principles and Practice Workshop /2004

Ms. Zeoli joined URS in July 2013 and has 13 years of experience in historic preservation and cultural resources management throughout the United States. In her position as architectural historian, she has acted as cultural resource liaison between various clients and local, state, and federal review agencies. Ms. Zeoli has completed numerous documentation and regulatory compliance projects including Section 106 studies (including eligibility evaluations, effects assessments, MOAs), NEPA studies (EAs and EISs), historic architectural surveys, HABS/HAER documentation projects, National Register nominations, historic preservation design consultation, and Historic Tax Credit Applications. She has surveyed and evaluated historic properties, evaluated eligibility in accordance with National Register criteria, evaluated project effects, and developed agreement documents to resolve adverse effects. Ms. Zeoli has worked with a wide range of resources in varying settings that include: transportation resources (historic roads, bridges, railroads, and airports); industrial properties (mills, breweries, manufacturing plants); institutional buildings (museums, churches, auditoriums); agricultural properties (farmsteads, tenant houses, cemeteries, rural landscapes); and urban buildings (residential and commercial historic districts). She meets the Secretary of the Interior's Professional Qualification Standards for Architectural Historians [36 CFR 61].

Project Specific Experience

Natural Gas Pipeline Projects in Pennsylvania and New York: Architectural Historian. Prepared eight Section 106 studies for proposed pipeline projects throughout northern Pennsylvania and south and central New York in 2013 and 2014. Work included background research, architectural surveys, inventory forms, eligibility assessments, effects determinations, and coordination with the PA and NY SHPO.

Rochester Gas & Electric Corporation: Russell Station Demolition Project, Greece, New York: Architectural Historian and Principal Investigator. A Historic Resource Inventory Form documenting the history and construction chronology, as well as assessing the significance, integrity and eligibility of the resource. Work included primary and secondary research and intensive-level survey. The station was recommended "Not Eligible" and the NYSHPO concurred in November 2013.

Scotch Plains Baptist Church, Parsonage, and Cemetery National Register Nomination, Scotch Plains, New Jersey: Senior Architectural Historian and Principal Investigator. The NRHP nomination was completed as part of a mitigation effort for alterations to the Route 22 bridge in Scotch Plains Township. The work included primary and secondary research, field investigations, and completion of the NRHP nomination form. The property was listed in the National Register of Historic Places on June 14, 2013.

Chicago Transit Authority (CTA), Wilson Transfer Station Rehabilitation Project, City of Chicago, Illinois: Senior Architectural Historian. Project involved Section 106 compliance for rehabilitation of the historic Wilson Station and reconstruction of 1,200 feet of elevated rail line within the National Register-listed Uptown Square Historic District. The work included an architectural survey, eligibility evaluations, effects assessments, consulting party coordination, and preparation of a Memorandum of Agreement.

Historic Architectural Effects Assessment Report, Potomac Yard Metrorail Station, City of Alexandria, Virginia: Senior Architectural Historian. Project consists of construction of a new Metrorail station adjacent to the National Register-listed George Washington Memorial Parkway. The work consisted of Section 106 and NEPA studies in support of an Environmental Impact Statement. The project also involved extensive consultation efforts with the Virginia Department of Historic Resources, the National Park Service, and other consulting parties.

California High-Speed Train Project, California High-Speed Rail Authority (CAHSRA), Merced to Fresno, California: Architectural History Task Leader. Project involved the preparation of an Environmental Impact Report/Environmental Impact Statement for the design and construction of a high-speed passenger train system for a 60 mile section between Merced and Fresno. Compliance efforts under Section 106 and NEPA involved conducting background research, conducting field survey, compiling data, eligibility evaluations, effects assessments, developing treatment measures, and coordinating with local, state, and federal agencies. Ms. Zeoli was task leader, managing teams in New York and California and was the primary author of numerous technical reports in support of the EIR/EIS including Historic Properties Survey Report (HPSR), Historic Architectural Survey Report (HASR), Finding of Effects Report (FOE), and Built Environment Treatment Plan (BETP).

Chicago Transit Authority (CTA), North Red Line Station Improvements, City of Chicago, Illinois: Architectural Historian. Project involved a Section 106 assessment for the rehabilitation of 8 stations along the North Red Line elevated railroad in the City of Chicago. The work included background research, field survey, National Register of Historic Places eligibility evaluations, effects assessments, and submission of Historic Architectural Screening reports for submission to the Illinois Historic Preservation Agency (IHPA) for review and concurrence.

New Jersey Turnpike Interchange, 6-9 Widening, New Jersey Turnpike Authority (NJTA), Cranbury Township, New Jersey: Architectural Historian. Project involved producing historic signage marking the spot where the newly widened turnpike crosses the National Register-eligible Camden & Amboy Railroad Historic District. The work was completed in compliance with a NJDEP Freshwater Wetlands permit. Work included background research, drafting text for the sign and coordination with the NJSHPO and sign fabricator.

St. Joseph North Pier Inner Light (St. Joseph, MI), Green Bay Harbor Entrance Light (Green Bay, WI), and Grand Marais Light (Grand Marais, MN): Architectural Historian and Photographer. Project was undertaken as mitigation for the replacement of three historic Fresnel lenses with LED lights. Effort consisted of photographic documentation of the lighthouses and lanterns and archival preparation of prints in accordance with each State Historic Preservation Office requirements.

Columbia Pike Transit Initiative, Washington Metropolitan Transit Authority (WMATA), Fairfax County, Virginia: Architectural Historian. Project involved the completion of Section 106 studies to evaluated alternatives that included enhanced bus or streetcar service along a heavily developed commercial and residential corridor, with numerous historic resources. The work included background research, historic architectural survey, and the preparation of approximately 60 reconnaissance-level survey forms for the Virginia Department of Historic Resources.

Cultural Resources Survey: Proposed Shot Tower Metro Station Hardening, City of Baltimore, Maryland: Architectural Historian and Principal Investigator. Project consisted of a Cultural Resources Survey in accordance with Section 106 for the Maryland Transit Authority. Conducted background research, field survey, and prepared a report to documenting and evaluating historic architectural resources in the project area including the Jones Falls Conduit and a portion of the Union Railroad Historic District.

Millhurst Mill HABS Level III Recordation, Manalapan Township, Monmouth County, New Jersey: Senior Architectural Historian. Project involved HABS Level III Recordation of the National Register-eligible, late-nineteenth century flour and feed mill. The project was undertaken to mitigate the adverse effect of the proposed reconstruction of Bridge MN-10 and the rehabilitation of the Millhurst dam. Ms. Zeoli conducted primary and secondary historical research to prepare a detailed history of the site and photographic documentation designed to capture character-defining features of the mill, dam, millpond, and raceway.

St. Peter the Apostle Church Convent, City of New Brunswick, Middlesex County, New Jersey: Historic Preservation consultant for the adaptive reuse of the church convent as a student ministry center. The church and convent were listed on the National Register of Historic Places in 2005 and the subject of an historic preservation easement held by the New Jersey Historic Preservation Trust. Ms. Zeoli coordinated with the Trust and the project team (church, architects, construction manager, and contractors) to ensure compliance with the Secretary of the Interior's Standards for Rehabilitation.

Springfield Avenue Bridge Replacement, Cranford Township, Union County, New Jersey: Architectural Historian. The work consisted of an Intensive-Level Architectural Survey and evaluation of historic architectural resources within the Area of Potential Effects for the proposed replacement of a historic bridge that was a contributor to three National Register-eligible historic districts. The work was completed in compliance with a NJDEP Freshwater Wetlands permit.

Woodford-Fishback-Venable Farm, Winchester, Clark County, Kentucky: Architectural Historian. Prepared the nomination of the early-nineteenth century Woodford-Fishback-Venable

Farm to the National Register of Historic Places. Cultural resources on the property boundaries reflect how patterns of traditional diversified agriculture were adapted to natural features in the Inner Bluegrass region. Ms. Zeoli conducted primary and secondary research and prepared the nomination according to the National Register of Historic Places guidelines. The farm was listed on the National Register in July 2008.

Upper Reaches of Boone Creek Rural Historic District, National Register of Historic Places Nomination, Fayette and Clark Counties, KY: Architectural Historian. Project consisted of the preparation of a nomination of the Upper Reaches of Boone Creek Rural Historic District. The district is a 10,742 acre rural historic landscape in Central Kentucky that has been engaged in agricultural pursuits since the settlement period. Ms. Zeoli conducted primary and secondary research, surveyed and photographed the district, and published the nomination according to National Register of Historic Places guidelines. The district was listed in the National Register of Historic Places in July 2009.

Philadelphia Civic Center, HABS Level II Documentation, City of Philadelphia, Pennsylvania: Cultural Resource Specialist and Project Manager. Project consisted of a Level II HABS Documentation of the Philadelphia Civic Center before its demolition in 2005 and its replacement with the Perelman Center for Advanced Medicine in 2008. Documentation included primary and secondary research, digital photography, recordation of historic features, and narrative description. Ms. Zeoli also assisted a professional photographer with large-format, HABS-quality photography of the building.

Adaptive Reuse of Memorial Hall, City of Philadelphia, Pennsylvania: Draftsman and Conservation Intern. Project consisted of the adaptive reuse of Memorial Hall for the Please Touch Museum. The museum was built in 1875 to serve as the art gallery for the Centennial International Exhibition in Fairmount Park in 1876. It is one of only two remaining buildings out of the over 200 buildings constructed for the Exposition fairgrounds. Ms. Zeoli worked with the preservation architect and architectural conservator to complete a detailed conditions assessment of historic features and prepare construction drawings in preparation for rehabilitation and adaptive reuse of Memorial Hall.

Professional Societies/Affiliates

Vernacular Architecture Forum/2014
Lambertville Historical Society/Board Member/2013-Present
Boston Architectural College/Adjunct Instructor/2012-Present
Bucks County Community College/Adjunct Instructor/2011-Present
Bluegrass Trust for Historic Preservation/2006-Present
Sigma Pi Kappa/Historic Preservation Honor Society/2005-Present
National Trust for Historic Preservation/2005-Present

Chronology

2010–2013: AECOM, Trenton, NJ
2009–2010: Richard Grubb & Associates, Cranbury, NJ
2007–2009: Cultural Resource Consulting Group, Highland Park, NJ
Summer 2007: Preservation Services and Technology Group, KY
Summer 2006: Clark County/Winchester Heritage Commission, KY
2005–2007: University of Kentucky/ Historic Preservation Program
2001-2005: Bucks County Community College, Newtown, PA
2001-2005: Kise Straw & Kolodner, Philadelphia, PA
1994-1998: Millersville University, Millersville, PA

Geographic Experience

New Jersey
Pennsylvania
New York
Rhode Island
Massachusetts
Delaware
Maryland
Virginia
Georgia
Florida
Kentucky
Illinois
Michigan
Wisconsin
California

Joel Dworsky

Graduate Archaeologist/GIS Specialist

Area of Expertise

GIS Database Management

Section 106 of the National Historic Preservation Act

Phase I, II, & III Archaeological Surveys and Excavations

Artifact Identification and Interpretation

Background Project Research

Human Osteology

GPS Systems

Years of Experience

With URS: 2

With Other Firms: 7

Education

M.A./2010/ Anthropology, Archaeology/College of William and Mary

B.A./2005/Millersville University/History

Continuing Education

OSHA 29 CFR 1910.120 HAZWOPER 40-Hour Certification Course (8-hour)

8-Hour Annual HAZWOPER Refresher Course (URS Corporation, 2013)

Williams Pipeline Safety Training

Shell Safety Training

Consol Energy Safety Training

PEC- Safe Gulf/ Safe Land USA Training

Mr. Dworsky joined URS Corporation in 2012 and has 9 years of experience in archaeology and cultural resources management. He has participated in the excavation of sites throughout the Mid-Atlantic Region, and Bermuda. He has previously served as the field and laboratory foreman/manager for Millersville University and oversaw the numerous Phase I, Phase II, and Phase III surveys. At Millersville University he constructed artifact databases, websites, oversaw artifact preservation and cleaning, and instructed student in field techniques and the fine points of field excavation. He also headed up the background research effort for that university conducting research throughout the tri-state area, Bermuda, the UK and Caribbean. As an archaeologist at URS, his responsibilities include fieldwork, in addition to his duties as a GIS specialist wherein he prepares maps, collects GPS data, manages the GIS databases of several projects and insures the accurate integration of field and laboratory data into a cohesive and comprehensive GIS database. Mr. Dworsky is the co-author of several technical reports and professional papers, and his experience encompasses historic and industrial archaeological investigations as well as human osteology.

Project Specific Experience

URS Corporation

Pennsylvania Turnpike Commission - Phase Ib Archaeological Survey for the PTC Turnpike Total Milepost 312 To 31. Co-authored and prepared the addendum report to the initial Phase Ib archaeological assessment which included the identification analysis of two sites in Chester County, PA, one prehistoric and the other a 19th century historic site.

Sunbury Transmission Line Project, Sunbury, Pennsylvania. GIS Analyst. Designed and help to implement a hovel testing strategy for the 33 miles of pipeline ROW that comprise the project APE. Managed and updated the GIS with data coming in from the field and generated new route recommendations based on that data. FERC compelled the section 106 survey of this area in advance of the construction of a gas pipeline proposed by UGI Company.

The survey uncovered many prehistoric and historic sites many of which are awaiting Phase II investigation.

Bartram's Garden Monitoring Project. Graduate Archaeologist, Field Archaeologist, GIS analyst. Oversaw the mechanical stripping of areas adjacent to a known prehistoric site along the Schuylkill River in Philadelphia, PA. Discovered new components to the known site. Excavated, mapped and reported new findings in a report addendum.

Constitution Pipeline Project, New York and Pennsylvania. Field archaeologist and GIS specialist for the Phase I survey of a more than 200 mile stretch of northern PA and central NY. FERC conducted the Section 106 survey of this area in advance of the construction of a gas pipeline proposed by Williams Gas Company. The survey uncovered many prehistoric and historic sites many of which are awaiting Phase II investigation.

General Electric Hudson River Project, Fort Edward, New York. Field archaeologist and GIS specialist for the Phase I survey of the Hudson River in the advance of dredging by General Electric. This shore survey was conducted to insure no sites were adversely affected by potential slumping of the riverbank if undermined by dredging activity in the river channel. In addition to the Phase I work, a Phase II study was conducted at Fort Miller, a French and Indian War era fort, located near Lock 5 on the Hudson River. This site was first investigated during the Phase I survey and received further testing because of a proposed processing plant for the decontamination of dredged soils. This Phase II investigation revealed the remains of the builder's trench and posts that comprised two palisade walls, as well as several pit features that contained military artifacts, burnt timbers, and period ceramics. This site is of importance because it was a small provisioning fort for the larger forts upstream and no fort of its kind from this period has been studied. At the present it is unknown if the client will push for a Phase III data collection.

Archaeological Investigations of the I-95/Girard Ave. Improvements Project, Philadelphia, Pennsylvania. GIS Specialist. Study conducted for the Pennsylvania Department of Transportation, Engineering District 6-0. Created GIS generated maps of the ongoing Phase IB, II, and III archaeological investigations along a three-mile long portion of the Interstate 95 highway corridor. Responsibilities include creating maps for a variety of discovered sites, including portions of the former Aramingo Canal prism, the Dyottville Glass Works, multiple 18th and 19th century domestic historic sites, as well as a prehistoric Native American encampment.

Richard Grubb and Associates

Archaeological Investigations at French Town, New Jersey. Field Technician. The work was done for the ACOE and preceded the expansion of an existing sewage treatment plant adjacent to the Delaware River. This Phase II investigation consisted of two deep 2x2 meter test units in deep flood plain soil terminating nearly 2 meter below ground surface. One test unit revealed evidence of Early Archaic occupations in one of the deepest buried "A" horizons.

College of William and Mary

Archaeological Investigations at Whitehall/The John Trimmingham Site, St. Georges, Bermuda. Field Foreman/Teaching Assistant. Performed for the Bermuda National Trust, National Museum of Bermuda, and the St. George Foundation. The work was done as a Phase II investigation of some foundation deposits discovered during the resurfacing of a road in the historic downtown district of St. Georges. The subsequent Phase II testing project undertaken by the College of William and Mary revealed a partial foundation dating to the 17th century. Documentary research revealed the owner of the parcel as one John Trimmingham, a prominent member of colonial St. Georges. One of the most interesting discoveries was two fully articulated bovine carcasses that had been buried beneath a collapsed wall of the house. It turns out that these bovine had suffered from hoof and mouth and were unceremoniously slaughtered and the walls of a ruin push on top of them. This is the only know instance of a livestock burial ever found on the island.

Millersville University

Millersville University Atlantic World Project, Southampton Parish, Bermuda. Field foreman, research director, lab director. This work was done for the National Museum of Bermuda and the Bermuda National Trust as well as the DuPont Foundation. The project consisted of the Phase I & II survey of Dickinson Store site (c. 1730-1800), SN Bermuda, the Phase I survey of the Rectory site (c. 1760-present), SN, Bermuda and the Phase I survey of the Perot Site, Bermuda. The purpose of this project was to examine the homes and store houses of Bermudian merchants known to have ties with Philadelphia merchants. The goal was to seek out evidence of smuggled non-English materials at these sites and/or material links back to Philadelphia. This was part of a larger effort to examine colonial Atlantic trade both legal and illicit from all its aspects including: the nodes of production, distribution and terminal markets. These studies focused on the those nodes of distribution, namely merchant warehouses or slave quarters (enslaved mariners often carried on their own trade in illegal port, and their trade goods like plates, buttons, and bottles, tend to survive better archaeologically than the more perishable goods of their masters, i.e. sugar, flour, rum.) Archaeological evidence was provided for illicit trade with French and Spanish Caribbean possessions that previously was merely a matter of historical footnotes and not wholly quantifiable, these took the form of several types of French faience and Dutch wares, and glass that had no legal avenue into a British possession, save thorough privateering. These findings corroborated the documentary accounts of Bermudian recorded by various government officials both Bermudian and foreign. This research filled a glaring gap in the archaeology of 18th century transatlantic trade, and laid the groundwork for a subsequent Phase II research project.

Millersville University Lancaster Colonial Settlement Project, Lancaster PA. Field Foreman, Instructor, Lab Director. This was done on behalf of Millersville University and the DuPont Foundation. The purpose of this project was to demonstrate the importance of Lancaster County, PA as a culture hearth for the western settlement of the nation. To that end a variety of sites were investigated to illuminate the settlement history of Lancaster County. A series of three locations underwent Phase I survey.

The Mylin Gun shop, the alleged birth place of the Pennsylvania Long Rifle and the homestead of one of Lancaster original settlers, was the initial focus of the project. This survey tested the area surrounding a small building currently hailed as the Mylin gun shop. The survey demonstrated that despite the popular perception, the building was in reality an 18th century blacksmith shop and was not used for gunsmithing. The original homestead of Martin Mylin, the long rifles alleged creator and one of the first settlers in Lancaster, was not discovered during survey.

The second Phase I survey area covered a series of private farms and a Boy Scout camp located upstream of the confluence of the Big and Little Conestoga Rivers. This was the supposed location of James Logan trading post (Logan was William Penn's principal Indian agent). The survey revealed several areas of historic activity but nothing dating to that early 17th century period. The search zone was narrowed to just a few small acres, but due to lack of landowner permission the project proceeded no further.

The final location for Phase I survey, Elizabeth Furnace Iron Plantation, proved to be the most rewarding of the three Phase I surveys. The survey revealed the presence of more than 13 standing early and mid-18th century structures as well as a variety of subsurface features including a furnace race. This furnace race adjacent to the Huber House, c. 1742, became the focus of a Phase II and Phase III investigation which yielded a variety of sealed 18th century strata. The artifacts recovered during the Phase III data collection enabled the discussion of enculturation in the mid-18th century display a shift in immigrant identity from a mostly Germanic identity to a more Anglicized outlook, which was accompanied by a corresponding shift in the preference of material goods.

Subsequent Phase II & Phase III testing of a barracks and adjoining summer kitchen revealed a massive bone midden which housed the remains of the meals from the 75 Hessian prisoners of war that were housed and worked at the furnace after the battle of Trenton. This bone midden revealed the use of primarily communal/yeoman food ways (i.e. Stews, soups) and a mixed diet including all kind of meat from pig, cow, horse, and deer to poultry.

A Phase III investigation and GPR survey or the core grounds of Elizabeth Furnace Plantation revealed the existence of the remains of the 18th century blast furnace, its casting house floor and a sub-surface stone arched furnace tail race. The Phase III investigation of the industrial core of Elizabeth Furnace provided insight into the production capacity and scale of industry of this particular iron furnace, and prompted the documentary investigation of its markets and investors. Both the documentary research and archaeological findings suggested that the furnace was producing for a foreign as well as domestic market. The search to understand the scope of this trade network led to Bermuda and the founding of the Millersville Atlantic World Project (See Above)

Professional Societies/Affiliates

Council for Northeast Historical Archaeology
Phi Kappa Phi (Honors Fraternity)

Presentations

“Pennsylvania Colonial Iron Production at Elizabeth Furnace: An Archaeological and Historical Analysis” Middle Atlantic Archaeological Conference. Virginia Beach, Virginia.

Papers

Dworsky, Joel G.
2011 *Ghosts on the coast of paradise: Identifying and interpreting the ephemeral remains of Bermuda's 18th century shipyards.* Master’s Thesis: College of William and Mary, Williamsburg, VA.

Trussell, Timothy and Joel Dworsky.
2007 Deep-Well Excavation: An Archaeological Case Study. *Journal of Middle Atlantic Archaeology* Volume 23:61-72.

Chronology

2012 – Present: URS Corporation
2010 – 2010: College of William and Mary
2010 – 2010: Richard Grubb and Associates
2005 – 2008: Millersville University

APPENDIX H

Public Involvement Materials and Meeting Notices

New Hampshire DOT
Department of Transportation

APPENDIX H

Agency Coordination Meetings

Federal Railroad Administration

Federal Transit Administration

New Hampshire Department of Environmental Services

New Hampshire Department of Transportation

New Hampshire Regional Transit Authority

New Hampshire DOT Department of Transportation

APPENDIX H

Agency Coordination Meetings: Federal Railroad Administration

New Hampshire DOT Department of Transportation

Ducker, Renee

Subject: FTA/FRA
Location: Volpe Center, Cambridge

Start: Fri 3/15/2013 9:00 AM
End: Fri 3/15/2013 11:00 AM

Recurrence: (none)

Organizer: Wilder, Russ

FTA – Peter "Pete" Butler peter.butler@dot.gov
Mary Beth Mello
Judy Molloy judy.molloy@dot.gov
Marlyn Scheffler Marilyn.scheffler@dot.gov
Bill Gordon - FTA
Trevor – FRA
Michelle Fishburne – Environmental
Kyle ……
Regional FRA contacts will be invited.

Desirable Demographics

Alternatives

Public Meetings – 1st one in June

Scope of the financial plan was discussed. Further definition and certainty of financial resources
I-93 corridor most unique in the bus service paying for itself
Origin of service was through mitigation

Initial Defuinition of alternatives. Alternative northern termini
Phasing ofver time
Meet with Mass Agency Officials week of April 1st

How far to carry a Amtrak alternative?
Stations in Massachusetts

City pair intact for FRA. MBTA service through entire corridor
Amtrak focus needs to be maintained
Service Development plan for extension to WRJ should not be interrupted.

North Station Capacity impacts from intercity service – overlay service

FRA evolving equipment standards – safety standards

FRA has bridge experts

Multi-stage screening process

Bi-state TD forecasting – new model, Jim Ryan, set up meeting Son of ARRF. Release next month? Meet week of April 15th?

Land Use interest

LPA – Form of it? Complete focus to every single of alternative. More input from stakeholders to get support for alternatives considered.

BRT cheaper and needs to be fully considered.

How to winnow out alternatives. Evaluation pivots off of purpose and need. Better travel times.

FRA winnowing of alternatives. Build, no-build, frequencies, class 5/4 track (speed)

NE study, planning, Southern NH – impacts of riders coming from Concord on NE Spine

Balancing support and FTA/FRA Process

Review Purpose & Need early (FTA/FRA) – Short and to the point is desired.

Kyle FTA/FRA (Tucson to Phoenix) – will send docs on this project to view screening criteria

Examples of products and methods
Completed SDPs? We may be the first to do this?
Network approach for SDP

EA level
Use update draft EA from 2003
MEPA
Air, noise & vibration, historic, wetlands,
Expect a NEPA document for SDP
Lead agency? – FRA? Tier 1s? not needed? Air conformity – Title 23.
Task 10 NEPA documentation. FRA needs NEPA document. FTA AA – NEPA document not needed by FTA. FTA – cooperating agency?
Planning stage not project development (2 year process)

Need a call with the new starts group. (Alex?) – Next week.

Combined contacts list out by next week.

Tiered EA for New Haven, Hartford and Springfield?

Have conceptual design.

Schedule by the end of next week.

1st steering committee week of May 18th.

Forward project scope schedule and map.

Detailed agenda needed.

Patrick Bower – I-93/Everett Turnpike

Ducker, Renee

To: Trevor.Gibson@dot.gov; Michelle Fishburne (michelle.fishburne@dot.gov); Patrick Herlihy; Kinney, Ken; David Nelson "Nelson, David (Boston)" "Nelson, David (Boston)" <David.Nelson@jacobs.com> (David.Nelson@jacobs.com); Chamberlin, Carl; Suprock, Julia

Subject: Notes/Follow-up on monthly conference call to review the status of the Boston-Concord Intercity Passenger Rail Study - July 1, 2014

Notes/Follow-up on Monthly call to review the status of the Boston-Concord Intercity Passenger Rail Study.

Attendees:
FRA
Trevor Gibson
Mike Longley
Lisa Smith
Michelle Fishburne

NHDOT

Patrick Herlihy

NHCC Consultant Team

Russ Wilder, URS
David Nelson, Jacobs

Agenda:

1. NEPA – Planned Public Outreach
    a. Planning meetings with MEPA and MADEP – noted that MBTA may fund some, or all of the necessary track improvements between Lowell and the state line. No infrastructure improvements south of Lowell are anticipated.
    b. May have an additional environmental resource agency meeting sponsored by NHDOT in early September
    c. Discussed timing of a public meeting to be held in November just prior to release of the EA and project study. Discussed how FONSI and EA public hearing would work. Details still need to be worked out
    d. URS will send out a copy of the latest project schedule the week of July 9th (Michelle and Trevor)
2. Annotated EA outline
    a. Michelle Fishburne is reviewing and will send comments the week of July 9th.
3. Work plan revisions
    a. URS made revisions based on FRA comments – FRA is reviewing the revisions
4. Purpose & Need
    a. Michelle Fishburne is reviewing and expects to have comments the week of July 9th
5. Amtrak ridership model
    a. Trevor Gibson received an e-mail from Drew Galloway about the ridership model results. For 4 intercity roundtrips (8 trains) a day between Boston and Concord, there is a strong correlation to the level of service for the Downeaster - ~350,000 boardings/year

6. Meeting with air impact evaluation leader
    a. This meeting took place. URS needs to send a proposed methodology to FRA (Michelle and Trevor)
7. Next meeting – not finalized in this call, but should be July 22nd at 9 AM?

Russell J. Wilder, PG
Vice President
URS Corporation
1155 Elm Street
Suite 401
Manchester, NH 03101-1508
Cell: 617-515-7258

URS
1155 Elm St.
Manchester, NH 03101
Phone: 603.606.4800
Fax: 603.606.4801

Memorandum

Project Number: 10161180

Date: July 29, 2014

To: NHCC Team

From: Russ Wilder

Subject: Meeting Notes – Conference Call with FRA – July 28, 2014

Attendees:

Patrick Herlihy – NHDOT
Trevor Gibson – FRA
Michelle Fishburne – FRA
Kyle Gradinger – FRA
Ryan Harris – Jacobs
Laurie Hussey – Cambridge Systematics
Dan Tempesta – Cambridge Systematics
Russ Wilder - URS

1. NEPA
   a. Discussion of the Intercity 8 alternative being carried forward as part of the LPA. The FRA would consider the final Intercity option (IR8) as an FRA LPA, understanding that there could also be an FTA LPA. This would allow the project to proceed with the EA and final meeting as scheduled since the three intercity options (IR8, IR12 & IR18) have already been presented and IR8 has been advanced for further assessment. The IR12 and IR18 options were never eliminated from further consideration, but it was decided that IR8 would be advanced for further development based on preliminary cost and ridership forecasts.
   b. EA for FRA Intercity would be in late November, there would be a workshop after that and a draft FONSI sent to FRA
   c. After the draft FONSI is submitted to FRA, it would need to have a legal sufficiency review by FRA
   d. This adds at least 3 months to the process.
   e. Discussion of amending the performance of the FRA grant by at least 3 months
   f. In the EA, need to be very specific about intercity service. Has to be easy to find and as a standalone in the TOC

2. Annotated EA outline
   a. Michelle has not reviewed yet, it has been a bit confusing to her as she has not clearly understood the alternatives being carried forward
   b. She will complete her review

3. Work plan revisions - Make it clear in the work plan the distinction between FTA and FRA efforts and the alternatives for each. Need to mention the production of a FONSI.
4. Purpose & Need – Make sure that Michelle has the latest version. The version she has is from November. We will check to make sure that she is using the latest version (probably is November 2013) - done
5. Amtrak ridership model – Complete and Cambridge is working with
6. Methodology for air impact evaluation – We have not gotten this to FRA yet. URS will follow up
7. Schedule – See above about November on.
8. Other Business –
    a. Service Development Plan – Need to produce a detailed outline for FRA
    b. One of the Grant deliverables is an alternatives analysis report. This needs to be sent to FRA (it is nearly complete and it has a separate section on FRA alts)
9. Next meeting – August 19th – 1PM EDT – Russ to send out an invite. - done

Meeting Notes – FRA Conference Call - July 28, 2014

Attendees:

Patrick Herlihy – NHDOT
Trevor Gibson – FRA
Michelle Fishburne – FRA
Kyle Gradinger – FRA
Ryan Harris – Jacobs
Laurie Hussey – Cambridge Systematics
Dan Tempesta – Cambridge Systematics
Russ Wilder - URS

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1. NEPA
    a. Discussion of the Intercity 8 alternative being carried forward as part of the LPA. The FRA would consider the final Intercity option (IR8) as an FRA LPA, understanding that there could also be an FTA LPA. This would allow the project to proceed with the EA and final meeting as scheduled since the three intercity options (IR8, IR12 & IR18) have already been presented and IR8 has been advanced for further assessment. The IR12 and IR18 options were never eliminated from further consideration, but it was decided that IR8 would be advanced for further development based on preliminary cost and ridership forecasts.
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    c. After the draft FONSI is submitted to FRA, it would need to have a legal sufficiency review by FRA
    d. This adds at least 3 months to the process.
    e. Discussion of amending the performance of the FRA grant by at least 3 months
    f. In the EA, need to be very specific about intercity service. Has to be easy to find and as a standalone in the TOC

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    a. Michelle has not reviewed yet, it has been a bit confusing to her as she has not clearly understood the alternatives being carried forward
    b. She will complete her review

3. Work plan revisions - Make it clear in the work plan the distinction between FTA and FRA efforts and the alternatives for each. Need to mention the production of a FONSI.
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6. Methodology for air impact evaluation – We have not gotten this to FRA yet. URS will follow up
7. Schedule – See above about November on.
8. Other Business –
    a. Service Development Plan – Need to produce a detailed outline for FRA

b. One of the Grant deliverables is an alternatives analysis report. This needs to be sent to FRA (it is nearly complete and it has a separate section on FRA alts)

9. Next meeting – August 19th – 1PM EDT – Russ to send out an invite. - done

URS
1155 Elm St.
Manchester, NH 03101
Phone: 603.606.4800
Fax: 603.606.4801

Memorandum

Project Number: 10161180

Date: August 19, 2014

To: NHCC Team

From: Russ Wilder

Subject: Meeting Notes – Conference Call with FRA – August 19, 2014

Attendees:

Patrick Herlihy – NHDOT
Trevor Gibson – FRA
Michelle Fishburne – FRA
Kyle Gradinger – FRA
David Nelson - Jacobs
Ryan Harris – Jacobs
Laurie Hussey – Cambridge Systematics
Dan Tempesta – Cambridge Systematics
Ken Kinney - URS
Julia Suprock - URS
Russ Wilder - URS

1. NEPA - Sections being drafted, met with NHNHS last week
2. Set up call with FRA on Friday, August 22 at 9AM to discuss FRA comments on the following documents:
   a. Annotated EA outline
   b. Work plan revisions
   c. Purpose & Need
   d. Public Involvement Plan
3. Methodology for air impact evaluation – Unclear whether this has been submitted. Russ to check
4. Schedule – Plan for release of the EA the week of November 17th. Scheduling Public Meeting and giving 2 weeks for comments (Michelle will check on necessary comment period). Answers to comments will be provided in the FONSI. All work needs to be completed by 12/31.
5. Discussion of no-cost time extension. NHDOT does not want to request and extension of the contract past December 31st
6. Other Business – Documents to be sent to FRA
   a. Service Development Plan – draft of outline to be sent through NHDOT this week - Trevor will send a copy of the SDP done for Ethan Allen
   b. Alternatives Analysis for Intercity is complete and will be sent to FRA for review.

Next Conference Call – September 16th – 10 AM EDT.

Conference Call Notes for 08/19/2014 FRA call:

Attendees:

- Trevor Gibson - FRA
- Kyle Gradinger - FRA
- Michelle Fishburne - FRA
- Patrick Herlihy - NHDOT
- Ken Kinney - URS
- Julia Suprock - URS
- Russ Wilder - URS
- David Nelson - Jacobs
- Ryan Harris - Jacobs
- Laurie Hussey - CSI

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1. NEPA - Sections being drafted, met with NHNHS last week
2. Set up call with FRA on Friday at 9AM to discuss comments on the following documents
   a. Annotated EA outline
   b. Work plan revisions
   c. Purpose & Need
   d. Public Involvement Plan
3. Methodology for air impact evaluation – Unclear whether this has been submitted. Russ to check
4. Schedule – Plan for release of the EA the week of the 17th. Scheduling Public Meeting and giving 2 weeks for comments. Answers to comments will be provided in the FONSI. All work needs to be completed by 12/31.
5. Discussion of no-cost time extension. NHDOT does not want to request and extension of the contract past December 31st
6. Other Business – Service Development Plan, Alternatives Analysis for Intercity will be sent to FRA for review. Trevor will send a copy of the SDP done for Ethan Allen
7. Next meeting – September 16th – 10 AM EDT. Russ to set up.

New Hampshire Capitol Corridor / FRA Conference Call Notes
October 21, 2014

Attendees:
Russ Wilder, URS
Dan Tempesta, Cambridge Systematics
Carl Chamberlin, URS
Ryan Harris, Jacobs

Mike Longley, FRA
Trevor Gibson, FRA
Lisa Smith, FRA
Waiching Wong, MTAC
Michelle Fishburne, FRA
Kyle Gradinger, FRA

Notes:

1. Discussion of the Preliminary Evaluation of Conceptual Alternatives and Recommended Alternatives for Detailed Evaluation document
    a. This document was submitted by NH to the FRA. The FRA provided comments on 10/21.
    b. NH consultant team: The team received the guidance on SDPs on Sept 22nd. In the context of the overall project, this document presents the universe of alternatives that were evaluated for the entire project, with emphasis on narrowing down 14 alternatives to 6. For purposes of public consumption in NH, the project team felt strongly that all alternatives needed to be considered and represented as shown in the Task 5 document.
    c. FRA: The issue with this presentation is that the intercity passenger options are included with all other options, which is an issue for completing the environmental document if the locally preferred alternative (LPA) is not the intercity option.
    d. NH: The SDP will be a document that fully meets the FRA's needs and will be an FRA-only document. The prioritization of these alternatives will include a narrative of pros and cons for all the options. It will be clear to the public that there are two programs in place—one with intercity options and one with commuter options. NH will send the meeting information to FRA for the public advisory meeting.
    e. Resolution: NH will be making separate tables (for Figure 3-1) for the commuter and intercity options within the document.
2. Environmental Assessment
    a. NH: The EA is very focused on the intercity options. They will be sending the draft EA to the FRA in the next few weeks.
    b. NH: Last major public involvement meeting will be the public advisory meeting in November.
3. Service Development Plan
    a. NH: The SDP is organized into 9 chapters, and discusses all alternatives considered and then provides further analysis of the intercity rail alternatives. SDP includes discussion on market analysis, rail service design and operations—which will focus on intercity 8 option (the most likely LPA).

b. NH: Can HSIPR funding be referenced in the document, even if construction grants have not been secured? FRA: Yes and TIGER funding can also be mentioned.

4. Project schedule
    a. NH plans to submit the entire set of deliverables by the end of the year. FRA believes that to complete the remaining work by then, the outstanding deliverables are needed from NH by the end of October, which then gives FRA three to four weeks to review, provide comments, and finalize the documents with NHDOT. A comment period is needed for the EA, and the FONSI will need to be signed by the FRA Administrator.
5. Status of deliverables
    a. Task 1 Deliverables
        i. Detailed Project work plan for FRA review and approval
            1. Updated version submitted to FRA on 9/8/14, FRA will provide comments
        ii. Detailed Project budget for FRA review and approval
            1. A budget was included in the PWP sent on 9/8/14. A crosswalk is needed to align the line items in the budget with the tasks in the statement of work—NH will provide
            2. The FRA needs a budget that includes all budget items such as the separate public outreach and involvement contract.
        iii. Engineering Agreement for FRA review and approval (if applicable)
            1. NH will provide the engineering agreement between URS and Pan Am
            2. There is no actual signed agreement between NH and the state-owned railroad.
    b. Task 2 Deliverables
        i. Purpose and Need Statement for FRA review and approval
            1. This is complete for Task 2, the final purpose and need and EA for this project is still being developed by NHDOT.
        ii. Technical memo on proposed AA criteria and preliminary service development planning methodology for FRA review and approval
            1. Has not yet been submitted to FRA. This analysis will identify how the intercity rail alternatives will be developed and compared against each other.
            2. NH will send a separate technical memo to FRA that combines information previously sent in a consolidated manner.
        iii. Alternatives Analysis Report for FRA review and approval
            1. This has not yet been submitted to FRA. This analysis will summarize and compare operations, capital investments, and costs/revenues of the intercity passenger rail alternatives.
            2. NH will send over an existing document for FRA to review.
        iv. Conceptual Engineering for Alternatives FRA review and acceptance
            1. NH will send to FRA.
    c. Subtask 3.1 Deliverables
        i. Draft NOI (if applicable)
            1. FRA asked that this deliverable be replaced with a Class of Action memo recommending an EA for the NEPA document based on the identified the corridor, no public controversy, and no significant environmental impacts being anticipated.
        ii. Agency and Stakeholder Involvement Plan for FRA review and acceptance
            1. FRA sent follow-up comments on 8/7/14. NH will address comments and send back.

    iii. Scoping Report for FRA review and acceptance
        1. Instead of a scoping report, a summary of public involvement will suffice. It should outline and highlight all meetings that have been done for the intercity proposals.
    iv. Final Purpose and Need Statement for FRA review and approval
        1. Purpose and Need will be finalized in the EA
d. Subtask 3.2 Deliverables
    i. Draft EA
        1. Needs to be submitted to FRA.
    ii. Final EA
        1. Needs to be submitted to FRA.
    iii. Draft FONSI
        1. Needs to be submitted to FRA.
    iv. Final FONSI
        1. Needs to be submitted to FRA.
e. Task 4 Deliverables
    i. Technical Memo on SDP Outline and Methodology for FRA review and approval
        1. NH will send FRA the existing list of 9 chapters of the SDP that can be used as an outline. This document will include introductory language and information on methodology.
    ii. Draft SDP for FRA review and approval
        1. Needs to be submitted to FRA.
    iii. Final SDP
        1. Needs to be submitted to FRA.

6. Monitoring
    a. FRA will provide draft desk monitoring checklists to NH.
    b. The desk monitoring review will include a phone call to go over the checklists. FRA would like to schedule this for the week of November 17th

APPENDIX H

Agency Coordination Meetings: Federal Transit Administration

New Hampshire DOT
Department of Transportation

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Project Team Kick-off Meeting

Date: 03/15/2013 **Time:** 10:00am **Location:** FTA Region 1 Volpe Center, Cambridge, MA

Attendees/Distribution:

Name (Affiliation)	Email	Study Team
Mary-Beth Mello – FTA Region One Administrator	mary.mello@dot.gov	Mark Sanborn (NHDOT)
Peter Butler – FTA	peter.butler@dot.gov	Patrick Herlihy (NHDOT)
Judy Malloy – FTA	judy.molloy@dot.gov	Ken Kinney (URS)
Marilyn Scheffler - FTA	marilyn.scheffler@dot.gov	Russell Wilder (URS)
Bill Gordon – FTA	william.gordon@dot.gov	David Nelson (Jacobs)
Trevor Gibson - FRA (phone)		Ryan Harris (Jacobs)
Michelle Fishburne – FRA (phone)		Rob DiAdamo (TPRG)
Kyle Bratinger – FRA (phone)		Laurie Hussey (Camsys)

Mark Sanborn and Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the past week of stakeholder meetings and then entered the discussion of the project scope and tasks.

Task 1 – Public, Stakeholder Involvement

Ken pledged that the study would be a transparent and open process and discussed the formation and composition of the Advisory and Steering Committees. These committees would report directly to NHDOT who would then report to the Legislature and eventually the Governor. The first Steering Committee is scheduled for Wednesday, May 15. The first public meeting is scheduled for Wednesday, June 5 2013 in Manchester, NH. Mark Sanborn added that the study team hopes to schedule a meeting with MassDOT officials for the week of April 1, 2013

Task 2 - Purpose & Need

Ken mentioned the desirable demographics of the corridor for improved regional transit service. Peter Butler said that the FTA would like to review the Purpose & Need early and that they would prefer it to be short and to the point.

Task 3 - Financial Planning

Ken discussed the scope of the financial plan and stressed that further definition and certainty of financial resources was a key goal. He said that as part of the financial planning process, it will be important to describe the success of Boston Express and use that information to help make the case for expanded transit options in the corridor. Mark Sanborn added that bus service in the I-93 corridor was originally implemented as a construction mitigation measure and is almost unique in that the bus service is paying for itself.

Task 4 – Phasing of Alternatives

David Nelson asked where FRA stands on the question of potential operators and Trevor Gibson replied that the FRA cannot support a rail study that does not include an Amtrak option. He added that the study and proposed alternatives cannot preclude the potential development of high speed rail between Boston and Montreal or compromise the SDP for a potential rail extension to White River Junction. Trevor continued that the study would have to address capacity issues at North Station, updated bridge safety standards and comply with evolving equipment standards being developed by the FRA safety office.

Task 5 – Preliminary Screening

Mary-Beth Mello described the screening process as pivoting off of the purpose and need that it should at once balance local support and the FTA/FRA process. The winnowing out of alternatives should follow the conventional screening process of build, no-build, frequencies, travel times, class 5/4 track (speed) and added that BRT can provide similar levels of service for much less upfront capital and that it needs to be fully considered. She also referenced the New England HST planning study and how it is considering the impacts of riders coming from Concord along the NE Spine.

Task 6 – Evaluation Criteria and Methods

Ken described the planned development of a bi-state model for the study working with MassDOT, NHDOT, NEMCOG, NRPC, SNHRPC and CNHRPC. Laurie Hussey added that Cambridge Systematics was familiar with the developing National Model that is similar in nature but more robust than the ARRF model. It was stressed that an accurate assessment of land use data will be important and suggested that the team speak with Jim Ryan regarding the modeling process.

Task 7 – Evaluation of Alternatives

Ken said that it will be important that the study consider all alternatives equally in order to ensure transparency and make the best case for the cost vs. benefit of the LPA. David Nelson cautioned that the study could get messy if there were too many alternatives advanced to detailed development and evaluation. Trevor suggested that it would be ok to evaluate alternate speed and frequency operating scenarios as sub-alternatives. Kyle said that the study would have to develop a Tier I level of impact documentation for the entire corridor from Concord to North Station. He suggested that the purpose & need, alternative screening evaluation and service development plan prepared for the Phoenix to Tucson rail study would be a good example.

Task 8 – Locally Preferred Alternative and Task 9 – Service Development Plan

Peter Butler asked whether it would be necessary to develop a Service Development Plan (SDP) if the LPA is an enhanced bus network. Trevor replied that the SDP would help to define the market, the ideal service frequency, required infrastructure and O&M costs for the potential future phasing of rail. Mark Sanborn added that even if enhanced bus is the first phase, that an SDP would be important to help manage expectations and what would need to happen before rail was feasible and what that system would look like. David Nelson added that important issues of governance would also be included in the SDP and that is not required in the FTA process.

Task 10 – Environmental Documentation

Russell Wilder answered David Nelson that any complimentary feeder bus or through ticketing would be handled in the environmental assessment process. Mary-Beth Mello surmised that she did not expect any surprises in the EA process and that it could build off of the Draft EA prepared in 2003. The process would have to respect MEPA regulations and would need to evaluate impacts to air, noise & vibration, wetlands and historic resources. She added that the NH SHPO had investigated the possibility of registering the entire corridor as an historic resource. Michelle Fishburne reminded the team that the eventual NEPA document would need to be included with the SDP, but that FTA follows Title 23 air quality conformity guidelines while the FRA does not. She suggested that the tiered EA prepared for the New Haven-Hartford-Springfield rail corridor could provide a good example.

Task 11 – Implementation

David Nelson asked what process we should be expected to follow with respect to the newly released MAP-21 guidance on transit studies that eliminates the Alternatives Analysis process. Mary-Beth Mello responded that this study is funded through TEA-21 so the team will need to follow the same AA process, but that the study would need FTA approval to actually move in to the project development phase.

NEXT STEPS

- Kyle (FRA) – Will send docs on the Phoenix-Tucson project to view screening criteria
- Ken Kinney - Need a call with the new starts group (Alex?)
- Mark Sanborn - Combined contacts list out by next week
- Ken Kinney/Mark Sanborn – Final project scope schedule and map
- Ken Kinney/Mark Sanborn - Detailed agenda needed

URS
5 Industrial Way
Salem, NH 03079
Phone: 603.893.0616
Fax: 603.893.6240

Memorandum

Project Number: 10161070

Date: June 28, 2013

To: Ken Kinney

From: Russ Wilder

Subject: Today's FTA Meeting Notes

Attendees

FTA

Mary Beth Mello
Noah Berger, Director of Planning & Program Development
Pete Butler
Judy Molloy
Alex Ekman – DC, New Starts
Liz Patel – Environmental Protection Specialist

NHDOT

Mark Sanborn
Patrick Herlihy

URS Project Team

Astrid Glynn & Dick Doyle – TPRG
Dan Tempesta & Laurie Hussey – Cambridge Systematics
Ryan Harris – Jacobs
Ken Kinney & Russ Wilder – URS

Meeting Notes

The name of the project is now: "New Hampshire Capitol Corridor Alternatives Analysis and Service Development Plan"

Alternatives Analysis is an evolving term; no longer required for new starts

The project model is the downeaster for the FRA portion and the MBTA extension to Providence for the FTA portion

The FRA is build/no-build. The FTA will also have a no-build alternative

FTA will have no formal approvals for the study (Ken Kinney will however, put together a recommended schedule of points in the project for informational meetings and coordination

FTA requested that Mark Sanborn provide them with any notices of meetings and any news articles about the project.

Guidance for charging to Parts A&B

The FRA/FTA charging guidance was reviewed and is acceptable to FTA

Purpose and Need

Alex Ekman recommended that we keep up to date on emerging New Starts guidance and pointed us to the Q&A section of the FTA website for guidance on how to request entry to project development. This should help us craft a document that will support applying for project development

The Purpose and Need statement for the project is acceptable. The EA purpose and need will flow from it.

Pete Butler noted that we should observe that the built-out network of roadways is maxed out with the completion of current projects (I-93)

NEPA Scope

For the EA, the FRA will be the lead agency. The FTA will be a cooperating agency.

Discussion of whether this EA will be a Service Level EA or a Tier I document. Need to parse the difference.

Pete Butler recommended that the Tier I EA for FRA for the New Haven, CT to Springfield, MA project could be used as a guide.

Liz Patel mentioned programmatic consultation on Tribal Resources for Section 106 issues. There should be joint involvement with FTA/FRA and make sure that SHPOs are included. DOI should not be included. FTA will help as needed.

4f issues may be too early for this stage of the project.

Noise & Vibration

- Review current FTA and FRA horn noise guidance, at this stage we may only be identifying sensitive receptors

Environmental Justice – review new FTA circular on environmental justice

Pete Butler if we were going to address traffic issues at park & rides and stations. Probably yes at high level

Note that this EA could result in another EA, not just an EIS or CE

Recommended writing an introductory paragraph setting the expectation of what the document is setting out to do and at what level of analysis for the project at this stage. If a project emerges from this study, then more environmental work will be done.

Ridership

Discussion of status of input data to ridership model(s) and selection of models to use

NH Capitol Corridor

FTA Meeting - November 20, 2013 – Follow Up

1. Attendees

FTA: Alex Eckmann, Ken Cervenka, Pete Mazurek, Jim Ryan
FRA: Trevor Gibson, Kyle Gradinger
FTA Region 1: Sean Sullivan, Nick Garcia
URS: Ken Kinney
CS: Jay Evans, Dan Tempesta, Marty Milkovits

2. Agenda

CS and URS presented on the work completed to date to assess ridership on the NH Capitol Corridor.

3. Discussion

FTA New Starts submission requirements

FTA New Starts submission requirements do not specifically require a detailed forecast model. However, it was acknowledged that the project can have requirements beyond the New Starts application. The FTA submission requirements are as follows:

- Percentage of transit dependent riders. The MBTA survey data is an acceptable source for this estimate.
- Plausible estimate of trips on project with a confidence interval.
    - Average trip length is acceptable to calculate VMT, i.e., the trips do not need to be exactly estimated for each station.

Potential forecast models

- FTA concurred that a full-blown four-step model is probably not the best choice for developing the submission requirements for this project because the MA and NH statewide models are not calibrated for the type of travel on this corridor (long distance and inter-state).
- Aggregated Rail Ridership Forecasting (ARRF) model may have been of use to the project in the earliest stages, but it was calibrated to new transit lines in less mature

transit markets than Boston and, therefore, should not be relied upon as the evaluation tool for preparing the submission requirements for this project.

- STOPS (Simplified Trips-on-Project Software) depends on all of the input transit data being assembled and coded in GTFS format. While it was acknowledged that running STOPS could produce an interesting forecast, several project-specific limitations suggest it should not be the first choice for moving forward, including:
    - Manchester, NH is not coded into GTFS format;
    - The large geographic scale of the "problem" this would represent for STOPS to consider could be challenging for the current version of the software; and
    - The ridership markets under consideration as part of the purpose and need for the project are not all handled by STOPS.
- FRA (Amtrak) intercity model could be promising for providing a forecast of Concord-Boston trips and will be requested.
    - This model may also help identify potential non-HBW type trips
- The group agreed that spending some time processing actual existing ridership data to seek to arrive at relationships that would inform a ridership forecast for this corridor would be a worthwhile effort. FTA suggested not model "estimation," per se, but looking at ridership and possible correlated causal factors to arrive at a way to directly estimate the commuter ridership of the project. This, combined with other tools/techniques to address special and intercity markets, was thought to capably supply the submission requirements for FTA and also satisfy FRA interests in the project and study.

Data processing approach suggestions

- Compare CTPP 2010 and 2000 data to identify major differences, if any
- Plot actual destination points from MBTA survey to determine destination zones for JTW analysis.

Intercity and non-HBW travel

- FRA is concerned that trips to/from Concord are not fully represented by JTW or commuter rail boarding models and would prefer intercity travel to be considered and forecast explicitly, potentially using the existing Amtrak model (FRA can facilitate its use)
    - Concord passenger activity is expected to include trip purposes such as; Higher Education, Health Care, Tourism, and Government.

- Occasional business travelers are likely to use intercity rail service.
- This service will act as a connecting service to other Amtrak lines.

- Example intercity services to examine for analog information are:
  - Downeaster
  - Chicago - Milwaukee

Other topics for continued discussion

- FRA wants to discuss the new rolling-stock requirements for service to Concord.
- Tables in the pre-meeting submission will be reviewed for labeling of number of trains to clarify round-trips versus single-trips.

4. Next Steps

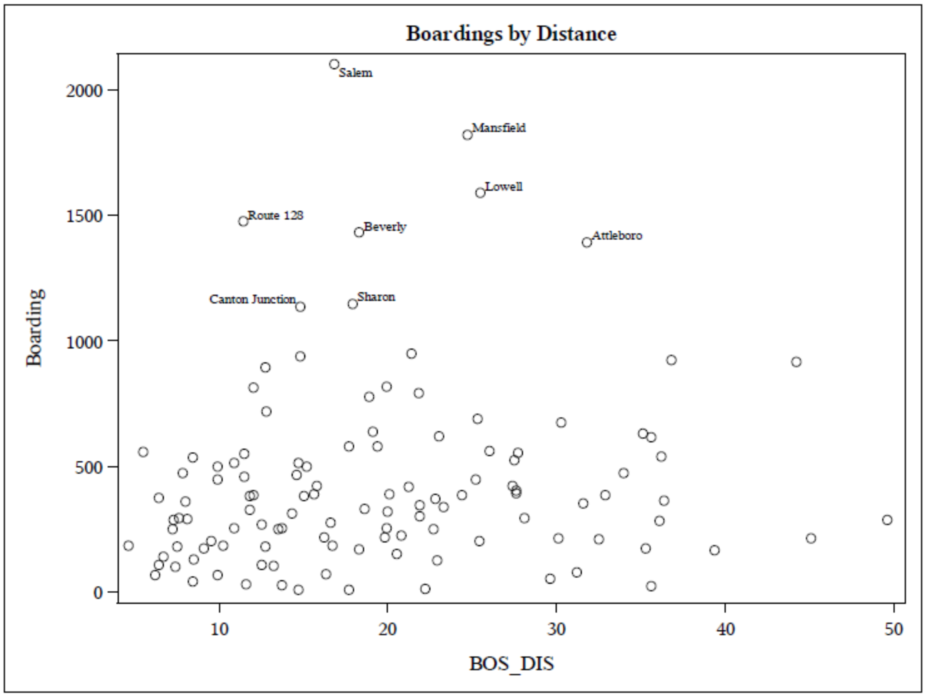
- Carefully review the available data for potential direct ridership forecasting relationships.
- Present a "straw man" model approach to elicit further discussion
  - Model will leverage both station boarding data and JTW shares
  - Factors will be developed for inter-city type travel
- Consider organizing GoToMeeting sessions with FTA/FRA to explore the data dynamically.

5. Supplementary Material

Boardings by Distance

Commuter rail station boarding data from the MBTA 2012 report are plotted against station distance to Boston in Figure 1. Stations within the Boston CBD or with competing subway service are excluded from the plot. Stations with more than 1,000 boardings are labeled.

Figure 1: Station Boardings by Distance to Boston Terminal



The next two figures show the same station boardings by distance segmented by population around the station. Figure 2 identifies the population with a ½ mile buffer. Figure 3 identifies population with a 6 mile buffer. There does not appear to be a strong correlation with distance or population density and boardings; other, unincorporated factors are at work.

Figure 2: Station Boardings by Distance to Boston Terminal - Half Mile Population

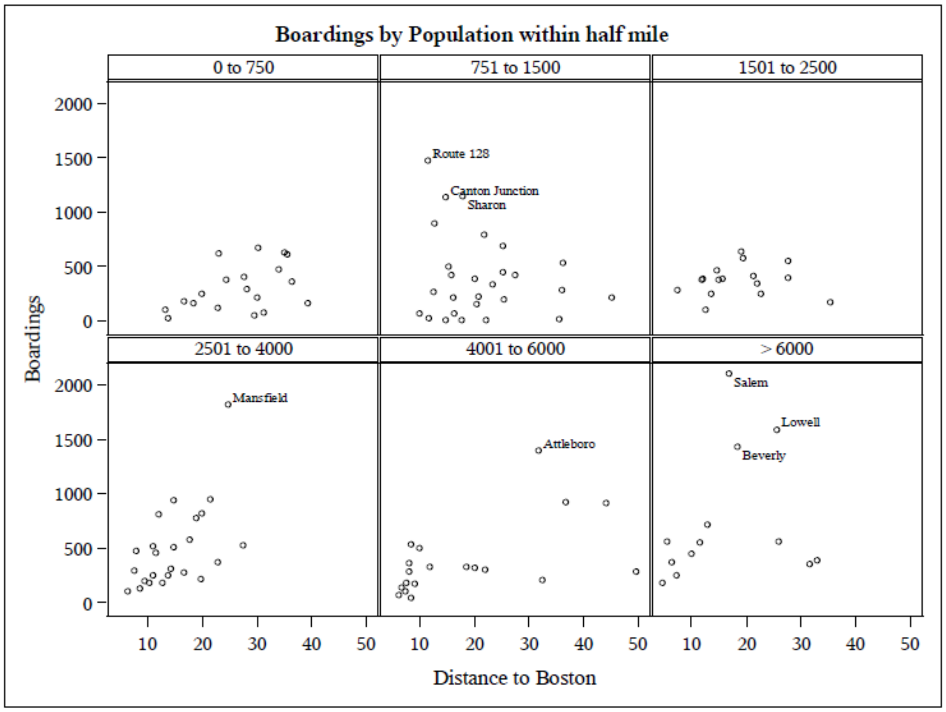
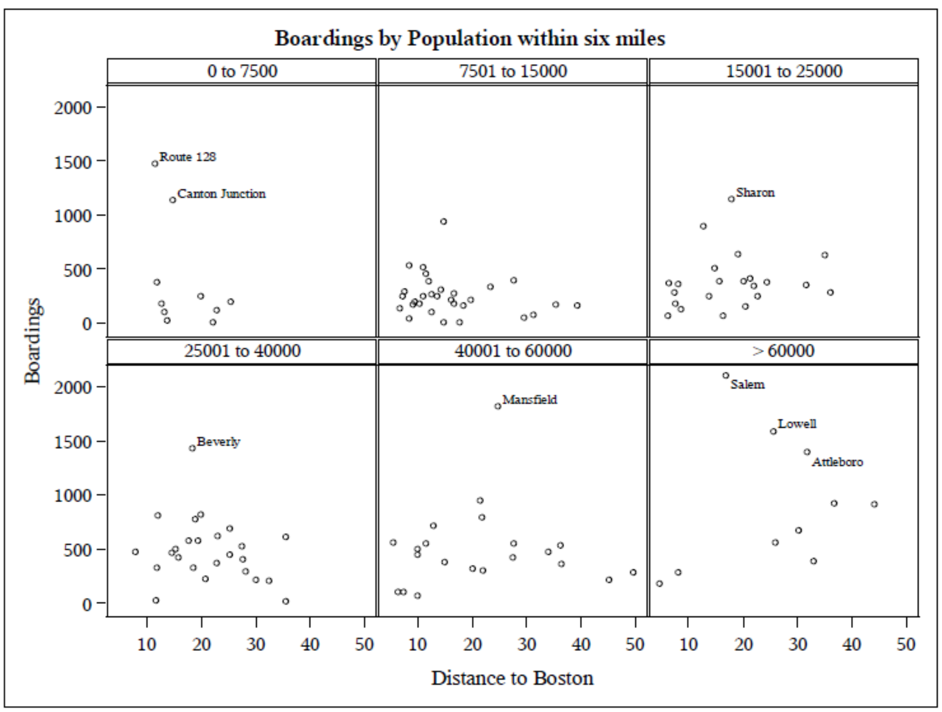


Figure 3: Station Boardings by Distance to Boston Terminal - Six Mile Population



CTPP and Station Boarding Data

First, we identified the 2010 CTPP JTW railroad trips originating in any NH, MA and RI zone destined for the Boston place, which is the city of Boston. Each zone was then associated with the nearest commuter rail station using straight line distance.

The sum of all JTW railroad trips is expected to be close to, but less than, the average station boardings because only work trips are represented. The nearest straight line distance is not a perfect criteria to associate zones with commuter rail stations. The straight line distance does not account for other explanatory factors in commuter rail station choice such as: the travel time to the station, parking availability, level of service and fare zone. One or more of these factors may ultimately need to be incorporated to assist with the utility of the forecasts for supporting project planning decisions.

Figure 4 compares the sum of JTW railroad trips with the station boardings. As expected, the boardings are higher than sum of JTW railroad trips for most stations although some stations have significantly less boardings, which indicates that the accuracy of the zone-station association method is limited.

Figure 4: Station Boardings by Sum of JTW Railroad Trips

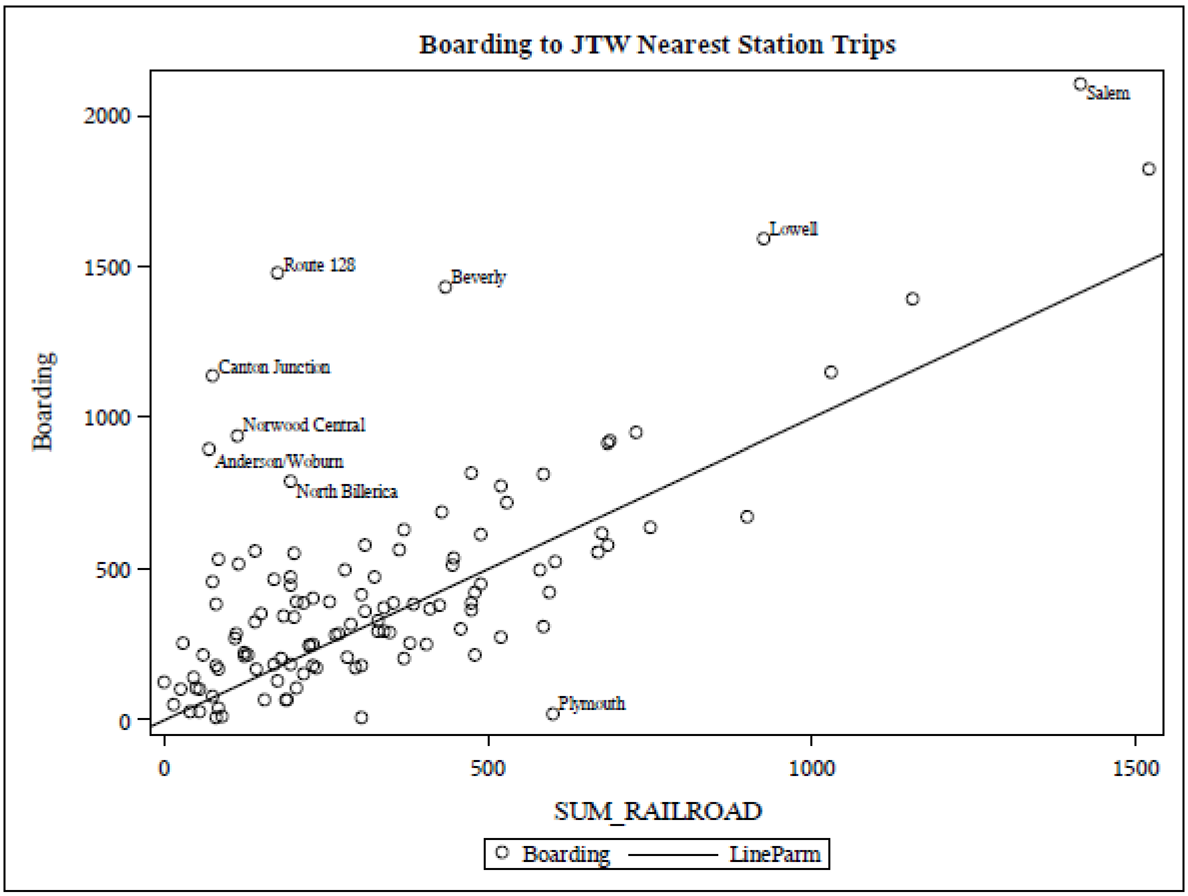
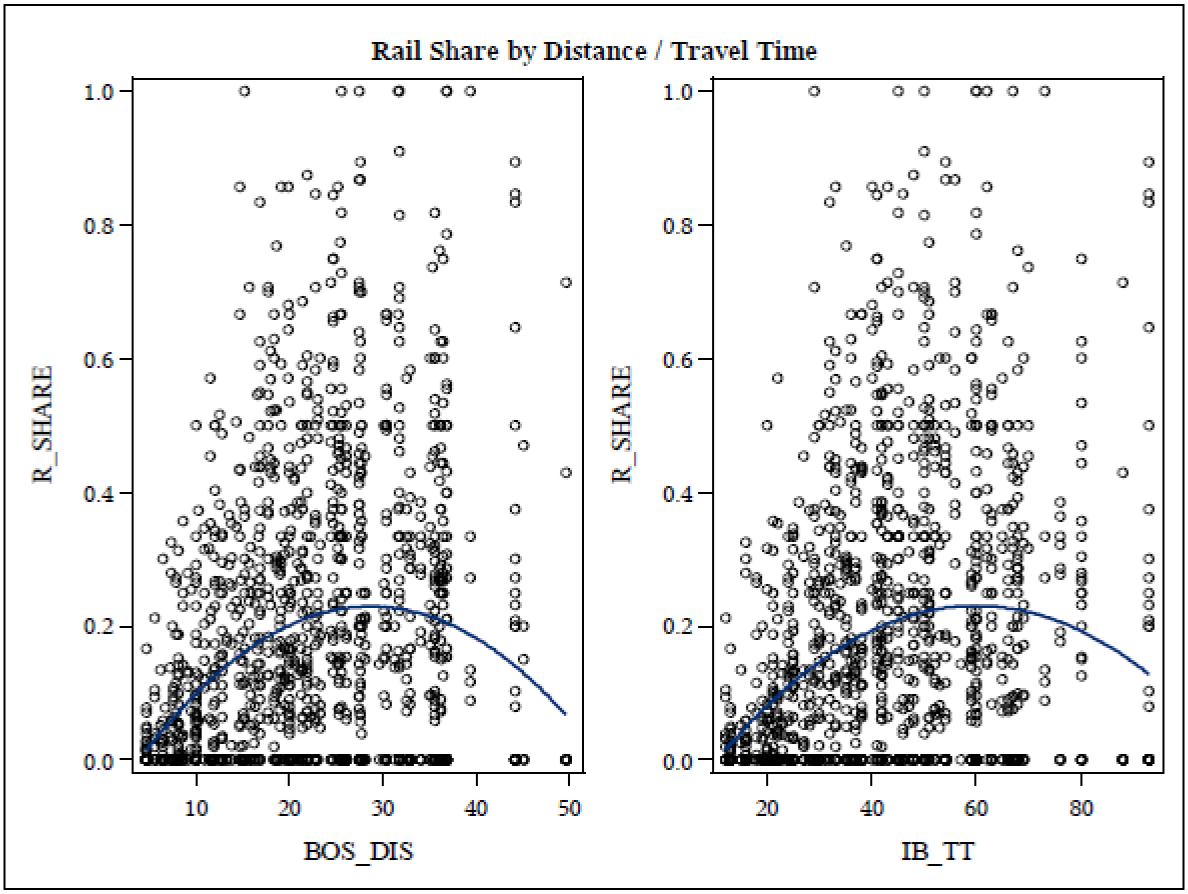


Figure 5 shows the JTW Railroad share of trips by station distance and travel time to Boston. Best fit polynomial lines show that the mode share appears to peak at about 30 miles from Boston.

Figure 5: JTW Zone Rail Share by Nearest Station Distance and Travel Time to Boston



Additional testing of relationships may be necessary to arrive at an acceptable approach for forecasting the service ridership. However, as was discussed at the meeting, the range of outcomes produced by the various techniques should also be considered to help guide the development of a project forecast (i.e., the high and low forecasts may provide an acceptable range of outcomes to consider for decision-making purposes).

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Project Team Kick-off Meeting

Date: 03/15/2013 **Time:** 10:00am **Location:** FTA Region 1 Offices at Volpe Center, Cambridge, MA

Attendees/Distribution:

Name (Affiliation)	Email	Study Team
Mary-Beth Mello – FTA Region One Administrator	mary.mello@dot.gov	Mark Sanborn (NHDOT)
Peter Butler – FTA	peter.butler@dot.gov	Patrick Herlihy (NHDOT)
Judy Malloy – FTA	judy.molloy@dot.gov	Ken Kinney (URS)
Marilyn Scheffler - FTA	marilyn.scheffler@dot.gov	Russell Wilder (URS)
Bill Gordon – FTA	william.gordon@dot.gov	David Nelson (Jacobs)
Trevor Gibson - FRA (phone)		Ryan Harris (Jacobs)
Michelle Fishburne – FRA (phone)		Rob DiAdamo (TPRG)
Kyle Bratinger – FRA (phone)		Laurie Hussey (Camsys)

Mark Sanborn and Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the past week of stakeholder meetings and then entered the discussion of the project scope and tasks.

Task 1 – Public, Stakeholder Involvement Ken pledged that the study would be a transparent and open process and discussed the formation and composition of the Advisory and Steering Committees. These committees would report directly to NHDOT who would then report to the Legislature and eventually the Governor. The first Steering Committee is scheduled for Wednesday, May 15. The first public meeting is scheduled for Wednesday, June 5 2013 in Manchester, NH. Mark Sanborn added that the study team hopes to schedule a meeting with MassDOT officials for the week of April 1, 2013

Task 2 - Purpose & Need

Ken mentioned the desirable demographics of the corridor for improved regional transit service. Peter Butler said that the FTA would like to review the Purpose & Need early and that they would prefer it to be short and to the point.

Task 3 - Financial Planning

Ken discussed the scope of the financial plan and stressed that further definition and certainty of financial resources was a key goal. He said that as part of the financial planning process, it will be important to describe the success of Boston Express and use that information to help make the case for expanded transit options in the corridor. Mark Sanborn added that bus service in the I-93 corridor was originally implemented as a construction mitigation measure and is almost unique in that the bus service is paying for itself.

Task 4 – Phasing of Alternatives

David Nelson asked where FRA stands on the question of potential operators and Trevor Gibson replied that the FRA cannot support a rail study that does not include an Amtrak option. He added that the study and proposed alternatives cannot preclude the potential development of high speed rail between Boston and Montreal or compromise the SDP for a potential rail extension to White River Junction. Trevor continued that the study would have to address capacity issues at North Station, updated bridge safety standards and comply with evolving equipment standards being developed by the FRA safety office.

Task 5 – Preliminary Screening
Mary-Beth Mello described the screening process as pivoting off of the purpose and need that it should at once balance local support and the FTA/FRA process. The winnowing out of alternatives should follow the conventional screening process of build, no-build, frequencies, travel times, class 5/4 track (speed) and added that BRT can provide similar levels of service for much less upfront capital and that it needs to be fully considered. She also referenced the New England HST planning study and how it is considering the impacts of riders coming from Concord along the NE Spine.

Task 6 – Evaluation Criteria and Methods
Ken described the planned development of a bi-state model for the study working with MassDOT, NHDOT, NEMCOG, NRPC, SNHRPC and CNHRPC. Laurie Hussey added that Cambridge Systematics was familiar with the developing National Model that is similar in nature but more robust than the ARRF model. It was stressed that an accurate assessment of land use data will be important and suggested that the team speak with Jim Ryan regarding the modeling process.

Task 7 – Evaluation of Alternatives
Ken said that it will be important that the study consider all alternatives equally in order to ensure transparency and make the best case for the cost vs. benefit of the LPA. David Nelson cautioned that the study could get messy if there were too many alternatives advanced to detailed development and evaluation. Trevor suggested that it would be ok to evaluate alternate speed and frequency operating scenarios as sub-alternatives. Kyle said that the study would have to develop a Tier I level of impact documentation for the entire corridor from Concord to North Station. He suggested that the purpose & need, alternative screening evaluation and service development plan prepared for the Phoenix to Tucson rail study would be a good example.

Task 8 – Locally Preferred Alternative and Task 9 – Service Development Plan
Peter Butler asked whether it would be necessary to develop a Service Development Plan (SDP) if the LPA is an enhanced bus network. Trevor replied that the SDP would help to define the market, the ideal service frequency, required infrastructure and O&M costs for the potential future phasing of rail. Mark Sanborn added that even if enhanced bus is the first phase, that an SDP would be important to help manage expectations and what would need to happen before rail was feasible and what that system would look like. David Nelson added that important issues of governance would also be included in the SDP and that is not required in the FTA process.

Task 10 – Environmental Documentation
Russell Wilder answered David Nelson that any complimentary feeder bus or through ticketing would be handled in the environmental assessment process. Mary-Beth Mello surmised that she did not expect any surprises in the EA process and that it could build off of the Draft EA prepared in 2003. The process would have to respect MEPA regulations and would need to evaluate impacts to air, noise & vibration, wetlands and historic resources. She added that the NH SHPO had investigated the possibility of registering the entire corridor as an historic resource. Michelle Fishburne reminded the team that the eventual NEPA document would need to be included with the SDP, but that FTA follows Title 23 air quality conformity guidelines while the FRA does not. She suggested that the tiered EA prepared for the New Haven-Hartford-Springfield rail corridor could provide a good example.

Task 11 – Implementation

David Nelson asked what process we should be expected to follow with respect to the newly released MAP-21 guidance on transit studies that eliminates the Alternatives Analysis process. Mary-Beth Mello responded that this study is funded through TEA-21 so the team will need to follow the same AA process, but that the study would need FTA approval to actually move in to the project development phase.

NEXT STEPS

- Kyle (FRA) – Will send docs on the Phoenix-Tucson project to view screening criteria
- Ken Kinney - Need a call with the new starts group (Alex?)
- Mark Sanborn - Combined contacts list out by next week
- Ken Kinney/Mark Sanborn – Final project scope schedule and map
- Ken Kinney/Mark Sanborn - Detailed agenda needed





NH Capitol Corridor
Rail & Transit Alternatives Analysis

FTA Coordination Meeting

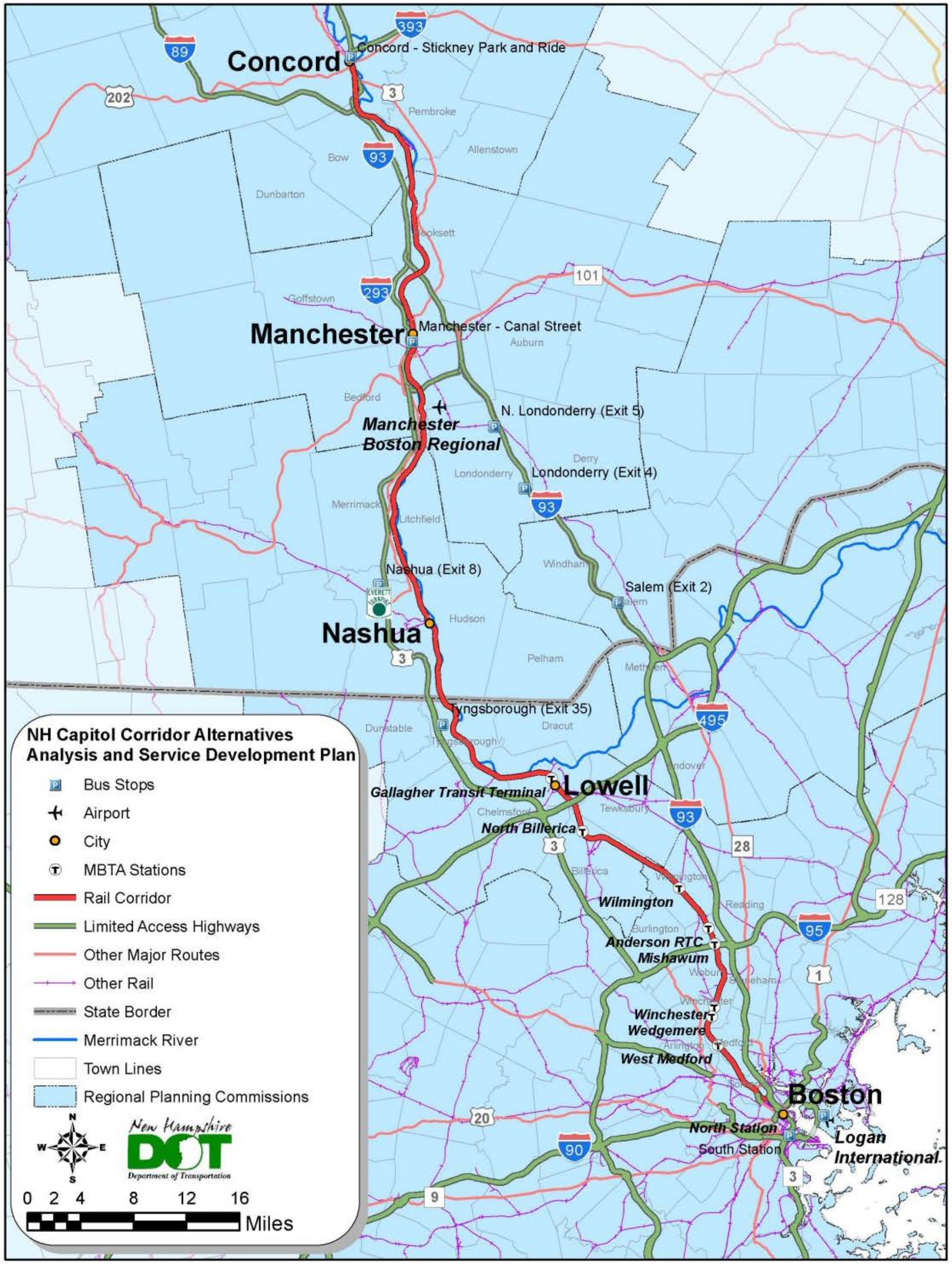
April 17, 2014

New Hampshire DOT

Department of Transportation

Agenda

- Alternatives/Screening
- Ridership
- Financial
- Interagency/Political Coordination
- Project Development

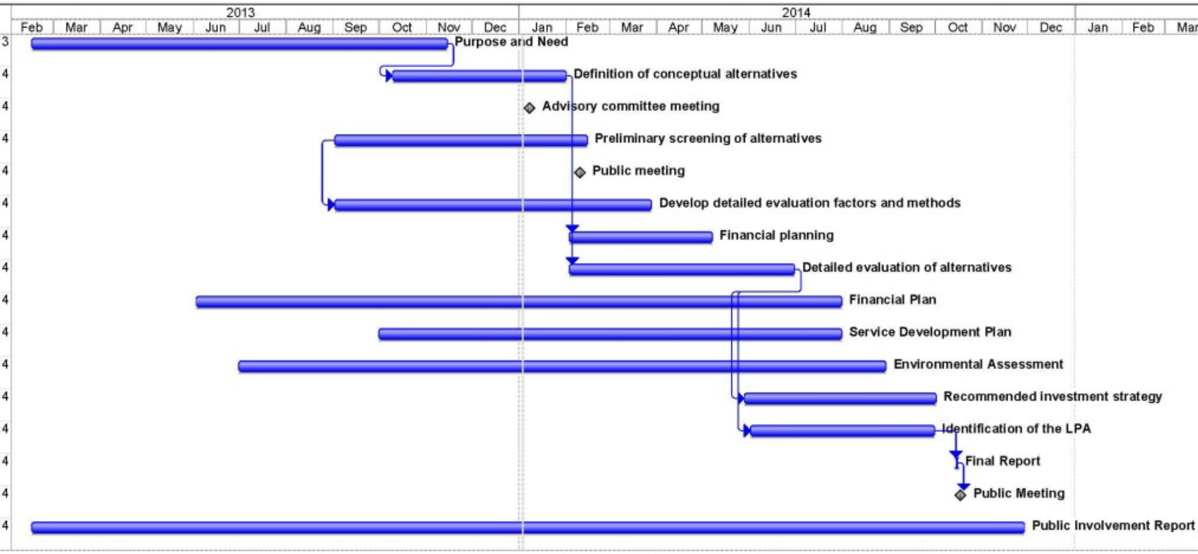


NH Capitol Corridor Alternatives Analysis and Service Development Plan
Bus Stops
Airport
City
MBTA Stations
Rail Corridor
Limited Access Highways
Other Major Routes
Other Rail
State Border
Merrimack River
Town Lines
Regional Planning Commissions
0 2 4 8 12 16
Miles
Concord
Concord - Stickney Park and Ride
Manchester
Manchester - Canal Street
Manchester Boston Regional
N. Londonderry (Exit 5)
Londonderry (Exit 4)
Nashua (Exit 8)
Nashua
Salem (Exit 2)
Tyngsborough (Exit 35)
Lowell
Gallagher Transit Terminal
North Billerica
Wilmington
Anderson RTC
Mishawum
Winchester
Wedgemere
West Medford
Boston
North Station
South Station
Logan International

Schedule

Alternatives Analysis Timeline

ID	Task Name	Duration	Start	Finish
1	Purpose and Need	9.75 mons	Fri 2/15/13	Thu 11/14/13
2	Definition of conceptual alternatives	4.1 mons	Thu 10/10/13	Fri 1/31/14
3	Advisory committee meeting	0 days	Wed 1/8/14	Wed 1/8/14
4	Preliminary screening of alternatives	6 mons	Mon 9/2/13	Fri 2/14/14
5	Public meeting	0 days	Mon 2/10/14	Mon 2/10/14
6	Develop detailed evaluation factors and methods	7.5 mons	Mon 9/2/13	Fri 3/28/14
7	Financial planning	3.4 mons	Mon 2/3/14	Wed 5/7/14
8	Detailed evaluation of alternatives	5.3 mons	Mon 2/3/14	Mon 6/30/14
9	Financial Plan	15.2 mons	Mon 6/3/13	Thu 7/31/14
10	Service Development Plan	10.9 mons	Tue 10/1/13	Thu 7/31/14
11	Environmental Assessment	15.25 mons	Mon 7/1/13	Fri 8/29/14
12	Recommended investment strategy	4.5 mons	Thu 5/29/14	Wed 10/1/14
13	Identification of the LPA	4.35 mons	Mon 6/2/14	Tue 9/30/14
14	Final Report	1 day?	Wed 10/15/14	Wed 10/15/14
15	Public Meeting	0 days	Fri 10/17/14	Fri 10/17/14
16	Public Involvement Report	23.3 mons	Fri 2/15/13	Fri 11/28/14



MBTA Commuter Rail: Thirty Five Years of Expansion

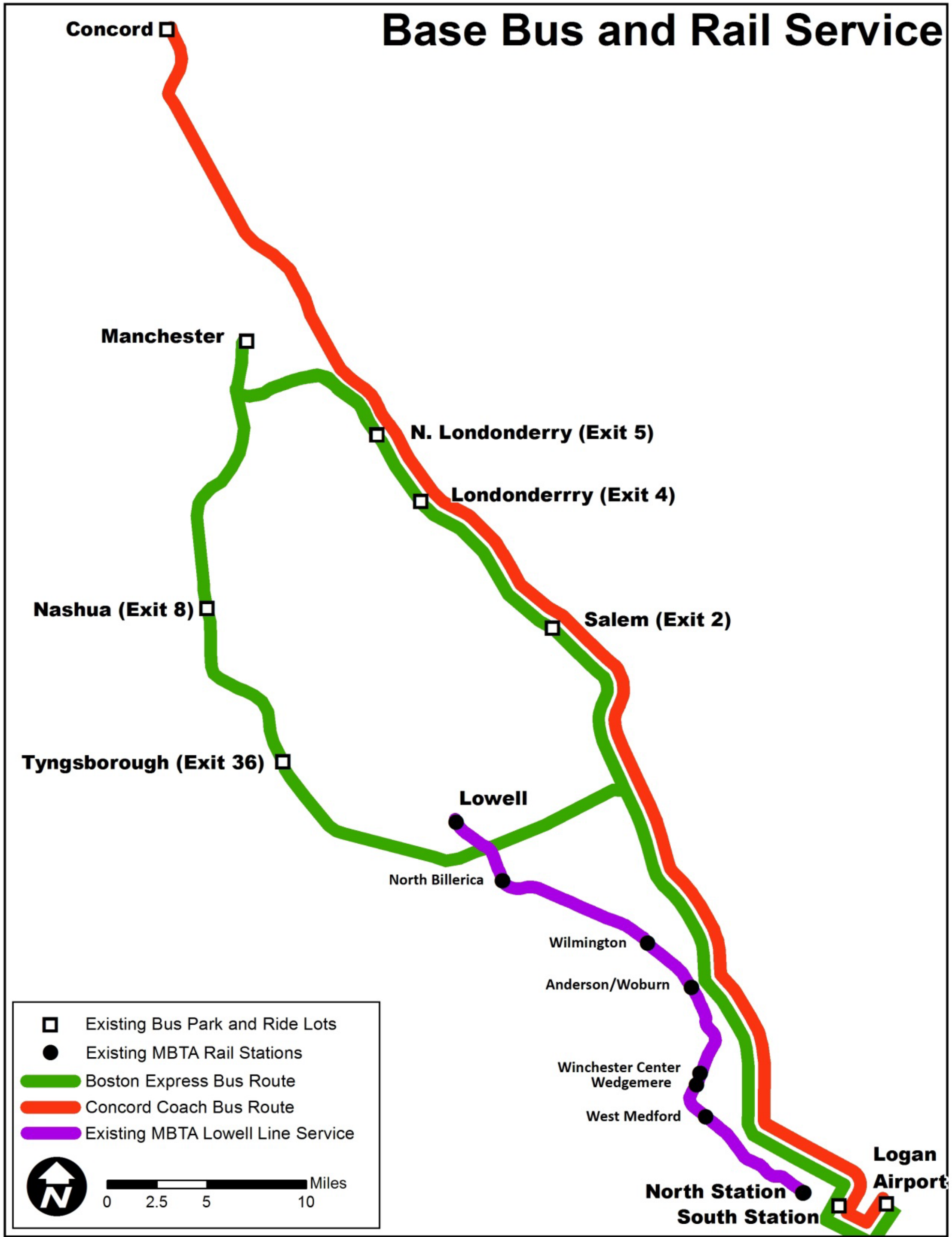
New Hampshire DOT Department of Transportation

Commuter Rail Service Options

Options	Weekday Revenue Trains				Route Miles	Station	Wkday Train Miles
	Lowell	Nashua	Manch	Concord			
1. Concord Regional	44	30	8	8	73	14	1,957
2. Concord Commuter	44	26	22	18	73	14	2,374
3. Manchester Regional	44	34	16	0	56	13	2,068
4. Manchester Commuter	44	30	20	0	56	13	2,091
5. Nashua Commuter	44	34	0	0	39	11	1,888
6. Nashua Minimum	44	16	0	0	35	11	1,496

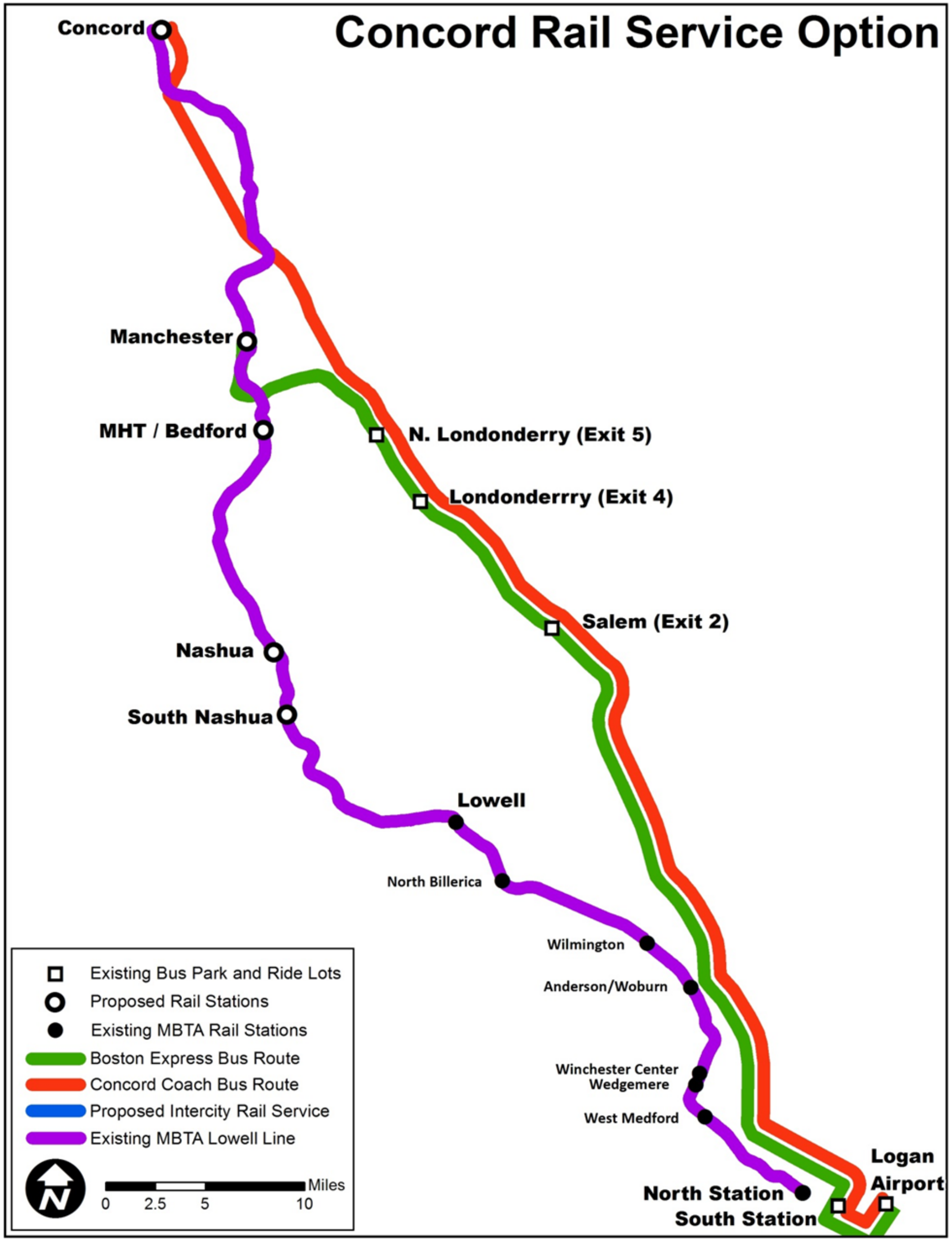
New Hampshire DOT Department of Transportation

Base Bus and Rail Service



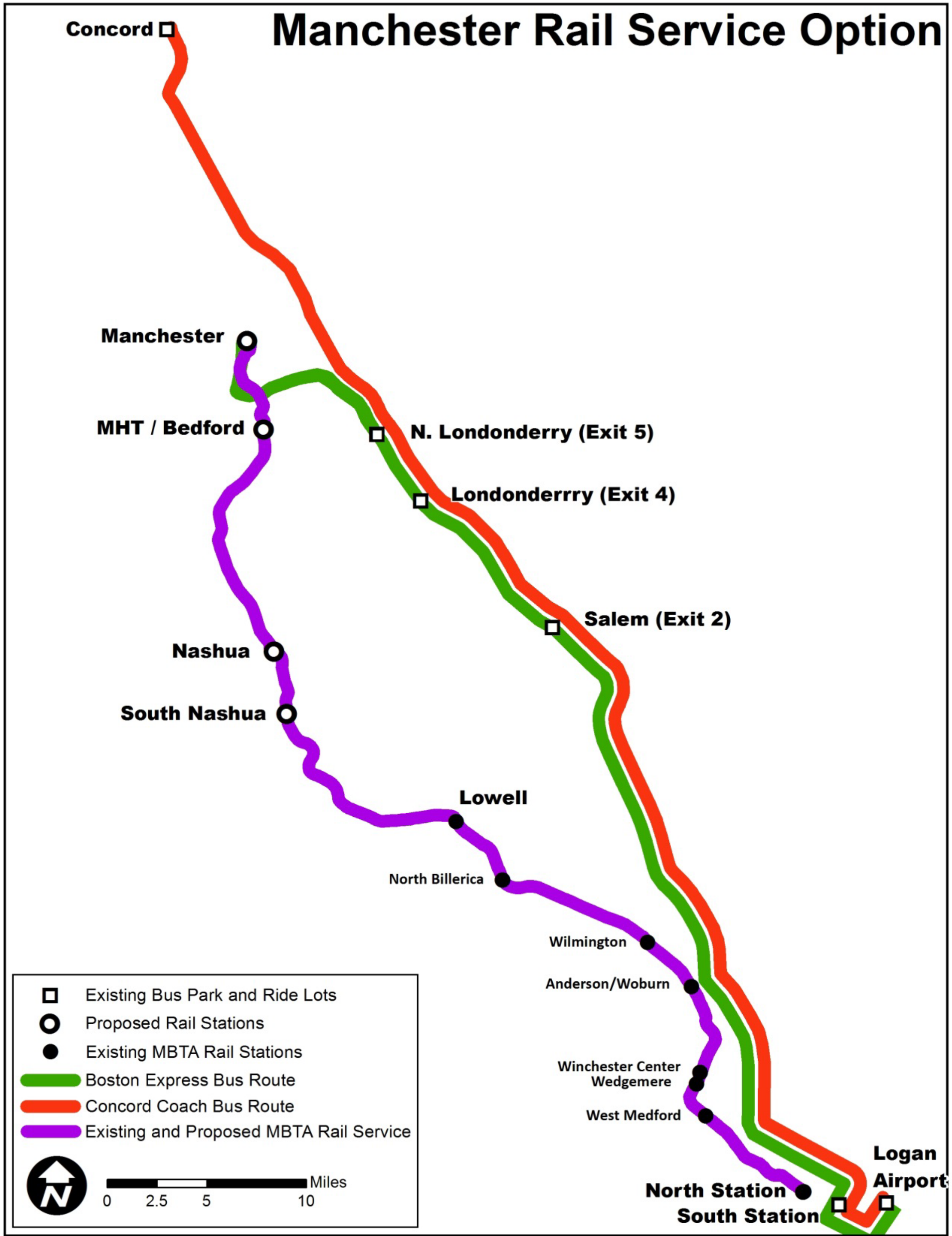
New Hampshire DOT Department of Transportation

Concord Rail Service Option



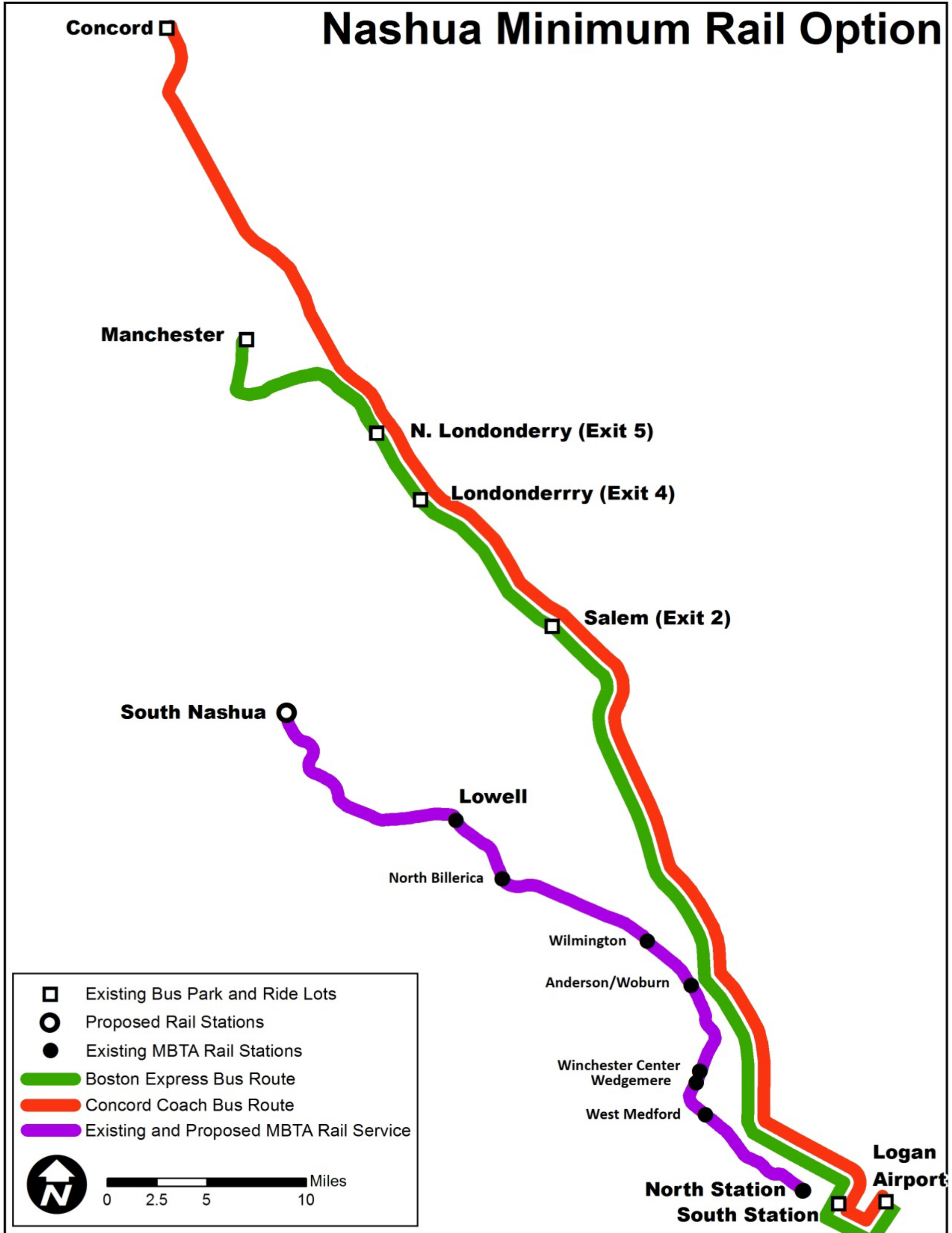
NH Capitol Corridor

New Hampshire DOT Department of Transportation



New Hampshire DOT Department of Transportation

Nashua Minimum Rail Option



New Hampshire DOT Department of Transportation

Potential Station Locations

Primary Criteria

- Market (Nashua, Manchester, Concord)
- Access (Major highways, exits, local roads)
- Track Characteristics (straight track, sidings)
- Land Use (residential, commercial, industrial)
- Lot Size/Configuration

Secondary Criteria

- Environmental (wetlands, river, habitat)
- Ownership (State or private)
- Sensitive Receptors (residential, schools, hospital)
- Miscellaneous Factors

Conceptual Stations

Station	Miles to Boston	Max Time to Boston	Min Time to Boston
Concord	73.4	1:54	1:46
Manchester	55.5	1:32	1:25
MHT / Bedford	50.1	1:24	1:17
Nashua	38.8	1:14	1:02
South Nashua	35.2	1:08	0:54

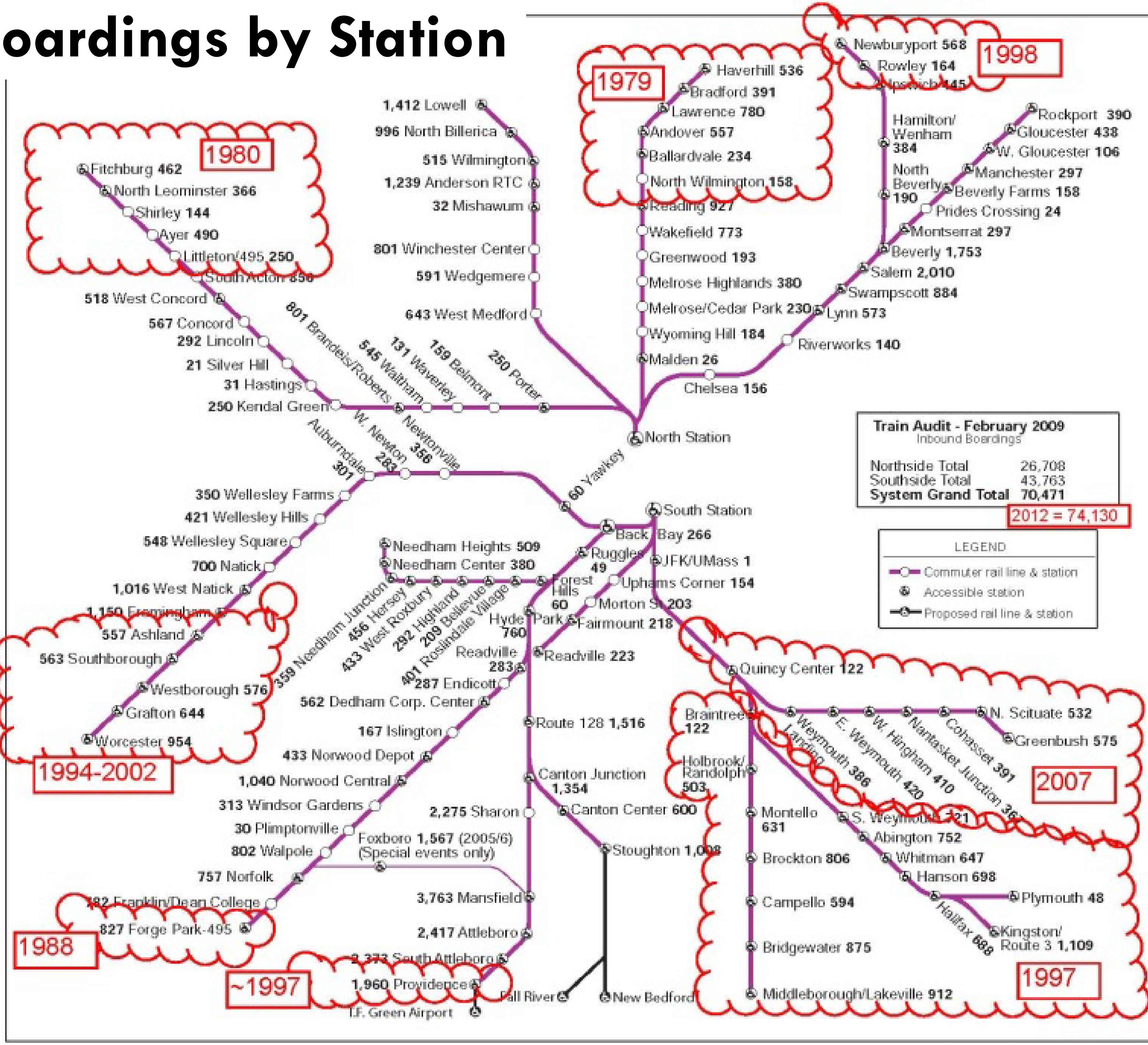
Express Bus Options

- Bus on Shoulder for Existing Service
  - 80 weekday buses
  - 8-12 minute savings for 16 am peak southbound buses
  - Afternoon savings are less
- Bus on Shoulder for Enhanced Service
  - Approximately 120 weekday buses
  - 8-12 minute peak savings over current travel times
  - 30-minute peak headway; 60-minute off-peak
  - All peak buses offer non-stop service to Boston

Rail Ridership

- Up to 3,000 total boardings per weekday
- Boston-Manchester
  - 16 trains to Manchester
  - 34 trains to Nashua
- Existing bus service on I-93

MBTA Boardings by Station



Bus on Shoulder Ridership

- Up to 1200 boardings per weekday
- Expanded Bus Service

NH Capitol Corridor Rail and Transit Study

Preliminary Screening of Conceptual Alternatives

Alternative	Cost	NH Ridership	Land Use / Economic Development	Environmental **Fatal Flaw ONLY**
No Build / No Transit Improvement	○	○	○	●
Concord Regional	◔	◑	◕	●
Concord Commuter	◔	◑	◕	●
Manchester Regional	◑	◑	◑	●
Manchester Commuter	◑	◑	◑	●
Nashua Commuter	◕	◔	◔	●
Nashua Minimum	◕	◔	◔	●
Intercity 8	◑	◔	◔	●
Intercity 12	◔	◔	◑	●
Intercity 18	◔	◔	◕	●
BOS	●	◔	○	●
BOS +	◕	◔	○	●

● ⟷ ○

better worse

Alternatives Advanced for More Detailed Evaluation

- No Build: Base Bus
- Base Bus on Shoulder (BoS)
- Base Enhanced (Base+)
- Bus on Shoulder Enhanced (BoS+)
- Nashua Commuter Rail Minimum – plus bus
- Manchester Regional Rail – plus bus
- Concord 8 Intercity Rail – plus bus

Project Implementation

Project Implementation Timeline

ID	Task Name	Duration	Start	Finish
1	**NH Capitol Corridor Study**	**434 days**	**Fri 2/15/13**	**Wed 10/15/14**
2	Purpose and Need	9.75 mons	Fri 2/15/13	Thu 11/14/13
3	Definition of Conceptual Alternatives	4.1 mons	Thu 10/10/13	Fri 1/31/14
4	Preliminary Screening of Alternatives	6 mons	Mon 9/2/13	Fri 2/14/14
5	Develop Evaluation Factors and Methods	7.5 mons	Mon 9/2/13	Fri 3/28/14
6	Detailed Evaluation of Alternatives	5.3 mons	Mon 2/3/14	Mon 6/30/14
7	Identification of Locally Preferred Alternative	4.35 mons	Mon 6/2/14	Tue 9/30/14
8	Final LPA Report	0 days	Wed 10/15/14	Wed 10/15/14
9	Service Development Plan	10.9 mons	Tue 10/1/13	Thu 7/31/14
10	Environmental Assessment	15.25 mons	Mon 7/1/13	Fri 8/29/14
11	**Project Implementation**	**1791 days**	**Mon 12/2/13**	**Mon 10/12/20**
12	Draft Plan to Restructure NHRTA	4.35 mons	Mon 12/2/13	Tue 4/1/14
13	Executive approval of the plan to restructure the NHRTA	3.3 mons	Mon 6/2/14	Mon 9/1/14
14	Restructure of NHRTA approved by governor and legisla	0 days	Mon 2/2/15	Mon 2/2/15
15	Recommended Financia/Governancel Plan	5.3 mons	Mon 1/5/15	Mon 6/1/15
16	Request to Enter Project Development	0 days	Wed 7/1/15	Wed 7/1/15
17	Project Development	19 mons	Tue 10/20/15	Mon 4/3/17
18	Legislative Approval of Financial/Governance Plan	0 days	Mon 4/3/17	Mon 4/3/17
19	Small Starts Application, Preparation and Submittal	6 mons	Tue 4/4/17	Mon 9/18/17
20	Construction	39 mons	Tue 10/17/17	Mon 10/12/20
21	Service Begins	0 days	Mon 10/12/20	Mon 10/12/20

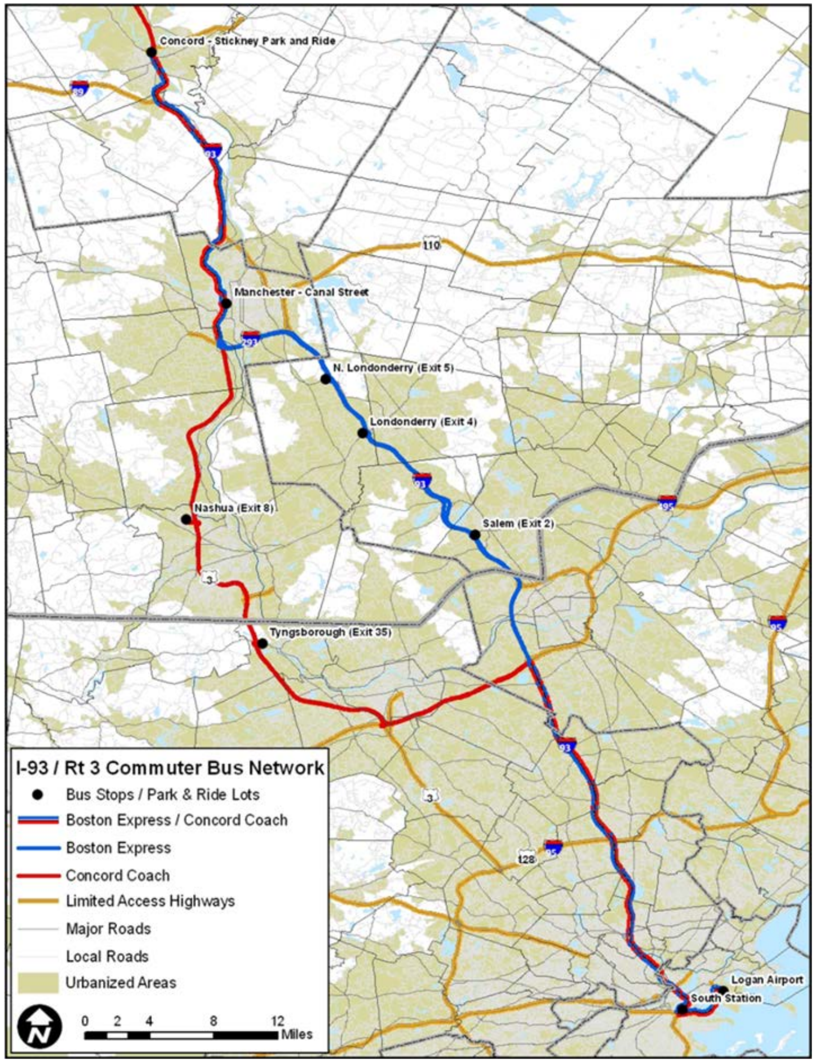
New Hampshire DOT
Department of Transportation

Ridership

- Bus Alternatives
  - Bus on Shoulder
  - Expanded Bus Service
  - Bus on Shoulder with Expanded Bus Service
- Rail Alternatives
  - Manchester Regional
  - Nashua Minimum
  - Intercity Concord 8

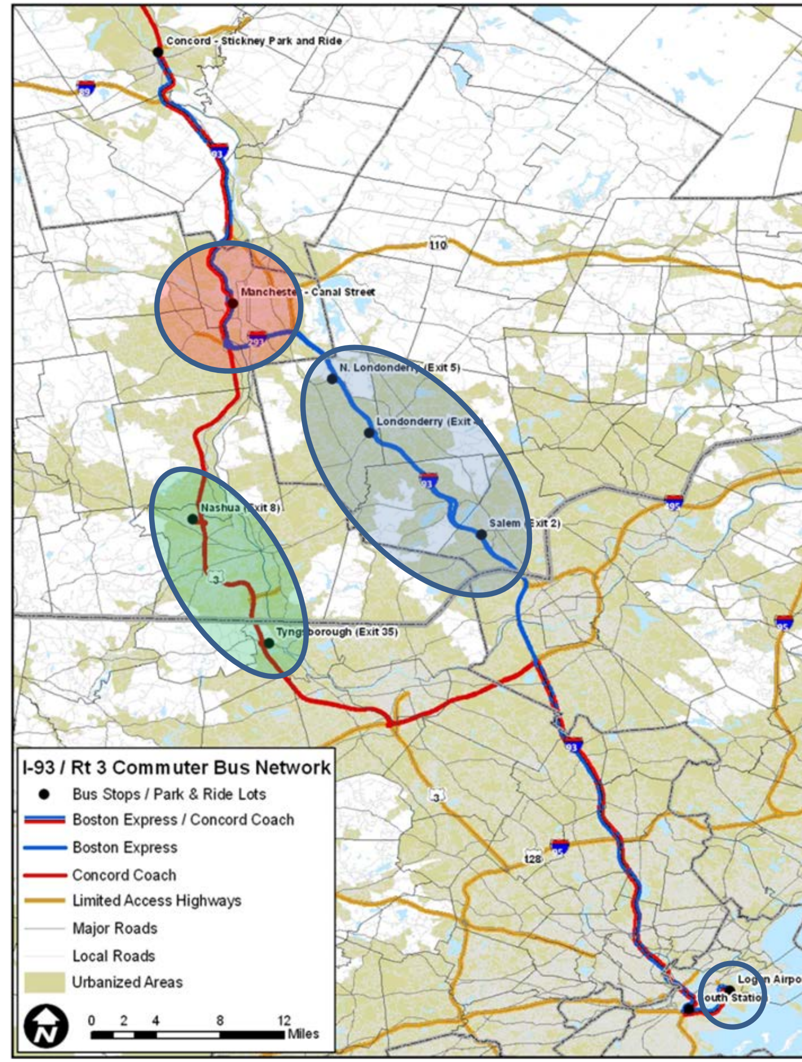
Current Bus Service

- Boston Express Route 3
  - Manchester
  - Nashua (Exit 8)
  - Tyngsborough (Exit 35)
  - Salem (Exit 2)
- Boston Express I-93
  - Manchester
  - N. Londonderry (Exit 5)
  - Londonderry (Exit 4)
  - Salem (Exit 2)
- Concord Coach



Bus Analysis Markets

- Manchester Market
- I-93 Market
  - N. Londonderry (Exit 5)
  - Londonderry (Exit 4)
  - Salem (Exit 2)
- Route 3
  - Nashua (Exit 8)
  - Tyngsborough (Exit 35)
- Logan Airport



New Hampshire DOT Department of Transportation

Time Savings & Frequency

Average Travel Time		Manchester	I-93	Rt 3	Logan Airport
Peak	Existing	1:49	1:08	1:19	1:38
Peak	Proposed	1:43	1:02	1:13	1:32
Peak	Percentage Change	-5.5%	-8.8%	-7.9%	-5.9%
Off Peak	Existing	1:29	0:54	0:59	1:23
Off Peak	Proposed	1:27	0:53	0:58	1:22
Off Peak	Percentage Change	-2.3%	-2.5%	-2.3%	-1.5%

Frequency		Manchester	I-93	Rt 3	Logan Airport
Peak	Existing	6	24	9	15
Peak	Proposed	6	34	22	62
Peak	Percentage Change	0.0%	41.7%	144.4%	313.3%
Off Peak	Existing	12	31	15	43
Off Peak	Proposed	26	29	27	57
Off Peak	Percentage Change	116.7%	-6.5%	80.0%	32.6%

Bus Ridership Estimates

Weekday Boards	Existing	BoS	Expanded	Expanded BoS
Concord	69	69	69	69
Manchester (Rt3)	30	31	36	36
Manchester (I-93)	28	29	34	34
N. Londonderry (Exit 5)	255	262	272	277
Londonderry (Exit 4)	162	166	173	175
Salem (Exit 2)	162	167	173	176
Nashua (Exit 8)	179	183	263	269
Tyngsboro (Exit 35)	71	73	105	107
Total Boardings	960	980	1,120	1,140
Average Weekday Percent Increase		2.4%	17.5%	19.6%

I-93 Boardings	607	624	652	662
Average Weekday Percent Increase		2.8%	7.4%	9.1%
Route 3 Boardings	280	287	404	412
Average Weekday Percent Increase		2.5%	44.3%	47.1%

Rail Ridership

- Preliminary Forecasts
  – Based on ARRF
- Current Commuter Rail
  – Based on MBTA System
  – Boarding Model
  – Needs FTA Forecasting Review

New Hampshire DOT Department of Transportation

Preliminary Rail Ridership

- Preliminary Forecasts
  – Based on Aggregated Rail Ridership Forecast Model

		Trains Per Day			
	Alternative	Nashua	Manchester	Concord	Boards
1	Concord Regional	30	8	8	1,350
2	Concord Commuter	26	22	18	1,510
3	Manchester Regional	34	16	0	1,570
4	Manchester Commuter	30	20	0	1,530
5	Nashua Commuter	34	0	0	1,020
6	Nashua Minimum	16	0	0	580

  – Manchester Regional & Nashua Minimum

Updated Rail Ridership

- Initial Draft Forecasts
  - Consistent with ARRF estimates for the Manchester Regional Alterative
  - Lower for the Nashua Minimum Alternative

Funding Update

- FTA approval of capital grant will require local match from stable and reliable sources of revenue
- Most common source of local revenue share – sales tax – not available in NH

Examination of Local Sources

- Exhaustive search of possible local sources
  - Sources used by other Major Capital Investment projects
  - Sources used by similar projects (i.e., commuter rail)
  - Other sources based on TCRP study

Examination of Local Sources (continued)

- Examination of feasibility and yield
  - Feasibility: ease of implementation
  - Yield: simplified estimate of annual revenue
- Initial assessment balancing implementation issues and anticipated revenue
- Discussion with key decision makers, including Commissioner and Governor
  - Short list of promising sources now emerging

Possible Funding Sources

Source		Feasibility	Yield	$M/Year
NH State Capital Program	High	Needs legislative action	High	$10.0
CMAQ	High	Requires apportionment reallocation	Medium	$2.0
NH Parking Fees	High	Part of NHCC project	Low	$0.6
Toll Revenue	Medium	Demonstrate benefit to toll road	High	$10.0
Vehicle Registration Fees	Medium	Needs legislative action	High	$5.9
Municipal Contributions	Medium	Nashua and Manchester	Medium	$2.0
RGGI	Medium	Competitive grant process	Low	$0.5
Property Tax	Low	State levies dedicated to education	High	$15.7
Lottery Revenues	Low	Dedicated entirely to education	Medium	$3.7
Passenger Facility Charges	Low	FAA approval required	Low	$1.0
Value Capture	Low	Need more study to determine	Low	–
Payroll Tax	None	Not available in New Hampshire	–	–
Fuel Tax	None	Restricted to highways	–	–
Dedicated Sales Tax	None	Not available in New Hampshire	–	–

Yield Estimate Assumptions

Source	Yield ($M/Year)		Justification
NH State Capital Program	High	$10.0	7.6% of 2014 debt payment (principal plus interest)
CMAQ	Medium	$1-2	10-20% of NH apportionment
NH Parking Fees	Low	$0.6	$3 per day parking fee
Toll Revenue	High	$10.0	$0.25 increase at Hooksett and Bedford toll facilities
Vehicle Registration Fees	Medium	$5.9	$5 fee on passenger vehicles and trucks (statewide)
Municipal Contribution	Medium	$2.0	$1.0 million/city; city discretion regarding source
RGGI	Low	$0.5	Based on historical awards
Property Tax	High	$15.7	0.1 mill applied statewide
Lottery Revenues	Medium	$3.7	5% of net proceeds
PFCs	Low	$1.0	Half of $1.50 PFC increase in 2016
Value Capture	Low	–	Need more detailed study to estimate; likely to be the basis for the municipal contributions

- Interagency/political coordination
  - NH
  - MassDOT
  - MBTA
- Project Development
  - Creative Financing

Memorandum

TO: File

FROM: Marty Milkovits

DATE: June 19, 2014

RE: FTA Meeting Minutes - June 13, 2014

Attendees

USDOT: Alex Eckmann
FTA: Jim Ryan, Ken Cervenka, Pete Mazurek
NH DOT: Shelly Winters, Lou Barker
URS: Ken Kinney
CS: Dan Tempesta, Jay Evans, Marty Milkovits

Agenda

The meeting reviewed the ridership model development and forecasts.

Discussion

The group agreed that the Journey to Work (JTW) model with piecewise linear formulation and employment input is the preferred model and appropriate for use in this project. The following points were also discussed:

Set-aside test set: Jim Ryan questioned the effectiveness of estimating the model using a subset of the full data set. The group agreed to re-estimate the models with the entire data set and check for significant change in the estimators.

Implications of using JTW: Jay Evans explained that a boarding model based on JTW, as opposed to population, does not include the potential induced demand whereby home and work locations change based on new modal options. Therefore, these forecasts should be considered to be closer to "opening day" ridership rather than mature ridership after the service has been operating for some time.

Sensitivity Testing: Pete Mazurek recommended that the model sensitivity to number of trains be tested.

Regional Bus Competition:

Airport travelers: There was a question about airport traveler demand at the MHT commuter rail station. Dan Tempesta explained that a recent survey of MBTA service to Logan Airport reported approximately 30 travelers used commuter rail to access the airport. Logan is a much bigger airport with higher parking costs and more commuter rail service options, which implies that the air travelers boarding at the MHT station would be small. The group will investigate air traveler access mode data availability for T.F. Greene.

Areas of Risk: Jim Ryan and Ken Cervenka recommended that the model be presented with areas of risk clearly identified. Specifically, the model assumes that:

- The existing MBTA fare structure is maintained;
- Current reliability levels are maintained; and
- Current travel times on both rail and highway are maintained.

APPENDIX H

Agency Coordination Meetings: New Hampshire

Department of Environmental Services

New Hampshire DOT

Department of Transportation

Outline of BLNMC Scope with Discussion Points for Meeting with NHDES May 14, 2013

Conference Rooms 213; Room 214, NH DES Headquarters, 29 Hazen Drive, Concord, NH

Expected Attendees:

NHDES
Becky Ohler – Air
Carolyn Russell- Commissioner's Office - Planning
Felice Janelle – Air
Gino Infascelli - Wetlands
Jacquie Colburn - Water
John Regan – Hazardous Waste
Tim Drew – Administrator, Public Information and Permitting Unit
Tracie Sales - Water
Vicki Quiram – Assistant Commissioner

NHDOT
Mark Sanborn – NHDOT Federal Liaison
Pat Herlihy – NHDOT Director of Aeronautics, Rail and Transit

URS Team
Russ Wilder - URS
Carl Chamberlin - URS
Jen Riordan – Smart Associates
Jeff McCullough - Nobis

Task 1: Public and Stakeholder Involvement

20 environmental stakeholder meetings, including public hearings to satisfy FTA/FRA requirements.

- *What does NHDES see as the critical environmental issues that would need to be addressed by the BLNMC AA Study?*
- *What environmental stakeholders would DES recommend meeting with?*
- *What role does NHDES see for itself in participating in this project?*

Outline of BLNMC Scope with Discussion Points for Meeting with NHDES May 14, 2013

Conference Rooms 213; Room 214, NH DES Headquarters, 29 Hazen Drive, Concord, NH

Task 2: Purpose & Need

Issues that will be addressed by the project beyond the transportation issue identified in the purpose will be included as Goals and Objectives. The Goals and Objectives will balance environmental and transportation values; support early and effective interagency involvement in environmental issues; and consider equally the projects schedule, cost, quality, natural and cultural resources, public input, and regulatory input.

- *What Environmental Goals and Objectives would NHDES see as relevant to this project?*
- *What is NHDES' perceived environmental need for the project…roadway congestion, poor air quality, unsustainable land use patterns, etc.*

Task 3: Financial Planning

Task 4: Definition of Alternatives

Task 5: Preliminary Screening

The objective of this task is select a feasible set of alternatives from the universe of options defined in Task 4 to advance into more detailed assessment in Task 7, leading to the selection of the LPA in the subsequent task.

For the preliminary screening the consulting team will rate each of the preliminary alternatives against the following criteria:

- Environmental impacts (at a fatal flaw level)
    - Including green environmental outcomes, energy savings and community livability

The URS Team will conduct a workshop to review the work and data developed to this point which will serve to objectively reflect the transportation problem defined by the Purpose and Need statements. We will facilitate this workshop to consider community environmental and economic impacts, cost effectiveness, financial feasibility and distributional equity for both costs and benefits.

- *What would NHDES consider as environmental fatal flaws when screening alternatives?*
- *What would NHDES recommend for criteria for this level of screening?*

Outline of BLNMC Scope with Discussion Points for Meeting with NHDES
May 14, 2013

Conference Rooms 213; Room 214, NH DES Headquarters, 29 Hazen Drive, Concord, NH

Task 6: Evaluation Criteria & Methods

Deliverables

- Technical memorandum: Travel Forecasting Methodology Report, including graphics
- O&M Costing Methods Report
- Capital Costing Methods Report
- Evaluation Criteria and Methods Memorandum
- Transportation Capacity & Simulations
- Community, Environmental, Equity Methodology

- *NHDES Comments on the scope of Environmental Equity*

Task 7: Evaluation of Alternatives

The strongest alternatives will be ranked and compared against the detailed evaluation criteria. These criteria will consist of economic development, land use, and environmental (natural, social and economic) impacts……….

- *In NHDES' view, what are the most critical environmental impacts that should be considered when evaluating alternatives?*
- *Are there particular key issues: i.e., air quality; difficult hazardous waste sites along the corridor; prime wetlands; wildlife habitat; water quality, etc.?*
- *Once these environmental impact types are identified, what type of detailed metrics would NHDES recommend to assess each alternative's potential impacts?*

Task 8: Locally Preferred Alternative

Under this task, URS will assist the Department in the selection of a corridor transport investment strategy that meets Department and stakeholder objectives, is likely to achieve state and local financial support, and is likely to qualify for federal capital funding. Based on the evaluation criteria and the technical assessments completed in Task 7, the consultant team will rate each of the final alternatives according to:

- Ridership
- Capital cost
- O&M cost
- Environmental impacts (based on analysis completed for the EA (Task 10)

- Environmental justice

- *In NHDES' view, what would be the compelling environmental reasons for selecting the LPA?*
- *How does NHDES envision the permitting process for the LPA if a rail alternative project is recommended? (See environmental assessment scope in Task 10 below.)*

Task 9: Service Development Plan

Upon selection of the preferred corridor investment strategy, URS will integrate the results of the Tasks 1 through 8 into an FRA Service Development Plan (SDP) document that complements the Alternatives Analysis report. The SDP will reference interim deliverables as appendices and be crafted to cover the following outline of information:

- Program Rationale
  - Purpose and need
  - Service rationale
- Operating Strategy
  - Planning methodology
  - Identification of alternatives
  - Operations modeling, including railroad operation simulations, equipment and crew scheduling analyses, and terminal, yard and support operations, which in turn reflect such variables as travel demand and rolling stock configuration; track sharing
  - Station location, access and analysis
  - Demand and revenue forecasts
  - Financial performance and projections for each phase of service
    - operating costs and revenues,
    - capital replacement costs, and other institutional arrangements affecting the system finances
  - Conceptual engineering and capital costs for each phase
  - Benefit-cost analysis
    - Operational, (Improved operations)
    - Transportation or
    - Economic with particular focus on jobs and "green" environmental outcomes

- *What is NHDES' vision of an economic benefit that is a "green" environmental outcome?*

Task 10: Environmental Assessment

- *Below is the scope of our environmental assessment process. How does NHDES envision participating in the scoping and review of this process?*

URS will prepare an Environmental Assessment (EA) for the preferred alternative in cooperation with the FTA and FRA and other relevant resource agencies. The EA will provide for scoping, public outreach, agency coordination and preparation of required NEPA documentation for submission by the Department. We will submit an ENF and begin the process of coordinating the environmental work in Massachusetts. The EA will be designed to meet the following objectives:

- Determine which aspects of the proposed action have potential for social, economic, or environmental impact;
- Identify alternatives and measures which might mitigate adverse environmental impacts;
- Identify other environmental review and consultation requirements which should be performed concurrently with the EA,; and
- Public involvement shall be summarized and the results of agency coordination shall be included in the EA.

Specific tasks consist of:

- Project Initiation - Initial Contact Letters
- Office Database Reviews
- Environmental Issues Mapping
- Determination of the NEPA class of action in conjunction with Task 5 – Preliminary Screening
- Wetland Mapping based on published information with limited field checks. Future field work will be necessary to support permitting
- ESA Evaluations/ Contamination Inventory (assumes 10 locations) at a screening level with limited field checks
- Noise & Vibration includes area review and preliminary screening for noise and vibration sensitive locations; Limited background noise and vibration measurements at representative noise and vibration sensitive locations; noise and vibration

modeling for preferred alternative; noise and vibration impact assessment; mitigation analysis and documentation

- Cultural Resources at a survey level similar to the effort for wetlands. Proposed budget allows for background research; consultation; 15 structure surveys and write up; assumes 6 bridges; 50 culverts; 3 historic districts.
- Air Quality: Transportation conformity will be evaluated since the Capitol Corridor project is being funded by FTA. The analysis will include emission calculations from sources associated with the proposed project. URS will also prepare the air quality sections (i.e., current conditions and environmental consequences) for the EA. To arrive at the cost estimate, the following assumptions were made:
    - To discuss air quality needs, two two-hour teleconferences with regulatory/participating agencies is assumed.
    - More in-depth discussions with Metropolitan Planning Organizations, transit agencies and regulatory agencies will not be required to perform this analysis.
    - No public or client meetings will be necessary for the URS Air Team.
    - Travel and any related cost is not required to complete this task and therefore is not included.
    - Analysis will be performed only on the Preferred Alternative in the Environmental Assessment.
    - General Conformity will not be required for any portion of the proposed project since the project is entirely funded by Title 49 (transit).
    - Preparation of the EA's air quality sections (i.e., current conditions and environmental consequences) will require minimal effort to develop. A high level analysis (i.e.; net emissions effects from the proposed versus existing conditions) will be conducted for these sections and an in-depth analysis and research will not be required. No emission calculations will be necessary as any baseline emissions will be provided by NHDOT.
    - For the current conditions section, it is assumed that specific information required to complete the section (e.g., baseline emissions) will be provided by NHDOT and would not require extensive research and/or calculations.
    - Readily available information will be provided by NHDOT in an expeditious manner, including expected commuter and railroad traffic projections for base and subsequent years including Level of Service (LOS) determinations for proposed stations.

- It is assumed that construction of stations will have minimal or no impact on LOS at the station location and therefore hot-spot analysis will not be required.
- EPA-approved mobile source emissions model such as MOVES2010 will be used to estimate emissions from project related sources.
- Air quality dispersion modeling analysis will not be performed as part of this current task.
- A formal report of the air emissions analysis will be prepared to be incorporated as an appendix to the EA. A brief discussion of the analysis to provide a summary will be included in the air quality environmental consequences section.

- Other Resources as Appropriate
- Mitigation

Deliverables

- Technical Memorandums:
  - Wetlands Mapping
  - Threatened and Endangered Species
  - Contamination Inventory
  - Noise & Vibration Assessment
  - Cultural Resources Assessment
- Air Quality Assessment
- FTA Specific Documents
  - Draft EA with one round of comments
  - Final EA
- FRA EA or Tier 1 EIS Document
  - Impact Analysis Methodology for FRA review and acceptance
  - Development of a Notice of Intent (NOI) to prepare an EIS (if applicable)
  - Draft and Final EA or Draft and Final FONSI

Meeting Agenda: Stakeholder Meeting NHDES

May 14, 2013 1:30PM

The purpose of this meeting is to provide an overview of the project to NHDES staff, solicit comments from the department, and identify any resource areas not currently being evaluated by the project team. URS will prepare an Environmental Assessment (EA) for the preferred alternative in cooperation with the FTA and FRA and other relevant resource agencies. The EA will provide for scoping, public outreach, agency coordination and preparation of required NEPA documentation for submission by the Department.

Comment [rw1]: This would be a fairly limited effort depending on what FRA says

Project Overview

The BLNMC Alternatives Analysis is defining and evaluating opportunities to improve inter-city transit service in the 73-mile corridor between Boston, MA and Concord, NH. While MBTA commuter rail service currently operates between Boston and Lowell, there has not been commuter rail passenger service north of Lowell since it was discontinued in 1967. A public-private partnership, supported by the State of New Hampshire, operates roughly 50 daily bus roundtrips within the corridor between New Hampshire and Boston; this service typically carries 1,800 passengers per day.

Increasing transportation demand and growing concerns about mobility, economic development and quality of life have led citizens and officials in New Hampshire and Massachusetts to explore options to improve transit service along the northern end of the BLNMC Corridor. The BLNMC project will evaluate a diverse set of rail and bus options for improving connectivity in the BLNMC corridor by leveraging existing transportation infrastructure, including the Pan Am Railway, US Route 3 and I-93.

Environmental Scope

Wetlands Mapping

- Performed by Smart Associates.
- High-level screening of wetlands within the full corridor, plus detailed review of wetlands at potential station stops or potential park and ride locations.
- Data included on issue maps, engineering plans, and documentation within the EA.
- Less critical for existing transportation infrastructure, more critical for new elements.

Threatened and Endangered Species

- Performed by Smart Associates.
- High-level screening of T&E within the full corridor, plus detailed review of T&E at potential station stops or potential park and ride locations.
- Data included on issue maps, engineering plans, and documentation within the EA.
- Less critical for existing transportation infrastructure, more critical for new elements.

Contamination Inventory

- Performed by Nobis
- High-level screening of contaminated sites within the full corridor, plus detailed review of contaminated sites at potential station stops or potential park and ride locations.
- Data included on issue maps, engineering plans, and documentation within the EA.
- Less critical for existing transportation infrastructure, more critical for new elements.

Noise & Vibration Assessment

- Performed by URS
- Identification of noise and vibration sensitive locations and collection of background noise and vibration measurements at representative locations.
- Data included on issue maps, engineering plans, and documentation within the EA.
- Data critical along the entire corridor.

Cultural Resources Assessment

- Performed by URS
- High-level screening of historical/archeological sites within the full corridor.
- Data included on issue maps, engineering plans, and documentation within the EA.
- Less critical for existing transportation infrastructure, more critical for new elements.

Air Quality Assessment

- Performed by URS
- Emissions modeling using industry standard model.
- Transportation conformity analysis for LPA.
- Data included on issue maps, engineering plans, and documentation within the EA.
- Data critical along the entire corridor.

Environmental Justice

- Performed by URS.
- High-level screening of Environmental Justice sites within the full corridor.
- Data included on issue maps, engineering plans, and documentation within the EA.
- Data critical along the entire corridor.

Questions

- *What does NHDES see as the critical environmental issues that would need to be addressed by the BLNMC AA Study?*
- *What environmental stakeholders would DES recommend meeting with?*
- *What role does NHDES see for itself in participating in this project?*

- *What Environmental Goals and Objectives would NHDES see as relevant to this project?*
- *What is NHDES' perceived environmental need for the project…roadway congestion, poor air quality, unsustainable land use patterns, etc.*
- *What would NHDES consider as environmental fatal flaws when screening alternatives?*
- *What would NHDES recommend for criteria for this level of screening?*
- *In NHDES' view, what are the most critical environmental impacts that should be considered when evaluating alternatives?*
- *Are there particular key issues: i.e., air quality; difficult hazardous waste sites along the corridor; prime wetlands; wildlife habitat; water quality, etc.?*
- *Once these environmental impact types are identified, what type of detailed metrics would NHDES recommend to assess each alternative's potential impacts?*
- *In NHDES' view, what would be the compelling environmental reasons for selecting the LPA?*
- *How does NHDES envision the permitting process for the LPA if a rail alternative project is recommended? (See environmental assessment scope in Task 10 below.)*
- *What is NHDES' vision of an economic benefit that is a "green" environmental outcome?*
- *Below is the scope of our environmental assessment process. How does NHDES envision participating in the scoping and review of this process?*

APPENDIX H

Agency Coordination Meetings: New Hampshire

Department of Transportation

URS MEETING NOTES

► **Project:** NH Capitol Corridor – BOSTON-LOWELL-NASHUA-MANCHESTER-CONCORD RAIL & TRANSIT ALTERNATIVES ANALYSIS (PARTS A&B) STATE PROJECT NUMBERS 16317 AND 68067-A

►**URS Project #:** 10161170 & 10161180

► **Meeting Type:** Face-to-Face

► **Meeting Date:** February 15, 2013

► **Meeting Time:** 9AM

► **Meeting Place:** 7 Hazen B64 G29 Christa McAuliffe Conf Rm (8-15)

►**Attendees/Distribution:**

Name (Affiliation)	Email	Name (Affiliation)	Email
Mike Pillsbury (NHDOT)	*mpillsbury@dot.state.nh.us*	*Ken Kinney (URS)*	*ken.kinney@urs.com*
Patrick Herlihy (NHDOT)	*pherlihy@dot.state.nh.us*	*Mark Shamon (URS)*	*mark.shamon@urs.com*
Mark Sanborn (NHDOT)	*msanborn@dot.state.nh.us*	*Russ Wilder (URS)*	*russ.wilder@urs.com*
Ron Grandmaison(NHDOT	*rgrandmaison@dot.state.nh.us*	*Carl Chamberlin (URS)*	*carl.chamberlin@urs.com*

- Mike Pillsbury welcomed the team and advised that during the study, we make sure we “follow the data”
- For communications, the team was advised to copy Pat Herlihy, Mark Sanborn and Ron Grandmaison on all materials
- Mark Sanborn will set up meeting with FTA/FRA for the week of March 11. The meeting will most likely be held in Boston (FTA’s office - Transportation Systems Center, Kendall Square, 55 Broadway, Suite 920, Cambridge, MA 02142-1093 – Mary Beth Mello, Regional Administrator for the Region I Office of the Federal Transit Administration). It is expected that the FRA will participate in the call via telephone from their offices in Washington, DC. The local office of the FRA is concerned with Railroad safety and not this project.
- It was emphasized that the Alternatives Analysis that meets FTA standards is critical to pursue any funding
- Stakeholders and the order of meeting with them was discussed. Mark Sanborn should be at all meetings:
    1. NHRTA – Meets 3rd Friday of the month at 10 AM in the Legislative Office Building, Concord, NH. Tom Mahon is the chairman and Kathy Hersh is the vice chairman that sets the agendas for the meeting.
    2. Pan Am – 1700 Ironhorse Park, North Billerica – Commissioner Clement to be involved
    3. MBTA – MassDOT Planning – Jody Ray (10 Park Plaza – Boston). It was noted that the team should use the MBTA method for ridership modeling (Cambridge Systematics). It

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was noted that it would be key to talk to CS before Mark Sanborn's call to Jody Ray to set up the meeting (week of February 18).

4. Ken and Mark to meet with Woody Blount (Son Ben) – Concord Coach Lines, 7 Langdon St. Concord, NH. Long term, Woody should be invited to be on the stakeholder committee. Also discussed meeting with Jim Jalbert, of C&J Bus Lines
5. Next would be the cities and chambers of commerce starting with the Nashua and Manchester:
   - Nashua – Donnalee Lozeau, Mayor and Kathy Hersh, Director, Community Development, 229 Main Street;
   - Manchester – Ted Gatsas, Mayor and Sean Owen (President, Wedu)
6. Manchester Airport – Mark Brewer
7. Regional Planning Commissions:
   - Nashua Regional Planning Commission – Kerrie Diers
   - Southern New Hampshire Regional Planning Commission – David Preece
   - Central New Hampshire Regional Planning Commission – Mike Tardiff
8. Cities - Concord – Jim Bouley, Mayor; Carlos Baia, Deputy City Manager, Development and Matt Walsh, Assistant for Special Projects
9. Amtrak
10. Downeaster – Pat Quinn, Portland, ME (How they work with Pan Am)
11. New England Southern
12. Legislature – Rep. David Campbell (D) Nashua; Rep. Candace Bouchard (D) Concord
13. Tom Irwin – Conservation Law Foundation
14. I-93 EIS TDM Options Task Force – attend a meeting. Task Force focuses on Environmentally Sustainable Communities and Transit Oriented Development. Bill Cass, NHDOT Director of Project Development; Bill Watson, NHDOT Administrator, Bureau of Planning and Community Assistance; Pete Stamas, Project Manager, I-93
15. Merrimack Valley Planning Commission, Haverhill, MA - Dennis DiZoglio
   - HOV or BOS
16. Local Transit Providers – Nashua Transit Authority, Manchester Transit Authority
17. T.F. Green Airport

- Discussion of Crown street Property in Nashua (see notes)
- The AA should be considered a complete reset of any previous work – (2003 & 2004)
- NHRTA - $40k in FRA grant for public outreach subcontractor to the NHRTA will be managed by NHDOT

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- NHDOT will develop a project-specific MOU with NHRTA. We should work through NHDOT for any interaction with NHRTA. Team will not attend future NHRTA meetings unless asked to attend by NHDOT
- Communications
    1. Need to establish roles and responsibilities for decision making with regard to the project steering committee (membership ~10-15). Initial meeting would be in May.
    2. For all public meetings, we will always schedule a pre-meeting meeting with NHDOT
    3. We will hold monthly project meetings with NHDOT
    4. All meetings will be recorded by a stenographer – emphasis on transparency
    5. Press will be invited through NHDOT
    6. Any calls we receive will be redirected to Patrick Herlihy or Mark Sanborn
- Environmental Work
    - All field work on RR property to be coordinated with Pan AM. Safety training needs to be up to date
    - Noise and Fumes to be evaluated (Bill in Legislature about idling of diesel locomotives in certain circumstances – no details yet) (HB 508)
        - Jim Cowan will lead noise and will do monitoring at Bradford and Scituate
        - Sally Adkins and Mike Kendall will lead air
    - Tasks in Work Plan should be described in real-world bullet-points
    - Purpose and Need is Critical – provide key bullet-points. Southern New Hampshire has mixed views on this
    - Who gets sued for environmental?
- Web-Site
    - Like the I-93 project, team needs to develop a standalone website that has a link on the NHDOT project page. The website should be: www.nhcapitolcorridor.com

Ken Kinney in NH/MA: weeks of March 11, April 1, April 15, May 13, etc.

These notes are an interpretation of discussions held. Please provide any additions or corrections to the originator within 5 days of the date signed; otherwise they will be assumed correct as written.

► *Prepared by: Russ Wilder*________________________ *Date: February 20, 2013*________

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New Hampshire Capitol Corridor

Project Briefing

July 19, 2013

New Hampshire Department of Transportation

Supported by URS Corporation

with Jacobs Engineering and Cambridge Systematics

Transit Service Overview

- Existing Services
- Improvement Options

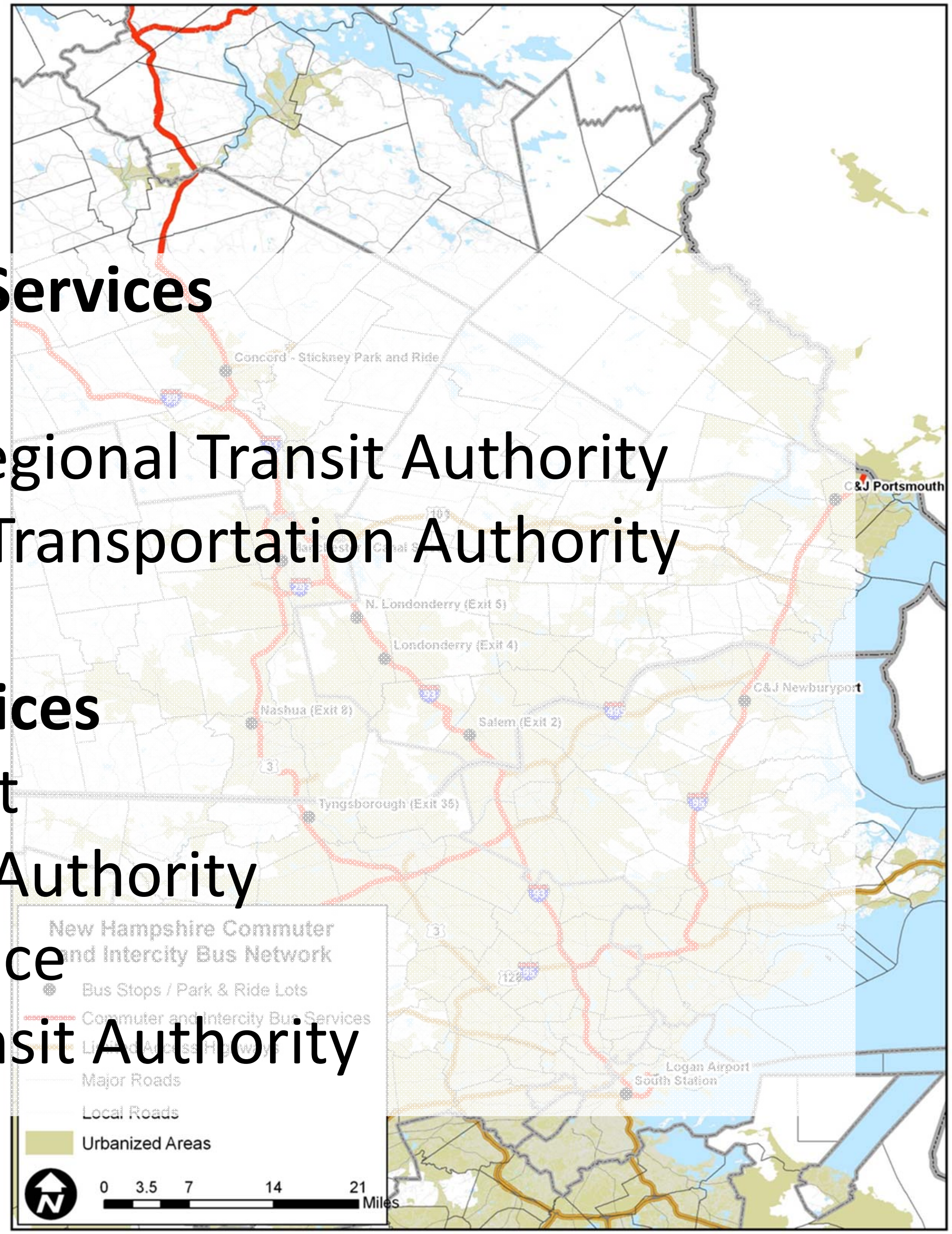
Existing Services

Corridor Express Bus Services

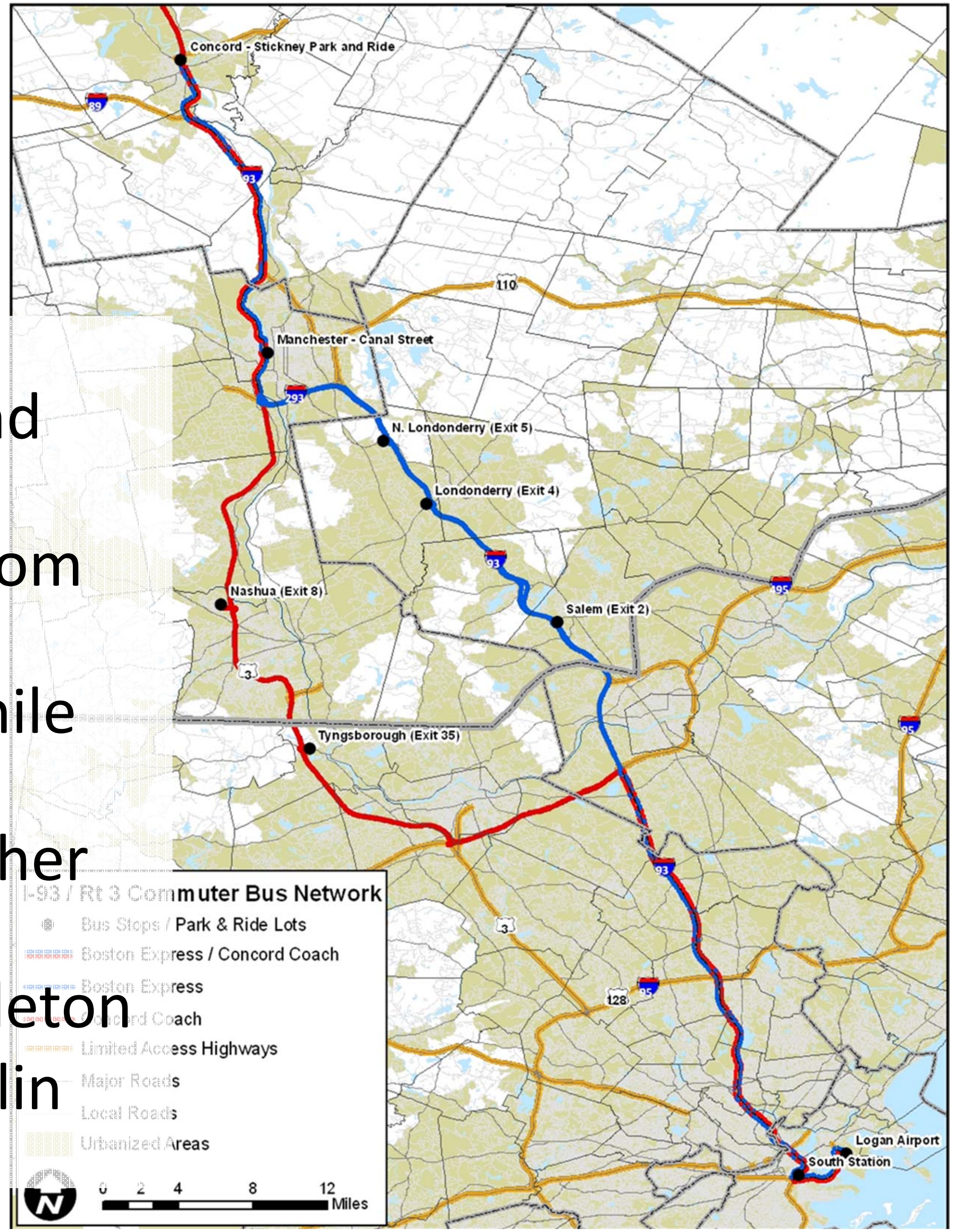
- Concord Coach
- Merrimack Valley Regional Transit Authority
- Massachusetts Bay Transportation Authority
- Boston Express

Local Supporting Services

- Concord Area Transit
- Manchester Transit Authority
- Nashua Transit Service
- Lowell Regional Transit Authority



- 22 weekday trips between Concord and South Station
- 80 to 110 minutes from Concord to Boston
- $0.21 to $0.22 per mile from Concord
- Limited service to other intermediate stops
- 4 trips extend to Littleton
- 2 trips extend to Berlin



80 Weekday Bus Trips

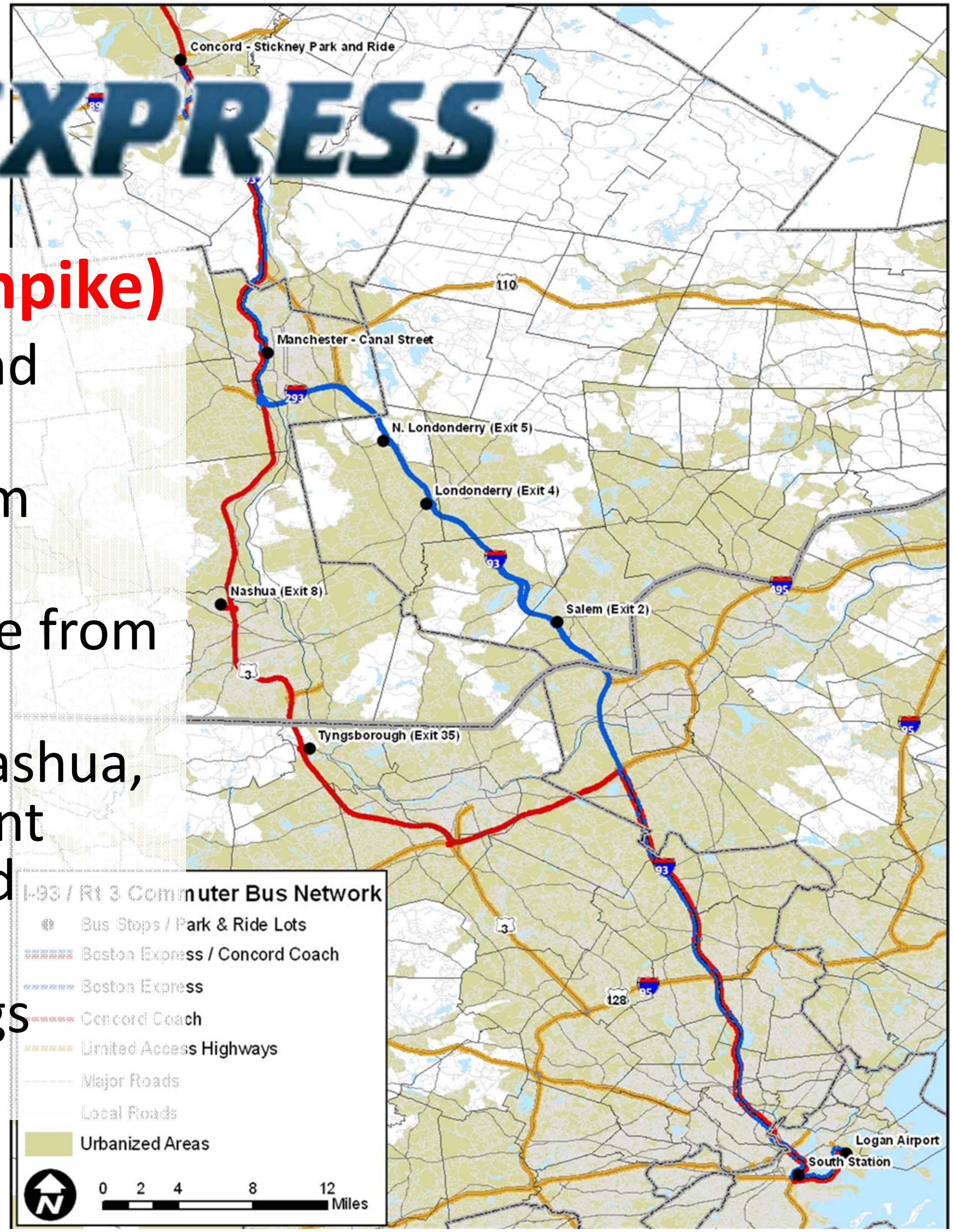
1,200 Weekday Boardings

- **Manchester**
- **Nashua**
- **Londonderry**
- **Salem**
- **Tyngsboro (MA)**

BOSTON EXPRESS

Nashua (Everett Turnpike)

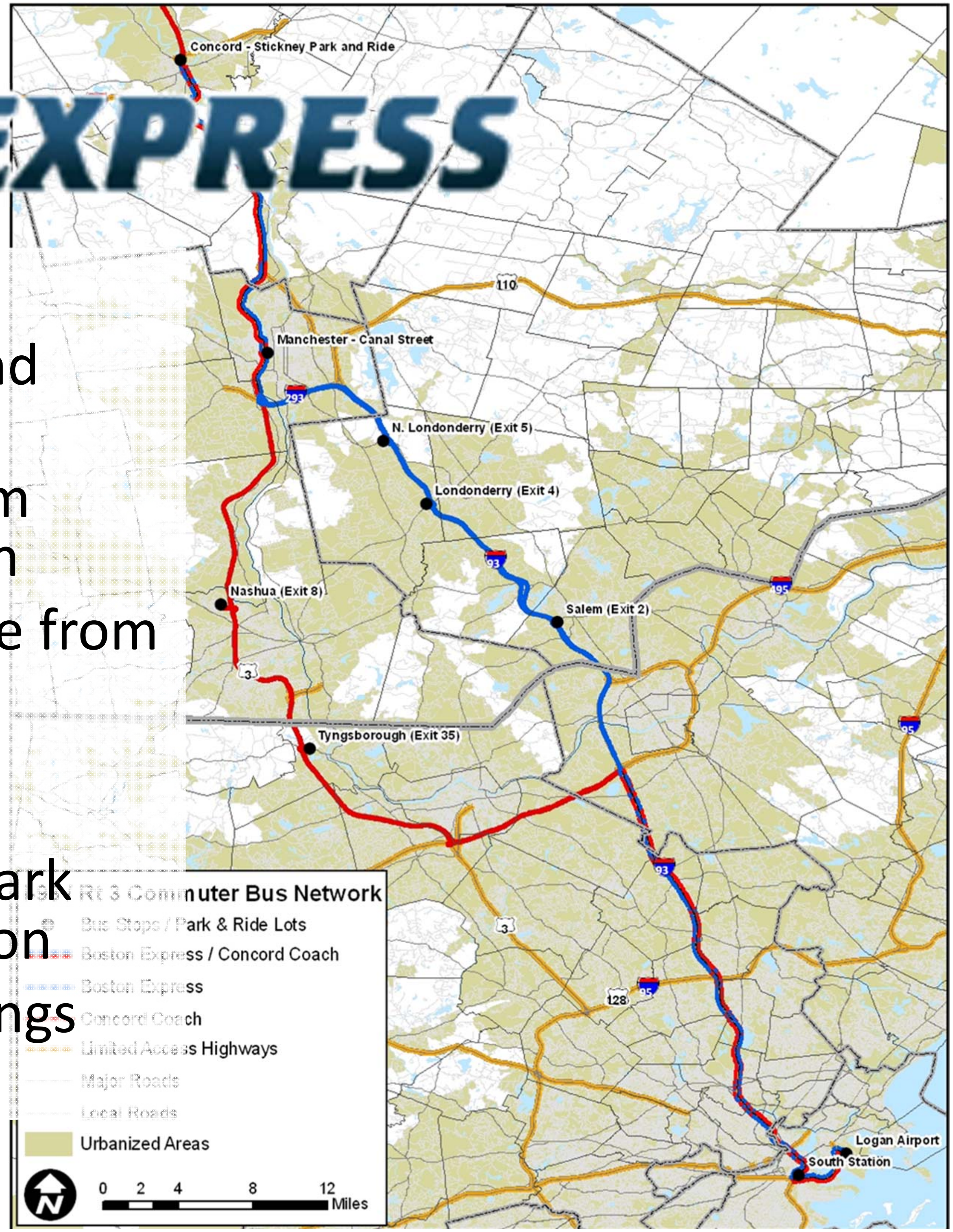
- 24 weekday trips to and from South Station
- 65 to 105 minutes from Nashua to Boston
- $0.16 to $0.25 per mile from Nashua
- Serves Manchester, Nashua, Tyngsboro, Government Center, Park Street and South Station
- 600 weekday boardings



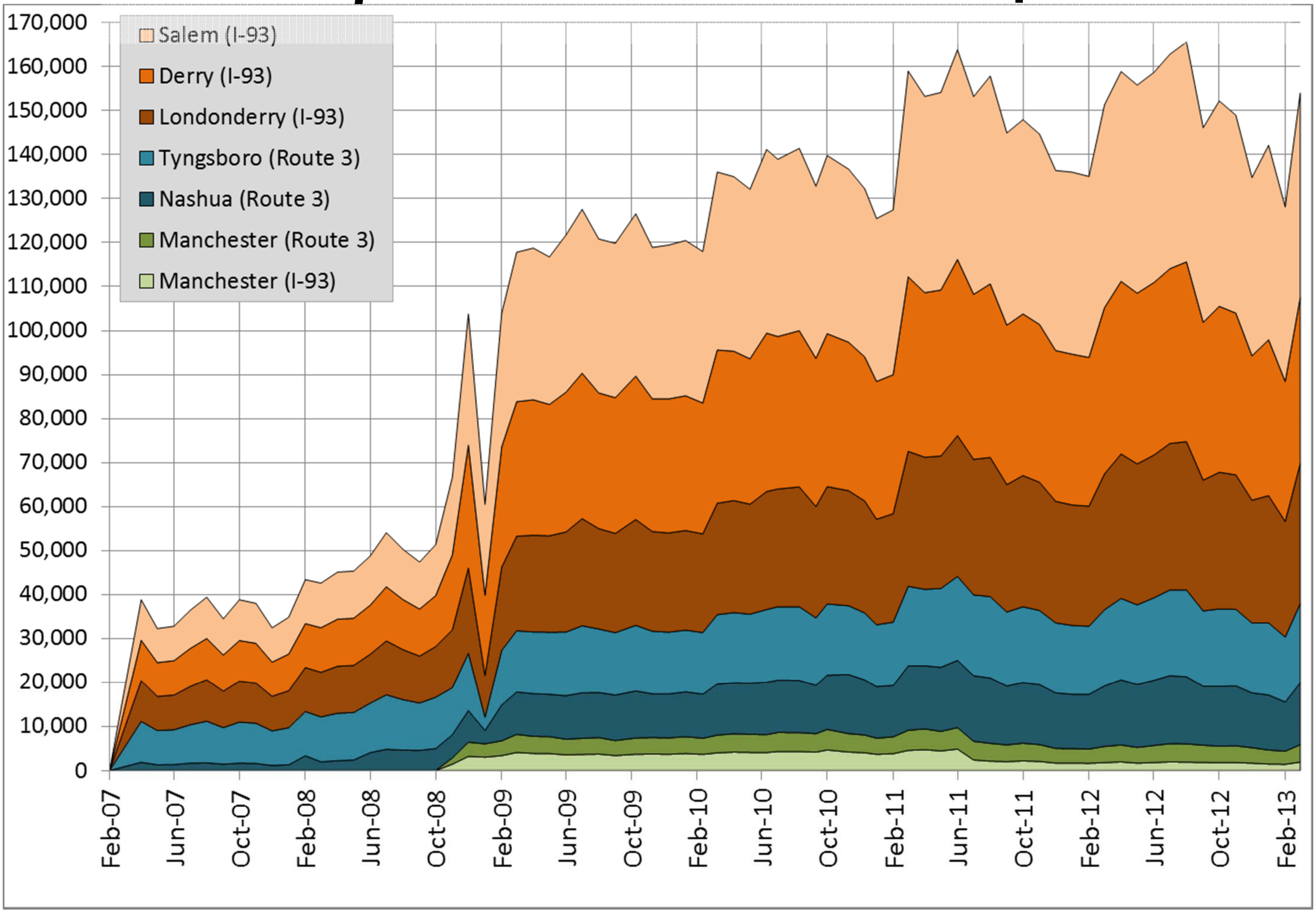
BOSTON EXPRESS

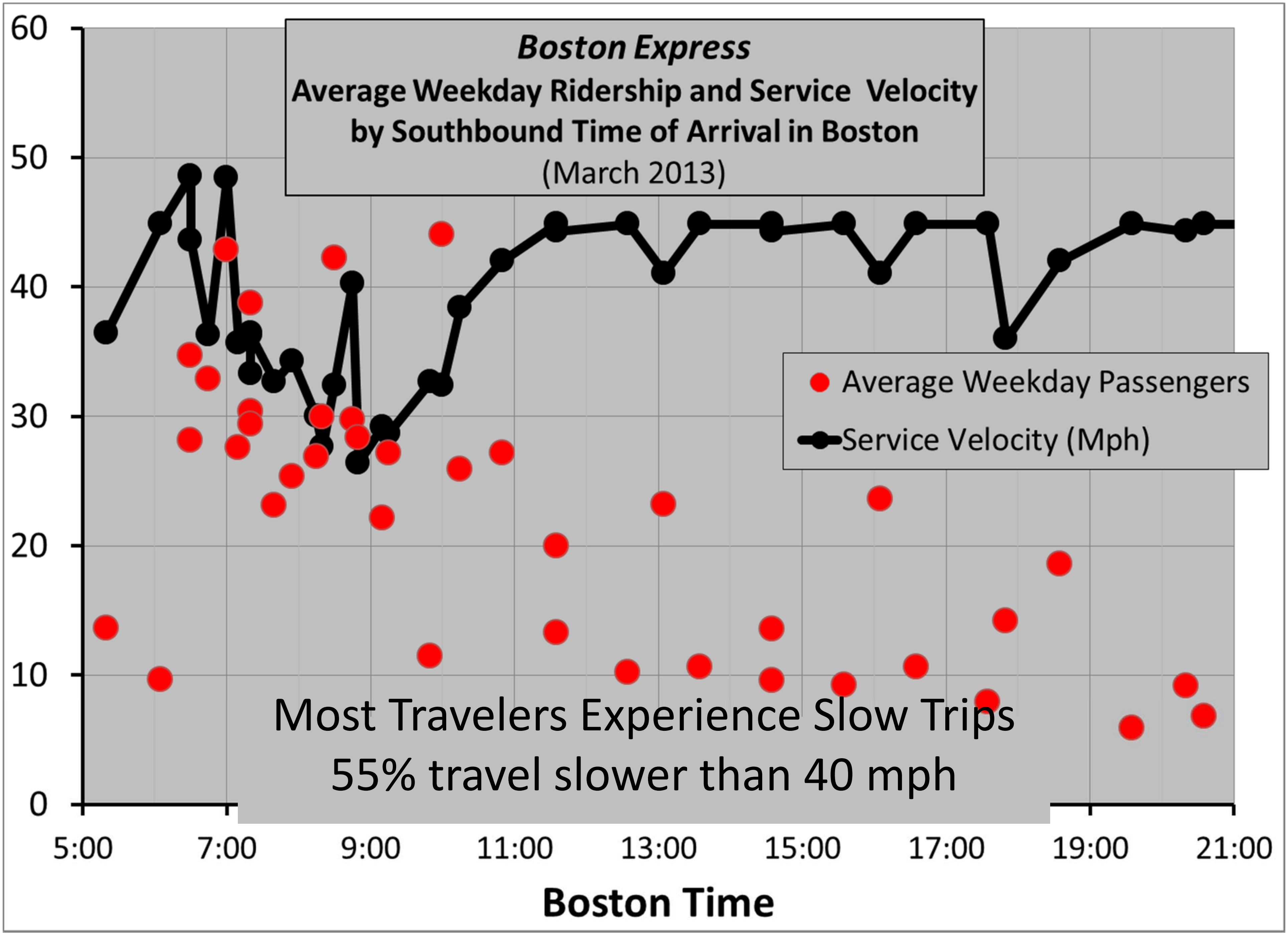
I-93 Service

- 56 weekday trips to and from South Station
- 65 to 100 minutes from Londonderry to Boston
- $0.18 to $0.25 per mile from Londonderry
- Serves Manchester (9), Londonderry. Salem, Government Center, Park Street and South Station
- 1,200 weekday boardings



Boston Express: Six Years of Ridership Growth





Boston Express
Average Weekday Ridership and Service Velocity
by Southbound Time of Arrival in Boston
(March 2013)
Average Weekday Passengers
Service Velocity (Mph)
Most Travelers Experience Slow Trips
55% travel slower than 40 mph
0
10
20
30
40
50
60
5:00
7:00
9:00
11:00
13:00
15:00
17:00
19:00
21:00
Boston Time

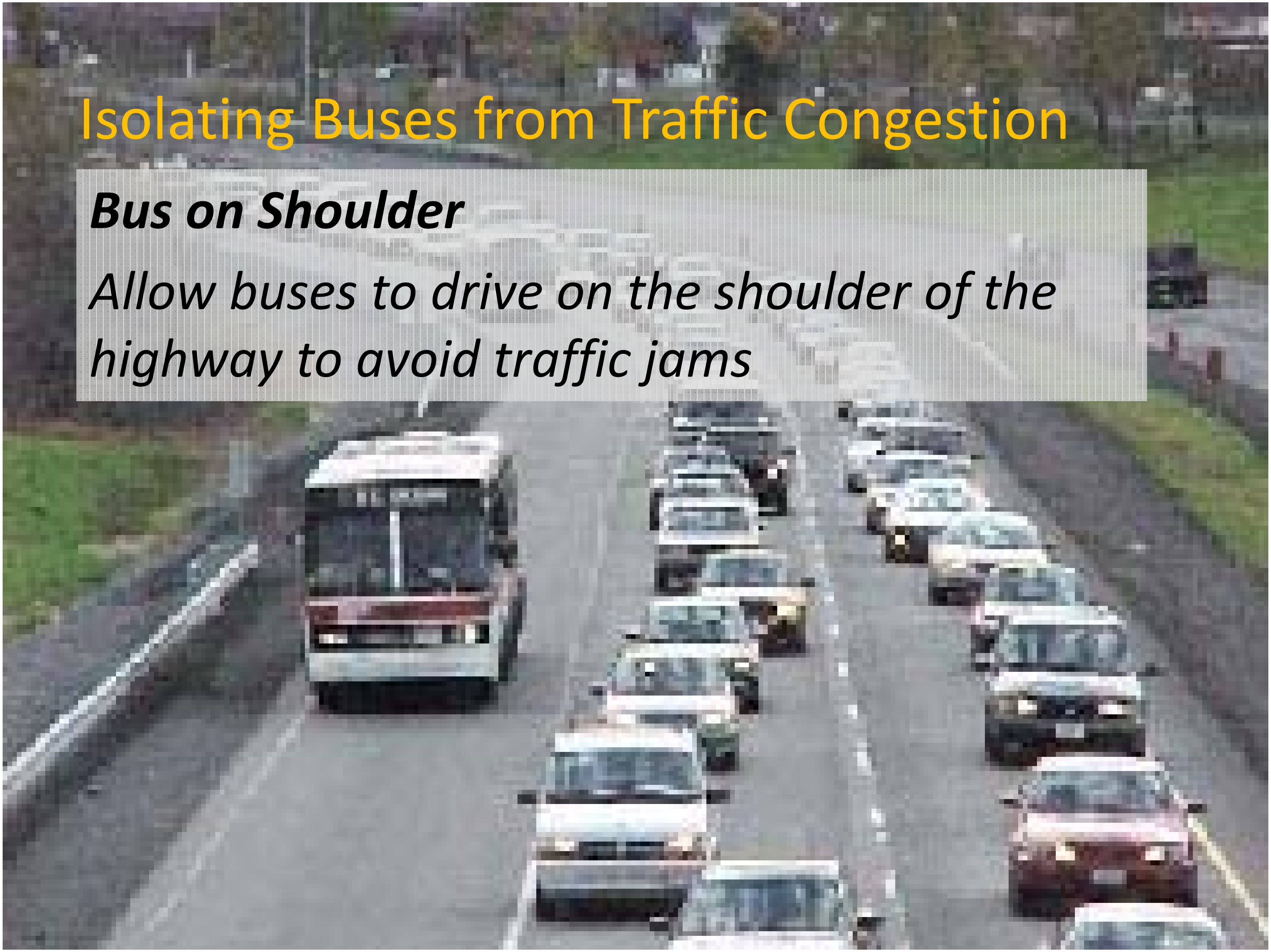
What can be done?

1. Isolate buses from traffic congestion
2. Exploit an alternative route that is free of traffic

Isolating Buses from Traffic Congestion

Bus on Shoulder

Allow buses to drive on the shoulder of the highway to avoid traffic jams



Buses on Shoulder

Bus on shoulder operation allows buses to use the shoulders of selected freeways during periods of congestion to bypass traffic, maintain schedules and enhance velocity

Bus on Shoulder (BoS)

Bus on shoulder is practiced in 11 US states including
CA, DE, FL, GA, IL, KS, MD, MN, NC, NJ, OH, VA, and WS
Minneapolis has >300 miles of BoS.
MassDOT and MVRPC are both evaluating BoS for I-93.

Exploiting a traffic-free route

Commuter Rail

Uses conventional railway tracks to offer local passenger service in urban areas

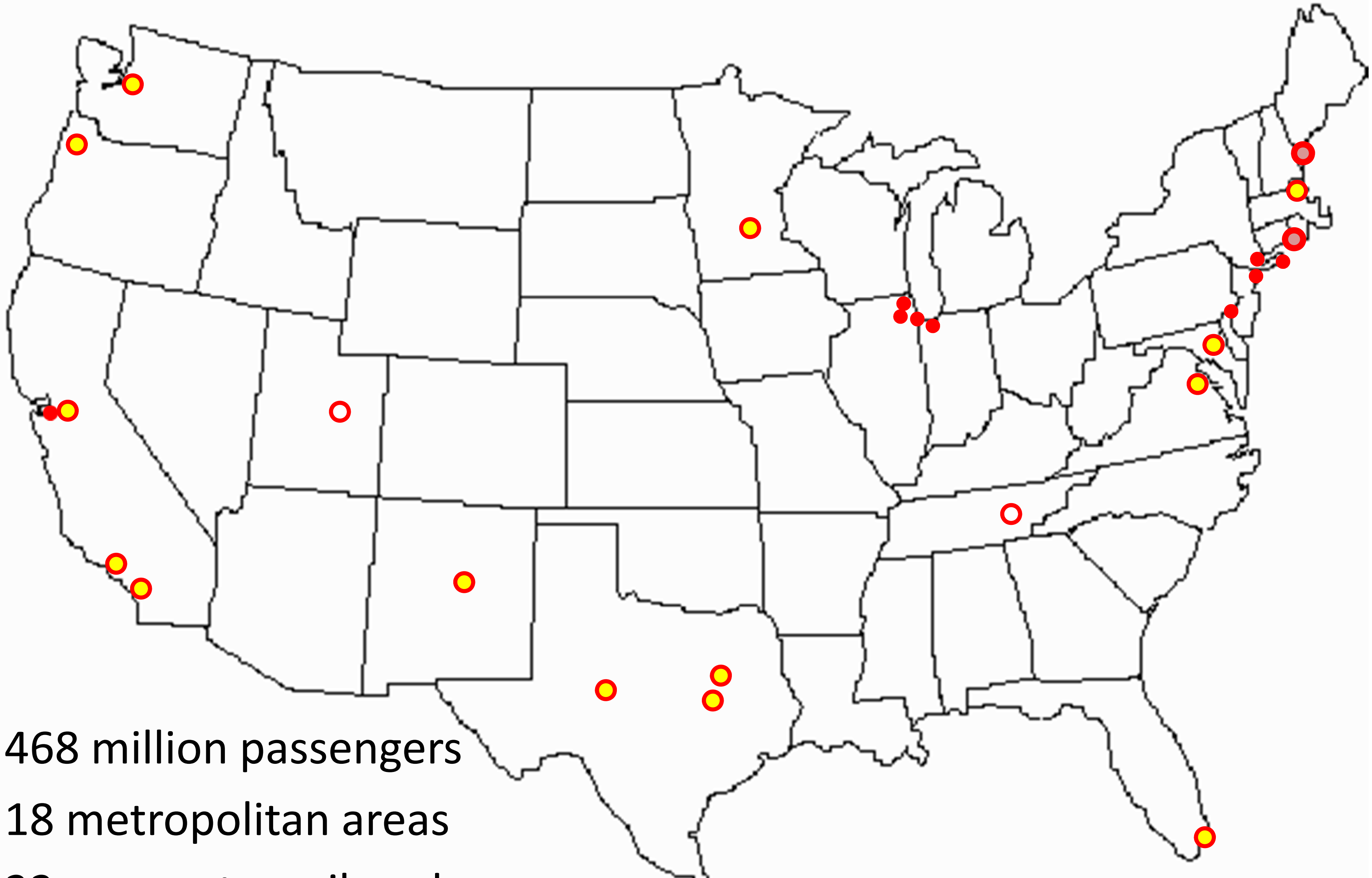
Fastest Growing Transit Mode in the USA

- 22 commuter and regional railroads
- 18 metropolitan areas
- 468 million annual passengers
- 24 mile average passenger trip length
- 56 million annual train miles
- 7,900 track miles
- 6,800 vehicles

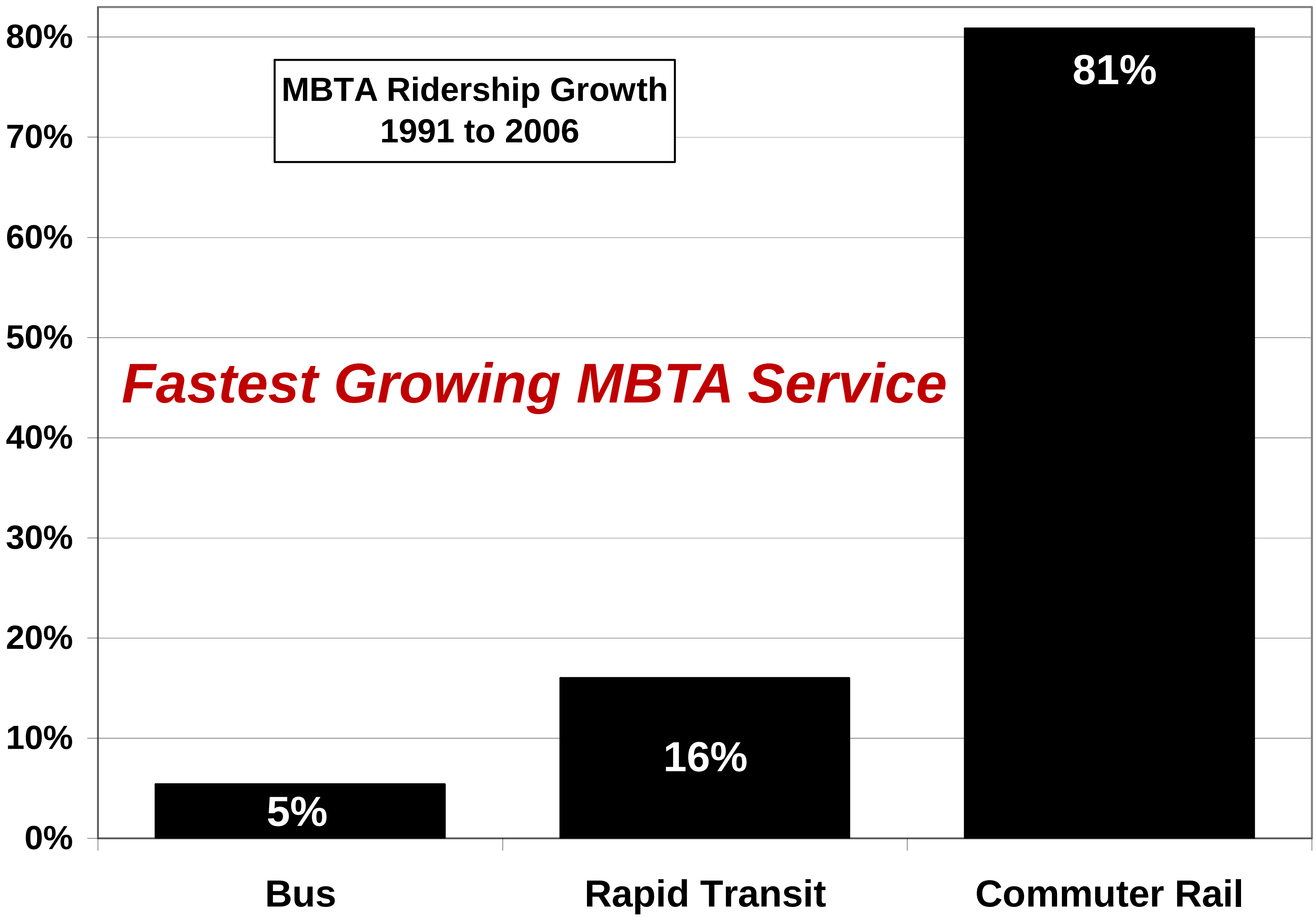
US Commuter Railroads: 1980

- 280 million passengers
- 8 metropolitan areas
- ~14 commuter railroads

US Commuter Railroads: 2012



- 468 million passengers
- 18 metropolitan areas
- 22 commuter railroads

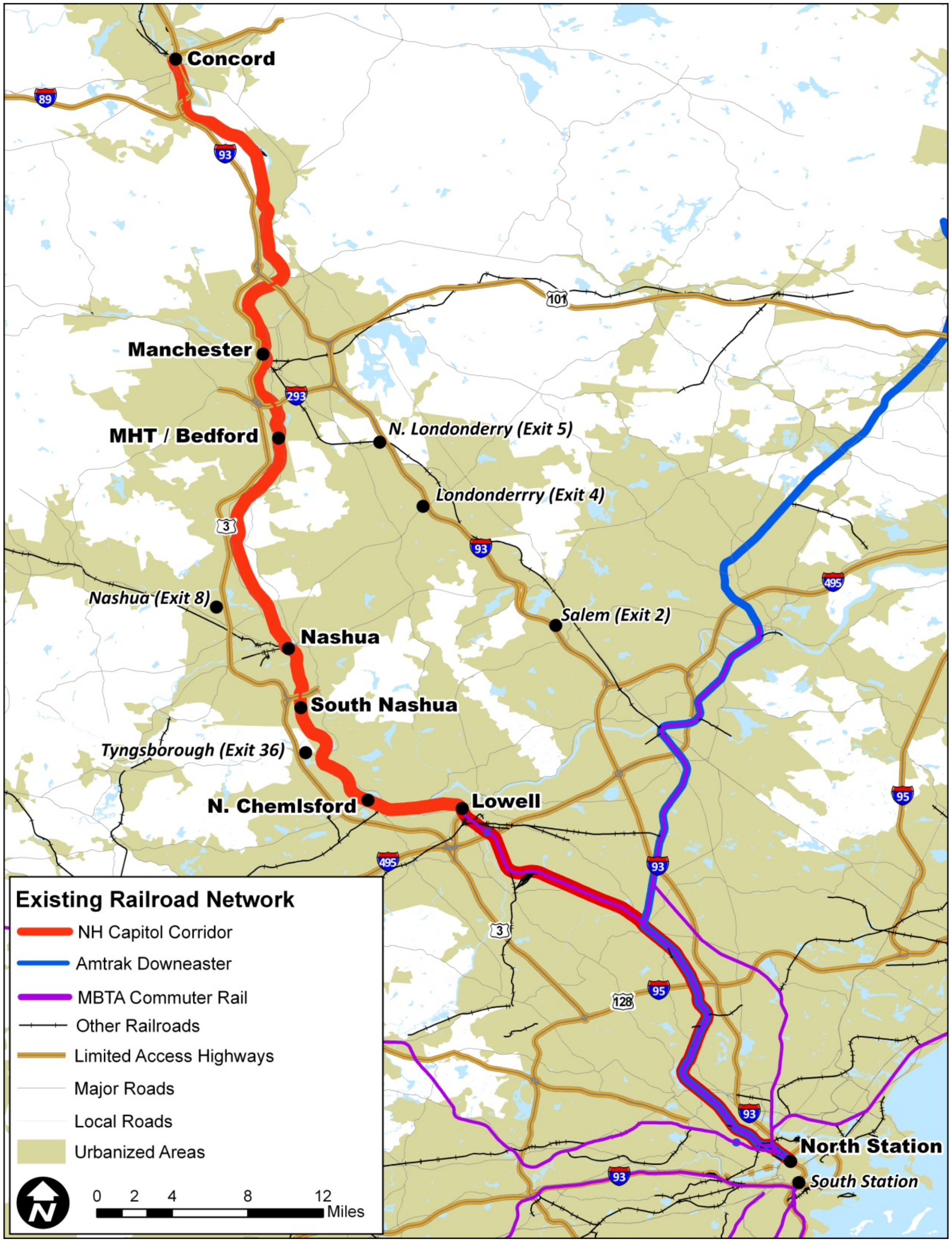


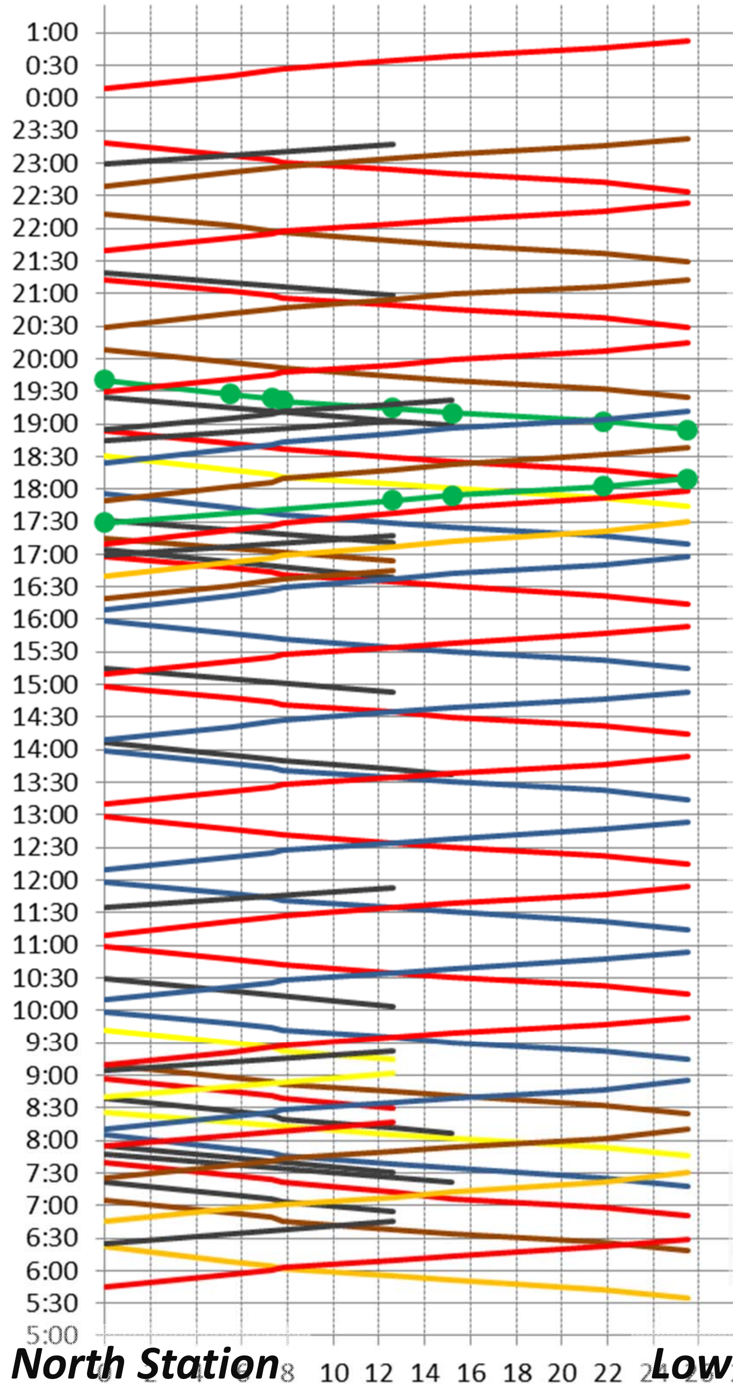
MBTA Ridership Growth
1991 to 2006
Fastest Growing MBTA Service
80%
70%
60%
50%
40%
30%
20%
10%
0%
5%
16%
81%
Bus
Rapid Transit
Commuter Rail

MBTA Commuter Rail: Thirty Five Years of Expansion

Service Options

- Six Commuter Rail
- Three Intercity Rail
- Two Express Bus





MBTA Lowell service requires

- **4 train sets in the morning**
- **5 train sets in the afternoon**
- **45 to 49 minutes from Lowell to Boston**
- **70 mph Max Speed between Lowell to Boston**
- **~150 daily deadhead train miles**
- **Limited freight service south to Boston**
- **10+ freight trains per day Lowell-Chelmsford**
- **<4 freight trains per day Chelmsford to Concord**

New Hampshire Main Line:
Current Schedule of Weekday Passenger Trains

Conceptual Stations

Station	Miles to Boston	Max Time to Boston	Min Time to Boston
Concord	73.4	1:54	1:46
Manchester	55.5	1:32	1:25
MHT / Bedford	50.1	1:24	1:17
Nashua	38.8	1:14	1:02
South Nashua	35.5	1:08	0:54
North Chelmsford	29.1	0:58	0:44

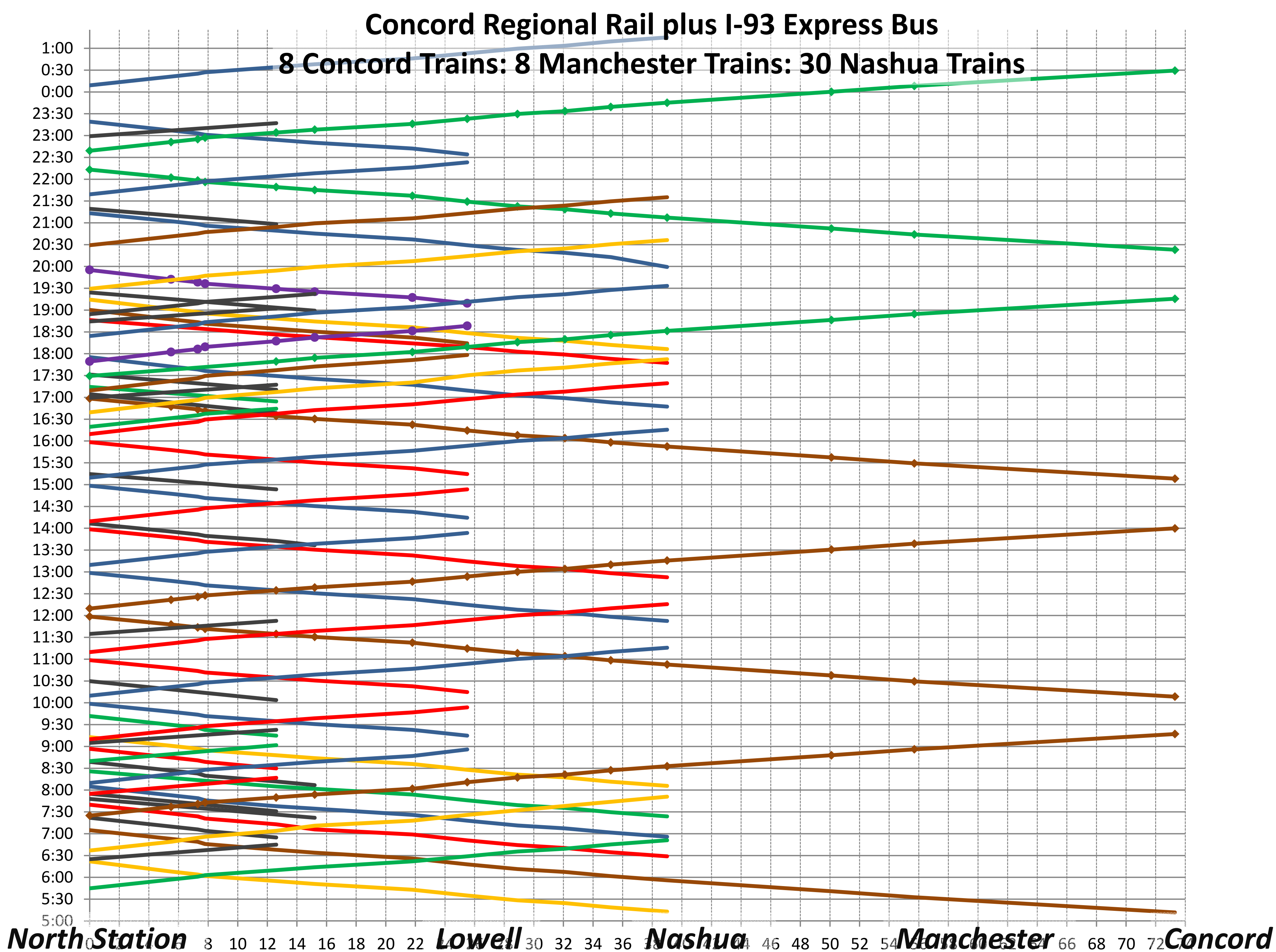
Commuter Service Options

Assumptions and Paradigms

- Extend existing MBTA service into New Hampshire
- Eliminate Boston Express Everett Turnpike Service
- I-93 Boston Express Service generally unchanged
- Coordinated local bus service for some options
- Generally transparent to existing MBTA customers
- No impacts on existing Amtrak services
- No upgrades to infrastructure south of Lowell
- Eliminates 6 weekday MBTA deadheads
- Upgrades to rail infrastructure north of Lowell including
  - Upgrades to existing track to FRA Class 3 providing for maximum passenger train speeds of 60 mph .
  - Commuter Option 2 requires FRA Class 4 track for 70 mph speeds

Commuter Service Options

Options	Weekday Revenue Trains				Route Miles	Track Miles	Station	Wkday Train Miles
	Lowell	Nashua	Manch	Concord				
Base Service	44	0	0	0	26	53	8	1,452
6. Nashua Minimum	44	16	0	0	39	80	11	1,566
5. Nashua Commuter	44	34	0	0	39	80	11	1,888
4. Manch Commuter	44	30	20	0	56	98	13	2,091
3. Manch Regional	44	34	16	0	56	98	13	2,068
2. Concord Commuter	44	26	22	18	73	115	14	2,374
1. Concord Regional	44	30	8	8	73	115	14	1,957


Concord Regional Rail plus I-93 Express Bus
8 Concord Trains: 8 Manchester Trains: 30 Nashua Trains
1:00
0:30
0:00
23:30
23:00
22:30
22:00
21:30
21:00
20:30
20:00
19:30
19:00
18:30
18:00
17:30
17:00
16:30
16:00
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14:30
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10:30
10:00
9:30
9:00
8:30
8:00
7:30
7:00
6:30
6:00
5:30
5:00
North Station
Lowell
Nashua
Manchester
Concord
8
10
12
14
16
18
20
22
30
32
34
36
46
48
50
52
66
68
70

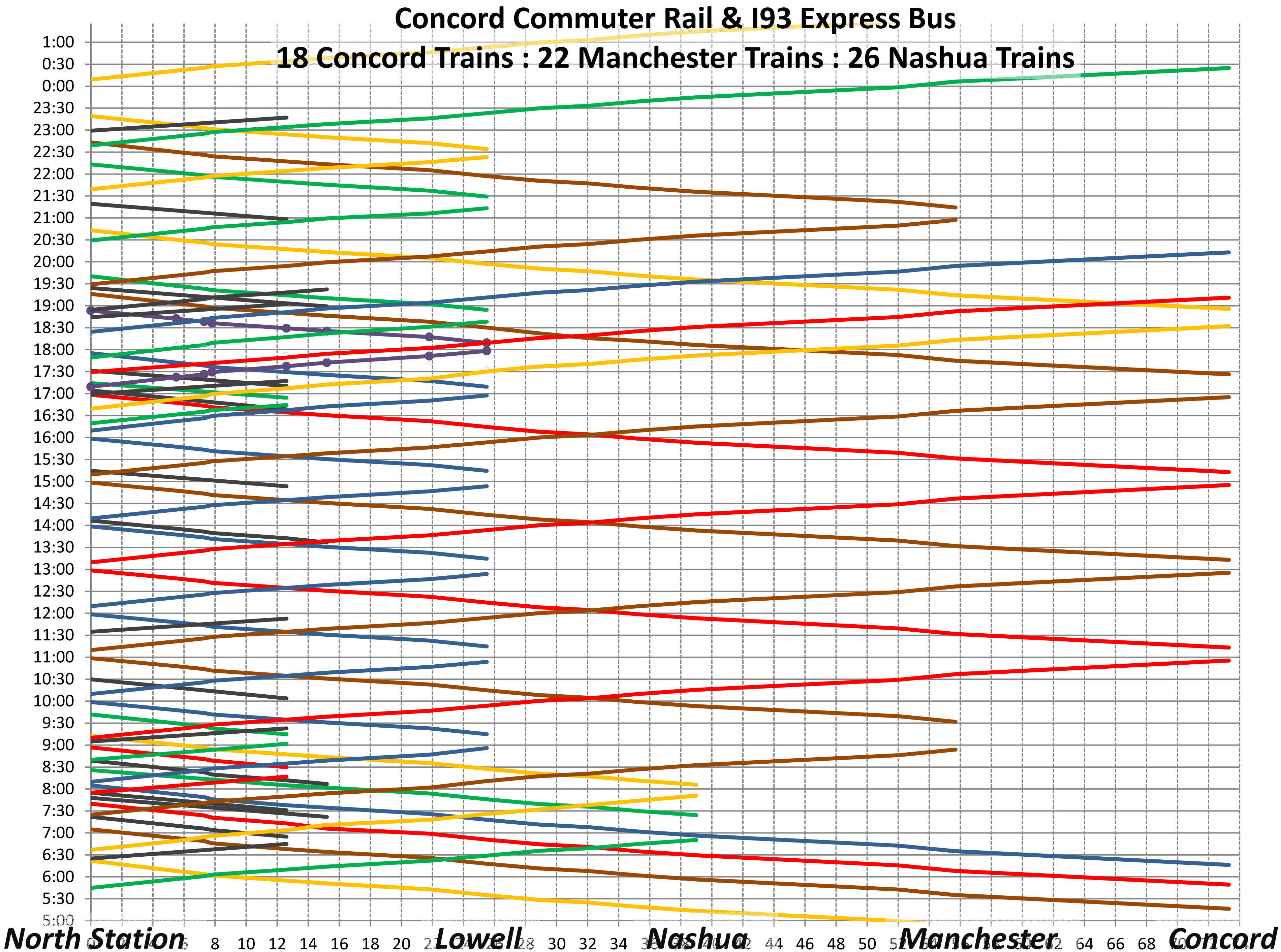
Concord Regional Rail & I93 Express Bus

Route Miles	73
Stations	14
Concord Trains	8
Manchester Trains	8
Nashua Trains	30
Weekday Train Miles	1,957
% Increased Train Miles	35%
Annual O&M Cost	$9-13
Capital Cost (millions)	$205-245

Eliminates BX service to Nashua and Tyngsboro

Some Nashua trips extended to Manchester with bus connections

Possible connections in Concord to private bus services to North Country



Concord Commuter Rail & I93 Express Bus
18 Concord Trains : 22 Manchester Trains : 26 Nashua Trains
1:00
0:30
0:00
23:30
23:00
22:30
22:00
21:30
21:00
20:30
20:00
19:30
19:00
18:30
18:00
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9:30
9:00
8:30
8:00
7:30
7:00
6:30
6:00
5:30
5:00
North Station
Lowell
Nashua
Manchester
Concord
8
10
12
14
16
18
20
30
32
34
46
48
50
64
66
68

Concord Commuter and I-93 Express Bus

Route Miles	73
Stations	14
Concord Trains	18
Manchester Trains	22
Nashua Trains	26
Weekday Train Miles	2,374
% Increased Train Miles	64%
Annual O&M Cost	$11-15
Capital Cost (millions)	$185-225

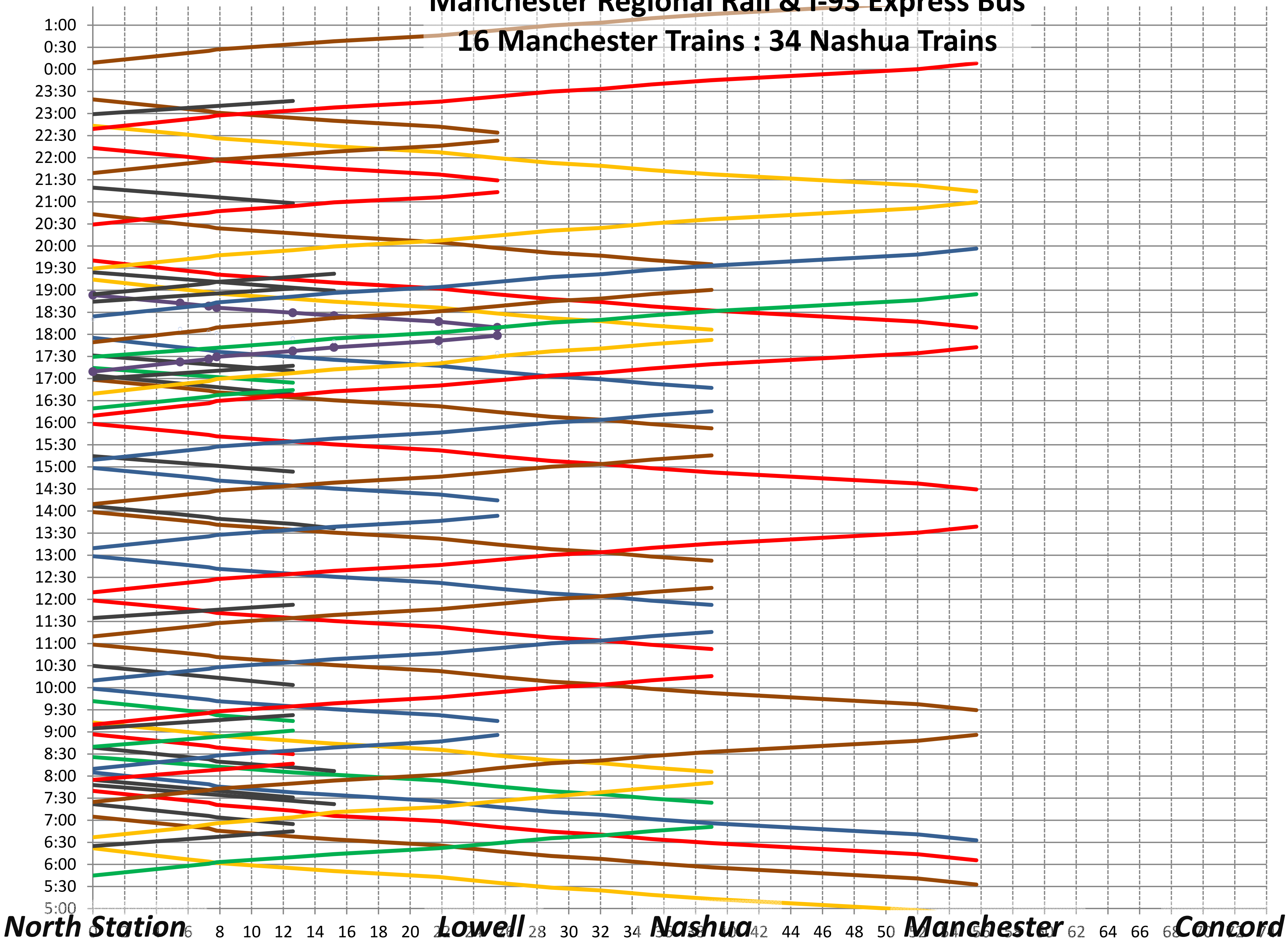
Eliminates BX service to Nashua and Tyngsboro

Up to six trips extended with connecting bus service

Possible connections in Concord to private bus services for North Country

Manchester Regional Rail & I-93 Express Bus

16 Manchester Trains : 34 Nashua Trains



Manchester Regional Rail & I-93 Express Bus

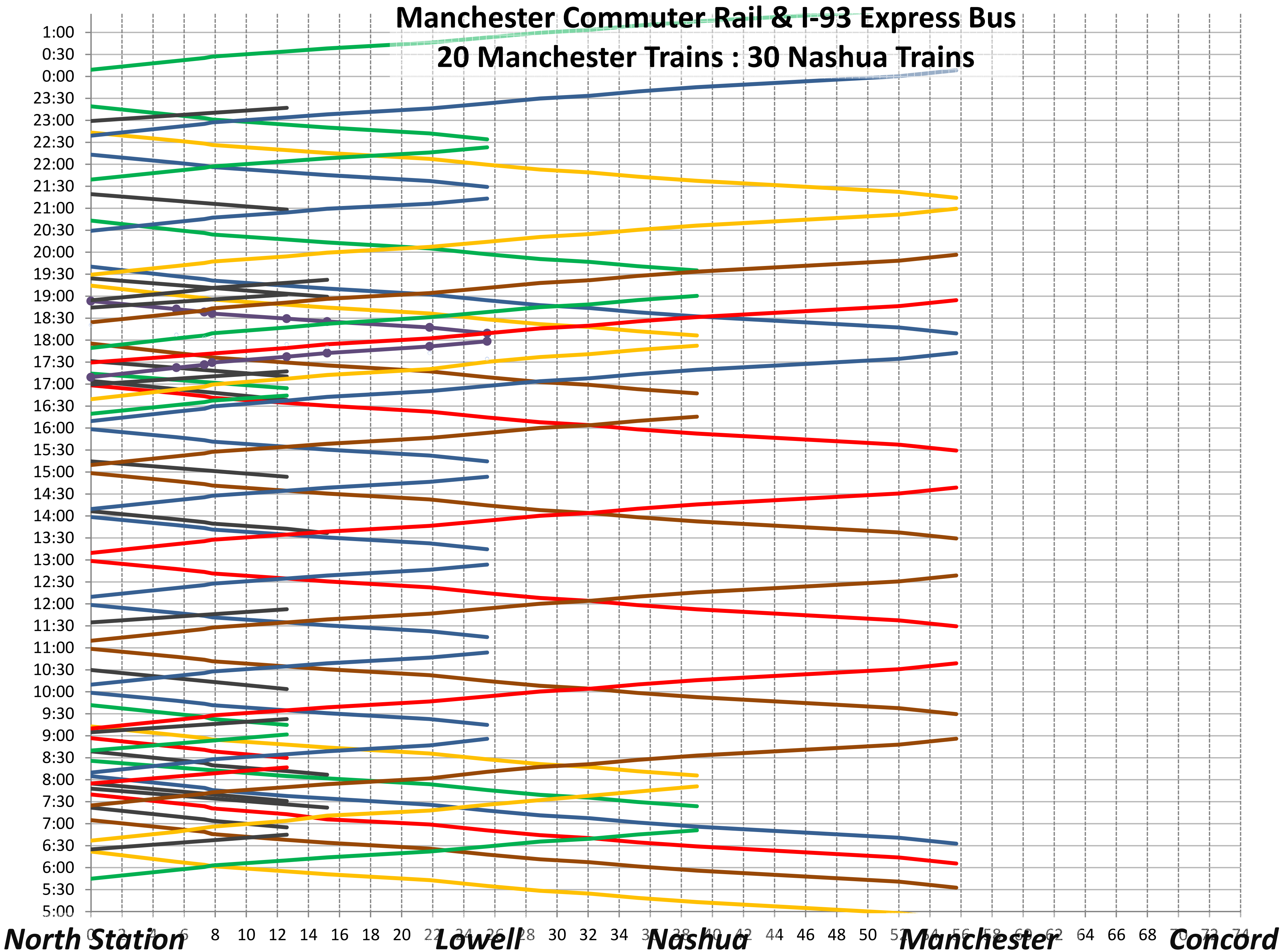
Massachusetts Bay Transportation Authority

Route Miles	56
Stations	13
Concord Trains	0
Manchester Trains	16
Nashua Trains	34
Weekday Train Miles	2,068
% Increased Train Miles	42%
Annual O&M Cost	$8-12
Capital Cost (millions)	$145-185

Eliminates BX service to Nashua and Tyngsboro

Several Nashua trips extended to Manchester and one Lowell trip extended to Nashua via bus connections

Possible connections in Manchester to private bus services to North Country


Manchester Commuter Rail & I-93 Express Bus
20 Manchester Trains : 30 Nashua Trains
1:00
0:30
0:00
23:30
23:00
22:30
22:00
21:30
21:00
20:30
20:00
19:30
19:00
18:30
18:00
17:30
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10:30
10:00
9:30
9:00
8:30
8:00
7:30
7:00
6:30
6:00
5:30
5:00
North Station
Lowell
Nashua
Manchester
Concord

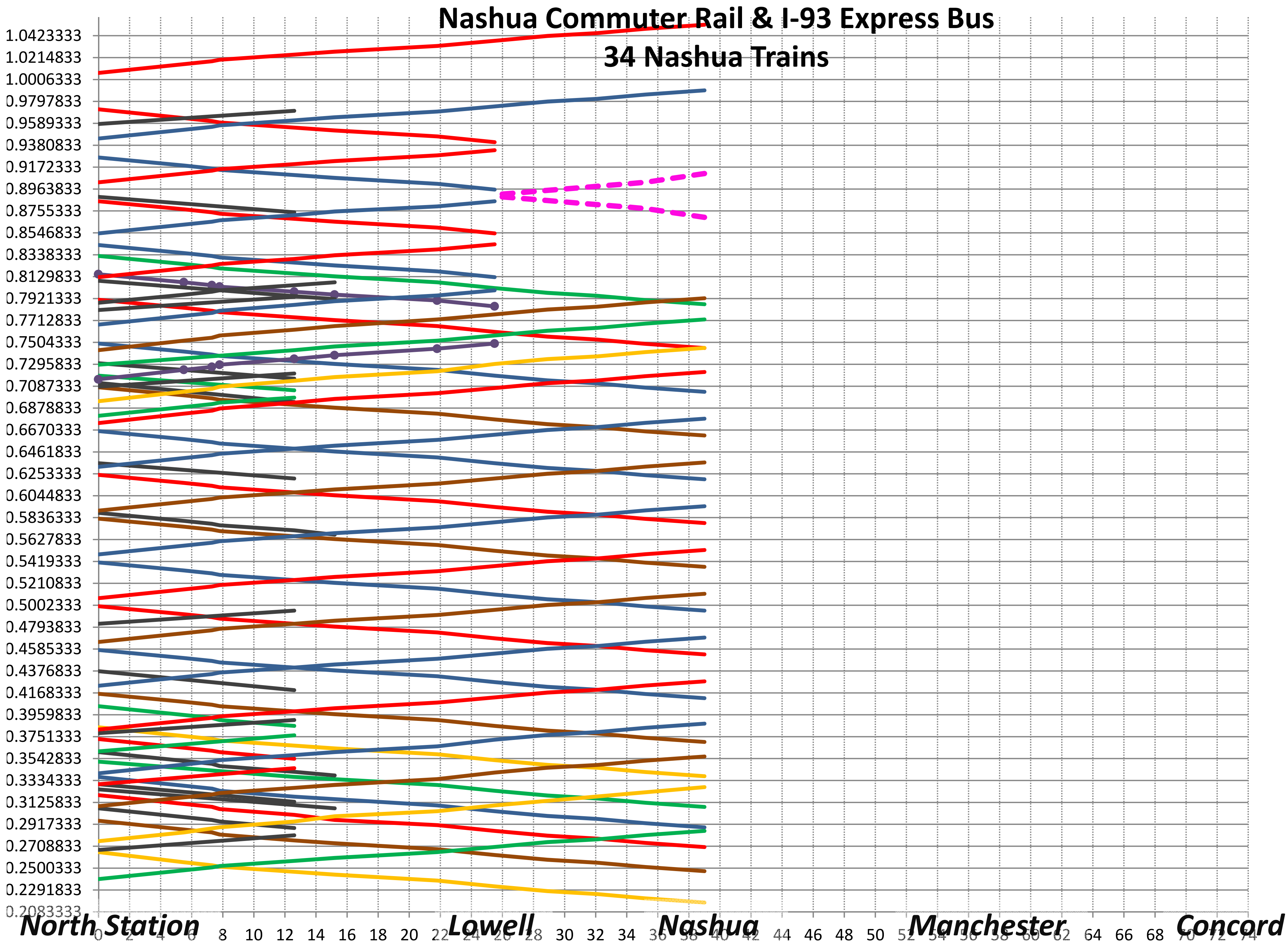
Manchester Commuter Rail & I-93 Express Bus

Route Miles	56
Stations	13
Concord Trains	0
Manchester Trains	20
Nashua Trains	30
Weekday Train Miles	2,091
% Increased Train Miles	44%
Annual O&M Cost	$8-12
Capital Cost (millions)	$145-185

Eliminates BX service to Nashua and Tyngsboro

Two Nashua trips extended to Manchester and one Lowell trip extended to Nashua via bus connections

Possible connections in Manchester to private bus services to North Country



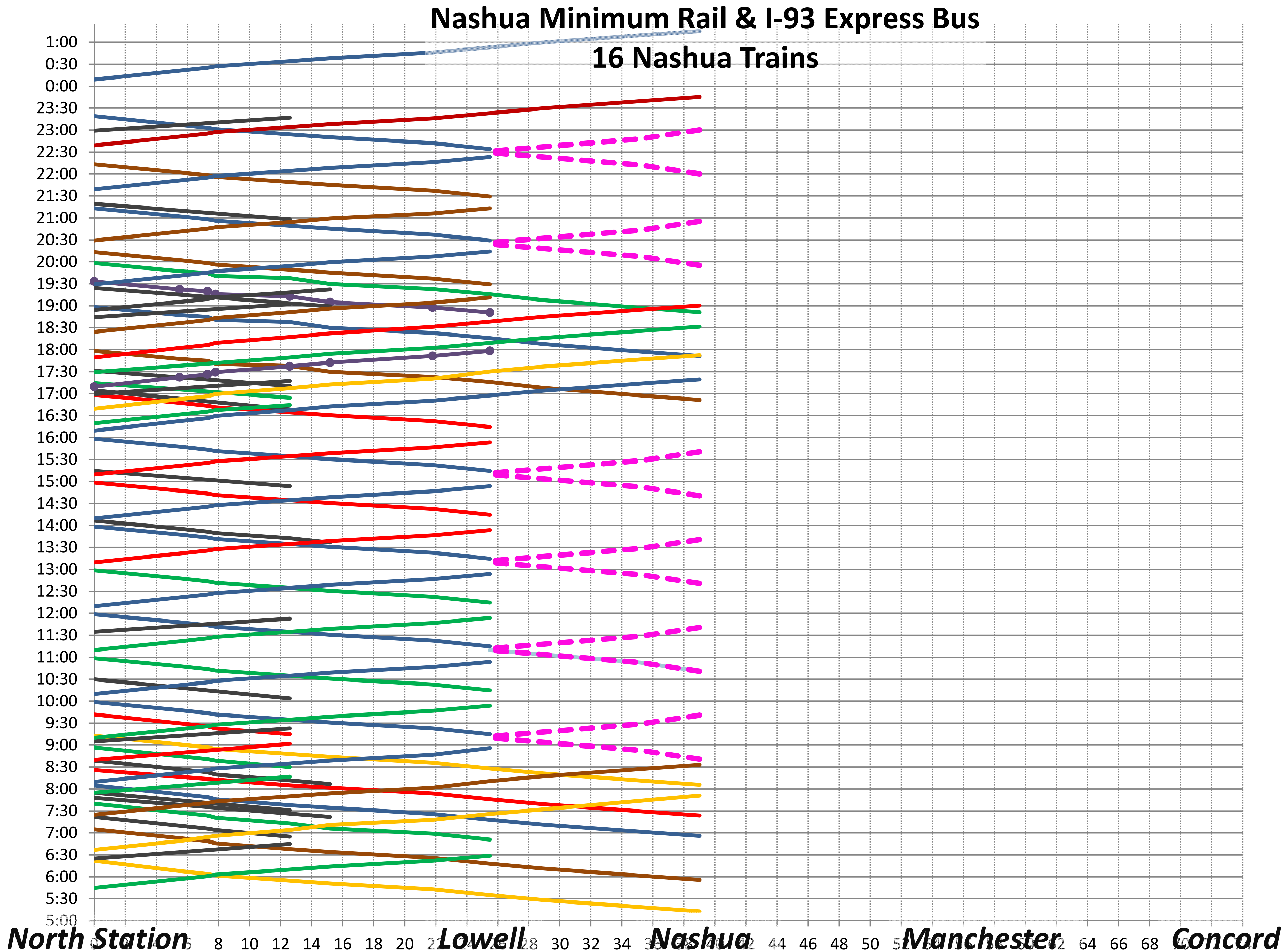
Nashua Commuter Rail & I-93 Express Bus
34 Nashua Trains
1.0423333
1.0214833
1.0006333
0.9797833
0.9589333
0.9380833
0.9172333
0.8963833
0.8755333
0.8546833
0.8338333
0.8129833
0.7921333
0.7712833
0.7504333
0.7295833
0.7087333
0.6878833
0.6670333
0.6461833
0.6253333
0.6044833
0.5836333
0.5627833
0.5419333
0.5210833
0.5002333
0.4793833
0.4585333
0.4376833
0.4168333
0.3959833
0.3751333
0.3542833
0.3334333
0.3125833
0.2917333
0.2708833
0.2500333
0.2291833
0.2083333
North Station
Lowell
Nashua
Manchester
Concord
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74

Nashua Commuter Service & I-93 Express Bus

Route Miles	39
Stations	11
Concord Trains	0
Manchester Trains	0
Nashua Trains	34
Weekday Train Miles	1,888
% Increased Train Miles	30%
Annual O&M Cost	$5-9
Capital Cost (millions)	$105-145

Eliminates BX service to Nashua and Tyngsboro

Two Lowell trips extended to Nashua and many opportunities to extend Nashua trips to Manchester via bus connections



Nashua Minimum Rail & I-93 Express Bus
16 Nashua Trains
1:00
0:30
0:00
23:30
23:00
22:30
22:00
21:30
21:00
20:30
20:00
19:30
19:00
18:30
18:00
17:30
17:00
16:30
16:00
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11:00
10:30
10:00
9:30
9:00
8:30
8:00
7:30
7:00
6:30
6:00
5:30
5:00
North Station
Lowell
Nashua
Manchester
Concord

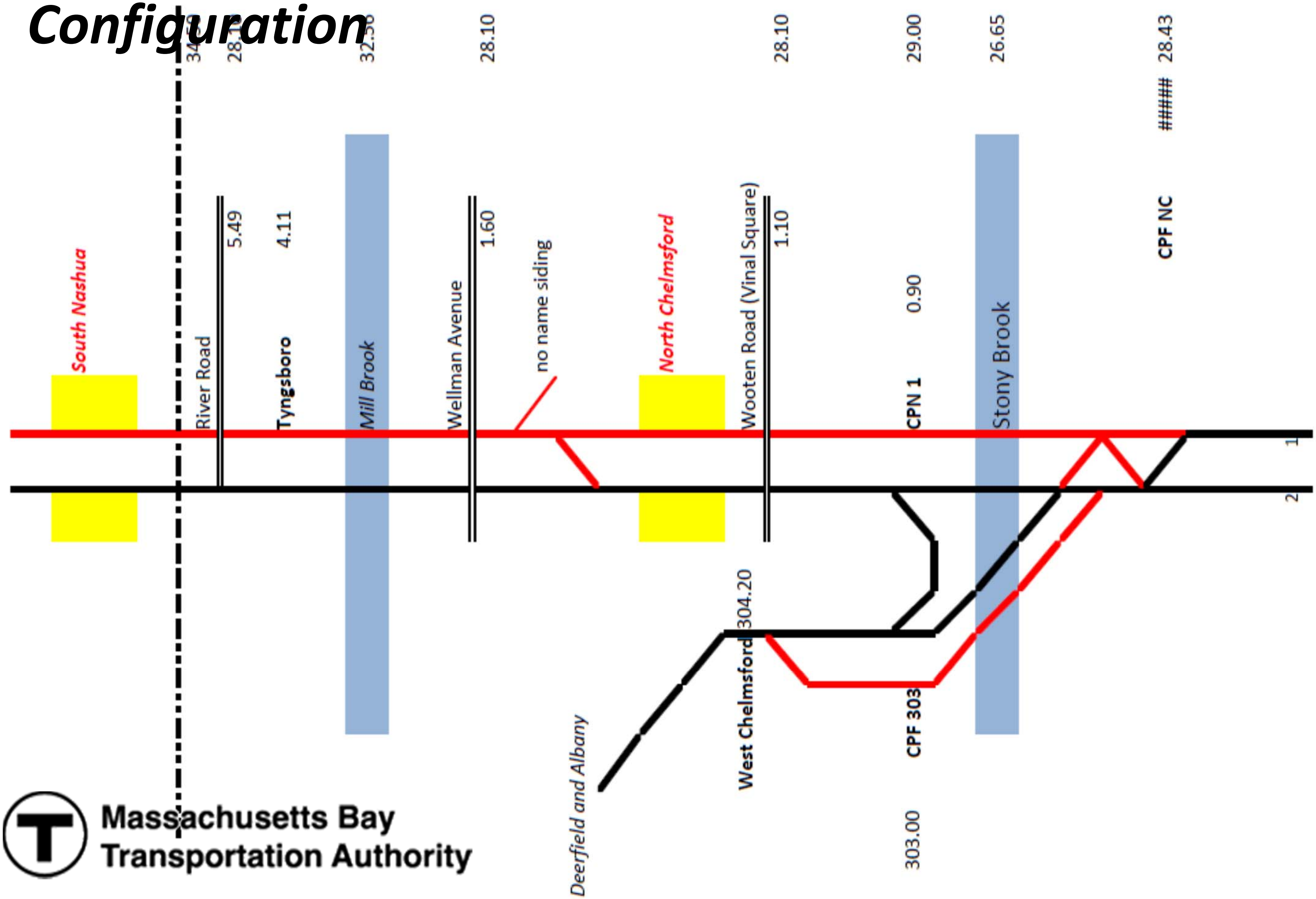
Nashua Minimum Rail & I-93 Express Bus

Route Miles	39
Stations	11
Concord Trains	0
Manchester Trains	0
Nashua Trains	16
Weekday Train Miles	1,566
% Increased Train Miles	8%
Annual O&M Cost	$5-7
Capital Cost (millions)	$105-145

Eliminates BX service to Nashua and Tyngsboro

Twelve Lowell trips extended to Nashua via local bus connection

Proposed Track Configuration



Massachusetts Bay Transportation Authority

Summary of Commuter Options

	Service Options					
	CR	**CC**	**MR**	**MC**	**NC**	**NM**
Route Miles	73	73	56	56	39	39
Stations	14	14	13	13	11	11
Concord Trains	8	18	0	0	0	0
Manchester Trains	8	22	16	20	0	0
Nashua Trains	30	26	34	30	34	16
Weekday Train Miles	1,957	2,374	2,068	2,091	1,888	1,566
% Increased Train Miles	35%	64%	42%	44%	30%	8%
Annual O&M Cost	$9-13	$11-15	$8-12	$8-12	$5-9	$5-7
Capital Cost (millions)	$205 $245	$185 $225	$145 $185	$145 $85	$105 $145	$105 $145

Massachusetts Bay
Transportation Authority

Intercity Service Options

Assumptions and Paradigms

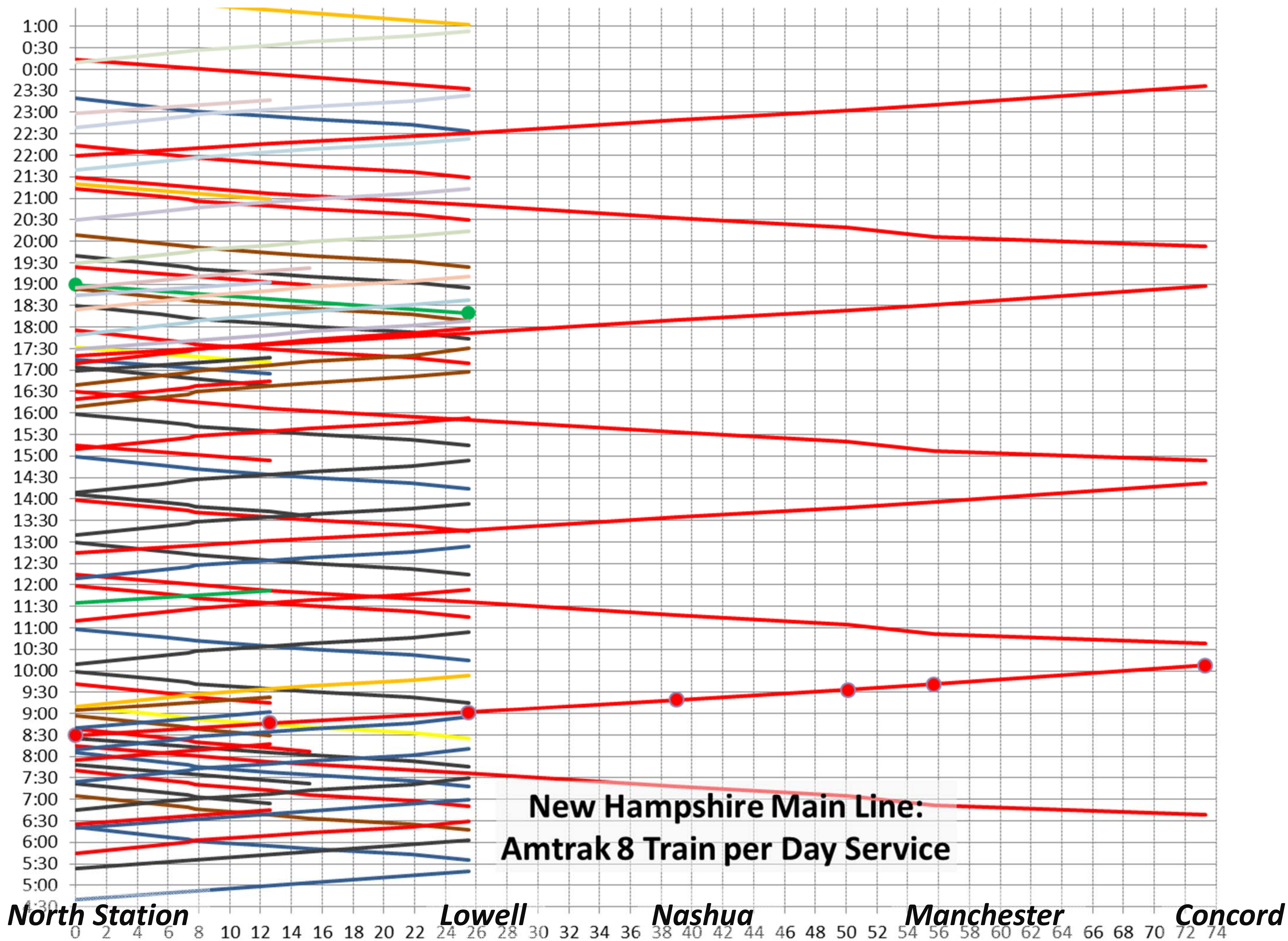
- Overlays Amtrak service on existing service into North Station
- Completely transparent to existing MBTA customers
- Possible changes to BX Manchester services
- No upgrades to infrastructure south of Lowell
- Upgrades to rail infrastructure north of Lowell including
  - FRA Class 4 track for 70 mph speeds
  - Industrial tracks for local freight services

Intercity Service Options

Options	Weekday Revenue Trains			Route Miles	Stations	Wkday Train Miles
	Nashua	Manchester	Concord			
Base Service	0	0	0	26	8	1,452
1. Amtrak 8	8	8	8	73	12	2,038
2 Amtrak 12	12	12	12	73	12	2,332
3. Amtrak 18	18	18	18	73	12	2,771

Conceptual Intercity Stations

Stations	Miles to Boston	Intercity Time to Boston	Min CR Time to Boston	Max CR Time to Boston
Concord	73.4	1:36	1:46	1:54
Manchester	55.5	1:22	1:25	1:32
MHT / Bedford	50.1	1:09	1:17	1:24
Nashua	38.8	0:56	1:02	1:14
Lowell	25.5	0:38	0:44	0:49



New Hampshire Main Line:
Amtrak 8 Train per Day Service
North Station
Lowell
Nashua
Manchester
Concord

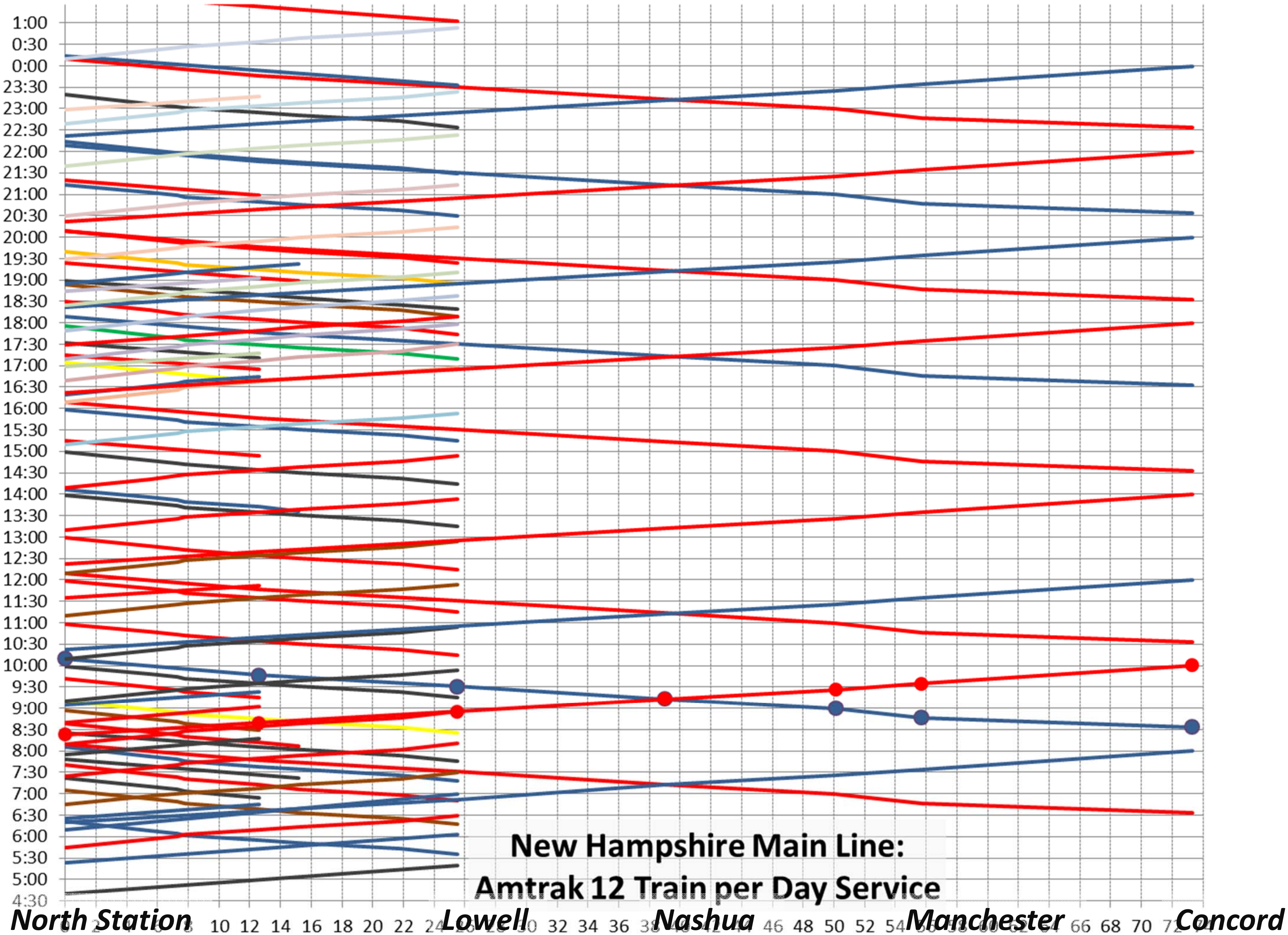
Amtrak 8

Route Miles	73
Stations	11
Concord Trains	8
Manchester Trains	8
Nashua Trains	8
Weekday Train Miles	2,038
% Increased Train Miles	40%
Annual O&M Cost	$7-10
Capital Cost (millions)	$140-180

No changes to BX service on Everett Turnpike or I-93

Possible connections to private bus services for North Country destinations

No local bus service extensions



New Hampshire Main Line:
Amtrak 12 Train per Day Service
North Station
Lowell
Nashua
Manchester
Concord
1:00
0:30
0:00
23:30
23:00
22:30
22:00
21:30
21:00
20:30
20:00
19:30
19:00
18:30
18:00
17:30
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9:30
9:00
8:30
8:00
7:30
7:00
6:30
6:00
5:30
5:00
4:30
10 12 14 16 18 20 22
32 34 36
46 48 50 52
66 68 70

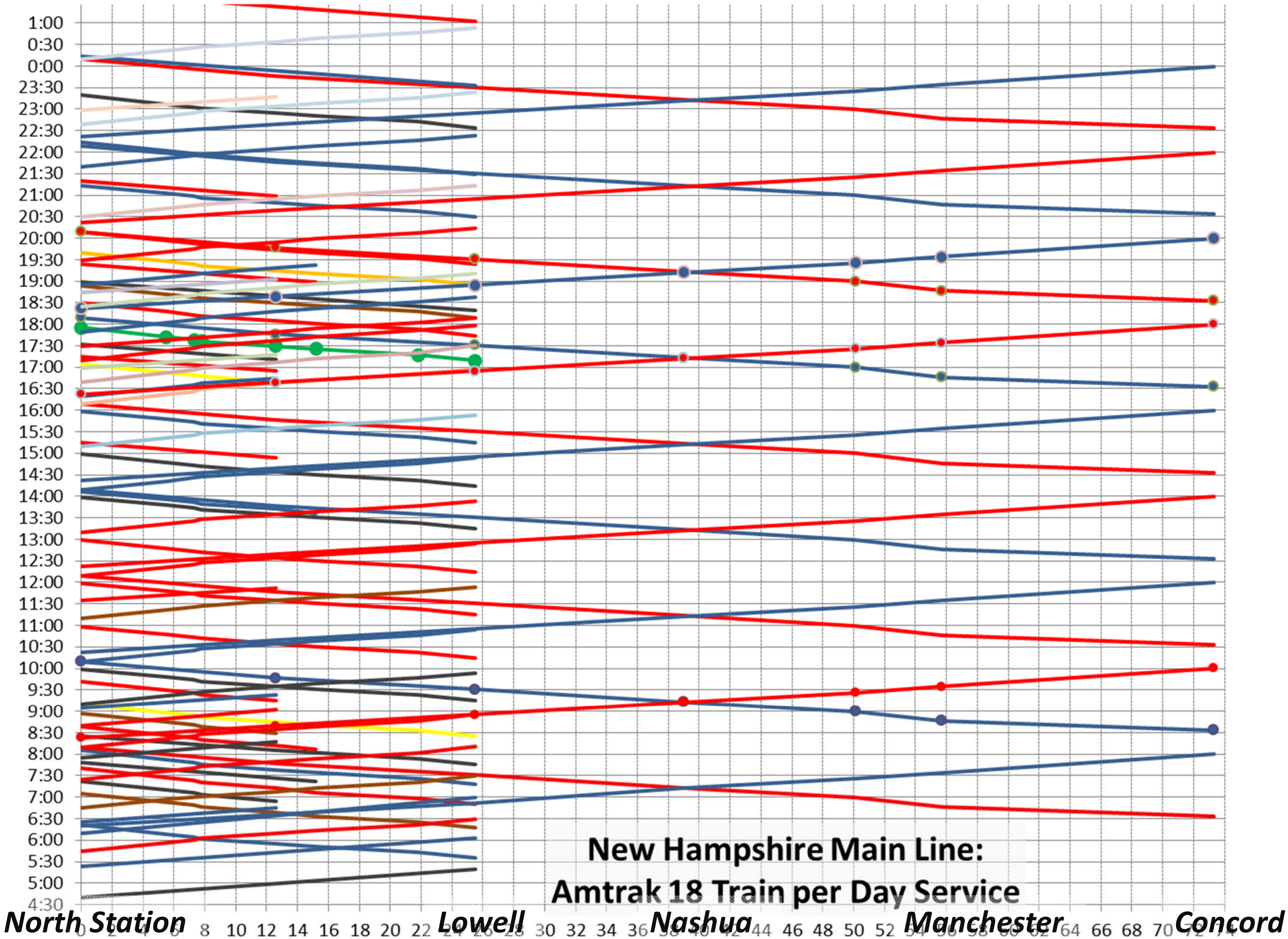
Amtrak 12

Route Miles	73
Stations	11
Concord Trains	12
Manchester Trains	12
Nashua Trains	12
Weekday Train Miles	2,332
% Increased Train Miles	61%
Annual O&M Cost	$11-15
Capital Cost (millions)	$145-185

Possible to eliminate BX service to Manchester

Possible connections to private bus services for North Country destinations

No local bus service extensions


New Hampshire Main Line:
Amtrak 18 Train per Day Service
North Station
Lowell
Nashua
Manchester
Concord
1:00
0:30
0:00
23:30
23:00
22:30
22:00
21:30
21:00
20:30
20:00
19:30
19:00
18:30
18:00
17:30
17:00
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8:30
8:00
7:30
7:00
6:30
6:00
5:30
5:00
4:30

Amtrak 18

Route Miles	73
Stations	11
Concord Trains	18
Manchester Trains	18
Nashua Trains	18
Weekday Train Miles	2,771
% Increased Train Miles	91%
Annual O&M Cost	$15-19
Capital Cost (millions)	$145-185

Possible to eliminate BX service to Manchester

Possible connections in Concord to private bus services for North Country destinations

No local bus service extensions

Summary of Intercity Options

	Service Options		
	8	**12**	**18**
Route Miles	73	73	73
Stations	11	11	11
Concord Trains	8	12	18
Manchester Trains	8	12	18
Nashua Trains	8	12	18
Weekday Train Miles	2,038	2,332	2,771
% Increased Train Miles	40%	61%	91%
Annual O&M Cost	$7-10	$11-15	$15-19
Capital Cost (millions)	$140-$180	$145-$185	$145-$185

Express Bus Options

Improve service for 1,200 existing bus passengers and attract new riders

- **Bus on Shoulder for Existing Service**
- **Bus on Shoulder with Expanded Service**

Express Bus Options

Bus on Shoulder for Existing Service

- 80 weekday buses
- 15-45 minute savings for 16 am peak southbound buses
- Afternoon savings are less

Bus on Shoulder for Enhanced Service

- ~120 weekday buses
- 15-45 minute peak savings over current travel times
- 30 minute peak headway 60 minute off peak
- All peak buses offer non stop service to Boston

Comparison of Travel Times to Boston for 8:30 am arrival

Stations	Current Bus Service	Intercity Rail	Proposed Commuter Rail	Bus on Shoulder
Manchester	2:20	1:22	1:25	1:35
Nashua	1:50	0:56	1:02	1:05

New Hampshire Capitol Corridor

Project Briefing

July 19, 2013

New Hampshire Department of Transportation

Supported by URS Corporation

with Jacobs Engineering and Cambridge Systematics

Capitol Corridor Transit Study

Project Initiation

February 15, 2013

Initial tasks, subtasks

Task 0:

- **Detailed work plan, including schedule -- URS**
- **Budget -- URS**
- **Engineering agreements with Pan Am, MBTA – NHDOT, Jacobs**

Task 1: Public, Stakeholder Involvement

- **Steering committee: membership, function**
- **Key stakeholder interviews (see below) – URS, Jacobs**
- **Website development -- URS**

Task 2: Purpose and Need -- URS

- **Market analysis -- CS**
- **Transportation facilities, services – URS, Jacobs**
- **Forecasting -- CS**

Task 3: Financial Plan

- **Initial options**

FTA/FRA review, Cambridge, week of March 11 – NHDOT, URS

Priority stakeholder meetings, starting week of March 11 – NHDOT, URS, Jacobs

- **MBTA, Mass DOT**
- **Pan Am -- commissioner**
- **Amtrak**
- **New England Southern Railroad**
- **Nashua RPC**
- **SNHRPC**
- **Central NH RPC**
- **NH Rail Transit Authority**
- **City of Nashua**

- **City of Manchester**
- **City of Concord**
    - **City stakeholders include planning/economic development, aldermen, chambers.**
- **Bus companies**
- **Manchester-Boston Airport**
- **Downeaster**
- **Congressional delegation/staff**

Rail Authority, NHDOT interface, roles

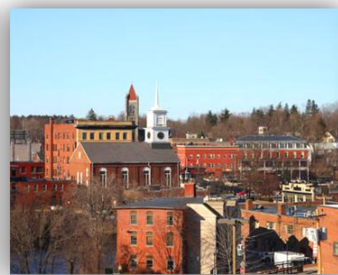
Other stakeholder issues

Management team, monthly meetings

Steering committee: membership, meetings

Ken Kinney in NH/MA: weeks of March 11, April 1, April 15, May 13, etc.



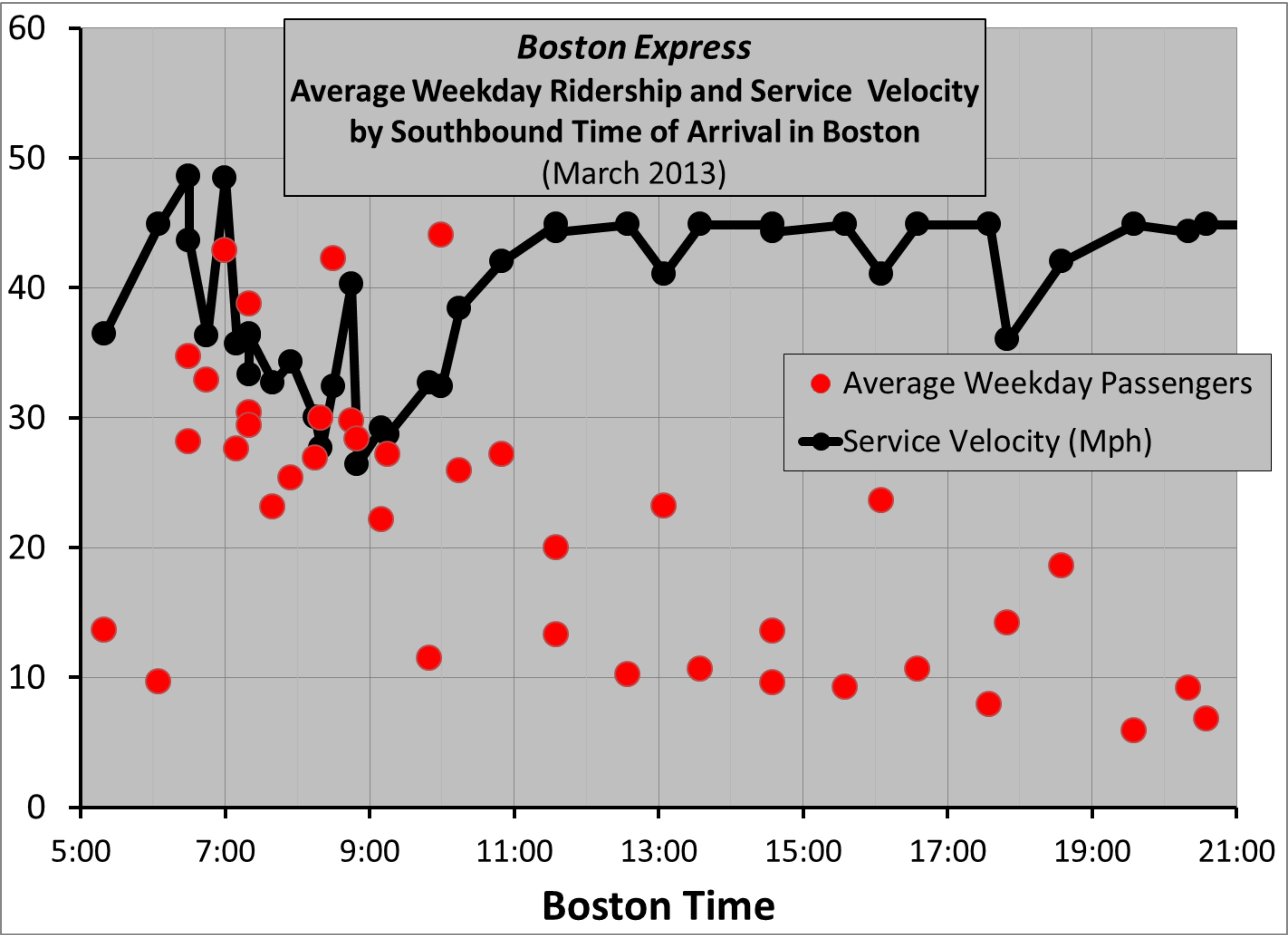


NH Capitol Corridor
Rail & Transit Alternatives Analysis

Project Briefing

September 17, 2013

New Hampshire DOT
Department of Transportation



Boston Express
Average Weekday Ridership and Service Velocity
by Southbound Time of Arrival in Boston
(March 2013)
Average Weekday Passengers
Service Velocity (Mph)
60
50
40
30
20
10
0
5:00
7:00
9:00
11:00
13:00
15:00
17:00
19:00
21:00
Boston Time

What can be done to avoid congestion?

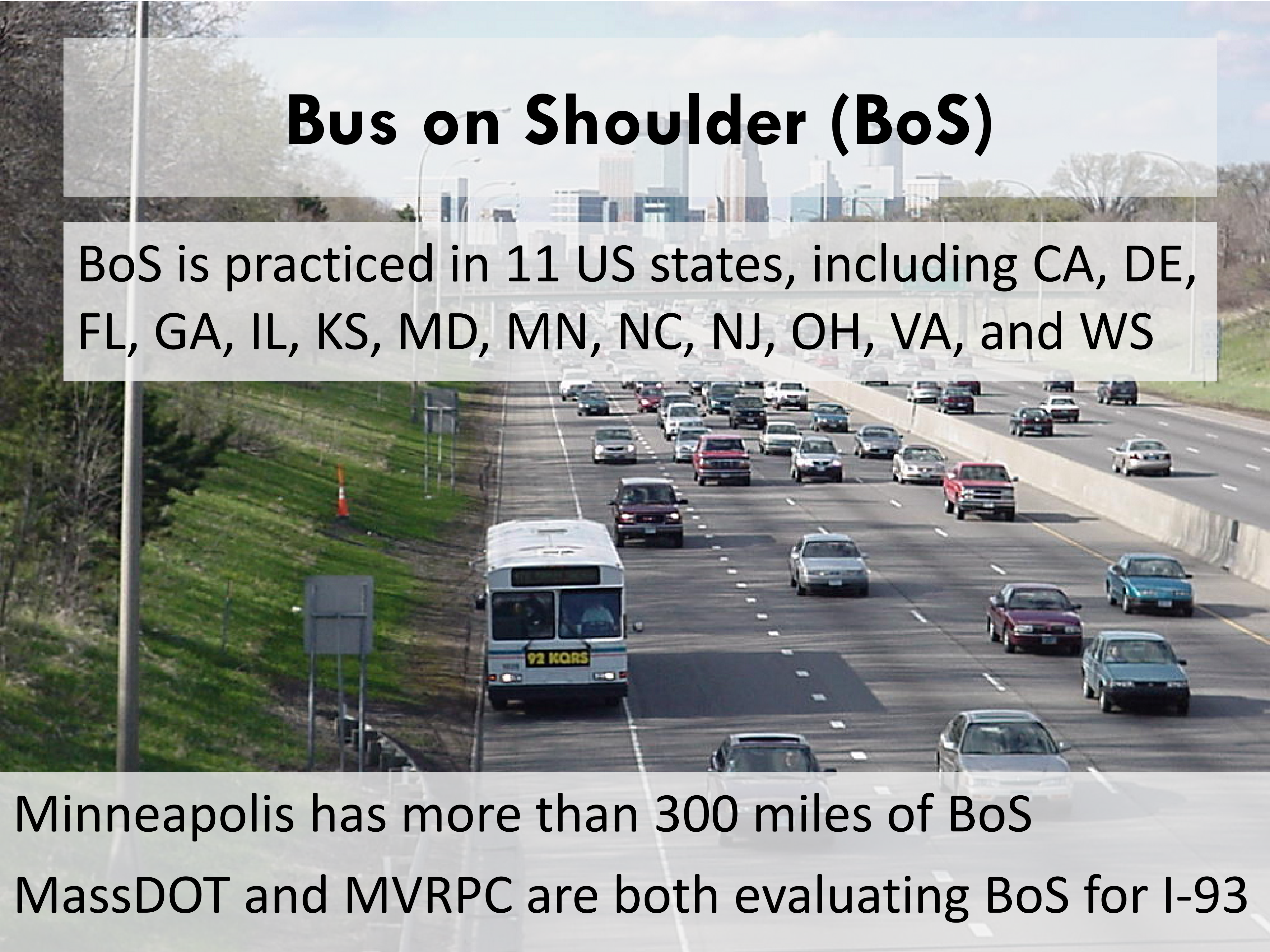
1. Isolate buses from traffic congestion
2. Develop an alternative route that is free of traffic

Isolating Buses from Traffic Congestion

- Bus On Shoulder in Greater Boston Only
  - Allow buses to drive on the shoulder of the highway to avoid traffic jams

Bus on Shoulder (BoS)

BoS is practiced in 11 US states, including CA, DE, FL, GA, IL, KS, MD, MN, NC, NJ, OH, VA, and WS



Minneapolis has more than 300 miles of BoS

MassDOT and MVRPC are both evaluating BoS for I-93

Developing a traffic-free route

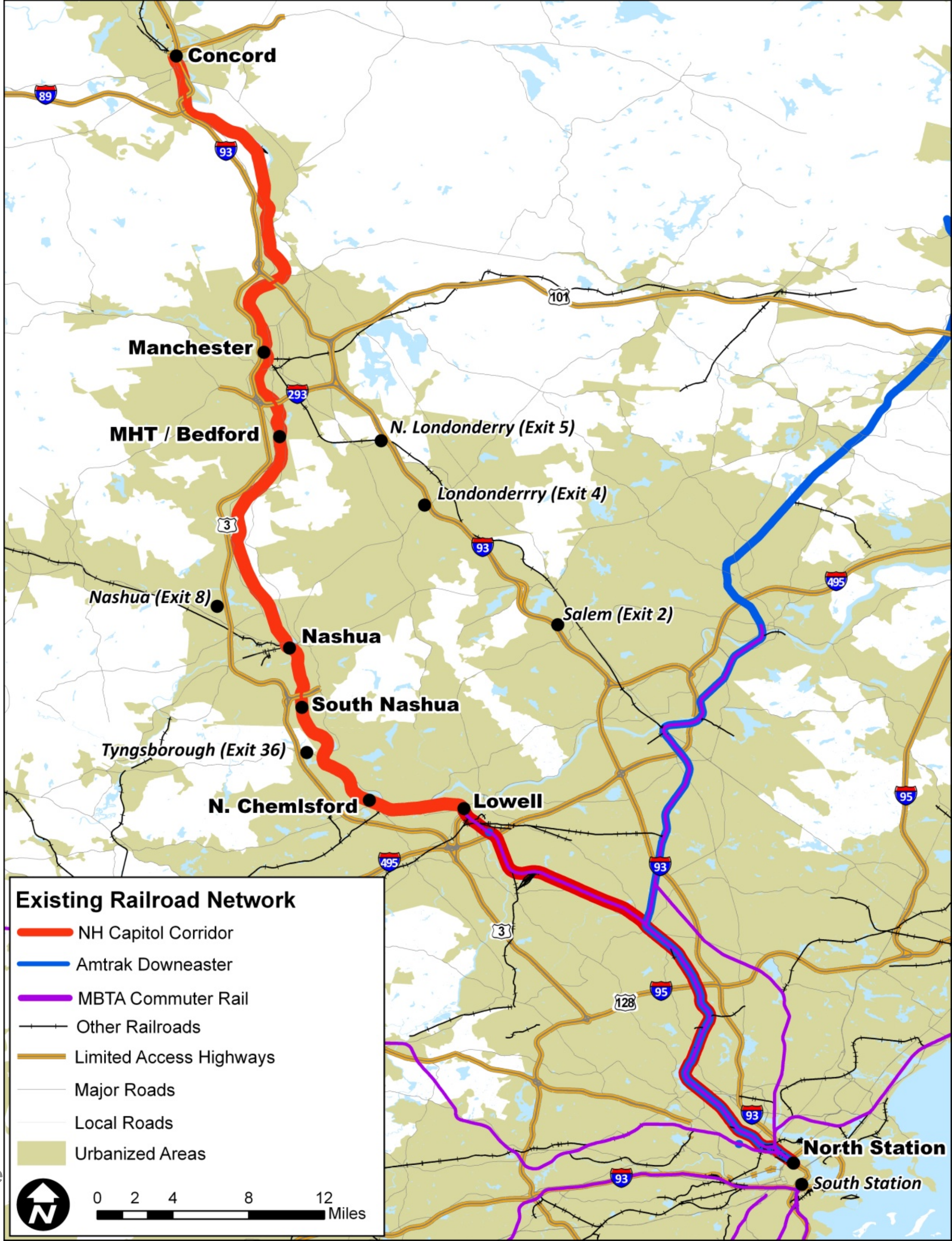
- Commuter rail
  - Uses conventional railway tracks to offer local passenger service in urban areas

MBTA Commuter Rail: 35 Years of Expansion

New Hampshire DOT
Department of Transportation

Service Options

- Six Commuter Rail
- Three Intercity Rail
- Two Express Bus



Commuter Service Options

Options	Weekday Revenue Trains				Route Miles	Track Miles	Station	Wkday Train Miles
	Lowell	Nashua	Manch	Concord				
Base Service	44	0	0	0	26	53	8	1,452
6. Nashua Minimum	44	16	0	0	39	80	11	1,566
5. Nashua Commuter	44	34	0	0	39	80	11	1,888
4. Manch Commuter	44	30	20	0	56	98	13	2,091
3. Manch Regional	44	34	16	0	56	98	13	2,068
2. Concord Commuter	44	26	22	18	73	115	14	2,374
1. Concord Regional	44	30	8	8	73	115	14	1,957

Conceptual Stations

Station	Miles to Boston	Max Time to Boston	Min Time to Boston
Concord	73.4	1:54	1:46
Manchester	55.5	1:32	1:25
MHT / Bedford	50.1	1:24	1:17
Nashua	38.8	1:14	1:02
South Nashua	35.5	1:08	0:54

Intercity Service Options

Options	Weekday Revenue Trains			Route Miles	Stations	Wkday Train Miles
	Nashua	Manchester	Concord			
Base Service	0	0	0	26	8	1,452
1. Amtrak 8	8	8	8	73	12	2,038
2. Amtrak 12	12	12	12	73	12	2,332
3. Amtrak 18	18	18	18	73	12	2,771

Conceptual Intercity Stations

Stations	Miles to Boston	Intercity Time to Boston	Min CR Time to Boston	Max CR Time to Boston
Concord	73.4	1:36	1:46	1:54
Manchester	55.5	1:22	1:25	1:32
MHT / Bedford	50.1	1:09	1:17	1:24
Nashua	38.8	0:56	1:02	1:14
Lowell	25.5	0:38	0:44	0:49

Express Bus Options

- Express Bus Options
  - Improve service for 1,800 existing bus passengers and attract new riders
    - Bus on Shoulder for Existing Service
    - Bus on Shoulder with Expanded Service

Express Bus Options

- Bus on Shoulder for Existing Service
  - 80 weekday buses
  - 15 – 45 minute savings for 16 am peak southbound buses
  - Afternoon savings are less
- Bus on Shoulder for Enhanced Service
  - ~120 weekday buses
  - 15 – 45 minute peak savings over current travel times
  - 30-minute peak headway; 60-minute off-peak
  - All peak buses offer non-stop service to Boston

Comparison of Travel Times to Boston for 8:30 am Arrival

Stations	Current Bus Service	Intercity Rail	Proposed Commuter Rail
Manchester	2:20	1:22	1:25
Nashua	1:50	0:56	1:02

Rail Ridership

Alt	Total Ridership	North-bound Boards	Southbound Boards				
		Boston	South Nashua	Nashua	MHT/ Bedford	Manchester	Concord
Concord Regional	2,570	1,280	590	350	100	120	60
Concord Commuter	2,920	1,430	470	280	260	290	110
Manchester Reg	3,000	1,490	630	380	190	220	--
Manchester Comm	2,940	1,450	560	330	240	280	--
Nashua Commuter	1,920	970	560	340	--	--	--
Nashua Minimum	1,410	710	410	240	--	--	--
Intercity 8	1,260	600	--	320	120	130	60
Intercity 12	1,480	700	--	370	140	160	70
Intercity 18	1,760	840	--	440	160	190	90

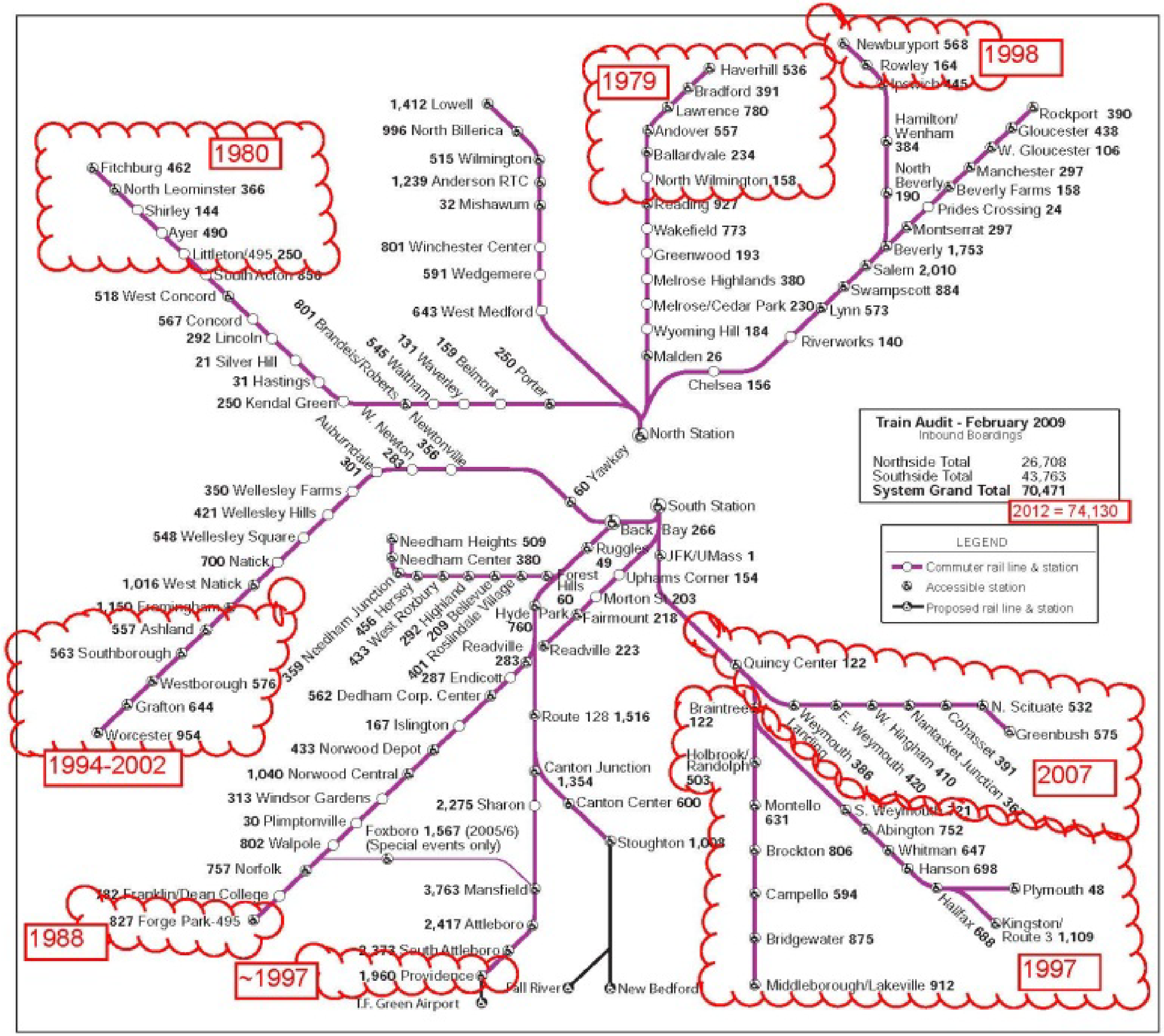
New Hampshire DOT Department of Transportation

Ridership Comparisons

MBTA Commuter Rail System Map

Typical Boston Bound Weekday Boardings

February 2009



New Hampshire DOT Department of Transportation

Key Question

- Rail option(s) compete well for federal funds?

Rail Costs: The Bottom Line

Annual requirement

- O&M
- Bond payment for non federal capital costs

Net of farebox, federal transit support

Illustrative Project: Manchester-Boston Commuter Rail

The Bottom Line: $8-10 million per year

Benefits

- Address the congestion issue at southern end of corridor, thereby reducing trip times and providing wider set of alternatives to the automobile.
- Improve access to higher-paying jobs in greater Boston. Commute from New Hampshire; return money to New Hampshire.
- Improve access to other tourism, recreation and cultural attractions in both greater Boston and in New Hampshire.
- Attract and retain population in New Hampshire, especially younger, highly educated professionals.

Benefits (cont.)

- Build that employee base to attract new businesses and grow existing ones in New Hampshire.
- Promote concentrated development (TOD) to mitigate sprawl development patterns, help accommodate residents seeking additional lifestyle choices and to reduce vehicle miles traveled.
- Attract tens of millions of federal transportation investment dollars by leveraging existing transportation infrastructure.
- Improve the potential for additional rail freight business.
- Provide additional transit service to the Manchester-Boston Regional Airport.

Key Question

- Dedicated revenue source(s) required?

Revenue Options

Funding Source	Revenue Potential	Capital, Operations, Both	Preliminary Annual Estimate (millions)	Comments
Toll Revenue	High	Both	$5.1	Assuming a $0.10 increase applied on the Central Turnpike. No elasticity has been applied.
Commuter Rail Parking	Low	Operations	$0.6	Assuming a $3.00 parking fee
Value Capture	Low	Both (depending on mechanism)	TBD	
City Contributions	Low	Both	TBD	Based on negotiations with cities. May include responsibility for stations.
MBTA Capital Contributions	TBD	Capital	TBD	Surplus Rolling Stock
FTA Formula Funds	Low	Both	$1-2	Apportionment determined based on various factors, including fixed guideway route miles and fixed guideway vehicle revenue miles
CMAQ	Low	Both	TBD	

New Hampshire DOT Department of Transportation

Alternative Evaluation, Screening

- Ridership
- Costs: capital, operating
- Economic development/land use
- Environmental fatal flaws

Next Steps

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Project Team Kick-off Meeting - ***NHDOT***

Date: 03/11/2013 **Time:** 4:00pm **Location:** NHDOT Office – Concord, NH

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
n/a		Mark Sanborn (NHDOT)
		Patrick Herlihy (NHDOT)
		Ken Kinney (URS)
		Russell Wilder (URS)
		David Nelson (Jacobs)
		Ryan Harris (Jacobs)

After the close of the meeting with CNRPC, the team met briefly with Mark Sanborn, who opened the meeting with the message that as we meet with stakeholders this week, he would like us to consider potential members for the steering committee. The first public meeting will be held on Wednesday June 5, 2013 and will be in Manchester, with a project midterm meeting in Concord and the final public meeting held in Nashua.

Mark requested that a study area map of the corridor be prepared as an early deliverable of the study.

Mark will coordinate with Ken and Julia to transfer copies of the all the relevant studies and reports he has on hand.

Mark also asked that we provide some time for an advocate of linear motor rail technology to make a presentation at the public meeting on his favored technology.

After our meeting with FTA/FRA at the Volpe Center in Kendall Square, Cambridge, MA on Friday, we will plan to have lunch and meet at the Cambridge Systematics office in Alewife, Cambridge, MA.

Boston-Concord Rail & Transit Alternatives Analysis

Task 1: Public and Stakeholder Involvement

- **Steering Committee**
- **Department management team**
- **Public meetings**

Task 2: Purpose & Need

Task 3: Financial Planning

- **Non-federal funds: capital and operations**
- **Alternatives**
- **Financial subcommittee**
- **Governance structure**

Task 4: Definition of alternatives

- **Up to 15**
- **Rail and bus**

Task 5: Preliminary Screening

- **Environmental impacts**
- **Land use and development impacts**
- **Transportation impacts**
- **Relative costs: capital, O&M**

Task 6: Evaluation Criteria and Methods

- **Travel demand forecasting**
- **Operations**

Task 7: Evaluation of Alternatives

- **Up to seven for final evaluation**
- **Ridership**
- **Infrastructure requirements**

Task 8: Locally Preferred Alternative

- **Ridership**
- **Capital cost**
- **O&M cost**
- **Environmental impacts**
- **Environmental Justice**
- **Cost effectiveness (FTA)**
- **Benefit cost (FRA)**
- **Transit-supportive land use, economic development**

Task 9: Service Development Plan

- **Program rationale**
- **Operations strategy**
- **Implementation plan**

Task 10: Environmental Assessment

Task 11: New Starts Submittal

- **"if determined eligible"**

david.nelson@jacobs.com
February 6, 2014

NH Capitol Corridor: MassDOT / NHDOT Coordination Meeting

NHDOT Requests

1. Memorandum of Understanding outlining mechanisms for joint development, construction, operations and service management.

2. MassDOT help engaging Pan Am.

3. Reduce uncertainty with respect to operating costs for service extension.

4. Finalize infrastructure requirements for commuter rail extension to Manchester.

APPENDIX H

Agency Coordination Meetings: New Hampshire

Rail Transit Authority

New Hampshire DOT

Department of Transportation

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Kick-off Week Stakeholder Meetings – ***New Hampshire Rail Transit Authority***

Date: 03/12/2013 **Time:** 2:00pm **Location:** Nashua City Hall – Nashua, NH

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
Thomas Mahon – Chairman, NHRTA	tjmahon@comcast.net	Mark Sanborn (NHDOT)
Kathy Hersh – Community Development Director	hershk@nashuanh.gov	Patrick Herlihy (NHDOT)
		Ken Kinney (URS)
		David Nelson (Jacobs)
		Ryan Harris (Jacobs)

Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process. Mark Sanborn provided some background on the NHRTA and the fact that they have no staff and only have the $40k contract from the FRA grant to do outreach. It is an interesting arrangement as NHRTA officially plays a role as a stakeholder but will still be responsible to advocate on project benefits.

Tom Mahon said that there was concern about any appearance of a conflict of interest in doing advocacy with respect to their status as a recognized agency of the state. He said that it would be important to control the message of the Authority and that it would be imperative to collect data, complete rigorous analyses and to ensure that no voting on alternatives occurred. The study results must stand on their own legs. He felt that there has been a lot of anecdotal information released to the public to the effect that “there is not enough density” or “how can that this increase property values?” It will be important to explain study conclusions and how we arrived at those results.

Kathy Hersh suggested that lessons learned from the previous effort are that stakeholder interaction and communication are key and that the message and the service needs to appeal to a younger, “hipper” audience. She would also like a marketing plan included in the final report.

Tom felt that the main goals of the study should be to find a solution that would best improve economic diversity and the ability for goods & services mobility. He referenced that 20% of state residents do not drive and that there has been a documented decline of first time drivers’ licenses. He suggest that there is less of a “NH advantage’ remaining and that while it is not all bad, NH public policy changes occur slowly. NH is now a purple state, with the division between North and South of state is growing more pronounced.

Kathy agreed with that assertion, but cautioned the team not to assume that the North Country is against rail. She suggested that it would be important to articulate the problem, to discuss the positive impacts to freight rail and to explain the federal cost and support of rail transit implementation.

The participants cautioned that the study should

- clearly demonstrate and verify the benefits of improved rail and bus service
- show residents how the rail or bus investment will benefit them
- not assume that the general public will understand what you’re talking about unless you are very clear and direct
- be prepared to defend its work.

In summary when the participants discussed regional problems that a major transit investment might address they included:

- Provide for a rapidly growing elderly population
- Provide for a increasing fraction of the population that does not drive. (20% of the adult population doesn't drive)
- Maintain the state's eroding position in the national and regional economy
- Promote economic diversity
- Improve mobility for people and goods.

Mark closed the meeting by asking what would be a fair NHRTA membership on the steering committee. Tom replied that two would be ideal, otherwise it might look as though the committee was stacked.

APPENDIX H

Capitol Corridor Stakeholder Contacts

New Hampshire DOT
Department of Transportation

Capitol Corridor Stakeholder Contacts

Name & Title	Organization	Address 1	Address 2	Tel.
John Judge President	Appalachian Mountain Club	5 Joy Street	Boston, MA 02108	617-523-0636
Michael Tardiff Executive Director	Central NH Planning Commission	28 Commercial Street Suite 3	Concord, NH 03301	603-226-6020
Carlos P. Baia Deputy City Manager	City of Concord Community Development Department	41 Green Street	Concord, NH 03301	603-225-8595
James Bouley Mayor	City of Concord	41 Green Street	Concord, NH 03301	603-225-8500
Thomas Galligani Economic Development Division Director	City of Nashua	229 Main Street PO Box 2019	Nashua, NH 0306103064	603-589-3260
Ted Gatsas, Mayor	City of Manchester	Manchester City Hall One City Hall Plaza	Manchester, NH 03101	603-624-6500
Donnalee Lozeau Mayor	City of Nashua	229 Main Street	Nashua, NH 03060	603-589-3260
Christopher Williams	Greater Nashua Chamber of Commerce	142 Main St #5	Nashua, NH 03060	603-881-8333
Tom Irwin Vice President	Conservation Law Foundation	27 North Main St.	Concord, NH 03301	603-225-3060
Timothy G. Sink, CCE President	Greater Concord Chamber of Commerce	49 South Main Street, Suite 104	Concord, NH 03301	603-224-2508
Michael J. Skelton President & CEO	Greater Manchester Chamber of Commerce	54 Hanover Street	Manchester NH 03101	603-792-4102
William Craig Director of Economic Development	Manchester Economic Development Office (MEDO)	One City Hall Plaza	Manchester, NH 03101	603-624-6505

Mark P. Brewer, A.A.E. Director	Manchester-Boston Regional Airport	One Airport Road	Manchester, NH 03103	603-624-6539
Kerry Diers Executive Director	Nashua Regional Planning Commission	9 Executive Park Drive Suite 201	Merrimack, NH 03054	603-424-2240 x12
Tim Roache Assistant Director	Nashua Regional Planning Commission	9 Executive Park Drive Suite 201	Merrimack, NH 03054	603-424-2240 x 28
Beverly A. Woods, Executive Director	Northern Middlesex Council of Governments (NMCOG)	40 Church St #200	Lowell, MA 01852	978-454-8021
Anthony Komornick, Transportation Program Manager	Merrimack Valley Planning Commission	160 Main St	Haverhill, MA 01830	978-374-0519 ext. 15
Joe Cosgrove, Environmental Program Manager	Merrimack Valley Planning Commission	160 Main St	Haverhill, MA 01830	978-374-0519 ext. 15
Karl Quackenbush, Executive Director	Boston Region Metropolitan Planning Organization (CTPS)	State Transportation Building 10 Park Plaza, Suite 2150	Boston, MA 02116-3968	617-973-7114
(See Director List)	New Hampshire Rail Transit Authority			
Catherine Corkery Director	New Hampshire Sierra Club	40 North Main Street 2nd Floor	Concord, NH 03301	603-224-8222
Cliff Sinnott Executive Director	Rockingham Planning Commission	156 Water Street	Exeter, NH 03833	603-778-0885
Jane A. Difley,	Society for the	54 Portsmouth	Concord, NH	603-224-9945

President / Forester	Protection of New Hampshire Forests	Street	03301	
David Preece Executive Director	Southern New Hampshire Planning Commission	438 Dubuque Street	Manchester, NH 03102	603-669-4664
US Agencies/Officials				
FRA				
Trevor Gibson	Federal Railroad Administration	1200 New Jersey Avenue, SE Mail Stop 20	Washington, DC 20590	202-493-6371
FTA				
USEPA				
Mark Kern	EPA New England	5 Post Office Square, ORA 18-1	Boston, MA 02109-3912	617-918-1589
Rosemary K. Monahan, PhD **Smart Growth Coordinator** **Army Corps of Engineers**	EPA New England	5 Post Office Square, ORA 18-1	Boston, MA 02109-3912	617-918-1087
Michael Hicks	US Army Corps of Engineers New England District Regulatory/Permitting Division	696 Virginia Road	Concord, MA 01742	978-318-8338
Federal Highway Administration				
Jamie Sikora Environmental Program Manager	FHWA – New Hampshire Division	James C. Cleveland Federal Building 53 Pleasant Street, Suite 2200	Concord, NH 03301	603-228-0417
New Hampshire Department of				

Environmental Services				
Gino E. Infascelli	NHDES Water Pollution Division	29 Hazen Drive; PO Box 95	Concord, NH 03302-0095	603-271-4194
Lori Summer	NHDES Water Pollution Division	29 Hazen Drive; PO Box 95	Concord, NH 03302-0095	603-271-4059
NHDOT				
Christine Perron Senior Environmental Manager	NH Department of Transportation Bureau of Environment	7 Hazen Drive	Concord, NH03302	603-271-3717
NH Fish & Game				
Carol Henderson Environmental Review Coordinator	New Hampshire Fish & Game Department	11 Hazen Drive	Concord, NH 03301	603-271-3421
NH Natural Heritage Bureau				
Melissa Coppola Environmental Information Specialist	NH Natural Heritage Bureau	172 Pembroke Rd PO Box 1856	Concord, NH 03301-1856	603-271-2215 x323
MassDOT				
MEPA				
Deirdre Buckley Director	Executive Office of Energy and Environmental Affairs (EEA)	100 Cambridge St., Suite 900 (9th Floor) Attn: MEPA Office	Boston MA, 02114	617-626-1044
Massachusetts Department of Transportation				
John D. Ray Deputy Director	Rail and Transit Division	10 Park Plaza	Boston, MA 02136	857-368-8555
Ronald Morgan	MBTA Planning and Development Office	10 Park Plaza	Boston, MA 02136	617-222-3130
MassDEP				
Stephen Johnson, Deputy Regional Director		205B Lowell Street - Route 129	Wilmington, MA 01887	978-694-3350

NHDES				
Timothy Drew	Public Information & Permit Administration	29 Hazen Drive; PO Box 95	Concord, NH 03302-0095	603-271-3306
NH Division of Historic Resources				
Elizabeth Muzzey, Director	NH Division of Historic Resources	19 Pillsbury Street - 2nd floor	Concord, NH 03301-3570	603-271-3483
Massachusetts Historical Commission				
Brona Simon	Secretary of the Commonwealth Massachusetts Historical Commission	220 Morrissey Boulevard	Boston, MA 02125-3314	617-727-2836
Elected Officials				
Congresswoman Niki Tsongas	Massachusetts 3rd Congressional District	**Lowell MA Office** 11 Kearney Square, 4th Floor	Lowell, MA 01852	: 978-459-0101
Senator Edward Markey		**975 JFK Federal Building 15 New Sudbury Street**	Boston, MA 02203	**617-565-8519**
Governor Deval Patrick Governor Charles Baker		Massachusetts State House Office of the Governor Room 105	Boston, MA 02133	617-725-4005
Governor Maggie Hassan		Office of the Governor State House 107 North Main Street	Concord, NH 03301	603-271-2121
Senator Jeanne Shaheen		Manchester Office 1589 Elm St. Suite 3	Manchester, NH 03101	603-647-7500
		Nashua Office 60 Main Street	Nashua, NH 03060	603-883-0196
Senator Kelly Ayotte		Manchester Office 1200 Elm Street,	Manchester, NH 03101-2503	603-662-7979

		Suite 2		
		Nashua Office 144 Main Street	Nashua, NH 03060	603-880-3335
Congresswoman Carol Shea Porter		33 Lowell Street	Manchester, NH 03101	603-641-9536
Congresswoman Annie Kuster		70 East Pearl Street	Nashua, NH 03060	603-595-2006
Ben Blount	Boston Express	7 Langdon Street	Concord, NH 03301	603-845-1999
Ben Blount	Concord Coach	7 Langdon Street	Concord, NH 03301	603-228-3300

APPENDIX H

Capitol Corridor Media Outreach

New Hampshire DOT
Department of Transportation

March 17. 2013 12:56AM

Riders have high marks for service despite occasional bus breakdowns

By BENJAMIN C. KLEIN
Sunday News Correspondent

ShareThis

NASHUA - Riding the Boston Express each day between Nashua and Boston, many commuters have had to endure mechanical problems on a bus. But despite the occasional breakdown, commuters interviewed by the New Hampshire Sunday News all agreed the professionalism and courtesy shown by bus employees and the convenience of the bus keeps them coming back.

Commuters returning to Nashua from Boston are helped with their luggage by the bus driver. (BENJAMIN C. KLEIN/Union Leader Correspondent)

BUY THIS PHOTO

Ruth Puopolo said she takes the bus to work everyday, leaving on the first bus out of Nashua to Boston in the morning and coming back at 5:20 p.m.

Puopolo said she was on a bus returning

from Boston once when the wipers stopped working in a snowstorm, forcing the bus to pull over.

Linked articles:
NH State police hope to ramp up bus inspections

Despite being on the side of the road, with Boston just in view, Puopolo said the experience wasn't too bad because "they did the best they could. The bus drivers and staff are outstanding. They are awesome."

Puopolo said the quality of the buses remains consistent, and that she feels safe during her commute for the most part.

"It depends on the Massachusetts drivers, like the time in Lowell when the guy was going the wrong way down the road," said Puopolo, who added that her commute on a bad day is three hours and on a good day is just over an hour.

Vicky Jaffe said despite being on multiple buses that have been forced to pull over either due to police or mechanical issues, her commuting experience is still a positive one.

"Being pulled over has never been traumatic, never had to get out or anything, and we are always back on the road quickly. It is usually when a 'check engine' light goes on and needs to be checked," Jaffe said. "But the buses themselves are good quality, always clean, and the drivers are good."

Despite her appreciation of the bus service, Jaffe said she would still like to see commuter rail lines put in. "As much as I like the bus I would like to see rail. With bad weather it would be very helpful."

Sean Howell agreed that while his bus experience has been very positive and "is a well-run operation, with buses always on time, and makes you feel safe," he would still like to see a commuter train system.

Citing gas prices and a tough economy, Howell said he has noticed more people taking the bus then a few years ago.

Greg McIntosh said while he has never been on a bus that has broken down, the worst part of his commute is often his fellow commuter.

"The worst thing is some of the passengers who are clueless," McIntosh said, explaining that some people will recline the whole way back on their seat.

For many commuters like Al Llukan who ride the Express everyday, the commute is boiled down to traffic conditions.

"Some days are better than others," he said.

bklein@newstote.com

Comments

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- Identify yourself. Accounts using fake or incomplete names are suspended regardless of the quality of posts.
- Say something new, stay on topic, keep it short.
- Links to outside URLs are discouraged, if used they should be on topic.
- Avoid comments in bad taste, write well, avoid using all capital letters
- Don't cite facts about individuals or businesses without providing a means to verify the claim
- If you see an objectionable comment please click the "Report Abuse" button and be sure to tell us why.

Note: Comments are the opinion of the respective poster and not of the publisher.

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The Conway Daily Sun

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SATURDAY, AUGUST 23, 2014 | MT. WASHINGTON VALLEY'S DAILY NEWSPAPER | 356-3456 | FREE

Rail revival?

Group unveils big plans for passenger and freight trains from Portland to Montreal. But will the Golden Eagle fly?

— Page 12

Rail group announces plans to run passenger and freight trains from Portland to Montreal

By Daymond Steer
THE CONWAY DAILY SUN

CONWAY – The Golden Eagle Railway Corporation has big plans to use the Mountain Division railroad tracks for passengers and freight, but is the ideas viable? One local rail expert says the concept is "unrealistic."

Golden Eagle Railway Corporation is working on running trains from Portland through the Mount Washington Valley and onto Montreal, said Golden Eagle's president David Schwanke, of Norridgewock, Maine.

Schwanke, and his associate, Michael Taylor, presented their idea to Conway selectmen on Tuesday. The State of New Hampshire-owned Mountain Division rail hasn't moved freight since the 1980s. Since 1995 portions have been leased by the Conway Scenic Railroad for regular excursion runs.

"We are putting back into play, now, passenger rail and freight," said Schwanke.

Schwanke said the first phase, running freight from Portland to Crawford Notch, would be complete by late spring.

It might take until 2017 for there to be passenger rail from the valley to Montreal, said Schwanke. Some ski trains, which would tie into the Boston area, may be operational by next fall, said Schwanke.

Ski trains haven't run to Conway since the mid 1950s.

"We don't have to wait for federal funding and we don't have to wait for state funding," said Schwanke. "As you know, that's usually the slowest part. Using the model we put together we're allowed to move a lot quicker."

In a short phone interview, Dwight Smith, founder of the Conway Scenic Rail Road, which opened in 1974, said Golden Eagle's plans are "unrealistic." Smith declined to elaborate.

When asked about Golden Eagle, Conway Scenic Railroad's current owner, Rus Seybold, had no comment.

Selectman Mike DiGregorio was impressed with what he heard.

"It think they are making some incredible headway which shows they are not involved with government in their planning," said DiGregorio.

Schwanke said his group has a verbal agreement with the State of New Hampshire regarding leasing the tracks. Schwanke said Golden Eagle has been in existence for about one year.

"I'm flabbergasted," said selectman Mary Seavey of Golden Eagle's plans. "It's phenomenal."

DiGregorio wondered where Golden Eagle is getting its money.

"What group are you with and where is all this revenue coming from?" DiGregorio asked. "These tracks [not counting the Conway Scenic's section] haven't been used in years. They are decayed and rotted."

Schwanke stressed that this will be funded privately. Schwanke said the cost to repair New Hampshire's tracks is $27 million.

The group is looking at a total investment of $60 million to cover the three states (New Hampshire, Vermont and Maine), and some of that has already been raised.

"This is the look we are going for, much like the luxury of the Orient Express," said one of the people involved with Golden Eagle. "A five-star experience with modern day safety features and outstanding customer service. The train image is just one possible branding should we decide to go forward with this model of locomotive."

Schwanke said investors range from individuals to small businesses to Fortune 500 corporations.

"This is all private," said Schwanke. "There's not a cent coming out of the state. There's not a cent coming from the town budget. If you guys deem it necessary to kick some in, I'll tell you I won't turn it away. Right now, we're not asking for a penny from anybody."

According to its own literature, Golden Eagle Railway was started by a group of "dedicated businessmen who had the dream to reinstate passenger rail in New England."

According to a brief online bio on Golden Eagle's website, Schwanke worked in Hollywood's movie industry for 31 years, of which 21 years were spent as a logistics manager. Schwanke worked another two years as a production manager/line producer.

According to IMDb, his film credits include "Don't Be a Menace to South Central While Drinking Your Juice in the Hood" and "Permanent Record" with Keanu Reeves.

Schwanke said he worked on "Little House on the Prairie" and "Highway to Heaven."

Schwanke is also a rail enthusiast.

"David started a movement in the Los Angeles area to reintroduce the old Red Car line from L.A. to San Bernardino," states goldeneaglerailwaycorporation.com. "Today, the metro link runs on this line."

Golden Eagle's vice president of engineering and restoration, Phil Warren, also has an impressive resume, according to a bio on Golden Eagle's website.

'He ran and owned Eagle Models, one of Europe's largest special effects companies, for more than 15 years and in doing so helped create 2,500 TV commercials," states the bio. "He was involved in more than 50 feature films, including: 'Star Wars,' 'Alien,' 'Superman,' 'Batman' and "James Bond.'"

When asked why it makes sense to bring the Mountain Division line back now, Schwanke said when the lines shut down many companies were left with trucking as their only shipping option. He said rail would be much more affordable than trucking. The trains will have the added benefit of taking trucks off the road which should ease traffic congestion.

Selectman Stacy Sand asked how many trains per day would run through Conway.

Schwanke replied there would be one freight train, one passenger train from Montreal and another passenger train coming from Portland. He also talked about running weekend trains to the casino in Oxford, Maine and to ski resorts in the winter.

Town manager Earl Sires asked how Golden Eagle expects to succeed when the Downeaster is struggling. Sires said the Downeaster's territory has a higher population density.

Schwanke replied that Golden Eagle is using a different business model and private funding.

He predicted 200,000 people would ride the train out of Canada. Another 75,000 would come from the Boston area through a tie-in with the Downeaster. A tie-in with the Vermonter would bring in between 30,000 and 50,000. Schwanke said estimates are based on "conservative" numbers. Golden Eagle can expect over 300,000 riders in the first year, he said.

Schwanke was confident people would want to use the trains.

"It will sell itself once they see it," said Schwanke who showed a reporter a photo of a beautiful dining car which would resemble what is imagined for the Golden Eagle.

Taylor compared the proposed passenger service to the Rocky Mountaineer that runs in Alaska or the Orient Express in Europe.

When asked if such a trip will be affordable, Schwanke said a round trip in coach from Portland to Montreal would cost $200. Schwanke said there will be coach, business class and first-class sections.

"There will be a sports bar on board," said Schwanke. "There will be a luxury restaurant on board. We hope to have some sort of coffee (shop). You name it, it will be there."

Golden Eagle is looking at employing a few hundred people in the near future, and Schwanke hopes many will be returning military veterans.

"They have done a lot for us," said Schwanke of veterans. "It's time for us to step up to the plate, as corporate America, and help them out."

The project would also include putting in several passenger rail stations in such places as North Conway, Fryeburg and Whitefield. Schwanke said the trains would bring people to destinations like the Mountain View Grand Resort.

The Conway station would be on North-South Road.

Sand asked what passengers would do once they got off the train in Conway.

Schwanke said there would be a parking facility at the train station. Golden Eagle would propose to bring in a major

see next page

from preceding page

car rental outfit to be located at the station. Local hotels and ski resorts could use vans to help people get around, he said.

When asked what the rail line might do for the Eastern Slope Regional Airport, selectman Carl Thibodeau, who is on the airport's board, said that's a question worth considering.

"That set of rails runs within sight of the runway," said Thibodeau, adding he intends to keep in touch with Golden Eagle.

Sand and Sires pointed out that the passenger and freight trains would be heading through Whitaker Woods and would run parallel to the proposed recreation trail planned for that area.

Sand was skeptical of Golden Eagle's proposal and she urged Schwanke to hold a public hearing on it. Sand likes the idea of bringing tourists to town by passenger rail.

"It almost sounds too good to be true," said Sand. "I want to know what is the freight that they are carrying that will justify the New Hampshire rails alone if they are talking a $20 million investment."

In a phone interview, Deborah Murphy, who is vice president of rail operations for Golden Eagle, said the freight trains will be hauling all types of products such as bottled water, wood pellets, cement and fertilizer.

"We're in the process right now of meeting with a lot of the shippers to determine who needs a different way to transport and whether or not we can access their facility," said Murphy adding that Golden Eagle is looking at using trucks, where need be, in combination with the trains.

Schwanke said 15 companies have told him they would be willing to ship with him.

Murphy said the company will be as environmentally friendly as possible.

"Just shipping anything by rail is more green than shipping over the road," said Murphy who has been in the rail industry for about 15 years. She is the publisher of a magazine called "Northeast By Rail" which is a "connection guide" for people who want to travel by train in the Northeast.

Thibodeau hopes the Golden Eagle project will work but he's not holding his breath.

"I'll believe it when I see it," said Thibodeau.

Last year, the Berlin City Council met with Schwanke and Golden Eagle's vice president Robert Steele. They along with Maine Rail Coalition and the Western Maine Economic Council were discussing bringing passenger rail back to this region. At that meeting, Ray Burton, the late Executive Councilor, called the proposal from Golden Eagle a serious one. Burton was a supporter of rail and commuter rail.

Fryeburg selectman Jeff Cox said the concept was interesting. Fryeburg selectmen's chair Paul Naughton said the Golden Eagle would have to come through Fryeburg if the plan is to run from Portland to Montreal.

For more information about Golden Eagle Railway visit goldeneaglerailwaycorporation.com or on Facebook at GoldenEagleRailway.

Conway Scenic Railroad runs excursion trains on the Mountain Division line through Crawford Notch. The Golden Eagle group is looking to use the same Mountain Division tracks. (JAMIE GEMMITI PHOTO)

AT LAST! TRAINS to BOSTON . . .

STARTING MONDAY — JANUARY 28, 1980

FROM NASHUA, MANCHESTER & CONCORD, N.H.

NEW HAMPSHIRE MAIN LINE

- P CONCORD (Near Shopping Ctr.)
- P MANCHESTER (Between Granite & Depot Sts.)
- P NASHUA (Hollis & Temple Sts.)
- LOWELL
- N. BILLERICA
- WILMINGTON
- North Station BOSTON

P Parking Available

TO BOSTON:

LEAVE: CONCORD	MANCHESTER	NASHUA	LOWELL	ARRIVE NO. STATION BOSTON
MONDAY-FRIDAY				
AM 5:30	6:00	6:25	6:55	7:42
AM 5:57	6:27	6:52	7:22	8:08
SATURDAY ONLY				
AM 9:35	10:05	10:30	11:00	11:47
SUNDAYS & HOLIDAYS				
AM 11:00	11:30	11:55	PM 12:25	1:12

FROM BOSTON:

LEAVE: BOSTON	LOWELL	NASHUA	MANCHESTER	CONCORD
MONDAY-FRIDAY				
PM 5:00	5:44	6:04	6:29	7:09
PM 5:35	6:19	6:39	7:04	7:44
SATURDAY ONLY				
PM 5:30	6:17	6:37	7:02	7:42
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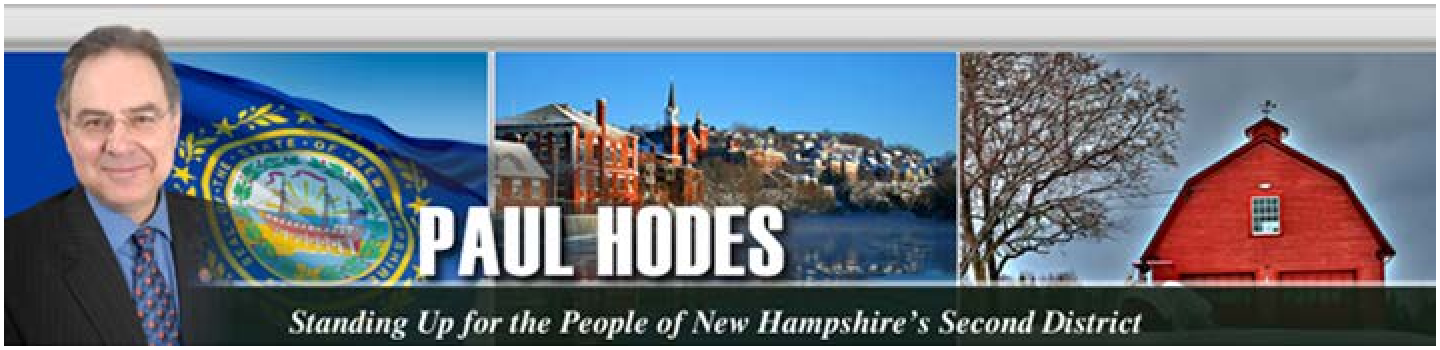

For Immediate Release
February 25, 2010

Contact: Aaron Rottenstein
Matt House
202-225-5206

HODES, SECRETARY LAHOOD, NH RAIL ADVOCATES MEET ON CAPITOL RAIL PROJECT

Washington D.C. – This evening, in the office of Congressman **Paul Hodes**, Granite State leaders met with Transportation Secretary Ray LaHood to discuss the future of the Capitol Rail Corridor project. At the meeting, LaHood promised to work with New Hampshire officials to review their proposal for funding for the Capitol Rail Corridor project. Attendees, who joined along with Hodes, included New Hampshire Department of Transportation Commissioner **George Campbell Jr.**, Nashua Mayor **Donnalee Lozeau**, and a representative for the Chair of the New Hampshire Rail Transportation Authority **Peter Burling**.

“I organized this meeting because I know that bringing passenger rail back to New Hampshire is critical to expanding the reach of our small businesses, creating good paying jobs and providing for our long term transportation needs,” **said Hodes**. “It was a good meeting and I am hopeful that New Hampshire can win funding shortly. As I’ve now told both President Obama and Secretary LaHood, this project just makes sense for the state and the region.”

“New Hampshire citizens have worked long and hard to get rail service from Boston to Nashua, Manchester, and Concord,” **said Campbell**. “It is my hope that with the US Department of Transportation, New Hampshire can find a partner to turn our hopes and aspirations into reality.”

“The Northern New England Corridor is a key component in completing the New Hampshire transportation system,” **said Burling**. “The commitment from Secretary LaHood and Congressman Hodes to see this application through will make high speed rail and passenger service a reality for New Hampshire Citizens.”

“This opportunity provided by Congressman Hodes was very productive,” **said Lozeau.** “Based on our discussion with the Secretary, we are confident that rail is back on course for success.”

The Capital Corridor project will help 500,000 Granite Staters in Southern New Hampshire travel between Concord, Manchester, Nashua and Boston. The line will also include a stop at the Manchester-Boston Regional Airport, and future plans include railways through White River Junction, VT and Montreal.

###

Rail study: Three stations for Nashua

Preliminary findings from a new rail study indicate the possibility of three train stations in Nashua if commuter rail makes its way back to New Hampshire.

By KIMBERLY HOUGHTON
Union Leader Correspondent

NASHUA — Preliminary findings from a new rail study indicate the possibility of three train stations in Nashua if commuter rail makes its way back to New Hampshire.

The Capitol Corridor rail study, which is still under way, has already identified potential train stops at the Pheasant Lane Mall, Crown Street and perhaps a layover station at the former WR Grace Organic Chemical site on Spit Brook Road, according to Tom Mahon, chairman of the New Hampshire Rail Transit Authority.

Mahon shared some of the initial findings with the aldermanic Planning and Economic Development Committee on Tuesday.In addition to the three possible train stations in Nashua, the study also includes potential stops in Bedford, Manchester and Concord. A less serious idea includes a train station in Merrimack as well, Mahon said.

The ridership is estimated at about 3,100 one-way trips per day, said Mahon. There has been a rough cost projection of about $190 million to construct the Capitol Corridor from Lowell, Mass., to Concord, although he stressed that was not a formal price-tag. He said there are other variables and cost mitigating measures such as support from the MBTA that could alter the cost.

"They haven't given me any numbers yet," he said of the estimated finances, which he expects won't be available until next year.

Mahon said the communities of Nashua, Manchester and Concord all have fairly well-developed plans on how to implement rail in their own cities, adding Merrimack also has significant vacant land available along an existing rail line.

"It is another transportation alternative for residents, and encourages development of commerce and industry along the corridor," Mahon said of passenger rail. Train ridership has the possibility of alleviating traffic congestion while simultaneously promoting high tech jobs by enabling development in multiple communities, according to Mahon.

Estimated weekday train miles for each city range from 1,500 miles to more than 2,000 miles on weekdays, he said. Furthermore, Nashua could expect to see about 16 trains per day, added Mahon.

Alderman-at-Large Dan Moriarty addressed the possible Spit Brook Road train station site, noting this could possibly enable a quick travel route from Exit 2 off the turnpike to the train stop.

Moriarty also questioned Mahon on the NHRTA's media policy after plans to have Dan Kelly, the mayor's designee on the rail board, update officials came to a confusing halt last month.

Moriarty quoted the policy, which stated "each board member has the right to update their town" about ongoing NHRTA efforts. Kelly was scheduled to discuss rail with the committee last month, but at the last minute removed his presentation from the agenda.

Mahon said Kelly has only been on the board since November, and Mahon didn't feel that Kelly "had the depth of knowledge" to provide aldermen with the most accurate picture. In addition, Mahon said Kelly is a designee of Mayor Donnalee Lozeau, and that Kelly has every right to update the mayor and subsequently update other city officials if Lozeau feels it is warranted.

khoughton@newstote.com

Home » News » Politics

June 06. 2013 1:38AM

Councilor pushes back on rail ad campaign

By DAVE SOLOMON
New Hampshire Union Leader

CONCORD — Executive Councilor Chris Sununu, R-Newfields, accused the state Department of Transportation of advocating for a controversial commuter rail proposal through a request for $40,000 to launch a public education campaign on the benefits of the Capital Corridor project.


CHRIS SUNUNU

The council approved the funding for the education effort in a 4-1 vote, but not after some heated debate.

"It's silly that we're going to tell people how wonderful the Capital Corridor is when we don't know if it's a good idea or not. That's why we're doing a study," said Sununu in questioning DOT Commissioner Christopher Clement at the Executive Council session Wednesday. "It's putting the cart before the horse."

Clement said the transportation department was not trying to influence the public on the plan to extend the existing commuter rail system across the Massachusetts border into Nashua, through Manchester and on to Concord.

"With all due respect, Chris, that's exactly what you're doing," Sununu replied. "You're advocating for the benefit of the Capital Corridor project."

The commuter rail proposal has been hotly debated for a decade. In February, the Executive Council voted to approve a $3.6 million feasibility study for restoring passenger rail service along the Merrimack River, with Sununu casting the only vote in opposition. The same study was defeated a year earlier by a Republican-dominated council.

$250-$300 million cost

The cost of actually restoring passenger rail from Nashua to Concord has been estimated at $250 million to $300 million. The study will determine the startup costs and provide estimates as to likely ridership, ongoing operating expenses and economic impacts.

"How can we be educating people on the benefits of the Capital Corridor if we haven't even completed a study on the benefits of the Capital Corridor?" Sununu asked.

The $40,000 education campaign would be funded with $32,000 from a Federal Railroad Administration grant and $8,000 from the state capital fund on behalf of the New Hampshire Rail Transit Authority.

Clement said the information campaign would help gather information for the viability study, which is scheduled for completion in December 2014.

The memorandum of understanding between the DOT and the Rail Transit Authority for selection of a public relations consultant states that “the sole purpose of the selected consultant shall be to promote the mission and activities of the NHRTA and educate the public on the benefits of passenger rail, and shall not be specific to any single project or function.”

“This is an important piece of a project we have already voted for,” said Councilor Colin Van Ostern, D-Concord.

Sununu said claims that the PR campaign would be objective are contradicted in the written explanation of the project submitted to the council, which stated:

“The DOT and NHRTA have agreed to partner in the selection of a consultant for the sole purpose of public outreach and public relations to increase the public awareness of the mission of the NHRTA ... and to educate the public on the benefits of rail as part of a comprehensive multi-modal transportation system, both statewide and specifically within the N.H. Capital Corridor.”

Nominations confirmed

In other votes, the council confirmed the nomination of John T. Beardmore of Hopkinton as the new commissioner of the Department of Revenue; and Peter C. Hastings of Derry as the new commissioner of the Department of Information Technology.

Roger A. Sevigny was confirmed to another term as commissioner of the Department of Insurance.

The council accepted the nomination of attorney James W. Craig of Manchester, Minority House Leader from 2004-2006, as commissioner of the Department of Labor.

dsolomon@unionleader.com

Comments

To improve the chance of seeing your comment posted here or published in the New Hampshire Union Leader:

- Identify yourself. Accounts using fake or incomplete names are suspended regardless of the quality of posts.
- Say something new, stay on topic, keep it short.
- Links to outside URLs are discouraged, if used they should be on topic.
- Avoid comments in bad taste, write well, avoid using all capital letters
- Don't cite facts about individuals or businesses without providing a means to verify the claim
- If you see an objectionable comment please click the "Report Abuse" button and be sure to tell us why.

Note: Comments are the opinion of the respective poster and not of the publisher.

Brian St. Onge said:

"It's silly that we're going to tell people how wonderful the Capital Corridor is when we don't know if it's a good idea or not."
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Warren, Jun. 8

Should Manchester's mayor receive a 59% pay raise?

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23%

No
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Thursday, March 20, 2014

Aldermen focus on cost of bringing commuter rail to Nashua, investigate costs of shorter rail line

By JIM HADDADIN

Staff Writer

NASHUA – Expanding passenger rail service to Manchester could cost as much as $200 million, but Nashua aldermen are investigating the price tag for a shorter expansion project that would end in the Gate City.

Members of Nashua's Planning and Economic Development Committee heard from New Hampshire Rail Transit Authority Chairman Tom Mahon on Tuesday about the status of an ongoing commuter rail feasibility study.

While cost estimates have dropped in the latest research, Mahon was blunt about the difficulties that a rail project would face in New Hampshire.

"It's going to be a challenge to come up with a funding mechanism to get this done," he said, explaining that a commuter rail expansion north from Lowell, Mass., to Manchester would carry a price tag of roughly $190 million.

However, Nashua aldermen are looking for answers about how much a shorter project creating one or two stations in Nashua would cost.

While a project might not be popular statewide, the city could potentially muster resources on its own or in conjunction with private businesses to bring passenger rail to Nashua.

"I think the general consensus in Nashua is one of, for the most part, majority support for commuter rail," said committee chairman Dan Moriarty.

Station locations

Given its proximity to Boston, Nashua is expected to have the highest ridership numbers of any location being considered for a commuter rail expansion in the state's so-called "Capitol Corridor" – the region between Boston and Concord.

A study underway now is examining two potential stops in the Gate City: one southern stop, either at Spit Brook Road or the Pheasant Lane Mall; and a downtown stop on Crown Street. If the line ends in Nashua, the project also would include a layover facility off Spit Brook Road.

Nashua's stations would be about 35 miles and 39 miles from Boston, respectively. At top speed, travel times from Nashua to North Station in Boston would vary between about 54 minutes to a little over an hour from the southern station.

Maximum travel time from the Crown Street station is estimated to be about an hour and 14 minutes.

At least three studies conducted since 2000 have attempted to analyze the pros and cons of bringing passenger rail north from Massachusetts. The latest, released in 2010, found that a new rail project could generate more than $2 billion in the region and create close to 1,000 jobs.

The study pegged potential ridership between 400,000 and 1 million one-way train trips a year.

Mahon said those numbers are “still holding” in the latest research, which shows that as many as 3,100 people would ride the train to or from New Hampshire in a single weekday.

Partnership with MBTA

One major change in the latest findings is the potential cost. While a project reaching Manchester was earlier estimated to cost as much as $300 million, preliminary figures show that the price would likely be lower, Mahon said.

“Part of that is due to the cooperation, if you will – potential cooperation – of the MBTA,” he said.

The Massachusetts Bay Transportation Authority, which oversees commuter rail operations in the Bay State, is “very interested” in expanding the existing Lowell line into New Hampshire and is “ready to help us in a number of ways,” Mahon said. He said the partnership could potentially mirror the MBTA’s relationship with transportation authorities in Rhode Island.

The MBTA worked with counterparts in Rhode Island to launch commuter rail service between Boston and T.F. Green Airport in Warwick, R.I., in late 2010.

Mahon said price estimates also came down because of the MBTA’s plans to refurbish older trains, alleviating the need to buy new units.

It’s also anticipated that public-private partnerships could help defray the cost of developing station sites in New Hampshire, Mahon said.

“The expense of the station sites can be mitigated or reduced,” he said.

Based on previous cost estimates, Moriarty said he calculated that a passenger rail project reaching Nashua could cost as little as $75 million. Presented with the latest costs for the full Capitol Corridor, Moriarty said he believes that number could drop into the range of $60 million.

Mahon declined to comment on those figures before contractor URS Corp. finalizes its work on the study.

“I’m not going to make any promises,” he said. “They haven’t given me any numbers yet. After serving on the budget committee in my community for 14 years, I don’t do anything until I see the numbers.”

Rolling forward

The financial analysis isn't expected to be completed until early 2015, Mahon said, although URS Corp. is expected to finalize its recommendations and ridership estimates by the end of this year.

The study is assessing options for a regional passenger rail service, similar to Amtrak's Downeaster train, and a separate commuter service.

The regional option would be run by Amtrak, would operate at higher speeds and offer fewer stops. Commuter rail would be run by the MBTA and generally would reach top speeds between 60 and 65 mph.

In Manchester, the study is focused on creating a park-and-ride style train station near Manchester Airport and another station downtown, either at Granite Street or Spring Street.

The proposed location in Concord would be on Stickney Avenue, which already has a bus station.

However, Mahon downplayed the possibility of service reaching Concord in the near future. He said ridership doesn't sustain bringing commuter rail north of Manchester.

"Right now, the northern terminus, if it goes that far, would be Manchester," he said.

The Washington Post

Back to previous page

Amtrak Downeaster exceeds 500,000 passengers as it celebrates 10th anniversary

By Associated Press, Published: December 12

PORTLAND, Maine — Amtrak's Downeaster is celebrating its 10-year anniversary this week, capping off a year in which annual ridership surpassed half a million passengers, Amtrak launched its eTicketing pilot program and workers made progress on an expansion of service north to Freeport and Brunswick that's to begin in the new year.

Ridership has doubled over the past six years, and the number of passengers topped 500,000 for the first time in 2011, Amtrak said. All told, more than 3.5 million passengers have ridden the train.

"It's been a success by every measure and we're looking forward to the expansion of the service to Brunswick," said Stephen Gardner, Amtrak's vice president of Northeast corridor infrastructure and investment development in Philadelphia. "This is a corridor to watch."

The Northern New England Passenger Rail Authority, which oversees the Portland-to-Boston service, has a string of events planned leading up to Thursday's anniversary.

Ten years ago, however, nobody knew whether the service would succeed when the first regularly scheduled train departed from Portland on the cold, rainy morning of Dec. 15, 2001.

Back then, some New Hampshire officials were openly skeptical of the prospects of the first Portland-to-Boston passenger rail service in more than 35 years. These days, New Hampshire still doesn’t contribute any operating costs, but the value of the train service speaks for itself.

“It’s hard to argue with the numbers,” said Bill Boynton, spokesman for the New Hampshire Department of Transportation. “It’s done very well.”

Ridership took off starting in 2005 thanks to increased frequency of round-trip service, track improvements that have shortened transit time and gas price spikes.

Over the past year, the Downeaster marked several milestones that included launching Amtrak’s eTicketing pilot program that allows passengers to print their tickets at home. Amtrak also boosted its free wireless network for riders who want to use their laptop computers and other digital devices.

For its 2011 fiscal year, ridership reached 509,986 passengers, and those numbers will continue to grow when the Downeaster service expands northward to Brunswick, said Patricia Quinn, executive director of the Northern New England Passenger Rail Authority, based in Portland.

A $38.3 million track extension is due to be completed in the new year, allowing stops in Freeport and Brunswick. That’ll mean another 36,000 annual passengers initially, then an additional 50,000 passengers once service expands to five roundtrips per day, Quinn said.

Existing stops between Portland and Boston are Old Orchard Beach, Saco and Wells in Maine; Dover, Durham and Exeter in New Hampshire; and Haverhill and Woburn in Massachusetts.

Lionel Caron was one of those who rode the first regularly scheduled train to Boston. He said he never had any doubts that the service would succeed, especially after gas prices rose. With the cost of gas, and the cost of parking the car in Boston, the Downeaster seems like a bargain, he said.

Caron said he enjoys the low-key vibe of the train, which he’s ridden several times. And he stands to benefit from the new station in Brunswick, since he lives about 12 miles away in Lisbon.

“If you fly, you don’t see much. If you take a train, you can look out the window and relax,” he said. “You can’t do that on a four-lane highway either.”

It was no small feat to get the service running.

It took 13 years and more than $60 million in public funds for track upgrades and equipment and countless hours of negotiating among various parties to get passenger trains running for the first time since 1965 on the 116-mile route between Portland and Boston.

“It does call for a celebration,” said Dana Connors, former Maine Department of Transportation commissioner who now serves on the rail authority’s board.

To mark the anniversary, the Northern New England Passenger Rail Authority is holding a pizza party for Amtrak workers on Monday and a luncheon for volunteers on Tuesday. On Wednesday, Amtrak and rail authority officials will ride the train from Boston to Portland.

And on Thursday, rail authority board members, transportation officials and other dignitaries will participate in an anniversary ceremony in Portland that coincides with the arrival of a Toys for Tots train carrying nearly 150 schoolchildren from Berwick, Maine.

Starting Dec. 15, fares are being reduced to $15, the lowest published fare for a one-way ticket in coach.

Wayne Davis of TrainRiders Northeast, which lobbied for a dozen years to make the rail service a reality, tries to avoid saying “I-told-you-so” but the reality is that he did.

“It’s exciting to think it was 10 years ago. Son of a gun,” Davis said. “Everything we ever said came true.”

Ducker, Renee

From: Bruneau, Jonathan <Jonathan.Bruneau@jacobs.com>
Sent: Friday, February 28, 2014 11:59 AM
To: Nelson, David (Boston); Kinney, Ken; Suprock, Julia; Chamberlin, Carl; Wilder, Russ; Harris, Ryan
Subject: Article references Exit 36 & Transit Center in Nashua/Tyngsboro

Article/discussion text (and web link) below that references Exit 36 south off FE Everett Turnpike (Rt 3) in Nashua and mentions the hope of bringing a 'transit center' to the area.
See Gray highlighted sections below.

www.nashuatelegraph.com/.../study-says-five-local-intersections-are-really.html

Study says five local intersections are really, really bad

By JIM HADADIN
Staff Writer

NASHUA – New findings from a traffic study of southern Nashua could be an important first step toward addressing the congestion in the region, even though they won't come as a surprise to drivers stuck at the traffic lights along Daniel Webster Highway.

The study found that five intersections in Nashua and Tyngsborough, Mass., are performing so poorly during certain parts of the day that they're in need of traffic mitigation work.

Among the worst was the intersection of Daniel Webster Highway and Danforth Road, which produced some of the longest delays. On Saturday afternoons – when shoppers are filling the Pheasant Lane Mall and stores nearby – the average driver waits more than 2½ minutes to get through the traffic lights there, the study found.

That's well above the threshold for corrective action established by the Transportation Research Board, a nonprofit advisory group working under the umbrella of the National Research Council. TRB's highway guidelines state that in an urban area, delays of 55 seconds or longer at a traffic light are cause for concern.

The studied showed that from 1-3 p.m. Saturdays, the average driver waits 153.3 seconds to get through the lights at Danforth Road and Daniel Webster Highway.

Lengthy delays also were logged in spots around the Pheasant Lane Mall, at the intersection of Spit Brook Road and Tara Boulevard just west of Exit 1, and at the site where Middlesex Road converges with Route 113 in Tyngsborough.

The findings were reported in a draft study released in December by the Nashua Regional Planning Commission and the Northern Middlesex Council of Governments.

“The analysis confirmed what everyone in the region or who visits the area already knew: That there are times when the Daniel Webster Highway, Spit Brook and the Pheasant Lane Mall gets pretty congested,” said Tim Roache, of the Nashua Regional Planning Commission.

No surprises

While the findings aren’t surprising, Roache said the study will be a vital component if the state tries to secure federal funding for highway projects in the future.

The study is examining the congested corridor between southern New Hampshire and northern Massachusetts. In addition to documenting the existing conditions, the study is assessing what the area will look like in the future if things remain unchanged.

It also will try to quantify the benefits of building a new exit ramp on the southbound side of Route 3, the highway that becomes the F.E. Everett Turnpike once it crosses into New Hampshire.

Getting the exit constructed is high on the wish list for Nashua officials, since it’s expected the new off-ramp would alleviate congestion throughout the area. The exit would be near the entrance to the Pheasant Lane Mall, allowing drivers heading south on the highway to bypass the dense retail corridor along Daniel Webster Highway to reach the mall and destinations to the south in Massachusetts.

The exit also is being eyed as a positive step toward bringing passenger train service back to southern New Hampshire. The new Exit 36 south would bring cars directly to the site where planners hope to build a new transit center outside the mall.

Tyngsborough could reap the benefits if both projects come to fruition. A majority of the town’s border area with Nashua doesn’t have sewer service, which hamstrings commercial growth.

If a new transportation hub is built in Tyngsborough, it would likely be connected with the sewer system at the Pheasant Lane Mall, creating new possibilities to extend the sewer connection to other areas of the town. Nashua is planning to analyze the capacity of its sewer system in the future and weigh possible linkages with Tyngsborough.

The long drive south

All of the shopping activity means traffic on the Daniel Webster Highway is heavier on Saturdays than during the workweek. Traffic counts from fall 2012 showed nearly 40,000 cars travel on the roadway on a typical Saturday.

The highest traffic volume was recorded just south of Spit Brook Road. That’s because this is the location where cars exiting Exit 1 of the turnpike end up. Traffic decreases steadily as you head south on the Daniel Webster Highway – presumably because drivers are reaching retail destinations along the way.

The study found the intersection with Danforth Road was the worst-performing area on Daniel Webster Highway. On a typical weekday, between 11 a.m. and 1 p.m., drivers can expect to wait at the stoplight for about 54 seconds. In the evening, from 4-6 p.m., the time reaches an average of 56 seconds.

Some other stretches of Daniel Webster Highway also logged crash rates that were above-average for the road conditions. The highest crash rate was the intersection with Dan Chan Street, which saw 63 accidents in three years. The majority – about half – were cars being rear-ended.

Another problem location identified in the study was the intersection of Spit Brook Road and Tara Boulevard, which is the only entrance into Nashua Office Park, Nashua Technology Park and the Gateway Hills Development, as well as the Radisson Hotel.

Congestion at this intersection is so bad that the John J. Flatley Co., which is developing around 400 acres around the former Digital Equipment Corp. site for Gateway Hills, says it needs another connection to the turnpike. As the Telegraph has reported, it would like a ramp at Exit 2 that would connect into the northern section of the property.

On weekdays, from 4-6 p.m., drivers at the Tara Boulevard intersection waited an average of about 139 seconds to make it through the traffic light where the roads intersect.

Future conditions

The authors of the study are soliciting feedback from the public about their findings regarding the existing conditions in the study area.

They also are preparing to unveil a draft of their research about how things will look in the future, based on population estimates, employment trends and other metrics.

The study is attempting to gauge traffic patterns in the year 2022, a theoretical date by which the new Exit 36 south could come online if funding materializes.

The study also will attempt to estimate the cost for the project. A previous study put the price tag at $17 million, although it's nearly certain the cost would be higher by the time the project gets underway, Roache said.

"A lot has changed given the price of asphalt, the price of oil. All that's tied together," he said.

Roache said his organization is tentatively planning to wrap up the study early this summer.

The document also will make recommendations regarding options for expanding public transportation in the area and enhancing pedestrian and bicycle accommodations.

"There's a very dense population that, if we can make some better accommodations, folks could take advantage of their proximity to all of those great retail destinations by walking and not necessarily having to get into their car and contributing to the traffic," he said.

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From: Nelson, David (Boston)
Sent: Friday, February 21, 2014 7:13 AM
To: Carl Chamberlin (URS); Bruneau, Jonathan; Russ_Wilder@URSCorp.com [Russ_Wilder@URSCorp.com]; Harris, Ryan
Cc: Ken Kinney (URS); Julia_Suprock@URSCorp.com
Subject: PanAm derails on the Hillsborough Branch in downtown Nashua.

Details and video at this link

http://www.nashuatelegraph.com/news/1029316-469/huge-crane-coming-to-downtown-nashua-to.html#

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Bus service from Nashua to Boston seeks more money as it keeps growing
By David Brooks, The Telegraph, Nashua, N.H.
McClatchy-Tribune Information Services

June 15--NASHUA -- The 6-year-old intercity bus service through Nashua to Boston continues to grow, to the point where its Exit 8 parking lot is 99 percent full on average -- but its costs are growing, too.
The New Hampshire Department of Transportation is asking for an increase of slightly more than $300,000 a year for the Boston Express service, which carried 560,000 passengers last year on more than a dozen buses daily.

It runs along two routes from Concord to Logan International Airport and Boston's South Station. One route runs along Interstate 93, carrying about two-thirds of the total passengers, and the other runs along the F.E. Everett Turnpike to Tyngsborough, Mass., and then Boston. The request for $2.47 million in Federal Transit Administration funds over the next three years, an increase from $1.55 million originally budgeted, will be considered by the Executive Council on Wednesday. Although this is federal money, it is "passed through" by the state, to use government-funding terminology, and must be approved by the council.

The operation costs about $5.5 million a year, and over the last two years, about 88 percent of costs have been covered by fares, according to Department of Transportation data -- a figure that transportation officials have called one of the highest rates in the country. In the service's first year, fares covered about 55 percent of costs. Rides cost up to $18 one way, depending on route, time and type of ticket.

Ben Blunt, general manager for Boston Express, said the hike in the funding request is the result of increasing costs for health insurance, fuel, maintenance on the buses as they enter middle age and other factors. Boston Express has operated the service for New Hampshire since it began in 2007. The dollar figure is the maximum that the company could bill for the service through 2018.

"We did our best guess trying to be conservative and accurate, but also safe in terms of allowing ourselves some flexibility if fuel costs do go crazy," Blunt said. What's keeping your clients up at night?

"We want to make sure that the state has the appropriate funding to keep the service going. We will not necessarily use it all -- hope we don't use it." An increase in fares could reduce the government payment, but Blunt said there are no plans to hike them at this time. "We are in discussions with the state about that," Blunt said. The route along the Everett Turnpike has increased about 50 percent in traffic since it started, despite a dip during the height of the recession. "We don't want to stunt that growth with a fare increase," Blunt said. A longer-term concern for the service would be the possible return of passenger rail service along the Merrimack River, connecting Nashua and Manchester with Lowell, Mass. This idea has many advocates, including Nashua Mayor Donnalee Lozeau, and is being studied by a government body called the Capitol Corridor Feasibility Committee.

"I think the assumption is (rail service) would cut into it a fair amount," said Fred Butler, public transportation administrator for the state Bureau of Rail and Transit, which oversees the Boston Express service. "We're going to know a lot by the end of 2014. The capital corridor study to be done will have some recommendations." The service is particularly popular with commuters who prefer the plush seats with WiFi service to driving on Route 128. An extra morning bus was added in March to meet demand.

The service originally boarded at what was then the state Welcome Center off Exit 6 of the turnpike, and moved to its current location alongside Southwood Drive, off Exit 8, in 2010.

That site has 275 painted spots, and in 2013, it averaged 271 vehicles, a whopping 99 percent use -- including some cars that use it as a park-and-ride lot. Butler said the state planned to restripe the lot this year, which might increase its capacity.

Exit 8 is by far the most popular spot along the Everett Turnpike bus route, accounting for about 60 percent of the route's 193,000 passenger boardings over the course of the year, far more than locations in Manchester or Tyngsborough.

David Brooks can be reached at 594-6531 or dbrooks@nashuatelegraph.com. Also, follow Brooks on Twitter (@GraniteGeek).

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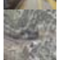

- Staff photo by Phil Kincade
  The Amtrak Downeaster train arrives in Durham in December. Amtrak is thinking about added more roundtrips to the route after reporting increased ridership and ticket revenue.
- Courtesy photo

  This aerial photo shows the location of a proposed commuter rail stop on Crown Street in Nashua.
- Courtesy photo

  This aerial photo shows the location of a proposed commuter rail stop at the Pheasant Lane Mall in Nashua. The mall is one of two southern stops in Nashua being considered for a commuter rail project.
- Courtesy photo

  This aerial photo shows the location of a proposed commuter rail stop off of Spit Brook Road in Nashua. This is one of two locations being considered for a train stop in southern Nashua.

Friday, March 7, 2014

Commuter train through Nashua could bring more riders than Amtrakâ€™s Downeaster

By JIM HADDADIN

Staff Writer

Extending passenger rail service from Massachusetts into Nashua and Manchester could draw more riders each year than Amtrakâ€™s Downeaster train, according to the chairman of the New Hampshire Rail Transit Authority.

Preliminary estimates show commuter rail service in New Hampshireâ€™s Capitol Corridor could draw as many as 3,100 boardings per day.

That number includes people taking the train south from Nashua and Manchester and those riding north to reach destinations in New Hampshire.

Extrapolated over the course of a year, the number of train trips to or from New Hampshire could top 800,000.

That number far exceeds the ridership for Amtrakâ€™s popular Downeaster train, which runs between Boston and Brunswick, Maine, with a series of stops in New Hampshire. Amtrak reported close to 560,000 trips on the entire Downeaster line during its most recent fiscal year, which ended in October.

The figures were offered up for comparison Wednesday by New Hampshire Rail Transit Authority Chairman Tom Mahon. Theyâ€™re another piece of data that could be used by proponents to bolster the argument for extending commuter rail service from Lowell, Mass., into New Hampshire.

The subject was the focus of a public forum Wednesday at the New Hampshire Department of Transportation building in Concord, where contractors studying commuter rail issues for the state presented their latest findings.

URS Corp. has passed the half-way mark in the stateâ€™s Capitol Corridor Rail and Transit Alternatives Analysis study, which has been in progress for more than one year. The firm is assessing options to reduce congestion on Interstate 93 and potentially bring passenger train service north from Massachusetts.

The feasibility study represents a crucial next step for commuter rail proponents, who are pushing for New Hampshire to bring commuter trains to Nashua, Manchester and potentially Concord.

The contractors performing the study are seeking public input on commuter rail and bus options, as well as the social, economic or environmental impacts of a potential rail project, and suggestions for alternatives that might avoid, minimize or mitigate adverse impacts.

URS Corp.â€™s preliminary estimates show a rail expansion reaching Manchester would cost in the range of $200 million.

URS considered multiple locations for commuter rail stations in each of the three cities in the corridor. Some of the criteria that shaped location preferences were track characteristics, the configuration and size of the available lot and access to either major highways or local roads, depending on whether the location is intended to be a park-and-ride or downtown transportation hub.

Nashua is expected to have the highest ridership numbers, given its proximity to Boston. The study is examining two potential stops in the Gate City: one southern stop, either at Spit Brook Road or the Pheasant Lane Mall; and a â€œdowntownâ€ stop on Crown Street.

In Manchester, the study is focused on creating a park-and-ride style train station near Manchester Airport and another station downtown, either at Granite Street or Spring Street.

The proposed location in Concord would be on Stickney Avenue, which already has a bus station.

Another rail option under consideration is a faster â€œintercityâ€ service, similar to Amtrakâ€™s Downeaster service. It would make fewer stops, compared to the commuter rail proposal, and would pick up passengers only at downtown stations and at Manchester Airport.

Based on preliminary estimates, New Hampshire would face costs in the range of $8 million to $10 million annually to build, operate and maintain the rail corridor. Project planners also are assuming federal funding is a necessity for the project to move forward.

The Capitol Corridor study is receiving federal funding from two sources, which have different objectives and requirements.

The Federal Transit Administration provided funding to study bus and rail options and how they would interact in the corridor. The Federal Rail Administration is paying to study the feasibility of intercity service between Concord and Boston. In the future, the route could conceivably be part of a high-speed rail extension to Montreal.

David Nelson of Jacobs Engineering said the tracks between Massachusetts and Concord used to be part of a passenger rail line running to Montreal, which ran at a maximum speed of 70 miles per hour.

The study has determined that without changing the alignment of the tracks, it would be difficult to run trains at a much higher speed, since the line follows the curves of the Merrimack River. Nelson said top speeds would probably hit 75 miles per hour.

â€œThis particular alignment where weâ€™re following the sinuous curves of the river, it creates geometric standards or issues that you donâ€™t face if youâ€™re doing the work in Chicago,â€ he said.

URS has identified two bus options and three commuter rail options to study further before presenting its findings at the end of this year.

The company will create more precise ridership and fare projections for each route, then make recommendations for preferred options.

Lawmakers will then decide whether to put together a financial plan to cover the estimated $8 million to $10 million annual cost of a commuter rail expansion. New Hampshire also will need to fund a $4 million engineering study in order to qualify for federal money.

If the project gains political support in New Hampshire and federal funding is approved, construction could start as early as 2017. The earliest date commuter rails service would begin is 2020.

Jim Haddadin can be reached at 594-6589 or jhaddadin@nashua telegraph.com. Also, follow Haddadin on Twitter (@Telegraph_JimH).

MY TURN

Please, councilors, get some facts first

Train study is worth conducting

By ROBERT B. WILLIAMS
For the Monitor

To make informed decisions, people need solid, current information. That is why the Executive Council vote against accepting federal money for the study of the feasibility of restoring rail service to Concord is disturbing. Have three councilors already made up their minds and they don't want to be confused with facts?

A letter writer said that a study had been done that showed that a freight line would work, but that passenger service would not. There was no information on the date of that study. What were the assumptions, e.g. gas prices when the study was done?

Today, with high gas prices and a likelihood that they will be high or higher in the future, a growing awareness of how carbon emissions contribute to climate change and a need to reduce oil imports so we can send fewer of our youth overseas to secure oil fields, we need to look at all aspects of transportation and energy policy.

I suggest we start by pointing out the unique energy efficiency of the flanged wheel rolling on a steel rail. You can move more tons of freight, more miles, with less fuel than any other way.

And for people who say they would never use the train, if many people do ride the rails, with less fuel used, air for everyone would be cleaner and highways would be less congested (and therefore safer).

After passenger train service was restored to some towns south of Boston, the real estate values in those towns went up.

We have not had a coordinated approach to transportation needs. We tend to think that public money spent on roads and airports are "solid investments in infrastructure" but that any money spent on rail facilities is "wasteful subsidy."

As you leave the airport in Zurich, Switzerland, you can walk right onto the subway and zip into the center of the city. But, as you leave the Manchester airport, there is no easy way to get to our state capital or travel south.

As buses come from Boston to Concord, and they stop in Londonderry, there is no parking lot right beside the highway, with an easy-off, easy-on. Instead, the bus has to make several stops and turns (using fuel and brakes each time) and go a fair distance off to a remote parking lot – and then reverse the process to come back to the highway to continue on to Concord.

When the raised, central artery highway was built in Boston in the 1950s and '60s, they planned for several additional roadways. Do people recall seeing the spots near the east end of the North Station where sections of the elevated road formed a "Y"? We could drive in from New Hampshire on one leg of the Y and see that the other part of the Y went for about 20 feet and ended abruptly with barriers and a squared, cut-off end.

There had been firm plans to extend the roads further, and all of a sudden there was a collective realization that more roads were not the answer. And many extensions were just never built.

So let the study proceed and then we can talk about it when we have the results in hand.

(Robert B. Williams lives in Chichester.)

MY TURN

Actually, commuter rail service makes good sense

Strong prospect for volume and growth

By GILMAN SHATTUCK
For the Monitor

Last week, I traveled to New York City. I went from and to Concord on the bus to South Station, from South Station on Amtrak Regional (several stops), returning on Acela Express (three stops). This comfortable trip on the train made me think of what could have been possible with train service from Concord to Boston – and how off-base Grant Bosse was in his column about possible train service on this line and Amtrak service elsewhere ("A commuter train to Concord? No thanks," *Sunday Monitor* Viewpoints, Sept. 23).

Amtrak train service on the Northeast Corridor between Boston and Washington is booming. All trains run at full or near capacity. This is the only Amtrak service that is profitable. It generates more than 50 percent of all Amtrak revenue.

More than 54 percent of all air and train travelers between Boston and Washington ride on Amtrak. They have come to realize that trains are a much better alternative to the vagaries and discomforts of air travel between these cities and points between.

We could have had this service many years sooner. The initial phase of the upgrade was completed in the 1970s. Congress refused to allow the completion for 20 years, so the Acela service did not start until 2000. Even though the Acela is an improvement that makes it effectively competitive with air travel, it does not begin to compare with service in other countries.

Train service between Vienna and Salzburg, Austria, allowing for the slightly longer distance between Boston and New York, will take 2:25 hours as of Dec. 1, compared to 3:30 on Acela. In France, where high-speed service has been in place for many years, comparable trips take even less time.

Amtrak is hobbled by whims of Congress forcing service on low-usage lines and not allowing upgrades to tracks and equipment for high-speed service. Amtrak does not have the funding to add additional service.

Lowell to Concord

The proposed phased extension of commuter rail northward from Lowell, Mass., and eventually to Concord makes economic and social sense. Yes, it involves a substantial investment to rebuild the existing alignment to modern standards. Yes, it will require a substantial subsidy for several years until passenger volume builds up.

Commuter rail service has boomed where it has been encouraged and supported. Commuter rail has an enormous effect in the Boston area. More than 130,000 riders use the MBTA commuter rail service on weekdays.

This was the pattern for the Downeaster service between Boston and Portland. This service began in 2001. Usage began slowly but has rapidly accelerated in the past three years to the point where it is the most rapidly growing line on the entire Amtrak system. Again, growth is limited by the availability of equipment. While perhaps the main intent of reinstating service on the line was for inter-city traffic, a very large and growing component of traffic is for commuters both into Boston and into Portland and intermediate points.

Subsidy is worth it

In years past, there was excellent regional and commuter rail service on the Concord-to-Boston line. There have always been job opportunities in Massachusetts and a need for commuter transportation. Because of the collapse of the rail system in New Hampshire, the only alternatives now are auto and bus transport. And an obsession to expand the highway system at huge cost and increasing air and noise pollution.

The prospect for traffic on the Concord-to-Boston line is very encouraging. There is a much higher population density and commuter density on the corridor that would be served by this line. The prospect is excellent both for volume and growth.

Yes, it will require a substantial subsidy in its early years, but a substantial amount of federal money will be available in these years. It will require some subsidy on an ongoing basis. It will require coordinated development of feeder transportation and parking.

Opponents of this service totally ignore the economic benefits and, more important, the social benefits to the community that this service will bring. The huge impact of sharply reduced air and noise pollution, less need to destroy property for ever more lanes of highways. These benefits like all investments in infrastructure are continuing and keep paying off in the years ahead.

(Gilman Shattuck lives in Hillsboro.)

Engineering firm presents possible Plaistow rail options

October 12. 2014 8:42PM

By ADAM SWIFT
Union Leader Correspondent

PLAISTOW — The debate over whether a commuter rail station and layover facility will be coming to Plaistow looks like it will only intensify by the end of the year.

At a public information meeting attended by about 60 people on Thursday night, the engineering firm presented its three alternatives for commuter rail station and layover facilities.

Over the coming several months, HDR Engineering will conduct additional traffic, air quality, and noise and vibration studies before making a final recommendation to the Project Advisory Committee and the town.

However, much of the community input during Thursday night's meeting revolved around the benefits versus the impact of extending the commuter rail from Haverhill, Mass., to Plaistow and not on the specific recommendations for station and layover facility locations. A number of residents also questioned whether the town will get the chance to vote on the project at the ballot box.

The first alternative calls for a layover station just over the state line in Haverhill, Mass., with the commuter rail station at the current Park and Ride facility on Westville Road, according to Ron O'Blenis of HDR Engineering. As required for all layover facilities, the one in Haverhill includes six tracks for the storage of six nine-car trains.

The other two alternatives call for combined commuter rail stations and layover facilities in Plaistow. One is off Main Street on Joanne Drive and the second is further up Main Street closer to the Atkinson line.

O'Blenis also raised the possibility of an alternative combining the layover facility from the Joanne Drive option paired with the commuter rail station on Main Street.

The question and answer period following the presentation by O'Blenis focused largely on the impact extending the commuter rail to Plaistow will have on the community.

"I'm not in favor of a layover station, but I wouldn't mind a train stop," said Plaistow resident Jay Roche. He added that it also didn't seem to be the best alternative to locate the stations and layover facilities in the center of town.

Roche said he was also upset that the consultant's study did not include a survey of local residents asking them if they planned on using the commuter rail if it was extended to Plaistow.

Several residents also said that they are upset that it hasn't been made clear what the procedure is for approval of the project and whether it will include a Town Meeting or ballot vote.

Town Manager Sean Fitzgerald said that previous discussions with selectmen indicated that they would present a proposal to voters at Town Meeting. He added that he would bring the issue before the board at its next meeting to seek clarification on the issue.

While a number of residents indicated that they were hesitant to see the commuter rail extension to Plaistow, there were several people who spoke of the benefits of bringing the service to the area.

Former Plaistow Selectman Larry Gill said the commuter rail station could economically benefit the residents of the town for generations to come.

“You’ve beat to death all the negativity with this,” Gill told those questioning the project. “This is an opportunity. You can ask all the hard questions you want, but get all the information to make a rational decision.”

Fitzgerald said the residents have to look at the benefits of commuter rail extension and not just the negative impacts.

“The future tells us that we need more modes of transportation,” said Fitzgerald. “There are benefits and not just impacts.”

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Home » News » Business

November 19. 2014 9:40PM

Former mayor makes pitch for commuter rail

By MICHAEL COUSINEAU
New Hampshire Union Leader

BEDFORD On the eve of the release of a major report on the potential of commuter rail in New Hampshire, former Manchester Mayor Bob Baines on Wednesday urged business leaders to lobby state leaders to get the attention of the circus to back rail to help attract needed skilled workers.

Unless we address this issue, we re going to kill the economy, not only for our region but the entire state of New Hampshire, Baines told a chamber of commerce gathering at the Manchester Country Club.

Baines, director of community relations at Manchester-based Dyn, said politics right now is a circus and went on to tell business leaders they needed to get the attention of the circus, the political arena. Get into that arena, into that environment and make a compelling case that this is a critical issue for our state of New Hampshire.

After Baines finished, his boss, Gray Chynoweth, Dyn s chief operating officer, joked on how they could handle the situation.

 We ll be handing out clown suits that people can hand to politicians who are opposed to rail, Chynoweth said.

State Sen. Lou D Allesandro, who attended the session, later disagreed with Baines circus comment and said political leaders labored to get funding and work started on the Interstate 93 widening project.

But, the Manchester Democrat said, Baines comments are clear and concise with regard to keeping young people here and providing opportunity.

Thomas Mahon, chairman of the New Hampshire Rail Transit Authority, said during the event that he hears from elected leaders, how do I explain to my constituents in Epsom how this is going to be beneficial to those who would be called upon to help pay for rail service.

Preliminary findings regarding bringing commuter rail to the Granite State will be shared at 7 Thursday night at the Nashua Public Library. The report will provide estimates on ridership, costs and the number of jobs created, as well as suggest ideal locations for stations, according to E.J. Powers, spokesman for the authority.

Venture capitalist T.K. Kuegler, managing partner of Wasabi Ventures, which is involved in numerous startup companies, said he recruits people from outside the state and needs to sell them on moving and working here.

Kuegler said New Hampshire businesses need a way to tap skilled workers living in the Boston area to commute to New Hampshire.

 It could be flying monkeys if that s what the study comes back and tells me what works, Kuegler said.

All I m here on this panel to tell you is you re completely screwed unless you do fix it. Screwed. You re screwed as a state. You might as well shut down. So either fix it or people like me won t stay because I m not going to be a salmon swimming upstream.

Chynoweth said when he quizzed young people during a Boston-area recruiting trip, only four of 65 raised a hand indicating they would consider working in Manchester. But when told they could hop a train to head north, 35 hands went up.

Every morning, there is a giant wall that gets erected. You can t get to and you can t get from Boston, he said. If you had something like rail to pierce that in a reliable way, all of a sudden you d have a much better access to the talent pool.

mcousineau@unionleader.com

State's high-speed rail plan from

Nashua to Concord derailed; DOT blames Pan Am Railways

By Robert M. Cook
Thursday, October 1, 2009

CONCORD — Plans to create a high-speed rail corridor from Nashua to Concord were derailed Wednesday after state Department of Transportation officials said they would not apply for $300 million in federal economic stimulus funds.

Related Articles and Media

Article: Dover Mounted Patrol wins a reprieve: Waiting to see if fed funds to save unit are available

DOT Commissioner George Campbell laid the blame squarely on the shoulders of Pam Am Railways for refusing to participate in talks with the state to create the 39-mile "Capital Corridor" project.

"By walking away from this unique and exiting initiative, Pan Am has effectively closed the window on strengthening New Hampshire's economy. Our citizens and businesses along this corridor deserve better transportation choices than they have today," said Campbell in a prepared statement.

Pam Am Railways was an important player in the process because it is the host railroad along the corridor, Campbell explained. The deadline for "Track 2 corridor service development and improvements" program applications is Friday.

Campbell said the state is discussing with Amtrak its interest in operating passenger rail along the "NH Capital Corridor." Currently, Amtrak's Downeaster train serves riders with five daily round trips between Portland, Maine, and Boston.

State officials and rail advocates said the proposed "NH Capital Corridor" project would run on 78 miles of upgraded track between Boston and Concord, connecting Concord, Manchester-Boston Regional Airport and Nashua with Boston's North Station.

Campbell said the state has applied for $1.4 million in planning funds for the Capital Corridor project as part of the $8 billion American Recovery and Reinvestment Act of 2009.

Mark Richardson, a spokesman for the New Hampshire Railroad Revitalization Association in Weare, said in May the proposed rail corridor could serve up to 600,000 riders per year, who would generate economic development for downtown businesses along the route.

"It reinvigorates the downtown areas and makes them livable and workable areas," Richardson said in May.

On Wednesday, he said, "Obviously, this is a setback."

He said until the state can work something out with Pam Am Railways to negotiate the use of the rail line, it will continue to be difficult to obtain any federal funding.

He also said that if a high-speed corridor train is created between Montreal and Boston and it ends up traveling through Vermont instead of New Hampshire, that would be a big loss for the state.

Chris Clement, deputy director of the state DOT, described the setback as "a blip" that will force the state to go down a different path.

He said DOT officials have already had good conversations with Amtrak officials and Amtrak CEO Joe Boardman told Clement he is interested in the project.

Clement said the state can also apply for federal funds next year when the federal government is expected to make another $8.5 billion available for high-speed rail projects.

If the state can reach an agreement with Amtrak, Clement said they can then apply for the federal funds next year. Given the needs of the state and the fact that it will continue to have an aging population, Clement, who lives in Durham, believes it is still a good idea to pursue the Capital Corridor project.

David Fink, president of Pam Am Railways in North Billerica, Mass., said he would be willing to negotiate with Amtrak if Amtrak approached him about using the rail line between Concord and Nashua for passenger rail.

"I do business with Amtrak every day," Fink said. "They run the Downeaster for me every day. They're business partners."

But Fink said during such difficult economic times the state should not be wasting its time on high-speed rail.

"It just doesn't make any sense," Fink said. "Let's straighten our house out and then look at what we have."

When asked if his decision to walk away from negotiations with the state in June was his way of getting back at the state for not allowing him to bid on a separate rail line, Fink would not comment.

"I don't want to sit down across the table from dishonest people," Fink said.

Fink walked away from negotiations with the state DOT on June 30 after he alleged his company was precluded from bidding on a rail line owned by state Rep. Peter Leishman, D-Peterborough.

In June, the Executive Council voted to have the Attorney General's Office investigate Fink's accusations that the state DOT was poised to renew a 10-year contract with Milford-Bennington Railroad owned by Leishman without adhering to renewal guidelines.

The council voted to extend the rail company's pact by only six months, thereby ensuring no interruption to freight delivery to the southwestern part of the state and to give the Attorney General's Office ample time to investigate Fink's claims.

Fink alleged in June that Leishman's contract required his company to notify the state in July 2008 of its intention for renewal and Leishman did not do that. Fink also said a new contract had to be approved by Feb. 1, 2009, which also did not happen.

Fink alleged that instead of the DOT opening the bid process, the contract was put on a fast track because Leishman is a member of one of the House Finance Committee's panels and the DOT was concerned not approving the contract could affect ongoing budget negotiations.

Ducker, Renee

From: Tom Mahon <tjmahon@comcast.net>
Sent: Friday, November 21, 2014 10:45 AM
To: Carlos P. Baia; Dan Kelly; Daniel Barufaldi; David Preece; Jonathan Edwards; Kerrie Diers; Malcolm Taylor; Mark Brewer; Michael Izbicki ; Michael Tardiff; Nancy Larson; Patrick Herlihy; Raymond Gagnon; Rep. Candace Bouchard; Rep. Sherman Packard; Richard Cane; Robert D Jaffin ; Sen. Jim Rausch; Sen. Peggy Gilmore; Stephen Pesci; Ted Starkweather; Tim Moore; William Craig
Cc: Adam Hlasny; Andrea and Rob Vibbert; Barbara Mcilroy; Barbara Pressly; Bernard Mulligan; Bette R. Lasky; Bill Boyd; Carol Morris; Chris Clement; Chris Williams; Christopher Kennedy; Christopher Stewart; Collin Lever ; Cynthia Copeland; Dave Kotsonis; DCameron; Dennis Fields; Dennis Grimes; Dennis Varney; Don Wendell; Donnalee Lozeau; E. J. Powers; editor@atlanticnortheast.com; Francois Rebello ; Hannah Bassett; Herbert A. Pence; Jake Berry; James Vayo; Jamie Kyle Simchik ; Jesse Turiel; Justin Frazier; Karen Miniutti; Katherine Hersh; Kinney, Ken; Kenyon Karl; layer03052@aol.com; make_tracks@comcast.net; Mark Richardson; Mark Sanborn; Martha Fuller-Clark; Matt Leahy ; Melanie Sanuth; Melissa Smart; Michael Lennon; Michael Smith; Mike Desrochers; Mike Skelton; Patricia Quinn ; Peg Fargo; Peter Griffin; Peter R. Leishman; Richter, Peter; Raymond Faulkner; Ronald Grandmaison; Ronald O'Blenis; rrbldrpete@comcast.net; Wilder, Russ; Sandra Keans; Scott Bogle; Scott Tranchemontagne; Shelley Winters; Simon Thompson; stoj@juno.com; Thomas Noel ; Timothy Sink; Tom Irwin
Subject: FW: More UL coverage - Rail study gets warm reception in Nashua

Additional coverage.

From: E.J. Powers [mailto:epowers@montagnecom.com]
Sent: Friday, November 21, 2014 9:00 AM
To: Thomas J Mahon; Michael L. Izbicki (msizbic@comcast.net); dpreece@snhpc.org; Patrick Herlihy (PHerlihy@dot.state.nh.us)
Cc: Jeff Mucciarone; 'Kit Morgan'
Subject: More UL coverage - Rail study gets warm reception in Nashua

More positive coverage.

Union Leader
Rail study gets warm reception in Nashua

By KIMBERLY HOUGHTON

Union Leader Correspondent

NASHUA — As state and city officials had their first look at the rail feasibility study unveiled Thursday, feedback on the document was relatively positive.

Several city aldermen and state representatives attended the public meeting where the New Hampshire Capitol Corridor Rail and Transit Alternatives Analysis was discussed.

The price tag associated with the various alternatives was also a popular topic at the standing-room-only venue at the Nashua Public Library.

Three rail options range in capital costs from $256 million to build into Concord, $246 million to build into Manchester and $120 million to build into Nashua — although there could be significant federal and MBTA contribution.

“The train will not pay for itself, and neither do highways,” said Alice MacDonald of Nashua, a commuter who supports passenger rail.

With 5,600 permanent jobs expected once rail is operating north to Concord for 10 years, supporters say it will be the economic engine needed to move New Hampshire ahead and attract young people.

Others say less expensive alternatives should be considered that would still generate great benefits.

Nashua Alderman Ken Siegel said the study should consider a rail stop just south of the Pheasant Lane Mall in Tyngsborough, Mass.

“This requires absolutely nothing from the state of New Hampshire,” said Siegel. “The MBTA wants to hook up to us. They want to make this happen.” Nashua would greatly benefit from a rail hookup just to the south, without the gigantic costs associated with other options, according to Siegel.

Chris Williams, president of the Greater Nashua Chamber of Commerce, urged state representatives not to delay, but to start the rail discussions in January. “This is what we need to move New Hampshire’s economy forward,” said Williams, adding 5,600 jobs is more than the local BAE Systems workforce, and more than the Fidelity Investments workforce in Merrimack.

Paula Johnson of Nashua, a former city alderman, said rail is a good option, but stressed that it can’t be more expensive than taking a bus. “How many riders will be able to afford this?” she asked.

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Ducker, Renee

From: peterjgriffin@comcast.net
Sent: Monday, November 10, 2014 11:46 AM
Subject: Fwd: WMUR Segment on Commuter Rail

Here is the link to yesterday's Project Economy program. Very brief, high content, and energy segment with David Preece and Gray Chynoweth, CEO of Dyn. Nice work supporting project.

http://www.wmur.com/money/nh-passenger-rail-service-under-study-again/29599670

Tom Mahon, Chairman

NH Rail Transit Authority

- Print
- Comments
-
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Staff photo by Don Himsel

A commuter train is parked and idles at the Gallagher Transit Terminal in Lowell, Mass., Monday, January 27, 2014.
Purchase Photo

Thursday, November 20, 2014

Meeting Thursday on commuter rail to NH report

By KATHRYN MARCHOCKI

Staff Writer

If you go

What: Public hearing on NH Capitol Corridor Project. All are invited.

When: 7-8:30 p.m., Thursday, Nov. 20

Where: Nashua Public Library, NPL Theater, 2 Court St., Nashua.

For more information: NH Capitol Corridor Project may be found on this link: www.nhcapitolcorridor.com.

NASHUA – Agencies putting the final touches on a nearly two-year commuter rail and transit study want to hear what people think of preliminary findings to ease traffic congestion along the 73-mile corridor from Boston, Mass. to Concord.

A public hearing will be held from 7-8:30 p.m. Thursday at the Nashua Public Library to gather public reaction to proposed rail and intercity bus options, their prospective costs and ridership. Comments could be included in the final report on the New Hampshire Capitol Corridor Project study due to be released mid-December.

“It’s important for us to get input from the citizens of New Hampshire about if and how passenger rail and bus transit opportunities should be advanced in the state so we can let the policy makers know how the public feels,” said Patrick Herlihy, director of aeronautics, rail and transit for the state Department of Transportation.

The final report will provide data related to the impact passenger rail expansion could have on New Hampshire. It also will identify specific station locations and financial options.

The public hearing will also provide the public with an opportunity to consider issues and concerns in the environmental assessment that is being prepared as part of the report.

The DOT is overseeing the Corridor Project Study and hired URS Corp. as its lead consultant. The $3.6 million study is funded from grants from the Federal Railroad Administration and the Federal Transit Administration.

In the works for 21 months, the Capitol Corridor Project explores ways to improve inter-city transit service from Concord to Boston – a 73-mile corridor traveled by some 165,000 vehicles a day.

The study examines potential passenger rail and bus transit services that would connect New Hampshire’s major population centers to metropolitan Boston.

It also explores the creation of a service development plan and related documents for intercity passenger rail between Boston and Concord. Cost and likely ridership estimates will accompany each option, according to state transportation officials.

Rail facilities within the corridor include existing Massachusetts Bay Transportation Authority (MBTA) commuter rail service from Boston to Lowell, Mass. and Pan Am Railways Inc. freight service between Lowell, Mass. and Concord.

In addition to existing rail infrastructure, highway corridors that are under consideration for commuter service investment include the US. Rt. 3/F.E. Everett Turnpike corridor and the Interstate 93 corridor that spans New Hampshire and Massachusetts. Both highways are being served by commuter and inter-city bus services.

Initial Capitol Corridor Study estimates show more than 3,100 riders are expected each weekday from Manchester to Boston for a yearly total of 800,000 riders – 250,000 more than the Amtrak Downeaster, which provides five round trips per day between Portland, Maine, and Boston, with New Hampshire stops in Exeter, Durham and Dover.

Nashua Mayor Donnalee Lozeau said the study will make 2014 a pivotal year in the process of determining whether commuter rail will expand north to Nashua.

Preliminary estimates show New Hampshire would face costs in the range of $8-10 million annually to pay for the rail expansion, plus yearly operations and maintenance expenses. The study is examining two potential stops in the Gate City: one southern stop, either at

Spit Brook Road or the Pheasant Lane Mall; and a “downtown” stop on Crown Street. The city recently acquired a property at 25 Crown St. hoping to convert it into a train station.

Earlier this month, Lozeau said New Hampshire and Massachusetts officials are exploring the possibility of the MBTA extending commuter rail service from Lowell, Mass. to Nashua’s doorstep without actually crossing the state border so Granite Staters would not bear the operating costs of the expansion.

The proposal would give officials in both states their first solid sense of whether enough riders exist in Greater Nashua to support rail expansion here – a critical test to determine if passenger rail is a viable option for Nashua, Manchester and possibly Concord.

At issue is whether New Hampshire would bear responsibility for operating costs if the MBTA is the entity that brings rail from Lowell to a location near the Pheasant Lane Mall in Tyngsborough, Mass., the mayor said.

The state line runs through the Pheasant Lane Mall and most of its parking lot lies in Tyngsborough.

“In New Hampshire, the thing that keeps holding up these discussions is the unknown question of who will pay the operating expenses” to bring passenger rail to New Hampshire, Lozeau said. “If we take that discussion off the table because (rail service) is not going to be operating in New Hampshire but close enough to see what the numbers are, then that will help the conversation.”

“In order for rail to progress, people need to see it be used,” Lozeau said.

The concept is being considered as part of the proposed construction of a Route 3 southbound off ramp at Exit 36 just south of the New Hampshire border in Tyngsborough. It would bring drivers near the entrance to the Pheasant Lane Mall in Tyngsborough.

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DOT commissioner to leave before fall

George Campbell will leave his post as commissioner of the state Department of Transportation by the end of the summer.

Campbell, 64, has overseen the department since May 2008 and is leaving now, before his term ends in December, to take a job in the private sector.

Gov. John Lynch released a statement yesterday crediting Campbell with replacing the Memorial Bridge in Portsmouth and finishing work on the Manchester Airport Access Road. Gov. Lynch said he will make a nomination as soon as possible to fill the remainder of Campbell's term.

"The department has been able to move forward on a number of important projects throughout George's term," Lynch said. "I thank him for his service to the state and wish him the best of luck."

Campbell will become a partner at Infralinx Americas, where he will oversee large-scale transportation development projects, DOT spokesman Bill Boynton said. Campbell previously served as Maine's transportation commissioner and mayor of Portland, Maine.

Campbell said in a statement that his department "made great progress in improving our transportation infrastructure, and it is my hope that progress will continue."

"It's been my honor to work with so many dedicated people at the New Hampshire Department of Transportation, who are truly extraordinary public servants and are committed to our mission of excellence in transportation," Campbell said.

MATTHEW SPOLAR

POSTSCRIPT

N.H. DOT presents preliminary options for Boston-Concord transit system

By MEGAN DOYLE
Monitor staff
Thursday, March 6, 2014
(Published in print: Thursday, March 6, 2014)

- Email
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Ken Kinney pointed his red laser at one of the illuminated slides of his presentation at the state Department of Transportation headquarters last night.

“You are here,” he told the group of about 30 people, the little red dot circling the middle of a list of dates.

“Here” is far from the last date on that schedule: the 2020 start of a new Boston-to-Concord transit system that could include passenger rail and expanded bus service.

Kinney, the project manager, is leading a study to find out what that system would look like – and how the state and local communities would pay for it, and whether it would be cost-effective to extend passenger rail service all the way to Concord. Kinney presented initial plans for what he called the "New Hampshire Capitol Corridor" at the public meeting, but his team also acknowledged they have a long way to go before commuters can catch a train from central New Hampshire to Boston.

"If we're going to move a rail project forward, we need to get about 50 percent of the capital costs from Washington," Kinney said. "Is there a decent likelihood that we would be able to do that?

"So far, the conclusion is this is not a slam dunk, but we feel that we can be in the ball game. We need a well-developed project to be in that ball game."

The study began early last year, when the Executive Council approved a $3.7 million contract with Kinney's firm, URS Corp., to study the feasibility of passenger rail in the 73 miles between Boston and Concord. About $3.2 million of that contract is paid for with federal grant money, and the state has picked up more than $411,000 of matching funds in bonds.

Today, some bus lines run between Concord, Manchester and Boston, and the Massachusetts Bay Transportation Authority runs passenger rail service between Boston and Lowell, Mass. One option presented last night extended the MBTA line from Lowell through Nashua, Manchester and Concord, although Kinney said Amtrak could also run an intercity line along that same route. In both scenarios, the trains would follow existing tracks used for freight.

He also suggested running buses in the shoulder lanes of the highways during peak traffic hours. That change alone could shave eight to 12 minutes off current travel times to Boston, Kinney said, and expanding bus service could also help make the commute quicker.

"What does rail do best?" Kinney said. "What does bus do best? And fundamentally, can we develop a system approach that takes advantage of what rail does best and what bus does best, and do them both? . . . I think our conclusion is that the answer to that is yes."

Their plan calls for one station in Concord – an addition to the existing Stickney Avenue bus station. Both buses and trains could run out of that expanded station, and URS consultant Carl Chamberlin said an ideal plan would also include a nearby layover station to hold trains between runs.

"We're in communication with the city," Chamberlin said. "We know this is an area they would like to develop."

The proposed passenger rail line could also stop at stations in downtown Manchester, at the Manchester airport, in Nashua and in Lowell before the end of the line in Boston.

"We want to improve access to higher-paying jobs in Boston," Kinney said. "We like to say, 'Commute from New Hampshire and return money back to New Hampshire.' "

But the project will be expensive, even if the federal government picks up half the tab. Capital and operating costs for a railway just from Boston to Manchester could cost the state between $8 million and $10 million per year, Kinney said. And most of the numbers in last night's presentation focused on the Boston to Manchester route, which Kinney said could pick up an estimated 3,100 riders on a weekday.

"Within New Hampshire as we move further south, the market is stronger and the ridership gets stronger, which has an impact on where we put the northern (end of the passenger rail line)," Kinney said.

Few members of the crowd commented about the plan, but Derry resident Paula Walach reminded the consultants of the benefits that public transit has for older commuters and travelers. Walach works for the Massachusetts Bay Commuter Railroad Co., which works with the MBTA, and she said she is a frequent railroad passenger.

"I'm over 65," she said. "Am I going to be driving a car for the rest of my life?"

Peter Dearness owns the New England Southern Railroad and runs freight out of Concord. He asked the consultants to consider his trains that run through the city when planning the station – and ideally, to plan for a separate track in the station for freight.

"If they do decide it would be beneficial and they get the funding, (we need to make sure) the rail footprint is protected up in the north end of town," Dearness said.

A full copy of last night's presentation will be available at nhcapitolcorridor.com. The meeting was the second of three public hearings on the study; the last hearing will be held in Nashua when a final report is ready in late fall.

Once the report is finished, if the state wishes to go forward with the project, it would need to secure federal dollars for it, then the Legislature and the governor would have to sign off on a plan. On Kinney's schedule, service could begin in 2020 – but Patrick Herlihy, director of aeronautics, rail and transit for the state, cautioned the group on that timeline.

"This is the best-case scenario," Herlihy said.

"If all goes well at a state (and) local level and a federal level, it can be done," Kinney said.

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April 08. 2013 10:55PM

Nashua alderman:City needs rail study

By KIMBERLY HOUGHTON
Union Leader Correspondent

NASHUA - A local alderman is recommending that an ad hoc committee be established to help officials fully understand and prepare for the financial costs associated with bringing rail to Nashua.

With an 18-month rail study under way by the state, Alderman Daniel Moriarty, Ward 9, believes now is the time for the city to initiate a similar effort focusing solely on the impact rail will have in the Gate City.

"I think that we are obligated to look into this further," Moriarty said on Monday. "All of us aldermen support rail, but I believe that we really need to substantiate that claim."

Moriarty is sponsoring a proposed resolution that, if approved by the full Board of Aldermen, would form an ad hoc committee to study the benefits and price tag of operating rail services in Nashua. The resolution will be presented to aldermen Tuesday night, when the board will have its first reading of the proposal.

According to the resolution, commuter rail in Nashua is expected to provide benefits to local citizens and businesses, however the operation and maintenance of commuter rail in the city will have associated costs that have not yet been determined.

"The Board of Aldermen should be informed and be prepared to address legislation regarding right of way, financing and administration of commuter rail servicing the citizens of Nashua," says the resolution.

Moriarty is proposing that the committee include three aldermen and two city residents. The group could meet monthly for nine months and then submit a final report to the Board of Aldermen, according to the proposal.

"I still believe that commuter rail is a good thing for Nashua, but we need to get access to all of the information out there," said Moriarty. "Nashua needs to figure out how we are going to pay for this. My intentions are not to make this propaganda, but a neutral effort."

His recommendation comes just two months after the Board of Aldermen voted to spend $1.4 million to purchase two parcels at 25 Crown St. that will be used as a park and ride facility and possibly a train station. The vote took place one week after the Executive Council approved a $3.6 million rail study to determine whether bringing rail back to New Hampshire would be feasible.

Mayor Donnalee Lozeau said previously that once the Crown Street property is acquired by the city, officials will have time to pursue the train station option - after reviewing information from the completed rail study - while moving forward with the commuter park and ride lot.

At the time, Moriarty opposed the land purchase, saying that while he supports rail and would appreciate having a train station, a better location would be near Exit 2 in south Nashua as opposed to the Crown Street site.

He maintains that a lot of upgrades will be necessary to make the Crown Street property feasible, saying there is much more to the project than the $1.4 million land buy, which is being funded with a combination of federal dollars and state toll credits.

According to Lozeau, the location is ideal because it is the only downtown area where there is 800 feet of straight train track that already exists. Still, it could take at least six years for a train station to be operating from the site, as the city will have to overcome several obstacles, the mayor said earlier.

From the time Lozeau began her campaign for mayor, she has voiced support for bringing rail from Boston, Mass., into Nashua. But the mayor doesn't just want a train to travel through Nashua; she ultimately wants to have a train stop in the city so residents can easily take advantage of passenger rail.

If authorized by city officials, the proposed committee will study those various initiatives, specifically focusing on the benefits and costs to the city, according to the resolution.

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Rail strategy change seems to be in order

New Hampshire now has something besides the absence of a state sales or income tax to distinguish itself from the other five states in New England.

It turns out it's also the only state to be shut out in its bid for some federal stimulus money targeted specifically for high-speed passenger rail projects.

Perhaps we should call that the New Hampshire DisAdvantage.

Last month, the U.S. Department of Transportation announced it was awarding $8 billion in American Recovery and Reinvestment Act funds to create jobs and spur development in 13 high-speed rail corridors spread across 31 states.

President Barack Obama made the official announcement Jan. 28 while visiting Tampa, Fla., to tout plans for a $1.25 billion rail corridor connecting that city and Orlando with trains capable of reaching 168 miles per hour.

Now it was bad enough last summer when New Hampshire officials chose not to even bother applying for $300 million to establish a high-speed rail corridor between Concord and Boston – even if it was a long shot – because track owner Pan Am Railways refuses to negotiate for right-of-way purchase rights.

But to be turned down for a (relatively) measly $1.4 million to help pay for design and engineering work is enough to add insult to injury.

For their part, New Hampshire officials noted two common denominators among the successful states: sizable financial support from state governments and the backing of rail companies.

"We have neither," conceded Bill Boynton, the state's transportation information officer, "and that's apparently not a great combination."

That must not have been a problem for the other New England states. Consider:

n Connecticut, Massachusetts and Vermont will share in $160 million to upgrades for the rail line that runs from New Haven, Conn., through Springfield, Mass., to St. Albans, Vt.

n Rhode Island track improvements will be part of a $112 million award for extensive work to the Northeast Corridor, which runs from Boston through New York to Washington, D.C.

n Maine will use $35 million to restore 30 miles of track to extend Downeaster service from Portland to Brunswick.

Undeterred, New Hampshire officials appear poised to reapply for the same $1.4 million planning grant when a second round of federal stimulus grants for rail – this time only $2.5 billion – becomes available after Oct. 1. Perhaps this time will be more successful.

But given Pan Am Railways' refusal to cooperate – it broke off negotiations with the state last fall after it was denied the opportunity to bid on providing freight service between Milford and Bennington – we believe state officials would be wiser to shift their focus to the less expensive Nashua-to-Lowell, Mass., leg of the project.

We believe that makes sense on several fronts.

First and foremost, the 73-mile trip from Concord to Boston is dependent on finding a way to connect to Lowell; without the Nashua link, there is no Concord or Manchester service to Boston.

It also would remove Pan Am for now, since the Massachusetts Bay Transportation Authority owns the rail line running to the state line. All that would be necessary is running a small spur to a rail station in Nashua, perhaps near the Pheasant Lane Mall.

As we stated in our Agenda 2010 editorial Sunday, we believe the establishment of commuter rail service from Nashua to Lowell is among the most important issues facing the region today.

Given the reluctance of Pan Am or the federal government to get behind the full project to date, perhaps this would be a good time to refocus on that Nashua-to-Lowell link, arguably the most critical piece to the puzzle.

Article published Oct 1, 2009

State's rail plans thwarted, but rail to city still possible

By KEVIN LANDRIGAN, Staff Writer
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CONCORD – Commuter rail supporters tried to put the best face on the state's refusal Wednesday to apply for $300 million in federal stimulus money to create a high speed train corridor from Boston through Nashua and on to Concord. The setback, though, could create an opening for rail to Nashua.

The refusal of track owner Pan Am Systems Inc. to negotiate with the state for right-of-way purchase rights effectively blocks the state from getting a slice of $8 billion in grants that the Obama administration will award next year, Transportation Commissioner George Campbell said.

"The competition for this money is too intense. The federal government made it clear to us if there is no operating agreement, there's no point in making an application or the state just loses its credibility for the future," Campbell said.

High-speed projects totaling $102 billion have already applied for these limited dollars. The deadline to apply is Friday.

This setback has Campbell placing a renewed look at bringing rail service back first only to the Massachusetts state line in Nashua next to the Pheasant Lane Mall.

This limited commuter rail effort would require building a rail spur and train station next to the mall parking lot and thus not require Pan Am’s support, Campbell explained.

The capital costs for it would be $80 million and Campbell said he’s planning to ask the Legislature next year to support it.

“I’m extremely disappointed that the capital corridor has been stymied for now, but I really remain hopeful that we’re going to bring commuter rail back to the state in some fashion,” Campbell said.

“I have given up hope of ever convincing Pan Am to come back to the table.”

Rep. David Campbell, D-Nashua, said extending the project only to Nashua makes sense, but taxpayers have to realize that’s still going to cost them.

“I’ve seen estimates that even with a robust fare box of customers we’d be looking at needing an annual subsidy of $5 million just to bring rail to Nashua,” Campbell said.

“As noble a goal as commuter rail may be, I just don’t see where there’s that much money laying around in Concord to do this.”

Meanwhile, the New Hampshire Rail Transit Authority applied for a $1.4 million planning grant last month regarding the Boston-to-Concord corridor. Campbell said he’s optimistic the state will learn in December that it’s won that grant.

Regarding the Lowell-to-Concord project, the state is seeking the support of Amtrak to step in and become the operator of the project. Campbell explained federal law precludes a state from running service over a private rail line by another private rail operator.

This high-speed rail network would run on 78 miles of upgraded tracks between Boston and Concord and connecting Concord, Manchester-Boston Regional Airport and Nashua, with Boston's North Station.

Amtrak runs the popular Downeaster rail service from Maine to Boston that makes two stops in New Hampshire and runs along sections of Pan Am-owned track.

Pan Am President David Fink said he's willing to talk with Amtrak but said it makes little sense to him to look at these projects in a down economy.

"I deal with Amtrak on a daily basis with the Downeaster, but so far, Amtrak hasn't contacted us," Fink said. "Talking about high speed trains in the times we are in economically just doesn't make a lot of sense to me."

Fink said it makes more sense for the state to seek a cheaper, short-term, demonstration to test the market for commuter trains.

"Why spend all the taxpayer's money when we don't know it yet if there's enough interest in it," Fink said. "We should try a cheap, bare-bones, year or two demonstration project to see if there is any real interest, for goodness sake."

DOT Chief Campbell said Pan Am initially had wanted to be the operator of the rail service. Last spring, Pan Am engaged in talks with the assumption the New Hampshire Rail Transit Authority would run the line until they broke off on June 30.

"It's ironic that Pan Am has come full circle from wanting to do this on their own to now to blocking all progress whatsoever," Campbell said.

Nashua Chamber of Commerce President Chris Williams said there's too much support among the public and business community for commuter rail to fail.

“We’ve had some short-term successes with this project and as the commissioner says, there are some other long-term options that we have that don’t involve Pan Am,” Williams said.

The state has time enough to regroup and seek from the Obama administration next year when it awards another $5 billion in high-speed rail grants.

“Support for commuter rail is growing and I think we’ll have many other opportunities to get this project fully funded,” Williams added.

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The Telegraph
It's Your Community.

Published: Sunday, December 9, 2012

The train hasn't left the station on NH commuter rail just yet, officials say

By MARYALICE GILL

Staff Writer

EDITOR'S NOTE: This is another in an occasional series of stories examining 50 years of Nashua business. Stories and multimedia pieces will focus on Milestones, Hidden Assets, and Economic Engines in the city's business community.

NASHUA – Most city leaders agree one of the best ways to attract high-quality businesses and employees from northern Massachusetts is to extend commuter rail from Boston to Nashua.

It's a vision that has been shared and discussed for decades, but the plan has stalled in the last few years.

Outside the city, not everyone was onboard.

New officials taking power in Concord, including a Democratically controlled Executive Council and House, have reignited talks of bringing commuter rail to Nashua. City leaders say the time to get the project moving again has arrived.

Earlier this year, the Executive Council voted to reject federal funds to study the feasibility of bringing commuter rail from Boston to Concord. But the $3.2 million in federal grants is still available, at least through 2013, officials believe.

"They have not expired, and the feds have not requested their return or have removed the grant offer," said Tom Mahon, chairman of the New Hampshire Rail Transit Authority.

The authority met Nov. 16 to discuss drafting a letter to Gov.-elect Maggie Hassan to share hopes of bringing the rail study grants before the governor and Executive Council again, Mahon said.

Hassan, along with three Executive Councilors who won seats Nov. 6, ran in support of rail in their respective races this fall.

A project such as commuter rail takes lot of time, money and support from multiple layers of government and the private sector.

"At this point, I'm optimistic," Mahon said. "But given the nature of New Hampshire politics, we still have to go through the legislative Capital Budget Committee to get the match for the Federal Transit Administration."

That won't be easy.

For one, rail opponents balk at the $400,000 state match required of the federal grants to do the study.

Others point to commuter services such as the Massachusetts Bay Transportation Authority – which has the highest debt burden of any transportation system nationwide – as a warning not to invest in passenger trains.

But if an ambitious regional planning project called A Granite State Future is any indicator, many residents' hopes of riding rail from Concord to Boston are still very much alive.

Surveys throughout the state revealed that people from Mason to Milford would like an accessible commuter rail system to Boston.

"Improved mass transit; freight – rail would encourage industrial expansion," a person from Boscawen said.

Another, from Henniker, called for "public transportation/carpool to Concord/airport/entertainment/more young folks and ideas/rail … Boston to Canada."

A Granite State Future is a three-year program executed by the state's nine planning commissions that will use grass-roots dialogue to update their respective regional plans.

"All of the meetings that we've gone to over the fall, we've gone to pumpkin fests and old home days, and everybody always asks, 'When are we getting rail?' " said Kerrie Diers, executive director of the Nashua Regional Planning Commission.

Locally, a brand campaign initiated by the Greater Nashua Chamber of Commerce and the city also indicated residents inside and outside Nashua want passenger rail running past the Massachusetts border.

But for every voice in favor of rail, there's a shout against it.

Meanwhile, the rest of the state waits to see what its new leaders will do about the lingering federal funds.

"Anytime there's a transition, we need to wait for any kind of direction regarding that," said Bill Boynton, spokesman for the state Department of Transportation. "We don't have a position at this point."

History

New Hampshire had a railroad service along the Nashua and Lowell Railroad since 1838.

Near the end of the 19th century, the network of lines came under ownership of a few major railroads – mostly Boston & Maine Railroad – and were used for business and travel.

The system thrived through World War I, but by about the 1980s, the increasing number of cars and trucks on the roads, combined with new ways of storing and transporting products, stifled passenger lines here.

Daily commuter rail from Nashua to Boston shut down in 1967, except for a brief experimental stint in 1980, when a few services operated from Concord to Boston's North Station through Lowell, relying on limited MBTA trains and New Hampshire's limited funds.

When the federal grant behind the service was terminated in 1981, so was the system known as "the Minute Man Service" from Concord, Manchester and Nashua to Boston, along with others around the country.

Ever since, a fight to restore Lowell's rail line through to Concord has ensued over how it should be funded, plus how to and who should operate it.

At least the last three governors have supported reinstituting a passenger service, but state Legislature support has flip-flopped with the party majority.

Meanwhile, several studies have been completed about bringing rail through the state, including a 2003 study that considered high-speed rail from Boston to Montreal and a 2004 environmental assessment on bringing trains over the Massachusetts line into Nashua. Another study led to the opening of the Amtrak Downeaster line, bringing commuters from Portland, Maine, to Boston in 2001.

In 2007, Gov. John Lynch signed legislation that first authorized the New Hampshire Rail Transit Authority. It has faced a number of unsuccessful death threats from state Legislatures ever since.

Crashing cars

Skeptics point to previous Granite State studies through the early 2000s that looked at bringing rail to Nashua on parallel lines through the state. Some, which have estimated the project could cost $300 million, calculate a price tag that's too high to risk a $400,000 state match to fund yet another federal investigation of the plan.

But proponents point to surveys such as the University of New Hampshire's Granite State Poll in 2011 that indicated more than half of New Hampshire residents still favor extending commuter rail up from Boston. Earlier studies indicated the economic spinoff of commuter rail in the first 20 years of operation is about $2 billion, along with the creation of nearly 1,000 jobs a year.

"There's significant activity in other areas of the region, and we're the doughnut hole in the middle where there's nothing going on," Mahon said. "If we fall behind on the capability to provide transportation resources, our economy is going to be affected."

The opposing sides are stubborn.

Just this year, Executive Councilor David Wheeler, R-Milford, joked about being tarred and feathered by Nashua aldermen who lambasted him at a public meeting for casting one of three votes that denied the federal rail study.

"It's very easy to be for something if you're not going to be asked to pay for it," Wheeler said during their April meeting. "Not only is it the cost of the study, but where are we going to get the money to subsidize the operation? … We just don't have that money."

He told The Telegraph editorial board shortly afterward that New Hampshire didn't have the population density to support commuter rail.

"One of the fundamental problems with trains is they don't have their own revenue stream," Wheeler told The Telegraph. "We are looking toward trains in the future; it's just, can we support them now financially?"

But local voters silenced Wheeler in November, instead re-electing Deb Pignatelli, D-Nashua, a vocal rail supporter, to fill his place.

Along the way, the state hasn't extinguished the idea of rail altogether; it has included room for rail lines along the Interstate 93 widening project and is weighing a possible rail station in plans for a multimodal transit facility at a future Exit 36 south to be built off the F.E. Everett Turnpike.

“We will be looking for direction from the new governor and council as to whether they would want to go forward with something like that,” Boynton said. “We’re going to wait and see if there is any sort of change in that approach.”

Meanwhile, cities such as Nashua haven’t given up on commuter rail, either. Mayor Donnalee Lozeau has suggested the city could work with the federal government, the governor’s office and other members of the Executive Council to consider using the rejected funds to bring rail to Nashua.

The city also is eyeing a $1.4 million land purchase on Crown Street for a potential park and ride and rail station there.

But perhaps, as new executives and legislators take office, it will resume the project as a top-down, statewide effort.

“What has stayed the same is the support for it,” Diers said. “The chambers, they’re still working very hard in support of this, as are all the regional planning commissions. That has not changed even though the funds were rejected; we’re still looking for options.

“We’re hopeful there are still options for those studies to go forward and really provide the definitive answers that we’re looking for.”

But the money won’t last forever.

“Right now they’re very patient, and they’re willing to let us make the effort to keep this alive and keep it going until we get the approval we need,” Mahon said. “I’m not sure we have another year. The feds might come and ask for it back.”

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Let's all get on board rail effort

TRANSPORTATION

It's an opportunity to enhance our state's economy, quality of life and transportation infrastructure

BY ROBIN COMSTOCK

Hear that sound, New Hampshire? Opportunity is knocking in the form of restoring passenger rail service along New Hampshire's Capitol Corridor. Along with providing a safe, reliable, efficient and environmentally friendly transportation option for New Hampshire citizens, this rail project presents a historic economic development opportunity for the state.

This ground-breaking initiative will provide passenger rail service from Boston's North Station to Nashua, Manchester-Boston Regional Airport, downtown Manchester and Concord. Current plans call for 10 to 12 round-trips per day, with an initial daily ridership of 3,000. To be sure, tremendous progress has been achieved to date in making this project a reality, but even more work remains. The New Hampshire Rail Transit Authority, a state-sanctioned authority of unpaid volunteers, deserves credit for its tireless work on this initiative.

As with any major project that requires a significant investment of financial resources, skeptics and naysayers question the viability and necessity of passenger rail service from New Hampshire to Boston's North Station and beyond. Fortunately, there are examples available to answer these types of questions.

One such example can be found a short commute from Manchester: Amtrak's Downeaster railroad. In March 2008, the Center for Neighborhood Technology, a Chicago-based research firm, was commissioned to conduct an economic impact study of the Downeaster. The results? The Downeaster is projected to generate $3.3 billion in construction investments and create more than 8,000 jobs over the next two decades for the state of Maine.

In the meantime, ridership on the Downeaster has increased over the past three years, and multiple transit-oriented developments have broken ground in several areas along the rail corridor in Maine.

Similar information tailored specifically to the New Hampshire Capitol Corridor is on its way. The New Hampshire Rail Transit Authority recently commissioned an economic impact study of the proposed rail service and is expecting the results later this winter.

The expansion of freight rail opportunities in New Hampshire is another important positive impact of this project. By upgrading the tracks from a grade 1 level, which are only capable of carrying trains at minimal speeds, to grade 5 tracks capable of carrying trains at more than 60 mph, products will be moved across southern New Hampshire more efficiently while relieving our congested highways, reducing pollution and saving energy. Manchester Boston Regional Airport already moves 200 million pounds of freight annually. Think a rail link would further enhance that?

Which brings us to perhaps the most significant benefit of the proposed rail project: the creation of a new transportation link between Manchester Boston Regional Airport and the greater Boston region.

The airport is the undisputed economic engine of New Hampshire, generating $1.24 billion in economic impact annually. Yet because the airport is only accessible by car, this critical economic engine isn't firing on all cylinders. A rail link will bring new customers and economic activity to the airport, further enhancing its already significant positive economic impact on the region.

Opportunities with as much promise to enhance our state's economy, quality of life and transportation infrastructure don't come around often. It's time we all get on board and support this important economic development project.

The Greater Manchester Chamber of Commerce has counted rail as one of its top strategic goals for the past three years and looks forward to seeing this project come to fruition. Join us and other stakeholders in supporting the New Hampshire Capitol Corridor and helping make it a reality.

Robin Comstock is president and chief executive of the Greater Manchester Chamber of Commerce.

DEPARTMENT OF TRANSPORTATION

QUESTION REGARDING THE PROPOSED INCREASE IN ROAD TOLL:

Q: SB 367 increases State Highway Fund Revenue an estimated $32m in FY 2015. Since the budget of the DOT is funded through the end of FY 2015, how does the DOT propose these funds be appropriated?

A: The DOT proposes this $32m in FY 2015 fund State Highway and Bridge Betterment Projects as follows:

- $12m to reconstruct very poor condition state roads;
- $13m for pavement/reconstruction on fair to poor condition state roads;
- $7m to fund State Aid Bridge projects (approximately 9 municipal bridge projects which will accelerate the existing schedule by one year).

QUESTION REGARDING DEPARTMENT OF TRANSPORTATION TEN YEAR PLAN:

Q: Is there any way to balance construction funding for the State's #1 red list bridge and continue construction progress on the State's #1 highway project priority?

A: Yes. The DOT proposes to reconcile this allocation of Federal Funds to balance several significant construction priorities in the following manner:

- Utilize debt financing to spread the construction cost of the NH share of the SML Bridge Project. That is, use Federal GARVEE bonds of up to $80m with debt service spread over 10 years;
- Utilize resultant $72m federal cash flow savings previously proposed for SML Bridge over FY 2015-2017 as follows:
    - $40m to fund the next major I-93 construction project which is the widening of I-93 between Exit 5 and the I-293 split. The project duration is estimated for three years, which extends and funds active construction by two years to 2017;
    - $24m to fund the first three years of the GARVEE bond debt service for SML Bridge construction noted above;
    - $8m to the Bedford NH101 Project to cover a funding shortfall from earlier estimates of the project.

March 3, 2014

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JUNE 6, 2013 | 2:43 PM

BY **SHERYL RICH-KERN**

When New Hampshire residents discuss the revival of commuter rail, they are usually referring to the controversial "Capitol Corridor," an estimated $300 million project which seeks to extend tracks northward from the MBTA station in Lowell to Nashua, and then on to Manchester and Concord.

Earlier this year, the Executive Council approved moving forward with a $3.9 million feasibility study that will explore the proposed rail's financial and environmental impacts.

Meanwhile, a smaller-scale push for locomotives is provoking a quieter debate in another pocket of the state: in **Plaistow**, a southeastern town bordering Haverhill, Massachusetts, with a population under 8,000.

Sean Fitzgerald, Plaistow's town manager, has long advocated for a commuter rail station, which would extend the Haverhill MBTA line by four or five miles. He trumpets it as an incubator for transit-oriented residential and commercial development, as well as a means of alleviating congestion from the highway.

In the last 15 years, the number of vehicles clogging the commercial Route 125 corridor has increased dramatically, according to Sheldon Wolff, owner of Wolff Realty Group in Plaistow since 1991. Because of the town's proximity to Route 495, I-93 and I-95, Plaistow is a magnet for large chain stores and businesses. "There's a bottleneck coming off 495 [from Haverhill] into 125. The town has been doing numerous things to alleviate traffic."

Fitzgerald says that depending on the time of day, "it can take 20 to 40 minutes to travel from Route 125 in Plaistow to the Haverhill MBTA station," with up to 26,000 trips a day.

Wolff acknowledges that commuter rail would likely ease traffic. But he says not everyone in town champions the arrival of a commuter train, mostly because its construction may also include a noisy layover station for the Massachusetts Bay Transportation Authority (MBTA) to park its trains overnight.

"If you want to leave your windows open in the summer, you're going to hear the diesel engines idling all night," says Wolff. In addition, he raises concerns about fuel spills seeping into groundwater.

Nonetheless, Wolff says the train could prove successful, but only if it's convenient and affordable. "If the train doesn't stop where they [commuters] need to go, and isn't going to cost the same or less [as driving in a car], they probably wouldn't take it."

Getting Rail on Track at an Affordable Cost

Town officials, along with the Rockingham Planning Commission, have been trying to restore the commuter train for at least two decades. In its heyday of the 19th century, the B&M Railroad bustled with three depots in Plaistow; passenger trains stopped four or five times a day in town on route from Portland to Boston. In all, the service spanned a hundred years, ending in 1968.

On June 5, the Executive Council and Governor voted 5-0 to spend $658,316 in federal Congestion Mitigation and Air Quality funds to study the environmental and economic feasibility of a commuter rail station in Plaistow. The study will look at locations in the vicinity of the Park and Ride lot on Westville Road, about a half-mile from the Route 125 intersection.

The study will also look at building a layover station for the Massachusetts Bay Transportation Authority (MBTA). This is despite heavy opposition from residents concerned about noise and pollution.

In a **benefit-cost analysis** prepared for the town in 2010, a private consulting firm concluded that over a 30-year period, new and existing rail users would realize $99.1million of savings from reduced auto maintenance and travel costs, such as gas and parking. This assumes that 24 percent of the Haverhill riders would divert to Plaistow.

“For those unable to drive,” says Fitzgerald, “the train will give them access to the social, cultural, and medical resources of Boston. And for those unable to take the train, less traffic through the congested areas will result in reduced travel time.”

If Plaistow can restore commuter rail through an interstate agreement with the MBTA, Fitzgerald projects that with the existing infrastructure, “we’ll meet or exceed costs associated with operations of the rail.”

Town officials estimate capital costs will reach around 30 million dollars, with the majority of funds coming from federal sources.

Exploring a Partnership with the MBTA

According to Cliff Sinnott, the executive director of the Rockingham Planning Commission, preliminary conversations between the MBTA and the town began in the 1990s. In 1996, Plaistow laid the groundwork for commuter rail when it established a **park and ride lot** with 277 spaces on Westville Road.

During the same time period, MBTA officials were scouting for alternatives for its current layover facility in Bradford, Massachusetts, a dense suburb south of the Haverhill MBTA train station, deemed too small and out of date for the MBTA’s current needs, and considered a nuisance by its residents.

In the fall of 2008, the MBTA approached town officials in Plaistow to pursue a commuter rail station in connection with a Plaistow layover facility.

But the conversation encountered roadblocks: Pan Am Railways, the holding company that owns the rail lines from Maine to Boston, would not grant access to other railroad operators.

However, in January of 2011, Pan Am signed a Trackage Rights Agreement with the MBTA, dissolving any future barriers to a commuter rail extension.

Finally, town officials could put rail back on track.

Yet, while some business leaders applaud the possibility of a Haverhill-Plaistow MBTA commuter rail extension, many Plaistow and neighboring Atkinson residents are up in arms over the construction of a layover station: as it turns out, they are no more likely to want the idling trains clamoring near their doorsteps any more than the residents of Bradford do.

Sinnott acknowledges that “layover facilities create noise and aren’t particularly welcome in closely-spaced residential areas.”

Some, like analyst Charlie Arlinghaus, president of the Josiah Bartlett Center for Public Policy, view this project as a solution that benefits MBTA more than it does New Hampshire. Arlinghaus wonders if MBTA officials would consider the four-mile extension from Haverhill if not for Plaistow providing a layover facility. “In exchange, a few commuters get to park their cars on this side of the border for essentially the same train ride?”

Fitzgerald is quick to point out that this scenario is not about an underlying deal or exchange: “If the state line didn’t exist, there would already be a stop in Plaistow.” He says New Hampshire can afford the minimal investment because “all we are doing is taking advantage of geographic proximity between the existing infrastructure in Massachusetts and the close proximity of the Plaistow Westville Road Park and Ride lot.”

He’s hoping the study will prove his point.

Fitzgerald also mentions that this type of interstate partnership already exists in Rhode Island, with the MBTA extending several miles south and west. In contrast, the anticipated MBTA partnership with New Hampshire extends the MBTA by only a few hundred yards.

MBTA officials are declining to comment on the proposed partnership, saying "at this stage in the process, we prefer to let New Hampshire officials make all the public comments on the project."

Voices striking an opposition

In 2010, the New Hampshire Department of Transportation began looking at sites for passenger and layover train stations near the Westville Homes on the border of Atkinson and Plaistow, as well as the Pen Box site on Main Street in Plaistow.

Last year at a town meeting, Plaistow residents voted 619-308 against pursuing any potential rail projects.

Executive Councilor Christopher Sununu represents the towns of Atkinson and Plaistow and attended several of the local meetings. He says, "what was on that ballot was poorly worded, very confusing and nobody really understood whether they were voting for or against it."

Sununu says that although everyone "pretty much agreed it [the vote on the warrant article] held no merit," he encouraged Plaistow town officials to take the controversial sites off the table or he was "not going to approve going forward with the study, because there would be a hundred different ways for Atkinson to kill the project down the road."

Mark Sanborn, federal liaison at the New Hampshire Department of Transportation, says that Sununu mediated with the DOT, the regional planning commission and the Plaistow board of selectmen to create a path forward — a path that would eliminate studying the two contested sites for a rail or layover station.

"Those sites will be noted in the study as not having local support and therefore not feasible," says Sanborn.

Robert Clark is a member of the Commuter Rail Investigatory Committee, which Atkinson selectmen set up to address environmental concerns.

Clark says he's glad the two towns and the state eliminated the two sites for the study, but remains concerned about the "pollution New Hampshire would inherit from Massachusetts," for example, the excessive idling of diesel engines.

"The age of the fleet increases the amount of pollution a diesel engine will emit," says Clark. "They [the MBTA] can bring the trains up here and let them idle for 24 hours a day if they choose."

Massachusetts has a law that limits idling for 30 minutes. However, according to the 2010 **Commuter Rail Investigatory** report, the MBTA has not always enforced these limits at its 14 layover facilities.

In fact, in 2010, the United States Environmental Protection Agency (EPA) filed a lawsuit against the MBTA for violating state regulations that prohibits engines from idling more than half an hour. The case settled without a trial. The MBTA paid a $225,000 fine, and had to install electric "plug-in" stations for each engine, replace at least 14 on-board power generators to reduce emissions, and begin using a low-sulfur fuel.

In addition to air pollution, Clark worries about the noise.

"Why are you forcing us to take a train layover yard, which is the worst part of any train system," he asks. "Every time a train leaves the yard, it has to test all its systems. The horn is one of them…with the 21 trains, we figured out there would be 64 sets of whistles we would be hearing in the valley area that would radiate in the surrounding towns."

He also questions why Plaistow needs a rail station. The Haverhill platform is only three or four miles away where you can park, take a train or a bus into Boston — without New Hampshire taxpayer monies. "Right now we have the best of both worlds," says Clark. "We don't pay anything for trains – even the Downeaster."

While the mileage is short, town manager Sean Fitzgerald says cars inch along that passage from Plaistow to Haverhill for up to 45 minutes during peak travel times.

Clark also points out that Plaistow's attempts to provide alternatives to the auto haven't panned out in the past. For example, an express bus from Epping, Kingston and Plaistow to Boston ran from 1994 to 2002, but discontinued because of lack of ridership.

Matthew Coogan, director of the **New England Transportation Institute**, says that a decline in bus riders is not a barometer of success or failure. As it turns out, he explains, buses pose the same unreliability as cars because both get stuck on multi-purpose roads: "Either we have to figure out a way to get buses some capacity on the roadway or expand the rails and get the rails some capacity." Admittedly, he favors any service that gets people out of their cars.

Minimizing Financial Risk

In contrast to the Capitol Corridor project, the study for commuter rail in Plaistow carries less financial risk, according to proponents like Cliff Sinnott of the Rockingham Planning Commission. For one thing, the trains already exist: Amtrak's Downeaster from Maine trundles through, but doesn't stop, in Plaistow.

"A lot of the capital costs don't apply here because the railbed, the switching and a whole lot of the infrastructure has already been upgraded to handle high speed trains," says Sinnott. "The second, and more persuasive [argument], is that because of the potential relocation of a layover facility, the ongoing operating costs will be essentially not charged [to New Hampshire]."

While there is no existing agreement, Sinnott notes that in 2010, the MBTA signed a letter of intent, proposing to assume the operating costs, in a partnership similar to the one it has with Rhode Island. "In that case, " say Sinnott, "New Hampshire will benefit from access to commuter rail without the operating costs burden that goes with it."

However, Sinnott adds that while the risk is minimal, it doesn't have the same ridership potential that the Capitol Corridor does. "In the long run, that [the Capitol Corridor project] makes a great deal of sense for where a lot of capital investment should be made for rail service in the future."

But despite the lack of population density, "this one [Plaistow rail] also makes sense because the barrier to entry is very low. The cost per passenger is probably the same or less than it would be for Nashua."

Plaistow town manager Sean Fitzgerald adds that a rail station could potentially increase valuations and investments in Plaistow, with economic activity that typically sprouts around commuter rail stops.

However, Josh Josh Elliott-Traficante, a policy analyst and director of transparency with the Josiah Bartlett Center for Public Policy, casts doubt that rail stations promote economic development. He says rail stations may influence where a business chooses to locate, but not whether or not it decides to open.

He cites a **2010 study by the Bookings Institution**, which suggests that transit investments do little to change urban structures, and can't — unless car ownership becomes prohibitively expensive: "More than three decades of research provides some reasonable indicators of conditions under which transit investment does contribute to changes in the spatial structure of metropolitan areas; *those conditions, however exist in relatively few places."*

Despite the question of economic feasibility, most public officials are not trying to put the spoke in the wheels of this project.

Chris Sununu, the only one of five Executive Councilors to vote against the Capitol Corridor feasibility study, says that although he's no fan of commuter rail, "this one is fairly unique in how it potentially can be funded. The study didn't cost that much and I told everyone, let's get the study and make sure we're all looking at same numbers and agreement about the impact of this before we decide to move forward."

Ultimately, both studies are moving forward, giving the state a useful comparison.

Correction: An earlier version of this story named state legislators as approving the study.

UPQJDT!

Transportation
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Comments

Disqus seems to be taking longer than usual. **Reload**?

Control of 18-mile stretch of track could affect commuter rail's return to NH


Peter Leishman, owner of the Milford-Bennington Railroad, sounds the horn as his train nears a road crossing in this 2000 photo.
UNION LEADER FILE

State Rep. Peter Leishman is back in the running for a contract to operate 18 miles of state-owned railroad track from Milford to Bennington, in a turn of events that could affect efforts to restore commuter rail service in the southern tier.

►**Rail study: Three stations for Nashua**

By DAVE SOLOMON
New Hampshire Union Leader

CONCORD — In a turn of events that could affect efforts to restore commuter rail service in the southern tier, state Rep. Peter Leishman is back in the running for a contract to operate 18 miles of state-owned railroad track from Milford to Bennington.

Last May, DOT Commissioner Christopher Clement recommended Leishman's arch-rival, Pan Am Railways, for the contract. But the Executive Council in a 3-2 vote decided it did not want to do business with Pan Am, formerly known as Guilford Rail System, even though Pan Am's cooperation is seen as essential to any restoration of commuter railroad service in the state.

At the time, Clement said Leishman's bid to the DOT was rejected because it was incomplete and missing essential information.

After the Executive Council rejected Clement's choice of Pan Am, the contract was put out to bid again. This time Leishman, a Peterborough Democrat, was selected to negotiate with the department.

In a Feb. 20 letter to Leishman, DOT Deputy Commissioner Michael Pillsbury writes that the department has completed its review of bids to operate the Hillsboro Branch Railroad Line, and that Leishman's firm, the Milford-Bennington Railroad, was "selected to proceed with negotiations toward an operating agreement."

"They've already sent an email to me, giving me some outlines of what they'd like to see," said Leishman. "They've already put a draft agreement together for us to accept."

Negotiations between Leishman and the DOT get underway as he pursues a complaint against the DOT commissioner for conduct in the last round of bidding. In a letter to Senior Assistant Attorney General Ann Rice, Leishman accused Clement of misrepresenting his first bid before the Executive Council.

"I have some real concerns with the commissioner's comments back in May when he said my application failed to contain information about how to get in touch with me, who the stockholders were, and other information that was clearly in my response to the RFP," said Leishman.

"My concern is that any official, whether they be a legislator, commissioner, or whatever, has to make accurate representations before any government body, and at the time I don't believe he (Clement) did that," he said. "I don't know if that's because he was given inaccurate information or not."

Leishman has received a letter from the Attorney General's Office stating that Clement will not be available to discuss the last RFP process while the current one is underway.

If Leishman survives the latest round and gets a contract approved by the Executive Council, it will resolve uncertainty over rights to the track that has persisted since Leishman's last contract expired in 2009.

Control of the short stretch of track has been a contentious issue ever since Guilford abandoned the line decades ago.

Leishman's company has operated the state-owned track for the past 20 years, mostly servicing a single customer, Granite State Concrete, in transporting crushed stone from a Wilton quarry to the company's processing plant in Bennington.

Pan Am Executive Vice President Cynthia Scarano said Pan Am did not submit a bid this time around, but endorsed a bid by the New Hampshire Central Railroad, which operates primarily in the North Country and is based in North Stratford.

Pan Am had previously demanded through its attorneys that the state conduct a bidding process to operate the line as a condition of its cooperation in commuter rail planning.

"We believe that there was definitely a bidding process," said Scarano. "We can't really comment on this one, because we didn't participate in it. However, we have been working with the NHDOT regarding passenger service throughout the state and will continue to do so."

dsolomon@unionleader.com

NEW HAMPSHIRE UNION LEADER
Thursday, May 16, 2013 • Page B1

Council rejects Pan Am bid for state-owned track

Milford-Bennington: Chris Sununu claims council playing "favorites;" Debora Pignatelli said company is not a "good corporate citizen."

By DAVE SOLOMON
New Hampshire Union Leader

CONCORD — The Executive Council in a 3-2 vote on Wednesday rejected a Department of Transportation proposal to give a subsidiary of Pan Am Railways control of an 18-mile stretch of state-owned track from Milford to Bennington.

Councilor Chris Sununu, R-District 3, accused the three-member majority of "trying to play favorites," in a reference to State Rep. Peter Leishman, D-Peterborough, who currently operates the Milford-Bennington Railroad freight line and was unsuccessful in his bid with the DOT.

"I can't see why we wouldn't go forward with (the DOT recommendation)," Sununu said. "I can't find a reason to say 'no' unless we are just starting to play favorites, and that's the most dangerous thing you can do."

While on the surface, all that's at stake is control of a tiny freight line, the intense debate reflected a 20-year feud between the parties involved that has affected the state's ability to make progress on commuter rail.

Councilor Debora Pignatelli, D-District 5, said her vote against the contract was based

See Pan Am, Page B2

Pan Am

Continued from Page B1

on the state's years of experience with Pan Am, known as Guilford Rail System before 2006. "This company has been a main obstacle in thwarting passenger rail to Nashua and Southern New Hampshire," she said. "I don't think this contract is good for Nashua or our state. The company has not been a good corporate citizen ... it has a past so checkered it's dizzying."

Pan Am Executive Vice President Cynthia Scarano said the company would have to consider whether it would participate in a second round of bidding.

"To be perfectly honest, that's something the whole group of us are going to have to sit down and discuss," she said from Pan Am headquarters in North Billerica, Mass.

She challenged Pignatelli's characterization of the company. "I don't think that her information is correct," said Scarano. "Our proposal included letters of support from 95 percent of the rail customers in the state, along with the endorsement of the two largest railway unions — the United Transportation Union and the Brotherhood of Locomotive Engineers and Trainmen."

An 'insult to the state'

Sununu said the proposal from Pan Am was complete, while the proposal from Leishman was full of holes. "They left multiple things blank because they assumed they were going to get the contract," he said. "That's insulting to the state of New Hampshire."

Councilor Colin Van Ostern, D-District 2, voted with Sununu in support of the Pan Am contract, while councilors Ray Pappas, D-District 4, joined Pignatelli in voting against.

Control of the short stretch of track has been a contentious issue ever since Guilford abandoned the line decades ago. Leishman's company revived freight traffic to serve a single customer, Granite State Concrete, in transporting crushed stone from a Wilton quarry to the company's processing plant in Bennington.

Granite State Concrete has lobbied aggressively in Leishman's favor since the council tabled the matter two weeks ago, telling councilors and anyone else who would listen that it did not think it could do business with Pan Am. The council tabled a vote on the contract on May 1 because Sununu was not present.

At that time, Pappas appeared to be leaning toward approval of the Pan Am deal, but a visit to Granite State Concrete influenced his final vote.

"We've got to keep the line running; we've got to keep the customer being served; and we've got to make sure the state captures some revenue," he said, "and I'm just not sure that this contract is going to produce any revenue given my conversations with the customer already on the line, and a potential second customer."

The potential second customer is Monadnock Paper Mills in Bennington, which is also considering freight service from Milford-Bennington Railways.

Simmering for years

Pappas said the enmity between Lieshman and Pan Am President David Fink runs between these interested parties makes politics looks like child's play," he said.

Burton agreed: "It's been simmering here for years," he said. "Mr. Leishman has been sending in money to the DOT, but they refuse it."

Leishman defended his initial response to the DOT requests for proposals and said he would resubmit. "I believe my response was complete, especially in light of my more than 20 years of service to the supportive customer and my well-documented history of maintaining the track to a better condition than the contract required, providing monthly review reports, and yearly marketing reports. After all, I am not a new prospective operator who has no experience operating this corridor."

The Democratic state rep suggested he was being made a sacrificial lamb to get Pan Am to cooperate on proposals for commuter rail. He quoted a 2009 letter from then-associate attorney general Ann Rice to David Fink, in which Rice wrote, "you conveyed the information to your legal counsel ... that if the contract were not put out to bid, Pan Am would pull out of ongoing negotiations relating to the Capital Corridor line."

Lieshman said a Pan Am attorney subsequently wrote to the DOT affirming that Pan Am was ending negotiations. "As far as I know, Pan Am has not stated any willingness to resume negotiations," Leishman said. "However, I have to wonder if Pan Am made a similar threat that if they didn't get this contract, they would pull out of any future passenger rail negotiations."

Ducker, Renee

From:	Thomas J Mahon <tjmahon@comcast.net>
Sent:	Friday, March 07, 2014 6:36 AM
To:	Carlos P. Baia; Dan Kelly; Daniel Barufaldi; David Preece; Jonathan Edwards; Kerrie Diers; Malcolm Taylor; Mark Brewer; Michael Izbicki ; Michael King; Michael Tardiff; Nancy Larson; Patrick Herlihy; Raymond Gagnon; Rep. Candace Bouchard; Rep. Sherman Packard; Richard Cane; Robert D Jaffin ; Robert Hall ; Sean Owen; Sen. Jim Rausch; Sen. Peggy Gilmore; Stephen Pesci; Ted Starkweather; Tim Moore; William Craig
Cc:	Adam Hlasny; Andrea and Rob Vibbert; Barbara Mcilroy; Barbara Pressly; Bernard Mulligan; Bill Wheeler; Carol Morris; Chris Clement; Chris Williams; Christopher Kennedy; Christopher Stewart; Collin Lever ; Dan Camara; Dave Kotsonis; DCameron; Dennis Fields; Dennis Grimes; Dennis Varney; Don Wendell; Donnalee Lozeau; E. J. Powers; editor@atlanticnortheast.com; Francois Rebello ; Jake Berry; James Vayo; Jamie Kyle Simchik ; Jesse Turiel; John Weaver; Josh Denton ; Justin Frazier; Karen Miniutti; Karl Kenyon; Katherine Hersh; Kinney, Ken; layer03052@aol.com; make_tracks@comcast.net; Marc Ambrosi; Mark Richardson; Mark Sanborn; Martha Fuller-Clark; Matt Leahy ; Melissa Smart; Michael Lennon; Michael Smith; Mike Desrochers; Peg Fargo; Peter Burling; Peter Griffin; Peter R. Leishman; Richter, Peter; Raymond Faulkner; Ronald Grandmaison; Ronald O'Blenis; rrbldrpete@comcast.net; Wilder, Russ; Sandra Keans; Scott Bogle; Scott Tranchemontagne; Shelley Winters; Simon Thompson; Thomas Noel ; Timothy Sink; Tom Irwin; Will Stewart
Subject:	Plaistow Station Locations Proposed

Good Morning,

Fast and furious, eh?

Tom Mahon

EagleTribune.com, North Andover, MA

March 7, 2014

Sites unveiled for potential Plaistow rail station

Eight locations studied in Plaistow, Atkinson, Haverhill

By Alex Lippa
alippa@eagletribune.com

---- — PLAISTOW — The engineering firm hired to study the possibility of commuter rail coming into Southern New Hampshire unveiled possible sites for a layover and commuter station yesterday.

There are six potential sites for a layover station and five for a passenger station.

Three of the layover stations would be located in Plaistow, with two touching the Plaistow border in Atkinson and one in Haverhill, Mass. Four of the five passenger stations are located in Plaistow, with one touching the Plaistow border in Atkinson.

The New Hampshire Department of Transportation directed HDR Engineering to look at all possible sites north of the existing Haverhill station up to the Newton line.

“These are sites that could be considered doable,” HDR Engineering project manager Ron O’Blenis said.

The locations were unveiled at a meeting of the Plaistow Rail Advisory Committee. Stakeholders from HDR Engineering, Northern New England Passenger Rail Authority, NHDOT, Rockingham Planning Commission, and Plaistow and Atkinson representatives were present.

While there are 11 options for the two stations, there are only eight separate locations. Three locations are being looked at for both a commuter station and a layover station.

“It would make sense for the layover station and passenger station to be located near each other,” said John Weston of HDR Engineering. “But that doesn’t necessarily have to be the case.”

Town Manager Sean Fitzgerald cautioned that this just a very early step in a long process.

“This is preliminary and there will be a lot of configurations,” he said. “These sites will be vetted through technical discussions. There will be a public meeting to present these options and why a number of them won’t work.”

The northernmost layover station would be located at the Newton border off Kingston Road.

“That area presents concerns because it’s located in a residential area and close to an aquifer,” Fitzgerald said.

There are two layover/passenger station options located west of Main Street. Two other options for layover stations are located in Atkinson at the Plaistow border, north of Route 121. A final layover station option is in Haverhill, close to Hilldale Avenue.

Atkinson resident Robert Clark said he preferred the site closest to Newton.

“It seems to fit all the criteria while impacting the least amount of people,” he said. “Certainly, there would be some people in Plaistow impacted, but not nearly as much as the two Atkinson sites.”

Clark said he was disappointed the Haverhill site was included.

“We’re using New Hampshire money for this project,” he said. “Why are we using that to look at Massachusetts sites?”

The study costs approximately $659,000.

There was one site that Plaistow and Atkinson officials agreed not to consider — the Westville Homes site off Blossom Road.

The firm is going to do an environmental assessment of the sites as part of the study. The study also would include estimates of the operating costs and forecast ridership.

The Massachusetts Bay Transportation Authority has been looking to replace the layover station in Bradford, which they have said is outdated.

But the possibility of a layover station in Plaistow has caused controversy.

In a nonbinding referendum in 2012, 619 residents said they would not be in favor of a layover station in Plaistow, while just 308 residents said they would be in favor. An additional 227 residents requested more information.

Prior to the meeting yesterday, two Plaistow residents spoke out in support of the study.

“We need to develop a mass transit system for the town of Plaistow,” said Larry Gil, a former selectman. “I’m dismayed to hear the negativity of the project before it is even given a chance.”

Plaistow resident Rick Blair said a passenger station would benefit him because he is legally blind.

“Whether it’s good for us or not, we haven’t found out yet,” he said. “I can’t get to Boston via car. I can’t get to Haverhill via car. It opens up lots of opportunities for those of us that can’t drive.”

The study is expected to be completed by the end of this year.

Ducker, Renee

From: Thomas J Mahon <tjmahon@comcast.net>
Sent: Friday, November 21, 2014 6:11 AM
To: Carlos P. Baia; Dan Kelly; Daniel Barufaldi; David Preece; Jonathan Edwards; Kerrie Diers; Malcolm Taylor; Mark Brewer; Michael Izbicki ; Michael Tardiff; Nancy Larson ; Patrick Herlihy; Raymond Gagnon; Rep. Candace Bouchard; Rep. Sherman Packard; Richard Cane; Robert D Jaffin ; Robert Hall ; Sen. Jim Rausch; Sen. Peggy Gilmore; Stephen Pesci; Ted Starkweather; Tim Moore; William Craig
Cc: Adam Hlasny; Andrea and Rob Vibbert; Barbara Mcilroy; Barbara Pressly; Bernard Mulligan; Bette R. Lasky; Carol Morris; Chris Clement; Chris Williams; Christopher Kennedy; Christopher Roy; Christopher Stewart; Collin Lever ; Cynthia Copeland; Dave Kotsonis; DCameron; Dennis Fields; Dennis Grimes; Dennis Varney; Don Wendell; Donnalee Lozeau; E. J. Powers; editor@atlanticnortheast.com; Francois Rebello ; Hannah Bassett; Herbert A. Pence; Jake Berry; James Vayo; Jamie Kyle Simchik ; Jesse Turiel; 'Josh Denton '; Justin Frazier; Karen Miniutti; Karl Kenyon; Katherine Hersh; Kinney, Ken; layer03052@aol.com; make_tracks@comcast.net; Mark Richardson; Mark Sanborn; Martha Fuller-Clark; Matt Leahy ; Melanie Sanuth; Melissa Smart; Michael Lennon; Michael Smith; Mike Desrochers; Mike Skelton; Patricia Quinn ; Peg Fargo; Peter Burling; Peter Griffin; Peter R. Leishman; Richter, Peter; Raymond Faulkner; Ronald Grandmaison; Ronald O'Blenis; rrbldrpete@comcast.net; Wilder, Russ; Sandra Keans; Scott Bogle; Scott Tranchemontagne; Shelley Winters; Simon Thompson; Thomas Noel ; Timothy Sink; Tom Irwin
Subject: Press Coverage of Public Meeting

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NEW HAMPSHIRE UNION LEADER

November 20. 2014 7:51PM

Big potential, big subsidies projected in new rail study

MICHAEL COUSINEAU
New Hampshire Union Leader

MANCHESTER — Commuter rail from Manchester to Boston would feature four New Hampshire stops and create 5,600 permanent jobs and 3,600 new residential units along the rail corridor by 2030, according to a study's preliminary findings out Thursday.

The rail stops in Manchester, Bedford and Nashua would handle 2,568 commuters each weekday riding to or from Boston, according to the New Hampshire Capitol Corridor Study.

Extending MBTA service only from Lowell, Mass., to Nashua would attract 670 weekday commuters while a third option reaching Concord and using Amtrak instead would serve 946 weekday commuters, according to the study.

A consultant narrowed its options to five: three rail options, a bus option or maintaining the status quo — but no one alternative is recommended.

“That is for policy makers to decide,” Patrick Herlihy, director of aeronautics, rail and transit for the state Department of Transportation, said in an interview. “2020 is the best-case scenario if rail service is chosen.”

The “Manchester Regional” option calls for stations at Manchester’s Granite Street across the street from the Jewel Nightclub, a second under the airport access road bridge in Bedford (connected to the airport via bus shuttle) and two stops in Nashua: on Crown Street and in the Spit Brook Road/Pheasant Lane Mall vicinity.

This option would run 16 trains each weekday to or from Manchester and 34 to or from Nashua, according to Kenneth Kinney, project manager for URS, an engineering consulting firm.

A “Nashua Minimum” scenario would offer 20 one-way train trips with the sole Granite State stop in the Spit Brook Road/Pheasant Lane Mall vicinity.

A “Concord Intercity” option would include stops at Stickney Avenue in Concord, as well as the Manchester and Bedford stops and only one Nashua stop, at Crown Street. There would be four trains a day in each direction, leading to lower ridership numbers compared to the Manchester alternative.

The Manchester Regional option calls for $246 million in total capital costs, with half that coming from federal grants and another $51 million coming from the value of MTBA supplying the trains and track rights. Calculations show about $7 million beyond ticket and advertising revenues would be needed annually to pay the debt service and the remaining operating costs.

By comparison, the Nashua Minimum scenario would cost $120 million in capital costs or $39 million after federal and MBTA contributions. That would leave a $4 million yearly gap to bridge.

The Concord Intercity option would cost $256 million, or $128 million after federal funds. The Concord option would not get any MBTA contributions, so $15 million a year would be needed beyond ticket and advertising revenue.

Put another way, that annual cost that still would need to be funded breaks down to $10 per estimated rider per one-way trip under the Manchester option, $22 for the Nashua alternative and $61 for the Concord option, according to the study.

Possible funding options include parking fees, vehicle registration fees, municipal contributions, lottery revenues and passenger facility charges from the Manchester-Boston Regional Airport.

At an economic summit sponsored by the Greater Manchester Chamber of Commerce this week, several business leaders advocated for commuter rail to New Hampshire, to attract skilled Boston-area workers.

The Manchester option would create 230 temporary jobs for construction of the rail line and an additional 3,400 construction jobs to build the real estate development generated by the rail. Starting in 2030, 1,700 new jobs would be created every year to the expanded rail service, according to the study.

“There is simply no economic development opportunity on the horizon that could transform New Hampshire’s economy like the expansion of passenger rail could offer,” said Thomas Mahon, chair of the New Hampshire Rail Transit Authority. “We firmly believe that the options are clear: invest in passenger rail or choose the status quo and face the negative consequences associated with our young people fleeing the state while our existing population ages and in-migration continues to decline.”

William O’Brien, the Republican nominee to be the next House speaker, said he doesn’t favor taxpayer-funded rail.

“If rail would work (in southern New Hampshire), then some private interests would have come along by now to pay for it,” he told the New Hampshire Union Leader.
Instead, O’Brien said, rail supporters are looking for round-about ways to finance the subsidy that rail demands, such as a surcharge on motor vehicle registrations.

“It’s not an energy-efficient way to move people; not a good use of money; and it would create a state bureaucracy that requires more taxation to sustain,” O’Brien said. “If you want to move people cheaply at one third the cost, use buses.”

What about the implications for economic development?

“If this would be such a boon to economic development, then I invite the people of Nashua to have their city government stand up and agree to pay for it. But I can’t go to the people in Milford or Orford or Laconia and say ‘You pay for economic development that’s going to go up to Nashua or Concord.”

Another study option was for existing buses running to and from Boston to New Hampshire to ride along the shoulders of Interstate 93 in Massachusetts, making trips quicker. A fifth option was to maintain the status quo bus service. Each of the last two options creates around $1 million in annual costs.

Some train service would run during the weekends but wasn’t the focus of the study.

A University of New Hampshire survey in February 2014 found 68 percent of New Hampshire residents favored the extension of passenger rail service.

Staff Reporter Dave Solomon contributed to this report.

Friday, November 21, 2014

Crowds pack commuter rail hearing at Nashua Public Library

By KATHRYN MARCHOCKI

Staff Writer

NASHUA – Expanding Boston-bound commuter rail from Lowell, Mass., to Manchester with other stops at Manchester-Boston Regional Airport and two others in Nashua – would be an economic boom for the region – bringing an estimated 5,600 new permanent jobs and 3,600 housing units by 2030, a two-year rail and transit study showed.

This Lowell to Manchester line – known as the Manchester regional commuter rail alternative – would draw a projected 668,000 annual riders and would costs a total $256 million in capital costs – about half of which could be eligible for federal grants and bonds, authors of the New Hampshire Capitol Corridor Rail and Transit Study said Thursday.

“There is simply no economic development opportunity on the horizon that could transform New Hampshire’s economy like the expansion of passenger rail could offer,” New Hampshire Rail Transit Authority chair Thomas Mahon said.

More than 225 people packed the public hearing room at the Nashua Public Library, stood in the aisles and spilled out into the hallway to hear the findings of rail and transit study, which is two years in the works and final results will be released by mid-December. They included many Nashua residents and elected officials and residents from as far as Manchester, Hollis, Mont Vernon, Londonderry. They were nearly unanimous in their support for rail expansion and urged elected officials and project authors to push for support among lawmakers.

“This is one of the … biggest economic development opportunities for the state,” Greater Nashua Chamber of Commerce President Chris Williams said.

“The issue is about jobs. It’s about moving the economy forward,” Williams added.

Williams urged Executive Councilors and state and local politicians to “have a real conversation about how the public and private sector can make this happen. We can’t do it without you,” he said to applause.

Nashua resident and longtime Boston commuter Elise MacDonald said she drives daily to Lawrence, Mass. To get the train to Boston. Like several other speakers, she favors developing a rail station on the Tyngsborough side of the state line adjacent to the Pheasant Lane Mall.

“If we can’t have New Hampshire rail yet, a stop in Tyngsborough would be wonderful,” MacDonald said to applause.

Ken Kinney of URS Corp., the lead consulting firm the state Department of Transportation hired to do the rail and transit study, laid out several scenarios ranging from expanding existing commuter bus service to Boston – the cheapest alternative that brought nearly no benefits in increased jobs, housing and economic development – to rail expansion along the entire 73-mile corridor from North Station in Boston to Concord.

The Manchester to Boston commuter option would feature 16 trains daily from Manchester and at least 20 daily trips from Nashua.

A more limited regional option of extending rail service just to Nashua would cost a total estimated $120 million in capital costs, Kinney said.

The Concord intercity option would involve four round-trips daily to Boston and would operate like an Amtrak-type service such as the Downeaster that now runs from Boston to Maine. It would cost the most – an estimated $256 million in capital costs, Kinney said.

Developing a limited rail expansion to Nashua only would bring an estimated 1,200 new permanent jobs by 2030 and about 600 new housing units, Kinney said.

Kinney recommended more discussion and debate is needed on the proposed rail and transit expansion.

“In order to move any project forward, we need to make a lot of progress on developing a credible financial plan,” Kinney said, noting the federal government typically will pay for half the capital costs but states and towns must show how they can pay the balance.

Kathryn Marchocki can be reached a 594-6589 or kmarchocki@nashuatelegraph.com. Also, follow Marchocki on Twitter (@Telegraph_KMarc).

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THURSDAY, DECEMBER 19, 2013

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By Tom Bell tbell@pressherald.com
Staff Writer

A pending deal to launch bus service between Auburn, Wells and Boston is on hold over concerns from the president of the prospective provider, who says the state could hurt his business by subsidizing competing train service.

Concord Coach Lines and the Maine Turnpike Authority have been discussing the proposed service, including construction of a new depot in Auburn, since August.

click image to enlarge

Passengers exit a Concord Coach Lines bus arriving Monday at the Portland Transportation Center. The bus line is looking into starting service from Auburn to Boston with a stop in Wells.

Gordon Chibroski/Staff Photographer

"This thing is paused because we feel we need to have a bigger policy discussion with the Maine Department of Transportation and the turnpike authority before we go any further," said Harry Blunt, president of the New Hampshire-based bus company.

Blunt would not specify what he wants from the turnpike authority before closing the deal, saying only that his company needs a "global" discussion with Maine officials about how private intercity bus service fits in with transportation planning and the state's plans for rail expansion.

What is certain is that the state is not prepared to offer subsidies to Concord Coach Lines for providing new bus service.

"If Mr. Blunt decides to take up more routes, it's up to him," said Department of Transportation spokesman Ted Talbot.

Blunt's concern about subsidies for rail service is unwarranted, Talbot said. The department does not support commuter rail between Portland and Auburn because studies show there's not enough demand, he said.

P rvw··

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Concord Coach Lines has been exploring the feasibility of starting a service that would connect Auburn with Boston's South Station and Logan International Airport. The route would include stops in Wells and possibly Portland, Blunt said.

STAFF GRAPHIC | MICHAEL FISHER

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The company was one of two that responded to the turnpike authority's request in July for letters of interest in adding stops at the park-and-ride lot at turnpike Exit 75 in Auburn and the Downeaster train station in Wells. Both properties are underused and owned by the turnpike authority.

The service would provide five daily round trips to Boston, Blunt said.

His major complaint is that intercity bus service has not been included in the state's public transportation policy, which he described as being focused exclusively on expanding rail service.

Amtrak's Downeaster rail service, for example, received a $35 million federal grant for its 30-mile extension last year from Portland to Brunswick. About half of Amtrak's operating costs in Maine are covered by public money.

Blunt said he doesn't want to invest millions for a new bus service – each coach costs $500,000 – and then see his ticket prices undercut by a heavily subsidized train service.

Rail advocates and legislators in Portland and the Lewiston-Auburn area have been lobbying to start commuter rail service between Portland and Auburn. Rail supporters say they are encouraged by last month's filing by the St. Lawrence & Atlantic Railroad, which is seeking to suspend freight service on its line between Auburn and Portland.

Blunt said Maine's transportation priorities are much different from those in his home state of New Hampshire, which has rejected passenger rail proposals but supported commuter bus service. Blunt noted that New Hampshire has built half a dozen bus terminals near exits of congested highways, and that several bus companies operate out of them, including his.

The deal being discussed by the Maine Turnpike Authority and Concord Coach Lines calls for the bus company to pay the entire cost of a new bus terminal in Auburn, and the cost of expanding the parking area. The company would rent the site for $1 a year. After 20 years, the turnpike authority would assume ownership of the facility, said Peter Mills, the authority's executive director.

In Wells, the bus company could use the current train station and parking area, but it would have to pay for any expansion, said Blunt.

(Continued on page 2)

1 | 2 | NEXT >>
Single Page

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Ducker, Renee

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Sent: Tuesday, October 28, 2014 7:28 PM
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Cc: Adam Hlasny; Andrea and Rob Vibbert; Barbara Mcilroy; Barbara Pressly; Bernard Mulligan; Bette R. Lasky; Carol Morris; Chris Clement; Chris Williams; Christopher Kennedy; Christopher Stewart; Collin Lever ; Cynthia Copeland; Dave Kotsonis; DCameron; Dennis Fields; Dennis Grimes; Dennis Varney; Don Wendell; Donnalee Lozeau; E. J. Powers; editor@atlanticnortheast.com; Francois Rebello ; Hannah Bassett; Herbert A. Pence; Jake Berry; James Vayo; Jamie Kyle Simchik ; Jesse Turiel; 'Josh Denton '; Justin Frazier; Karen Miniutti; Karl Kenyon; Katherine Hersh; Kinney, Ken; layer03052@aol.com; make_tracks@comcast.net; Mark Richardson; Mark Sanborn; Martha Fuller-Clark; Matt Leahy ; Melanie Sanuth; Melissa Smart; Michael Lennon; Michael Smith; Mike Desrochers; Mike Skelton; Patricia Quinn ; Peg Fargo; Peter Burling; Peter Griffin; Peter R. Leishman; Richter, Peter; Raymond Faulkner; Ronald Grandmaison; Ronald O'Blenis; rrbldrpete@comcast.net; Wilder, Russ; Sandra Keans; Scott Bogle; Scott Tranchemontagne; Shelley Winters; Simon Thompson; Thomas Noel ; Timothy Sink; Tom Irwin
Subject: Public Meeting article

Nashua Telegraph
Tuesday, October 28, 2014

State to hold Nashua meeting to improve bus, rail service

NASHUA (AP) — The New Hampshire Department of Transportation is holding a public meeting next month to seek input on a set of transportation alternatives to improve bus and rail service between Concord and Boston.

The Nov. 20 meeting will be held at Nashua Public Library from 7 p.m. to 8:30 p.m.

The department is evaluating opportunities to improve inter-city rail and transit service through a study jointly funded by the Federal Transit Administration and the Federal Railroad Administration. It was approved by New Hampshire's Executive Council in February 2013.

The study will examine rail and bus transit options and intercity rail alternatives to address transportation, economic development, sustainability, quality of life and environmental issues along the Interstate 93 and Everett Turnpike corridors from Concord to Nashua, with connections to Boston.

Rail expansion from Boston to Manchester could generate thousands of new jobs

By: **NHRTA** | 14 HOURS AGO

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NHRTA

Public meeting Nov. 20 in Nashua.

NASHUA, NH – Preliminary results of the two-year study on the expansion of passenger rail service along the 73-mile stretch from Boston to Concord known as the NH Capitol Corridor are in – and the benefits to New Hampshire's economy are significant.

According to initial study findings, establishing four commuter rail stops between Lowell, MA., and downtown Manchester (known as the Manchester Regional Rail alternative) would draw a minimum of 668,000 riders a year, leading to the creation of 5,600 permanent jobs supporting 3,600 new residential units along the corridor by 2030. Approximately 230 jobs would be created for the construction of the rail line and an additional 3,400 construction jobs would be created to build the real estate development generated by rail. Beginning in 2030, 1,700 new jobs would be created every year due to the expansion of passenger rail. The preliminary study findings can be found at http://cd3.campaigndispatch.com/link.php?M=1613119&N=4360&L=14211&F=H.

The New Hampshire Department of Transportation (NHDOT) held the final public meeting Nov. 20 at the Nashua Public Library to collect community input and discuss the latest findings of the **NH Capitol Corridor Study**. The study team lead by URS Corporation presented several options focused on the commuter and intercity rail alternatives at seven potential stations between Nashua and Concord, considered bus improvements and examined a no-build scenario.

According to the analysis, the Manchester Regional Rail alternative serving four stations in Nashua – one stop at Crown Street and one stop at either Spit Brook Road or Pheasant Lane Mall and Manchester – stops at Granite Street and Manchester-Boston Regional Airport – would have an annual ridership of 668,000 and offer the greatest economic benefits with moderate construction impacts.

"There is simply no economic development opportunity on the horizon that could transform New Hampshire's economy like the expansion of passenger rail could offer," said Thomas Mahon, chair of the New Hampshire Rail Transit Authority. "While preliminary, these initial results demonstrate the positive impact rail could deliver to New Hampshire. Once the final report is submitted in December, policy makers will have all the evidence they need to make a choice. We firmly believe that the options are clear – invest in passenger rail or choose the status quo and face the negative consequences associated with our young people fleeing the state while our existing population ages and in-migration continues to decline."

The study team also identified preliminary costs associated with developing the various alternatives. According to the report, the total capital cost to extend passenger rail to Manchester is estimated at $246 million. The final version of the study, due out in December, will have more precise costs as well as financing options, including the potential for federal grants for up to half of the capital costs, and bonding recommendations.

Slides from the Nov. 20 presentation embedded below:

Public Meeting 2014-11-20-FinalNH Capitol Corridor Rail & Transit Alternatives Analysis

Rail continues to maintain strong public support in the Granite State. A February 2014 University of New Hampshire survey commissioned by the Greater Nashua Chamber of Commerce found that 68 percent of New Hampshire residents favor the extension of passenger rail service. Governor Hassan stated that rail was needed to position our state for the future in her recent victory speech.

According to Mahon, once the final report is received in December, the NHRTA board will evaluate the findings and develop a strategy for addressing the next step in this process – beginning the critical project development phase. This stage is crucial to the future of passenger rail service and consists developing a detailed financial plan, final engineering, and preparation of funding applications for submission to the Federal Rail Administration and the Federal Transit Administration. Assuming NHRTA obtains the needed $4 million in funding to conduct the project development phase, work could conceivably kick off in the spring or summer of 2015 depending on what option is chosen.

"These facts cited in the initial study findings illustrate that passenger rail fosters development, jobs and increased community investment," said David Preece, Executive Director & CEO of the Southern New Hampshire Planning Commission and NHRTA board member. "There is no denying that rail serves as a catalyst for the type of smart development and multi-modal transportation options that will attract businesses and talented young professionals to the state, not to mention generating critical tax revenue. The only question is whether New Hampshire is ready to grasp this opportunity."

According to Preece, now is the time for business leaders and the public to have their voices heard by support rail at http://cd3.campaigndispatch.com/link.php?M=1613119&N=4360&L=14211&F=H.

About the NH Rail Transit Authority
The ***NH Rail Transit Authority (NHRTA)*** *was established in 2007*

and is tasked with encouraging and overseeing the redevelopment of passenger rail services throughout New Hampshire with an initial emphasis on the NH Capitol Corridor. The NHRTA is administratively attached to the New Hampshire Department of Transportation and has broad based membership from 11 cities and towns, 7 regional planning commissions, two state senators and two state representatives, the NHDOT, the Manchester-Boston Regional airport, and four appointees by the governor. Learn more at http://cd3.campaigndispatch.com/link.php?M=1613119&N=4360&L=14211&F=H.

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- News
- Manchester Regional Rail
- NH Capitol Corridor Study
- NH DOT
- NH Rail Transit Authority

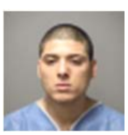
Rail expansion from Boston to Manchester could generate thousands of new jobs

NASHUA, NH – Preliminary results of the two-year study on the expansion of passenger rail service along the 73-mile stretch from Boston to Concord known as the NH Capitol Corridor are in – and the benefits to New Hampshire’s economy are significant.

Turkey Trot Nov. 21 at West High School

MANCHESTER, NH – The annual West High School Turkey Trot will be on Friday November 21, 2014 at 9:15 a.m. Please expect traffic delays in the area of Wet High School as well as the neighborhoods in the vicinity of the course.

‘Disruptive’ 7-Eleven customer faces multiple drug charges



MANCHESTER, NH – Angel Gonzalez Acevedo, 24, of Manchester, was arrested Nov.

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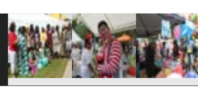

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Rail Study Group Expects 3,000 Riders Daily Between Manchester and Boston

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BY RYAN LESSARD

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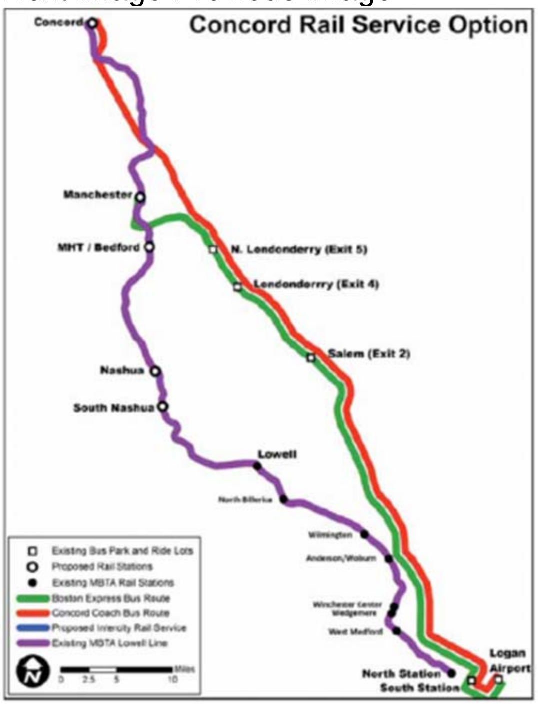
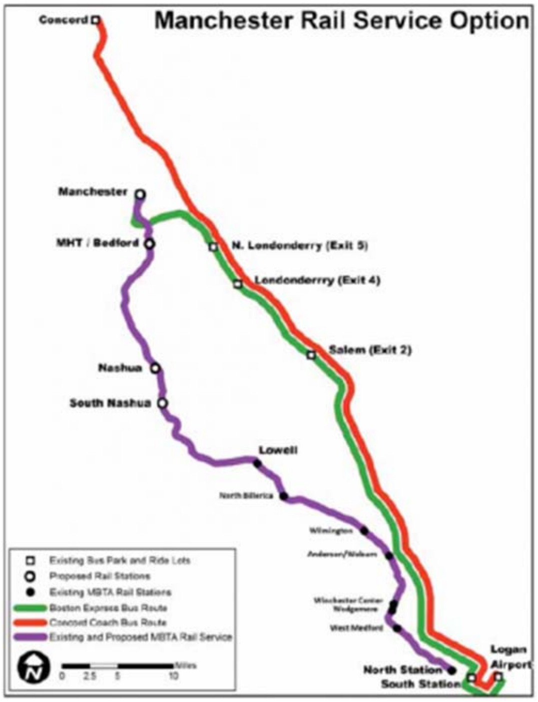


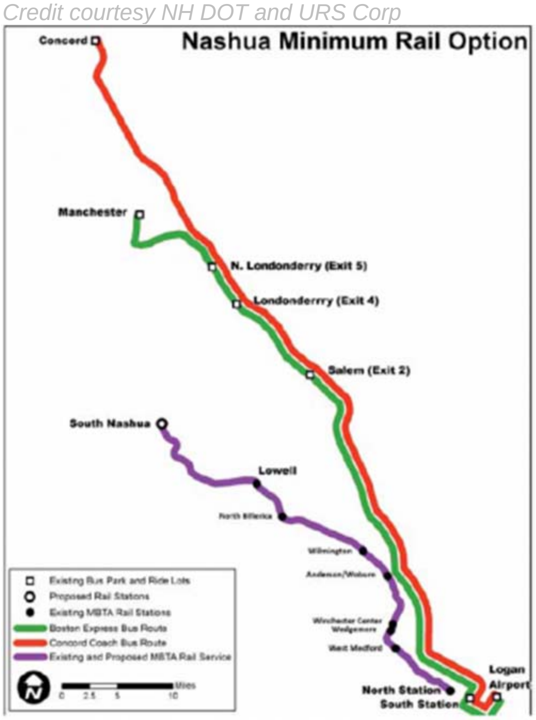
Concord to Boston.

Credit courtesy NH DOT and URS Corp



Manchester to Boston

Credit courtesy NH DOT and URS Corp



Nashua to Boston

Credit courtesy NH DOT and URS Corp

Possible plans for Concord train station

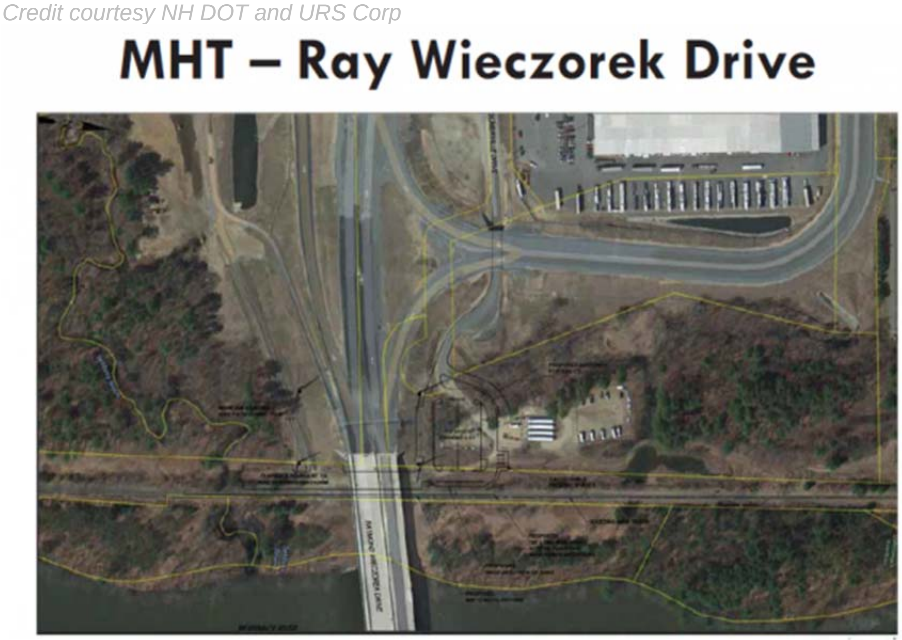
Credit courtesy NH DOT and URS Corp

Possible plan for north downtown Manchester station

Credit courtesy NH DOT and URS Corp

Possible plan for south downtown Manchester station

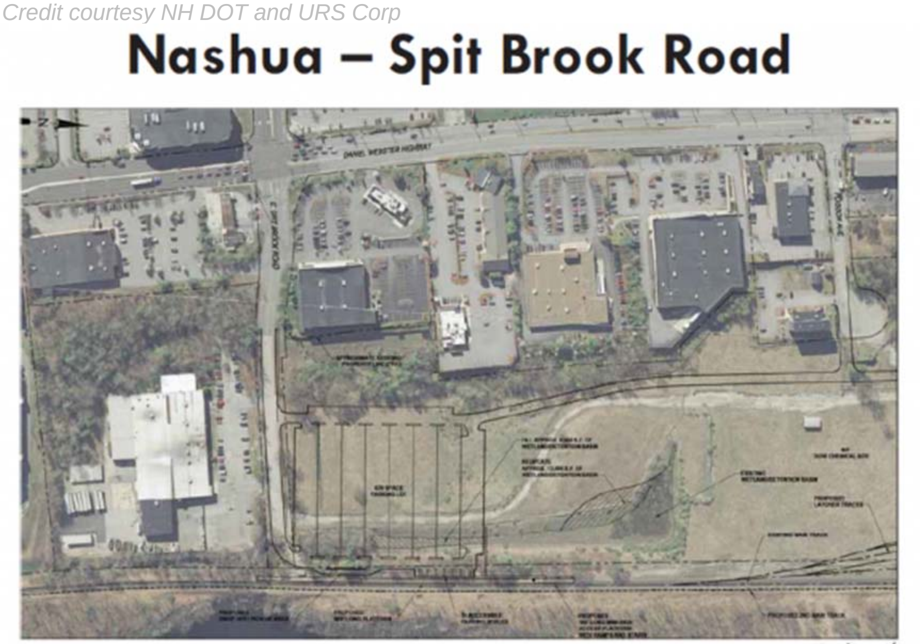
Credit courtesy NH DOT and URS Corp



Possible plan for Manchester airport station

Possible plan for Nashua station

Credit courtesy NH DOT and URS Corp



Possible plan for Nashua station

Credit courtesy NH DOT and URS Corp

Possible plan for Nashua mall station

Credit courtesy NH DOT and URS Corp

New details released by the Capitol Corridor rail study group during a public hearing Wednesday night point toward higher ridership than expected.

Listen

Ken Kinney is a consultant from URS Corporation and the project manager for the rail study. He says 3,100 passengers could be expected to use the commuter rail service each day, both ways between Boston and Manchester.

“The answer to that question, is that 3,000 number any good? It’s not spectacular, but it is satisfactory.”

Kinney says that's enough to compete for a federal grant, which would be needed to pay for at least half the project. It’s also more than twice the number of passengers who ride the Downeaster between Portland and Boston.

Of the options presented, one would build upon an existing Mass Transit rail from Boston to Lowell.

The study, which is expected to be complete later this year, will outline expected costs, financing options and a schedule to complete construction by 2020.

The executive council approved the nearly $4 million feasibility study last year.

Tags:

Rail

NH Dot

View the discussion thread.

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RIGHT TRACK?

Dick Lemieux said: Waste of money. 174,000 is less than the number of passengers on the Everett Turnpike in ONE DAY. BTW, the $10 and $22 per rider per year figures in the article are bogus. It s $10 and $22 per rider per TRIP.

(Perhaps a correction is in order?) The Manchester Regional scenariowould cost over $30,000 perday to operate.

Tom Keeler said: Fully support service to Concord and Manchester. The project will pay for itself, increase employment, and reduce highway congestion.

Michelle Lapointe Bernier said:

Where are 2,200 more houses going to go? We won t have any trees left around here at that rate.

Laura Foote said: Please no, I really don t want train expansion.

People can drive or like I do, take the bus. Have you seen how disgusting the commuter rails are? Full of graffiti, trash and transients. Just what Concord needs right? Hell to the NO!!!!!

@drewbiemer said: I get arguments for passenger rail but do we want Concord to become a Bostonsuburb?#nhpolitics

In response

@AlexBWeech said: We do not want Concord to be a Boston suburb, but we do want connectivity with Manchester and Nashua.

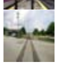
(and) I d rather that instead of letting MBTA run commuter rail here have NHRTA run the lines.

@Patsfantk said:train or not, we already are

@Passeriform said: I don t think the two are necessarily connected. Fewer cars on the road would be better for everyone.

@JonRichardsonNH said: only 42% born in #NH. 25% born in MA & growing faster than #NH born





- Staff photo by Don Himsel

  A MBTA commuter train leaves the station in Lowell, Mass., Monday January 27, 2014.

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- Staff photo by Don Himsel

  A commuter train is parked and idles at the Gallagher Transit Terminal in Lowell, Mass., Monday, January 27, 2014.

  Purchase Photo

- Staff photo by Don Himsel

  Grant money and toll credits will fund the purchase of about 7 acres of land on Crown Street for a park and ride lot that would accompany a rail station. This view looks north across Crown Street towards East Hollis Street.

  Purchase Photo

Tuesday, February 18, 2014

Study of options to reduce congestion on I-93 in NH is halfway complete

By JIM HADDADIN

Staff Writer

Travel time to Boston

The following estimates were generated by URS Corp., the company studying transportation options in New Hampshireâ€™s Capitol Corridor. The numbers show the estimated travel time to reach Boston by 8:30 a.m. on a weekday using different modes of transportation.

â€œBus on shoulderâ€ refers to a proposal to allow buses to travel on the shoulder of Interstate 93 to avoid congestion south of Interstate 495 in Massachusetts. â€œEnhancedâ€ bus on shoulder would offer more frequent bus service on the same routes.

Commuter rail and intercity rail are proposals to extend passenger train service north from Lowell, Mass., to destinations in New Hampshire.

Manchester to Boston (hours and minutes)

Existing bus service: 2:20.

Bus on shoulder: 2:10.

Enhanced bus on shoulder: 2:00.

Commuter rail: 1:28.

Intercity rail: 1:23.

Nashua to Boston (hours and minutes)

Existing bus service: 1:50.

Bus on shoulder: 1:40.

Enhanced bus on shoulder: 1:40.

Commuter rail: 0:59.

Intercity rail: 0:58.

MANCHESTER â€“ Transportation administrators in Washington are warming to the idea of bringing commuter rail to New Hampshire, but the project still faces significant challenges, according to a contractor studying the issue for the state.

Preliminary estimates show extending passenger train service to Manchester would facilitate approximately 3,100 new train trips each weekday.

That ridership number â€œdoesnâ€™t jump off the charts,â€ but itâ€™s sufficient to keep representatives from the Federal Transit Administration and the Federal Railroad Administration interested in the project, according to URS Corp. project manager Kenneth Kinney.

Kinney appeared in Manchester on Jan. 21 to brief members of an advisory committee about the progress of the stateâ€™s Capitol Corridor Rail and Transit Alternatives Analysis study.

URS Corp. is overseeing the project, which has been in progress for more than one year and is now halfway complete. The firm is assessing options to reduce congestion on Interstate 93 and potentially bring passenger train service north from Massachusetts.

The feasibility study represents a crucial next step for commuter rail proponents, who are pushing for New Hampshire to bring commuter trains to Nashua, Manchester and potentially Concord.

Kinney said federal officials are ready to support a commuter rail expansion, should new federal funding become available in the future. But one big unknown is how the state would finance its share of the project. Based on preliminary estimates, Kinney said, New Hampshire would face costs in the range of $8 million to $10 million annually to fund capital projects, operations and maintenance.

â€œThatâ€™s what we need from some source, or combination of sources,â€ he said.

Rail options

URS Corp.â€™s preliminary estimates show a rail expansion reaching Manchester would cost in the range of $200 million, according to New Hampshire Rail Transit Authority Chairman Tom Mahon.

That number is slightly underneath earlier estimates, which had pegged the cost at as much as $300 million. Mahon said one cost-saving measure could be refurbishing older trains owned by the Massachusetts Bay Transportation Authority, which oversees commuter rail in Massachusetts.

The study also is examining the possibility of private companies making the investments necessary to build stations and platforms along the route.

Advocates say commuter rail would not only ease congestion by taking cars off the road, but also spur clusters of development around train stations. The rail concept also is aimed at improving access to higher-paying jobs in greater Boston, facilitating tourism and helping to attract and retain young professionals in New Hampshire.

Nashua is expected to have the highest ridership numbers, given its proximity to Boston. The study is examining two potential stops in the Gate City: one southern stop, either at Spit Brook Road or the Pheasant Lane Mall; and a â€œdowntownâ€ stop on Crown Street.

In Manchester, the study is focused on creating a park-and-ride style train station near Manchester Airport and another station downtown, either at Granite Street or Spring Street.

The proposed location in Concord would be on Stickney Avenue, which already has a bus station.

Another rail option under consideration is a faster â€œintercityâ€ service, similar to Amtrakâ€™s Downeaster service between Boston and Portland, Maine. It would make fewer stops, compared to the commuter rail proposal, and would pick up passengers only at downtown stations and at Manchester Airport.

â€˜Bus on shoulderâ€™

All rail options would be paired with continued bus service between Boston, Manchester and Concord.

To speed up bus trips, the study is evaluating the idea of having buses travel on the shoulder of Interstate 93 in portions of Massachusetts south of Interstate 495.

The concept was first rolled out in Minnesota and has been adopted in other parts of the country. Estimates show giving bus drivers the option of riding in the shoulder of the road could save an average of between 8 and 22 minutes on trips to Boston during peak travel times.

Itâ€™s up to transportation officials in Massachusetts to decide whether to move forward with the concept. Tentative plans call for buses to ride in the shoulder only when traffic in the general purpose lane drops below 35 miles per hour; in that scenario, drivers would be permitted to travel up to 15 miles per hour faster than surrounding traffic.

Results expected by fall

URS has identified two bus options and three commuter rail options to study further before presenting its findings at the end of this year. The company will create more precise ridership and fare projections for each route, then make recommendations for preferred options.

Lawmakers will then decide whether to put together a financial plan to cover the estimated $8 million to $10 million annual cost of a commuter rail expansion. New Hampshire also will need to fund a $4 million engineering study in order to qualify for federal money.

If the project gains political support in New Hampshire and federal funding is approved, construction could start as early as 2017. Mahon stressed the state is still far from seeing the project get underway.

â€œKeep in mind that if this thing were to move forward, theyâ€™re projecting the first train in December of 2020,â€ he said.

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Subsidy OK'd for thriving bus line
By Garry Rayno, The New Hampshire Union Leader, Manchester
McClatchy-Tribune Information Services

June 19--CONCORD -- Boston Express Bus, Inc., which provides subsidized commuter bus service to Boston, will receive about $5 million in new federal subsidies to continue providing the service through fiscal year 2017. Department of Transportation Commissioner Chris Clement called the company "the most successful new start in the country" at the Governor and Executive Council meeting Wednesday.

Boston Express won a bid to provide commuter bus service between Manchester and Boston during the Interstate-93 expansion project as part of the state's environmental impact statement. The contract was awarded in 2008. The company originally won a contract to initiate bus service along the FE Everett Turnpike to Boston in 2007.

On Wednesday, the council approved separate contracts for the two routes that provide $5.4 million in Federal Highway Administration funds to continue the services through June 30, 2017. With the additional money, the total subsidies in the two contracts will be $14.1 million through June 30, 2017. Under New Hampshire law, highway funds generated from auto registrations and the gas tax cannot be used to subsidize this service.

The company will be able to use the money for net operating expenses, marketing and customer service, maintenance and improvements to state-owned bus terminals and storage facilities, and to repair and overhaul its aging bus fleet as well as increases in operating expenses with greater ridership such as medical insurance and fuel.

Although there have been discussions about fare hikes along the two routes, company officials said recently there are no plans to increase them.

The I-93 route served about 30,500 customers per month during 2013 for a total of 366,000 riders, while the FE Everett route serves about 16,000 riders a month, which is double the ridership since service began, according to information from the Department of Transportation.

Along the two routes, Boston Express carried about 580,000 passengers last year.

Contingency fund

The Council approved a contingency fund of $5.2 million to address emergency repairs to highways and bridges damaged in a storm.

Currently state transportation officials have to find the money within the agency's budget to pay for repairs like those caused by a flash flood or the tornado in 2008. Clement told the council it took his department three years to make up for the money spent to clean up and make repairs after the tornado.

The money for the fund would come from proceeds left over from $150 million in GARVEE (Grant Anticipation Revenue Vehicle) bonds issued for the I-93 expansion project. District 3 Councilor Chris Sununu, R-Newfields, said the bonds were intended for the I-93 project, but now the department wants to use the money for something else.

"We're trying to create a small account for emergencies," Clement said. "The money has to come from somewhere." He said the money would be used for capital costs not operating expenses, noting the request was approved by Administrative Services and the Joint Legislative Fiscal Committee.

Managed care contracts

Contracts with the two remaining managed care companies administering the state Medicaid program were approved by the Council. A third company recently withdrew from the program.

The contracts contain new rates for the next fiscal year that were approved by the federal Center for Medicaid Services.

Although they are three-year contracts, new rates have to be approved each year, according to Health and Human Services Commissioner Nicholas Toumpas.

The change also reduces the state payments to the companies by $485 million to $460 million for the next fiscal year because the second phase of managed care will not begin Dec. 1 as intended, but instead will begin at a later date that has yet to be determined.

The delay affects long-term services for the elderly and developmentally disabled, such as nursing home and community based services.

Toumpas said while he may be back later to ask for additional money to be added to the managed care contracts, the patients who would have been served will continue in their current fee-for-service programs.

Sununu said he was concerned there was no set date to implement the second phase of the managed care program. "I don't want to be kicking the can down the road for the (developmentally disabled)," Sununu said.

Gov. Maggie Hassan, who appointed a managed care oversight commission that recommended delaying the second phase, said there needs to be a new plan to implement the program developed by the state officials and stakeholders.

"We will have a date with a robust plan," Hassan said.

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The Battle to EXPAND RAIL

BY REBECCA MAHONEY

Gray Chynoweth, COO of hot tech company Dyn in Manchester, traveled to Boston last year to meet a group of about 60 young tech professionals looking for jobs. He told them about Dyn's innovative work in Internet performance, its growth opportunities for employees and its award-winning culture. Then he asked, "So who is open to working in Manchester at Dyn?"

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The experience confirmed what Chynoweth and many other business owners in NH have long believed—that expanding passenger rail in Southern NH could be the key to growing business, attracting talent and driving economic development in the state.

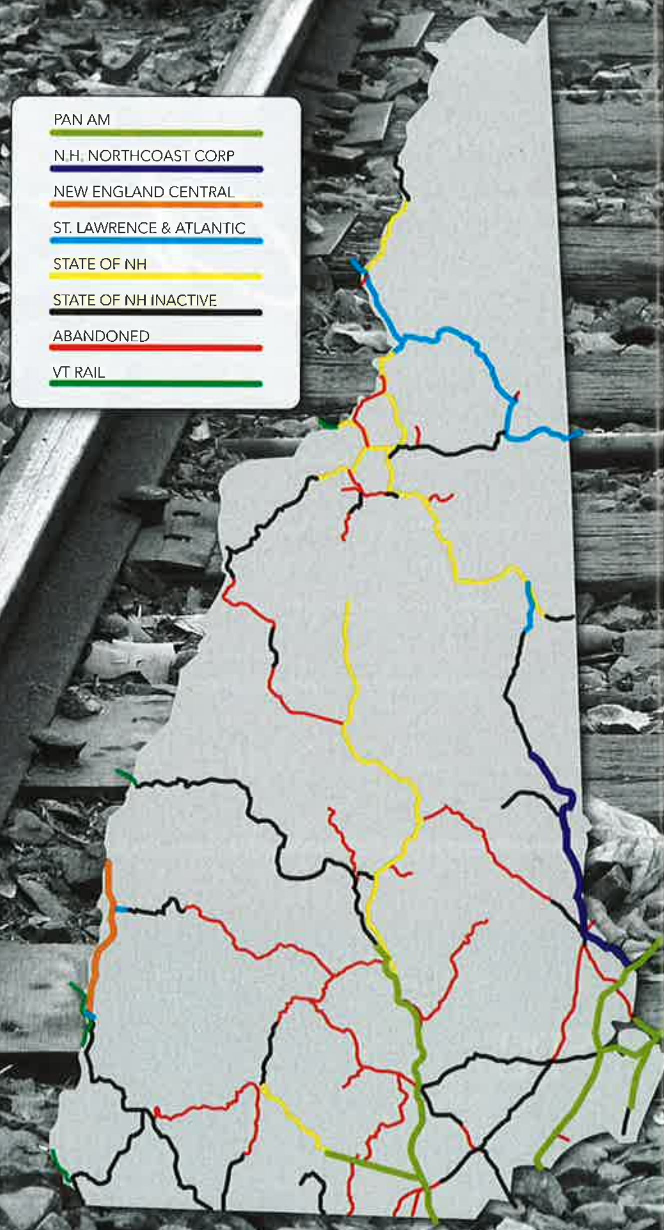
Businesses are among the strongest advocates behind a plan now being studied to extend passenger rail from Boston to Manchester as early as 2020. But the State of NH had not, until last year, even been willing to fund a study of rail. (In 2012, the Executive Council voted 3-2 against funding a study.) And if the study approved in 2013 does recommend moving forward with passenger rail, state leaders would need to find upwards of $200 million to pay for it.

State transportation officials are expected to release the recommendations later this year. The governor, Executive Council and Legislature will then decide whether to move forward. And since the study is not expected to be released until after the November elections, it's uncertain whether passenger rail would have the political support it needs to become a reality.

Some political leaders already oppose the plan. "I'm not anti-rail. I'm anti-bad project," says Executive Councilor Chris Sununu (R-Newfields), who was the only councilor out of five to vote against the $3.9 million study last year and was one of three who voted against the study in 2012. "Nobody has come up with even a remote idea of how we'd pay for it, and the benefits, in my opinion, are minimal. The arguments being made (for the train) are ludicrous."

Sizing up Rail

In 2012, the Business & Industry Association held a panel about NH rail service, titled "Economic Catalyst or Multi-Million Dollar Mistake." And that pretty much sums up where the two sides still stand. Opponents say expanded passenger rail service is too costly and inefficient and would require subsidies of $8 million to $10 million a year to operate. Supporters counter that all transportation is subsidized to some degree and that the return in terms of economic development will offset costs.



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Transportation officials released some preliminary findings in March, mapping a rail line that roughly traces the course of the Merrimack River and makes stops in Nashua, Manchester and Bedford, says Patrick Herlihy, director of aeronautics, rail and transit for the NH Department of Transportation. In Nashua, the train would stop by the Pheasant Lane Mall or on Spitbrook Road and again downtown, likely on Crown Street. In Manchester, the station likely would be located either off Spring Street in the Millyard or off Granite Street near the WMUR-TV station, he says.

Another stop would be located along Raymond Wieczorek Drive near Manchester-Boston Regional Airport, which could help the airport better compete with other northeast airports that are connected to rail, including Boston's Logan Airport and T.F. Green in Providence, RI, says Mark Brewer, director at Manchester-Boston Regional Airport.

For example, Brewer says, he was recently approached by the president of a major European airline interested in bringing service to the Northeast. The man's first question was "Do you have rail at the airport?" Brewer had to tell him no.

The total cost of the Capitol Corridor project is estimated at $150 million to $200 million, which would include laying new track or upgrading the existing track for passenger train service and building or updating platforms, Herlihy says. The existing rail lines through the area are for low-level freight service and would need to be upgraded to passenger-level standards. Though federal funding would likely cover at least 50 percent of the capital costs, there would be annual operating costs. That's if the train met its projected ridership of 3,100 daily passengers.

Those numbers simply don't add up for opponents of the plan. "We're talking about making hundreds of millions of investment for something that only about 3,000 people are projected to use?" says Joshua Elliott-Traficante, policy analyst and director of transparency for the Josiah Bartlett Center for Public Policy in Concord. "I haven't been convinced that bus service is somehow not acceptable or not sufficient to meet the transportation demands, for a fraction of the cost."

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'Is that train paying for itself yet?' There is a misconception that all of the modes of transportation pay for themselves. They clearly do not," says Patricia Quinn, executive director of the Northern New England Passenger Rail Authority. "While $8 million is a sizable subsidy, just as you have to still invest in your roads, you have to invest in your rails."

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Significant Obstacles

State officials have debated the possibility of expanding passenger rail service in the Capitol Corridor for more than a decade. Though this latest initiative appears to have gained more support, it still faces major obstacles. Opponents of rail expansion say the state is already investing a significant amount of time and money in widening a 20-mile stretch of Interstate 93 and that the state doesn't have the money to invest in or operate rail.

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BY ERIKA COHEN

While nine freight railroads operate in the Granite State, NH has more opportunity than traffic when it comes to shipping freight by train. Most freight activity is focused on two railroads lines—one in the Seacoast and one through Nashua, Manchester and into Concord—both owned by Massachusetts-based Pan Am Railways. (The exact value of products shipped by rail in NH is unknown. But products shipped via rail include steel, oil, coal and wood.)

Freight rail received intense attention during the past year, especially in the Seacoast, as Pan Am shipped $673 million in crude oil through NH and Maine in 2013, presumably to an Irving refinery in Canada. That route, established in 2012 with an initial shipment valued at $1.5 million, continues to be used in 2014.

Public Service of NH (PSNH) in Manchester depends on Pan Am's other freight line to deliver coal five to eight times a month to its power plant in Bow along the Capitol Corridor. PSNH also receives limestone by rail, which reduces sulfur and mercury emissions at the Bow facility.

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For this reason, Law Warehouses lost out on a contract to bring wood pellets into New England as the company with the pellets found it cheaper to use rail to ship to Canada and then truck them to New England rather than ship directly to Law Warehouses by rail.

North Country officials and businesses say rail has potential, though only with infrastructure investments. There are 20 miles of the St. Lawrence & Atlantic Rail line in the North Country (17 in NH and three in Vermont). But the NH/Vermont portion has less capacity than neighboring states, says Jeff Hayes of the North Country Council. That line has a capacity of 263,000 pounds, while the rest of line has a capacity of 286,000 pounds, according to the NH Department of Transportation (DOT). The state applied and was rejected for a federal grant to upgrade that line four times, most recently last year. It applied again for $8 million in federal funding this year and is waiting to hear back.

The state did receive $1.4 in federal funds to upgrade 42 miles of rails between Rollinsford and Ossipee owned by NH Northcoast Railroad, a subsidiary of Boston Sand & Gravel. That line connects with Pan Am's tracks in Rollinsford, linking Ossipee and the rail network in Boston. The overall project cost is $2 million, with the state and NH Northcoast kicking in funds. That will allow more cars to run at higher tonnages, which improves the economic competitiveness of the region, according to Patrick Herlihy, director of aeronautics, rail and transit for the NH DOT. ■

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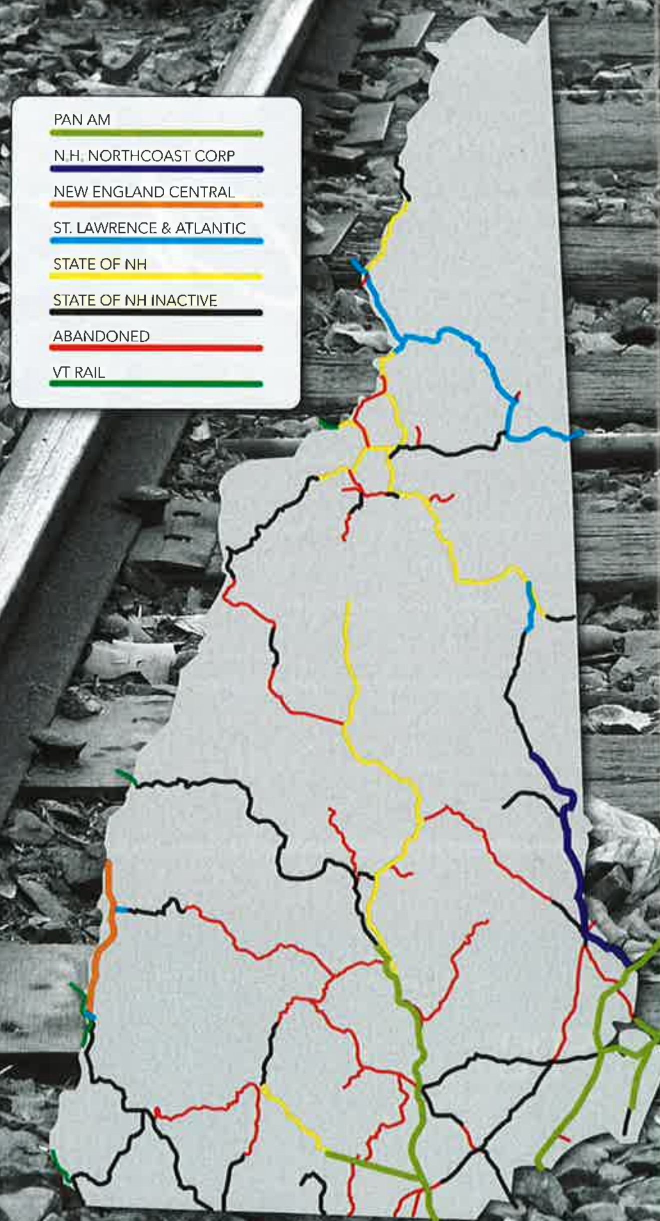

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Public Service of NH (PSNH) in Manchester depends on Pan Am's other freight line to deliver coal five to eight times a month to its power plant in Bow along the Capitol Corridor. PSNH also receives limestone by rail, which reduces sulfur and mercury emissions at the Bow facility.

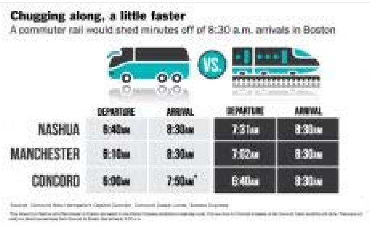
For Law Warehouses, a distribution center in Nashua, rail is about 5 percent of its business, despite the fact that a rail line comes right to the distribution facility, says President Brian Law. He asks if it could be higher. While Law says rail is often preferred as you can typically carry three to four truckloads on a train for the same cost as one truck, that math does not always work in NH. The Hillsborough branch of the Capitol Corridor is limited to 5 miles an hour, Law says, which is set by track owner Pan Am, which did not return calls by press time.

For this reason, Law Warehouses lost out on a contract to bring wood pellets into New England as the company with the pellets found it cheaper to use rail to ship to Canada and then truck them to New England rather than ship directly to Law Warehouses by rail.

North Country officials and businesses say rail has potential, though only with infrastructure investments. There are 20 miles of the St. Lawrence & Atlantic Rail line in the North Country (17 in NH and three in Vermont). But the NH/Vermont portion has less capacity than neighboring states, says Jeff Hayes of the North Country Council. That line has a capacity of 263,000 pounds, while the rest of line has a capacity of 286,000 pounds, according to the NH Department of Transportation (DOT). The state applied and was rejected for a federal grant to upgrade that line four times, most recently last year. It applied again for $8 million in federal funding this year and is waiting to hear back.

The state did receive $1.4 in federal funds to upgrade 42 miles of rails between Rollinsford and Ossipee owned by NH Northcoast Railroad, a subsidiary of Boston Sand & Gravel. That line connects with Pan Am's tracks in Rollinsford, linking Ossipee and the rail network in Boston. The overall project cost is $2 million, with the state and NH Northcoast kicking in funds. That will allow more cars to run at higher tonnages, which improves the economic competitiveness of the region, according to Patrick Herlihy, director of aeronautics, rail and transit for the NH DOT. ■

Mar 28, 2014



More transportation options

The Capitol Corridor consultants aren’t just examining commuter rail options. They are also studying the possibility of an intercity rail, which would make fewer stops but be faster, as well as the possibility of combining rail with expanded express bus service to Boston.

At the scoping meeting, consultants described expanding bus services from 80 weekday buses to 120. In addition, they are looking into the possibility of running them on the shoulder of the freeway during peak traffic hours.

These options could shave from 15 to 30 minutes off commutes.

All aboard?
Optimism surrounding Capitol Corridor study

Earlier this year, Gray Chynoweth, CEO of Manchester high-tech company Dyn, asked a group of early career professionals at The Startup Institute in Boston how many of them would consider commuting to Manchester for work.

“I think it was like three out of 50 raised their hand,” he said.

Off the cuff, he asked them how many would commute to southern New Hampshire if there were a convenient commuter rail option.

This time, about 35 hands went up.

Interest in creating a passenger rail system from southern New Hampshire to Boston has been bubbling up for years, but stakeholders are more optimistic now than ever that it could turn into a reality.

The $3.7 million Capitol Corridor study is halfway complete this month. On March 5 consultants working for the New Hampshire Department of Transportation announced their most specific set of extended options for the 73 miles between Boston and Concord to date at a public scoping meeting at the DOT in Concord.

“It feels like people who advocate for it are more excited now about the likelihood of us actually realizing rail than they have been,” said Will Craig, Manchester’s economic development coordinator, at the meeting. “It sounds like people are optimistic, and there were times when people thought this project was always out of reach. I don’t think that’s the feeling anymore.”

In a best-case scenario Manchester, Nashua and Concord (one, or up to all three cities) will be connected by rail to Lowell and Boston by 2020 — but as with any major government project, the price tag could stall or halt that outcome.

Consultants, cities tout benefits

At the scoping meeting consultants described a list of benefits and outcomes that have helped drive their decisions on which options to study. According to project manager Kenneth Kinney, the commuter rail would attract about 3,100 passengers. Relieving congestion on the southern end of the corridor would improve access to higher-paying jobs in Boston, he said at the meeting. While that may seem like a loss for the Granite State, “We like to say commute from New Hampshire and bring money back to New Hampshire,” Kinney said at the March 5 meeting.

Perhaps even more enticing to local employers, passenger rail could attract young, highly educated professionals to state’s job market. That’s important to city authorities who are in conversation with local companies.

“If you talk to high-tech companies in our millyard, they are sure they could get people to come up here every day,” Craig said in a phone interview.

Chris Williams, Nashua Chamber of Commerce director, hears the same thing. The chamber has been pushing the idea of rail for eight years, he said in a phone interview, and every week executives hoping to see passenger rail come up to Nashua remind him how important it is to attract talent from the Merrimack Valley.

“Our businesses … care very, very deeply about this issue,” Williams said in a phone interview. “It’s one of the the single biggest economic development opportunities for the state.”

Concord Chamber of Commerce Director Tim Sink and Deputy City Manager Carlos Baia have experienced the same concerns.

“One of the common concern for CEOs — especially of high-tech, medical arts, science industries — is the notion of trying to get that qualified employee base from the south,” Baia said in a phone interview.

A major focus for consultants was also the idea that downtown stations promote environmentally friendly, transit-oriented development in New Hampshire that helps mitigate sprawl. Rail stations would promote a desire for downtown living options, Kinney said at the meeting.

Concord has already seen movement in that direction, Baia said in a phone interview. Last summer, the city’s first market-rate residential development with 25 units opened up on Main Street, and the city council has been offering financial incentives to facilitate market-rate housing downtown for 10 years.

“These are folks who want to be in a vibrant living location, where they can go downstairs to eat in a cafe, and go shopping nearby. I believe that a train service downtown would add to that experience,” Baia said in a phone interview.

In Nashua, developers of the Cotton Mill Square conducted a market analysis that inspired them to create the 109-apartment development that will open this spring.

Rail developments

It’s unclear how far north a commuter rail line connecting New Hampshire to an existing rail line would run. While developers have plans for options all the way to Concord, it could stop in Manchester or at the very least south Nashua.

“We have three levels of investment, three levels of service,” Kinney said at the meeting. “…The Nashua minimum refers to the lowest-cost rail option we could implement.”

Consultants have narrowed down station location options to six and say a combination of park-and-ride and walkable downtown stops would attract the most passengers.

In Concord, the station would be at Stickney Avenue near the current bus station.

In downtown Manchester, Spring Street and Granite Street locations are in the running. Granite Street is particularly attractive because it’s close to the bus station. There’s only one viable option for a park-and-ride stop near the Manchester-Boston Regional Airport, on Ray Wieczorek Avenue.

In Nashua, Crown Street is slated for the downtown location, and there are two park-and-ride-style options at Spit Brook Road near Exit 1 on Interstate 93, and another at the Pheasant Lane Mall.

Officials in Concord and Manchester said a rail that only reached Nashua would not be very useful to their cities. It wouldn’t inspire transit-based development, and it’s likely commuters would stick to their current mode of transportation. Even if rail came up to Manchester, Concord residents wouldn’t see much use.

“There would be pretty much very little benefit,” Baia said. “If it goes to Manchester, one could argue there might be some benefit, but it would be limited. If it comes down to hopping on bus to go to Manchester, then hopping on a train at Manchester, that doesn’t sound too convenient.”

Price tag predicament

Capitol Corridor consultants have been in conversation with members of the state government, but it’s too early to know whether the money to build the passenger rail will be made available. Even if the project wins funding at the state and local level, it won’t be able to move forward without getting about 50 percent of the capital costs from Washington — about $100 million.

That funding is competitive, and while the project isn’t a slam dunk, it’s in the ballgame, Kinney said at the meeting. A rail from Concord is slated to attract 3,100 riders, which makes it attractive to federal funders.

One of the project’s shortcomings is the impossibility of reaching high speeds. Trains will only run up to 75 miles an hour for sustained segments of the existing tracks they will be running on.

“When our great-great-grandfathers built this line, they very closely followed the Merrimack River, and the Merrimack River by no stretch of the imagination is straight,” engineering lead David Nelson said at the meeting. “…To some extent this is sort of back to the future. We’re in the same time frame as back in the 1950s, and the ’40s and the ’20s.”

It could hurt the case for funding from Washington, but the cost-benefit of attempting a higher-speed rail wouldn’t justify the marginal costs, Kinney said.

Ultimately, snagging the funding will determine how far north the rail will go, if it happens at all.

“Costs go up as you go farther; political support may increase as it goes farther too,” Nelson said during an interview after the meeting. “How this all shakes out is something for the people of New Hampshire to figure out.”

In the next couple months, the consultants will be studying the economic feasibility of the project, sharing results with policy-makers this fall.

City planners suspect that its results will be favorable.

“I think the report, once it comes out, will be able to show seminal findings rather than speculate what those are now,” Williams said. “But I will say I am confident that report is going to show a very good return on the state’s investment — for the communities it passes through, for the state itself, and the business community.”

As seen in the March 27, 2014 issue of the Hippo.

Concord Monitor | Page A03 Saturday, 22 November 2014

SHARE

Transit study: Commuter rail would have economic benefits

By KATHRYN MARCHOCKI

Telegraph

Expanding Boston-bound commuter rail from Lowell, Mass., to Manchester with other stops at Manchester-Boston Regional Airport, and two others in Nashua, would be an economic boom for the region, bringing an estimated 5,600 new permanent jobs and 3,600 housing units by 2030, a two-year rail and transit study showed.

This Lowell-to-Manchester line known as the Manchester regional commuter rail alternative would draw a projected 668,000 annual riders and cost a total of $256 million about half of which could be eligible for federal grants and bonds, authorsof the New Hampshire Capitol Corridor Rail and Transit Study said Thursday.

"There is simply no economic development opportunity on the horizon that could

SeeTRANSIT A4

TRANSIT

Continued from A3transform New Hampshire s economy like the expansion of passenger rail could offer, New Hampshire Rail Transit Authority Chairman Thomas Mahon said.

More than 225 people packed the public hearing room at the Nashua Public Library, stood in the aisles and spilled out into the hallway to hear the findings of rail and transit study, which has been in the works for two years and will be released by mid-December. They included many Nashua residents and elected officials and residents from as far as Manchester, Hollis, Mont Vernon and Londonderry. They were nearly unanimous in their support for rail expansion and urged elected officials and project authors to push for support among lawmakers.

This is one of the . . . biggest economic developmentopportunities for the state, Greater Nashua Chamber of Commerce President Chris Williams said.

The issue is about jobs. It s about moving the economy forward, Williams added.

Williams urged executive councilors and state and local politicians to have a real conversation about how the public and private sector can make this happen. We can t do it without you, he said to applause.

Nashua resident and longtime Boston commuter Elise MacDonald said she drives daily to Lawrence, Mass., to get the train to Boston. Like several other speakers, she favors developing a rail station on the Tyngsborough side of the state line adjacent to the Pheasant Lane Mall.

If we can t have New Hampshire rail yet, a stop in Tyngsborough would be wonderful, MacDonald said to applause.

Ken Kinney of URS Corp., the lead consulting firm the state Department of Transportation hired to do the rail and transit study, laid out several scenarios ranging from expanding existing commuter bus service to Boston the cheapest alternative that brought nearly no benefits in increased jobs, housing and economic development to rail expansion along the entire 73-mile corridor from North Station in Boston to Concord.

The Manchester to Boston commuter option would feature 16 trains daily from Manchester and at least 20 daily trips from Nashua.

A more limited regional option of extending rail service just to Nashua would cost a total estimated $120 million in capital costs, Kinney said.

The Concord intercity optionwould involve four round-trips daily to Boston and would operate like an Amtrak-type service, such as the Downeaster that now runs from Boston to Maine. It would cost the most an estimated $256 million, Kinney said.

Developing a limited rail expansion to Nashua only would bring an estimated 1,200 new permanent jobs by 2030 and about 600 new housing units, Kinney said.

Kinney recommended more discussion and debate is needed on the proposed rail and transit expansion.

In order to move any project forward, we need to make a lot of progress on developing a credible financial plan, Kinney said, noting the federal government typically will pay for half the capital costs, but states and towns must show how they can pay the balance.

Ducker, Renee

From: Thomas J Mahon <tjmahon@comcast.net>
Sent: Tuesday, October 21, 2014 12:17 PM
To: Carlos P. Baia; Dan Kelly; Daniel Barufaldi; David Preece; Jonathan Edwards; Kerrie Diers; Malcolm Taylor; Mark Brewer; Michael Izbicki ; Michael Tardiff; Nancy Larson ; Patrick Herlihy; Raymond Gagnon; Rep. Candace Bouchard; Rep. Sherman Packard; Richard Cane; Robert D Jaffin ; Robert Hall ; Sen. Jim Rausch; Sen. Peggy Gilmore; Stephen Pesci; Ted Starkweather; Tim Moore; William Craig
Cc: Adam Hlasny; Andrea and Rob Vibbert; Barbara Mcilroy; Barbara Pressly; Bernard Mulligan; Bette R. Lasky; Carol Morris; Chris Clement; Chris Williams; Christopher Kennedy; Christopher Stewart; Collin Lever ; Cynthia Copeland; Dave Kotsonis; DCameron; Dennis Fields; Dennis Grimes; Dennis Varney; Don Wendell; Donnalee Lozeau; E. J. Powers; editor@atlanticnortheast.com; Francois Rebello ; Hannah Bassett; Herbert A. Pence; Jake Berry; James Vayo; Jamie Kyle Simchik ; Jesse Turiel; 'Josh Denton '; Justin Frazier; Karen Miniutti; Karl Kenyon; Katherine Hersh; Kinney, Ken; layer03052@aol.com; make_tracks@comcast.net; Mark Richardson; Mark Sanborn; Martha Fuller-Clark; Matt Leahy ; Melanie Sanuth; Melissa Smart; Michael Lennon; Michael Smith; Mike Desrochers; Mike Skelton; Patricia Quinn ; Peg Fargo; Peter Burling; Peter Griffin; Peter R. Leishman; Richter, Peter; Raymond Faulkner; Ronald Grandmaison; Ronald O'Blenis; rrbldrpete@comcast.net; Wilder, Russ; Sandra Keans; Scott Bogle; Scott Tranchemontagne; Shelley Winters; Simon Thompson; Thomas Noel ; Timothy Sink; Tom Irwin
Subject: U-L article

Kuster: Passenger rail could help to lead manufacturing renaissance in Nashua

From left, State Rep. Latha Mangipudi, Nashua Alderman Diane Sheehan, Nashua Alderman James Donchess and Congresswoman Annie Kuster gather Monday beside the old railroad bed in Nashua to discuss the importance of bringing commuter rail into New Hampshire. KIMBERLY HOUGHTON/Union Leader Correspondent

Annie Kuster calls on opponent Marilinda Garcia to pledge to stand with her and fight for rail funding in Washington.

By KIMBERLY HOUGHTON
Union Leader Correspondent

NASHUA — On Monday, Congresswoman Annie Kuster stood by the railroad tracks in Nashua and pledged to fight for Nashua's economy while supporting efforts to bring rail into New Hampshire.

Kuster, joined by three city aldermen, described Nashua as the state's innovation hub, adding the Gate City is helping to lead a manufacturing renaissance.

"But, without proper infrastructure, these companies won't be able to access the workers, suppliers and customers they need to be successful," said Kuster. "That is why business leaders throughout the southern tier are looking to their political leaders to push for one of the most important economic development projects of our time — the expansion of passenger rail into the Granite State."

Gathered outside of Nancy's Diner along the old railroad bed, Kuster said she is ready to hit the ground running as soon as the ongoing rail feasibility study is completed.

"If the feasibility study shows that this project makes sense, I call on (opponent) Marilinda Garcia to put the New Hampshire economy before her extreme ideology and pledge to stand with me to fight for rail funding in Washington," said Kuster.

According to Kenny Cunningham, of Marilinda Garcia's campaign, "Marilinda Garcia is supportive of passenger rail and looks forward to reviewing the feasibility study that will soon be released on a potential new railway-project in Nashua. While this project could potentially be a boon to one of the state's top economic hubs, Marilinda believes it is vital that comprehensive studies are conducted on the project before further action is taken to ensure that New Hampshire taxpayers' money is being spent wisely."
While acknowledging that rail is ultimately a local decision, Kuster said it will take a team effort to pull together and make it a reality.

Alderman-at-Large Diane Sheehan, also a candidate for Executive Council for District 5, said the Nashua Board of Aldermen previously voted to send a message to Concord that Nashua needs rail.
"It is the largest economic opportunity that New Hampshire faces in the coming decade," said Sheehan, adding it is vitally important to bring transportation infrastructure into the city to promote jobs and businesses.
Kuster agreed, stating in an open letter that expanding rail has the potential to infuse billions of dollars into the economy by creating thousands of new jobs.

"Nashua companies facing hiring difficulties will be able to attract new talent, and expanding businesses will be encouraged to set up shot here," she added.
Grant Morris, who owns New Sky Productions, a video production company in Nashua, said he was forced to hire a new employee who resides in New York, adding the talented pool of candidates from the Boston area did not want to commute into New Hampshire.
"Convincing people to commute into New Hampshire from Boston, or anywhere near Boston, was a nonstarter for people," said Morris, explaining he could only hire someone who had no choice but to move into the area.
Alderman-at-Large James Donchess said city officials are fully behind bringing rail into Nashua, adding the city needs supporters in Washington to help with the joint effort.

khoughton@newstote.com

See School, Page B4

Next stop Manchester? Consultants pinpoint 3 possible rail stops in city

◆ **Update on rail study:** City officials told a regional train service could cost $8 million to $10 million annually to operate.

By TED SIEFER
New Hampshire Union Leader

MANCHESTER — City officials on Tuesday were briefed on the progress of a study examining the feasibility of extending passenger rail from Boston to the Queen City and beyond.

Patrick Herlihy, the director of aeronautics, rail and transit for the state Department of Transportation, told the Board of Mayor and Aldermen that a regional train service running between Manchester and Lowell, Mass., would cost the state and local authorities $8 million to $10 million a year to operate.

This assumes that federal agencies would cover at least 50 percent of the capital costs to build the system. The total cost of the project is projected to top $200 million.

Herlihy is overseeing the ongoing federally funded study of the Capitol Corridor, which, in its most ambitious form, would run from Concord to Nashua, with stops in downtown Manchester and at the airport, and then connect with the MBTA commuter rail system. The study is also considering on-shoulder bus service to Boston as an alternative to rail or in conjunction with it, with the goal of reducing highway congestion in southern New Hampshire.

The line would largely follow the course of the Merrimack River, where there is already a rail line that serves freight trains. New track would have to be laid for passenger train service.

Herlihy said the consultants conducting the study still have many questions to answer, including how the project would be financed. The study is expected to run through the end of 2014.

See Rail, Page B4

Rail

Continued from Page B1

Still, Herlihy said bringing passenger rail could have many economic benefits for the state, such as greater access to jobs in the Boston area and a boost in tourism.

He said Manchester in particular could benefit from transit-oriented development near a rail station downtown. "We're looking to attract and retain younger, highly educated professionals in the state," he said. "Many of them prefer to not drive automobiles and prefer alternative forms of transportation."

Herlihy said the consultants have estimated that a train line between Manchester and Boston would have about 3,100 boardings per weekday.

He said the consultants have identified two possible sites for a station in downtown Manchester, one off Spring Street in the Millyard and the other off Granite Street, near the WMUR-TV station.

The airport station would be off Raymond Wieczorek Drive, on state land that could also accommodate a park-and-ride.

Herlihy said the consultants are focusing on a regional rail option for Manchester, which would make about 16 trips a day, fewer than a commuter line but more frequent than an Amtrak-style service.

Several aldermen expressed optimism about the prospect of passenger rail coming back to Manchester, while others expressed concerns about the cost.

Mayor Ted Gatsas said after the meeting that there needed to be more financial analysis to see if the project was worth the investment in Manchester.

"There's no doubt it makes sense to try and spur economic development, but you've got to find out what the end results will be, what the subsidies are going to be and what's expected of local communities," he said.

Nashua officials have expressed strong support for commuter rail and are actively considering plans to build at least one station in the city.

More information about the rail study can be found at: www.nhcapitolcorridor.com.

tsiefer@unionleader.com

High-speed rail project sidetracked

By GARRY RAYNO
New Hampshire Union Leader Staff
14 hours, 24 minutes ago

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CONCORD – The dream of high-speed rail in the Merrimack Valley was jolted yesterday when the Department of Transportation announced it would not seek federal stimulus money for the $300 million project.

Department of Transportation Commissioner George Campbell blamed Pan Am Railways for ending negotiations in June on the use of tracks it owns between Nashua and Concord. The state needs operating rights to apply for the money.

"It's very unfortunate that we are not able to take advantage of this huge window of opportunity for passenger rail in New Hampshire with any prospect of success at this time due to the lack of cooperation and involvement of Pan Am Railways, the host railroad along the corridor. By walking away from this unique and exciting initiative, Pan Am has effectively closed the window on strengthening New Hampshire's economy," Campbell said in a statement.

The deadline to apply for the $8 billion federal stimulus money for high-speed rail is tomorrow. Campbell said without operating rights, submitting an application would "wreck our credibility."

Pan Am President David Fink said today's economic climate is no time to begin high-speed, commuter rail service. New Hampshire should be concentrating on balancing its budget and shoring up its pension fund, he said. "Let's take a deep breath and come back and look at this in three or four years, maybe," Fink said.

He said his company is negotiating the use of its rails with Maine, Massachusetts, Connecticut and New York. "I don't know what the commissioner wants to say about that," Fink said.

Pan Am ended talks with New Hampshire after the Executive Council renewed Milford-Bennington Railroad's lease of state-owned tracks. The company is owned by state Rep. Peter Leishman, D-Peterborough.

Fink claimed Campbell was pressured by legislative budget writers to give Leishman the lease, although an investigation by the Attorney General's Office found no evidence of wrong-doing.

Campbell said the state had been negotiating with Pan Am for six years for the operating rights and to operate service along the Concord to Nashua corridor.

Fink said the state asked for a proposal and "I gave them a proposal, a very Spartan proposal, that was the least costly. That did not meet with their approval; they wanted something much more costly. People think this money is free. It's not. It's our money."

Campbell said not applying for construction money does not mean the commuter rail project is dead. He said Amtrak has shown interest in working with the state. The state will apply for $1.4 million in planning funds for the project between Nashua and Concord, Campbell said. "That keeps us in the game."

YOUR COMMENTS

People comment how rail is not viable from a cost perspective and, therefore. should not be considered.

If this rationale were applied to roads, we wouldn't have those either.

What people don't understand is the MASSIVE government subsidy of highway infratructure that we all pay through Federal Income Tax, gas taxes and tolls.

Put roads against trains on an even playing field and see how they measure up.
- **Dan, Auburn**

"High-speed rail put the previously profitable
Japanese National Railways into virtual bankruptcy and forced the government
to absorb $200 billion in high-speed debt."

"...even in the face of high fuel prices, the Japanese continue to rely primarily on personal motorized transport rather than high-speed trains...."

High-Speed Rail, The Wrong Road for America, Randal O'Toole, CATO Institute
- **Robin, Henniker**

That's one boondoggle avoided...

We don't need new rail lines to bring business to NH. Simply lower business taxes (and stop creating new ones on LLCs) and the businesses will drive, fly, walk here as fast as they can.
- **Mark, Amherst**

You know, it is stunning how you rail buffs think society owes you a free ride.

$300 million divided by NH's population means the equivalent of more that $200 per resident.

$300 million divided by even the wildest, unfounded, overinflated ridership projection comes out to at least $60,000 per passenger.

You people are asking every man, woman and child in NH to ante up $200 each to subsidize your commute to your $100k/year job in Boston.

You people want a train to Boston? Form a corporation. Sell stock. Buy Fink a nice dinner so he'll let you use his track. Pay your own way. Build your own choo choo.

I'll even let you keep all the economic development profits you say the rail will generate.

How's that?
- **Robin, Henniker**

JT, Japan is a slim, narrow country, and also heavily taxes the population. They also employ people to shove citizens into crowded trains.

I have a solution for you. Move to Japan.

We don't want your toy trains, or your taxes. Quit meddling.
- **David Goss, Manchester**

Simply declaring that highways do not pay for themselves does not make it true.

Read the federal government's Bureau of Transportation Study, and you will see that the highways were NEGATIVELY subsidized. That is, federal tax receipts, mainly from gasoline and diesel excise tax receipts, exceeded federal outlays.

Rail and small airports receive by far the largest subsidies per passenger mile.

http://www.bts.gov/programs/federal_subsidies_to_passenger_transportation/pdf/entire.pdf

In NH, it is of course true that the state's gasoline excise taxes plus the toll revenues are not presently covering all of the operating and capital needs. Partly because of diversions to other operating funds.

The fact is that not one major mass transit system in the country is supported only by user fees.

The political question to ask the voters is, is a sales or income tax worth it.

Again, I think its a no brainer.

And, furthermore, a passenger rail in NH, with the winter weather, would be very slow, expensive, and unreliable. Ask any long-time train mass transit commuter what happens when the weather gets bad.
- **Ditmar Kopf, Hollis**

Umm. The roads don't pay for themselves either. The gas tax has not covered the cost of highways for a long time. Construction and maintenance are augmented form the general fund - so the roads are "money losers" as well.
- **David, Hudson**

You know, in Japan there is a national railway system and it is so convenient. There is less traffic and pollution as a result. Not have a rail system or attempting to get it is a big mistake.
- **JT, Manchester**

The railroad companies serving this state never did serve the state properly even when they were at the high point of their power when they controlled the legislature completely. So I find it almost a belly laugh to read the statement made by this person. He is mad becauseof the contract to operate a rail line owned by the state was awartded to someone else. I can not blamde him for being upset due to the sweethear political deal that got blessed by the attorney general sure seems of a questionable nature. However, His spoiled child ougtlook does him no honor .
- **albert, northwood**

Evidently Mr. Fink is concerned about the economic vitality of NH, which would be precisely the first time he's ever been concerned with anybody other than himself. More likely, he wants the line Milford-Bennington received and was holding everything hostage until he got exactly what he wanted. His name is very fitting.

I truly hope this isn't the death of rail but as long as we are beholden to scumbags such as Mr. Fink who are championed by out-of-touch entities like the UL, we will unfortunately remain behind the eight ball.

Lower taxes may help to bring in or keep some companies in NH. The most promising ones however - the companies identified by local and state economic developmers as those that will truly help fuel the growth of our economy - will remain in Mass until there is some viable mass transit system in the state. A lack of rail and mass transit has been identified in every economic development report as a primary inhibitor of economic growth in this state. We can't let one dirtbag hold the entire state hostage.
- **Jason, Londonderry**

I gather from the majority of writers out there that you all think Mr Fink is right so let's go forward. First we need to stop wasting money widening I-93 unless it becomes a toll road and therefore a profit center for the state. Besides the vast majority of us in this state don't use it so why should we have to pay for it. It does nothing for the residents on the coast or over in Keene nor up in the North Country. I seldom go south of Manchester and already pay to use I-93 at the Hookset toll booth. All of the users of the Everett Turnpike and the Spaulding Turnpike don't use it but they do pay for their ride every day so why should we rob them to pay for the "few" that use I-93 every day and besides they are only driving to another state to go to work.

Next we need to save the state a lot of money by shutting down all of the remote Motor Vehicle offices and in fact all other state department offices. We need to have them all concentrated in the Concord office complex on state property and they should only be open from 8 to 5 on week days. That way we can eliminate many of the state workers and if you want any services you can drive to Concord and wait in line like the rest of us. It would save the state a bundle of money by eliminating the rental fees for all those remote locations. Next we need to eliminate all of the state highway workers and instead contract out all road maintenance to private companies including all snow plowing. In fact for many private companies they will not plow until we get a minimum of 2 inches of snow so the savings should show up right away. We can stop grass cutting and trash collecting on the roads and instead use prison labor to do that work for free.

Just by eliminating the work on I-93 until it becomes a profit center toll road and dumping at least 50% of all state workers plus all the "now excess" state offices the state will be well on it's way to a balanced budget and full funding on the Pension system for those that are left. Yep My Fink is right and New Hampshire's future will look bright now that he writes policy for the state.
- **Don Armstrong, Henniker**

Governor Pawlenty's performance in Minnesota is more remarkable when you realize his taxpayers were saddled with 'independent' Ventura's money losing light-rail.

The Vermonter has existing tracks, depressed cities, and Dartmouth. Claremont can use the 'stimulus'. But no one is speaking of beefing up that existing line. $8 billion buys a lot of trains. Where is the outrage?

It's not about rail and it's not about schools -- it's about control. It's not your kid and it's not your car. Keep your hands off of both.
- **Steve, Manch**

No money should be wasted on mass transit studies unless the state first gets people to agree on how the rail would be financed.

That is, whether there should be an income or sales tax to support it. There is no other alternative. The rail will not pay for itself, and any economic development from a train will not generate the money needed to operate it. Rail boosters will have to make the case that the sales or income tax is worth it.

I think its a no-brainer.
- **Ditmar Kopf, Hollis**

What we really do not need is for a gutless, political appointee taking orders from a self-centered, me-first, multi-millionaire person from the private (for profit and greed) sector. Fink simply was not getting his way regarding the rail corridor, so he pouts and takes his game home while all of the rest of us are stuck with traffic jams and parking lots on the highways. NH lacks a multi-modal transportation infrastructure because former and present political appointees and governors were very short-sighted. Consumers and commuters are going to pay the price with high prices of goods that could be shipped by rail because of Fink and his greedy attitude. If the Northern RR corridor were re-opened and the present capital corridor improved, then freight and passenger service could move in to and out of NH bypassing Fink's temper tantrum. Also, Fink's present corridor could be taken by eminent domain proceedings for the public good, but with the gutless politicians "leading" NH, that option is not likely.
Bottom line: Fink and his "me" attitude wins over the needs of the many with this present action by political appointees. That result is a bad one.
- **Gary L. Kerr, Chichester**

"Pan Am ended talks with New Hampshire after the Executive Council renewed Milford-Bennington Railroad's lease of state-owned tracks. The company is owned by state Rep. Peter Leishman, D-Peterborough."

................and Atlas Shrugged.
- **mark, hooksett**

So sad to hear, rail allows commerce and residential expansion without huge new highways. How much is the 293 expansion costing? Maybe the state should look at eminent domain for that railbed.
- **Jeremy Hitchcock, Manchester, NH**

300 Million Dollars to link Nashua with Concord?
- **Harry, Brown**

I am not one for paying for wasteful projects, but the rail service was always one that I thought would be good for NH. There are many people that commute down to Boston daily from Concord. Most I know of drive, but a few take the bus. I for one, would rather take the rail service to Boston than fight the traffic and parking issues.

The bottom line is that David Fink is still upset that the state renewed the Milford-Bennington lease. It is not the economy or anything else. He is upset and this is how is going to get back at the state. What the state is asking is to lease his rails for the project. He isn't going to invest in the rail service, he is going to get paid once they use the rails. He has nothing to lose and everything to gain.

I am glad the economy is going so well for his company that he can walk away from guaranteed revenue for his company so that he can give the state the finger for what it did on another deal.

Next time David, just tell the truth and don't lie about the economy holding it up. Tell all the NH residents that your pissed at the state and you don't want them using your rails. We are on to your game and we know the truth.

Childish politics........... That's all!
- **Bob Hill, Concord**

Congratulations to Mr. Fink for not jumping on the band wagon to get free money from the government, money that the government does not have and will have to print further increasing our debt. Could it be that Mr. Fink should run for public office with his conservative views of economy? Yes we need rail service to prosper but we also need to make sure that we do things in an order that will make us secure. The present "throw money at everything and the problem will go away" mentality is flawed.
Brad Sears
- **Brad Sears, Newport, NH**

Concord and surrounding communities would do well "particularly Manchester" to Mass Transit

Over in Newburyport the terminal is always packed,

If we could connect Exeter/Hampton to Concord "summer tourist revenue" and connect willow street to Mass transit "all round revenue"

Within a few years you would see seasonal rail service to our ski slopes.

Additionally if these people would think outside the box a little they would work with Conrail to connect to the Boston lines. I am sure there is a better answer to restoring rail service.
- **Eticus, Rochester**

Thank you Mr. Fink,
Can you imagine how much alternative energy R&D and real projects we could get in NH for $300 Million that would positively improve the environment and not require an ever increasing subsidy year after year the way rail does?
Just Imagine how good life would be!
- **Pat D., Londonderry**

Now that the rail boondoggle appears dead for at least a generation, we should be looking at expanded bus service in New Hampshire.

Many transportation experts will tell you that bus provides more benefits than rail, at the fraction of the cost. While it's not the "beautiful people" choice, buses allow for competition of services, which is beneficial for users; it is much less a burden on taxpayers; and because it is not a fixed line, it provides schedule flexibility, which allows for buses to react to changing social demographics.
- **Ryan, Hooksett**

"sunset the committee that rationalized that $300 million plus $10 million per year, for the benefit of less that one tenth of one percent of New Hampshire residents, would somehow be a good expenditure of the people's money.

I quoted Dick from Concord because his post sums it up beautifully. Not only is this proposed rail project a waste of money, it is a waste that would benefit only the tiny minority that depends on subsidized transportation.

Let's also remember that in the last 40 years there has never been a Government/union project that didn't end up costing many times more than the proponents original estimates. Big Dig anyone?
- **Ron, Manchester**

mr fink lets not forget what nh has done for you b&m pan-am you have done it on handouts from nh and the feds and the mellon bank and panam was raped along with the b&m to fill your pockets and run ! so dont tell me nh needs to balance its budget ! you just want your fingers in the pie ! shame on you !
- **dennis, hooksett nh**

This would be a good time for the Governor to step in and drive a stake through the heart of this wasteful project.

The first step would be to withdraw the state's application for another $1.4 million in planning funds that would be spent planning something that should never happen.

The second step would be to sunset the committee that rationalized that $300 million plus $10 million per year, for the benefit of less that one tenth of one percent of New Hampshire residents, would somehow be a good expenditure of the people's money.

Carpe diem, Governor.
- **Dick, Concord**

It's unfortunate that the state cannot move forward in re-establishing passenger rail--just as the nation is investing in bolstering alternatives to car transportation.

There's was a time when Americans understood how to act in the national interest. But nowadays its everyman for himself and the community take the hindmost.

Under today's dysfunctional system we'd never have built an interstate highway system in the 1950s. All other developed countries have installed and continue to expand, rail and other alternatives to car/truck transport. It's the smart thing to do. Having alternatives makes a country not only more efficient and versatile, but safer as well.

But local self interests reign supreme today. Two businesses can't compromise, so NH will not have a viable alternative to cars and trucks. This is, in the long run, not acceptable.

It's critical we understand that preparing for the future includes taking care of the larger community interests first. Someday we will pay for our inaction--for our lack of preparation.
- **Chris Herbert, Manchester**

I don't know whether to be happy about getting stupid wasteful government spending or not.
- **Bob, Salem**

Great news. NH does not need the "money-pit" of rail which will never pay for itself. The MBTA in Mass is in debt for billions of dollars. If you people want to play on trains move to Mass and run up their debt.
- **Jay Collins, Laconia**

In one breath JetBlue in another breath no rail because of this guy Fink? And, he should be telling us to balance our state budget? Maybe we could balance it if we brought in more commerce. What is wrong with this picture. More than meets the eye, bet on it. How much are they trying to hold us up for?

"Pan Am President David Fink said today's economic climate is no time to begin high-speed, commuter rail service. New Hampshire should be concentrating on balancing its budget and shoring up its pension fund, he said. "Let's take a deep breath and come back and look at this in three or four years, maybe," Fink said."
- **joekelly, manchester**

NOTE: If you have visited this page before, newer comments may be hidden. Press F5, or hold down the Ctrl key while reloading or refreshing the page. (Another option for Firefox users is the **Clear Cache add-on**.)

December 04. 2014 8:14PM

Another View -- Mark Connolly: NH business must get behind passenger rail

MARK CONNOLLY

ACCORDING to a preliminary report released recently by the New Hampshire Department of Transportation and New Hampshire Rail Transit Authority, expanded passenger rail in the Granite State could be the boost our economy needs. The full report is expected in December, and we should expect plenty of political jousting over the cost and benefits of passenger rail service in central New Hampshire.

For now, a question is whether the state's business community will rise to the occasion to champion what could be a huge job creator as well as new economic engine for our state; also in play will be whether our legislative leaders in this instance can put aside ideological differences to compromise for positive economic change. The benefits of doing so could be the difference between an economy that continues to stagnate and one that improves markedly.

The statistics and metrics for passenger rail service are clear: more than 165,000 cars commute down Routes 3 and I-93 every day from Concord to the Boston area — all of this leading to congestion, pollution and lost business opportunities because of the lack of meaningful rail transportation in the Granite State.

And let's be candid about the current economic condition of New Hampshire. We are losing a vitally important demographic group and future driver of our economy — the 25-34 year-olds — with New Hampshire experiencing one of the highest net outward migration rates of younger people in the nation. Couple this trend with a historically low job growth rate in the state during the last several years and add in the fact that 2/3 of the jobs created here since the Great Recession now pay less than New Hampshire's median wage rate. This does not build a sustainable, growing economy, nor does it make it easy for us to continue enjoying the "New Hampshire Advantage" of relatively lower taxes—an aging population places increasing demands on state services.

Furthermore, we just are not attracting a sufficient level of entrepreneurial capital to spur job growth in New Hampshire. In fact, the current capital formation rate here now lags the region and the nation. Much of our "Advantage" is being lost because of high energy and land costs as well as an aging transportation infrastructure.

In terms of job growth and positive economic impact, the preliminary study of expanded passenger rail outlines real, tangible benefits. Rail could even be the key to recharging the state's economic engine. Thomas Mahon, chairman of the New Hampshire Transit Authority, confirmed what many in the business community believe concerning passenger rail service, saying recently, "There is simply no economic development opportunity on the horizon that could transform New Hampshire's economy like the expansion of passenger rail could offer."

Here's the bottom line: passenger rail service between Boston and central New Hampshire will result in higher land values, enhance vital transportation networks in the state, create jobs/improve wages, and reduce commuting times — all which will serve as economic multipliers across the state.

Undertaking expanded passenger rail for New Hampshire is important and doable. But it will take a working partnership between the various members of the New England Congressional delegation to secure federal funds, businesses leaders to commit to financially support such a transportation network, and state officials to look at our financial commitment in a creative way.

By being creative, I mean not direct funding by the state but instead working with the financial community to explore how the incremental business profits taxes and property taxes resulting from passenger rail can be targeted to defray bonding expenses. There will also be revenue enhancements from parking and rooms and meals taxes and ridership commitments from the business sector. Ultimately, the tax revenue generated from passenger rail should be used to pay the capital and operating costs of the system. And we should avoid raiding designated state funds set aside for financial projects, as New Hampshire policy-makers often do when facing tough choices.

Let’s not start the debate this winter by saying this is too hard or too expensive or engage in the same old posture-politics game. The business community and public sector will need to join together to show how we should and can do this. And like the Manchester airport, the economic impact of passenger rail service in central New Hampshire will extend far and wide.

For that matter, just think what the economy of the state would now look like had we not redeveloped the Manchester airport. Or think what the economy of the nation would be like today had we not developed rail service during the 19th century.

In order to grow a business or economy, one needs to invest. New Hampshire, it is time to invest in our future and ourselves. The return on this investment could be a game changer for the state’s economy.

Mark Connolly owns New Castle Investment Advisors, LLC, in Portsmouth. He is the former state director of securities regulation.

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APPENDIX H

Project Advisory Committee

New Hampshire DOT
Department of Transportation

APPENDIX H

Project Advisory Committee – November 18, 2014

New Hampshire DOT Department of Transportation

NH Capitol Corridor Study
Project Advisory Committee Meeting
AGENDA

September 18, 2014 @ 1:30 PM
New Hampshire Department of Transportation (Room 114)
7 Hazen Drive, Concord, NH

- **Study Overview**
- **Alternatives Selected for Further Review**
- **Evaluation Criteria**
- **Evaluation of Alternatives**
- **Recommended Strategy**

Stakeholder Meeting #3, NHDOT
November 18, 2014

- **Tom Mahon, NHRTA**
  - Was there any consideration given to the number of riders who currently drive from southern NH to parking lots in Lowell?
    - ➢ Dan Tempesta: New Hampshire residents make up 10-15% of existing riders at Lowell. We made an assumption that these riders would now be using the new South Nashua station and therefore these riders were not counted in the Net New Riders figure. Also, it was assumed that existing bus riders would also shift to rail and those riders were also not counted as Net New Riders.
  - Was there an inclusion of Saturday and Sunday service?
    - ➢ David Nelson: For simplicity sake, the cost estimates only looked at weekday service, and the costs and revenues from weekend service would have to be evaluated as the project moves forward.

- **Fran Taylor**
  - If you expand bus service, why do ridership numbers not change?
    - ➢ David Nelson: The ridership numbers would increase with expanded bus service, but there is only so much that can be done in the face of traffic congestion.
  - I took a trip to Boston on Monday 11/17 in the rain that should have taken two hours but ended up taking five hours
  - I witnessed the change in the community in Brockton when train service began there and saw the people lining up to take the train. So even just having a station in a community can be a benefit.

- **Peter Leashman (sp?), NH House**
  - I am concerned with how high the costs are and the fact that New Hampshire is in financial trouble.
  - I am supportive of extending the train from Lowell to Nashua, but the costs come out to almost $11m/mile, how does this compare to recent $1m/mile Brunswick extension?
    - ➢ David Nelson: The difference in costs relates to the different situations on the two lines. In the case of the Brunswick extension, a large portion of it is on the PanAm mainline and didn’t need a lot of improvements, but the branch to Brunswick needed more. Also, the level of those improvements did not come up to the same level of improvements proposed for the Capitol Corridor and were completed for a lower traffic and lower speed line.. Also to note, the FTA requires that a 35% contingency be included in all costs and this adds millions of extra dollars to our costs in order to ensure that there are no surprises as the project moves forward.
    - ➢ Ken Kinney: These are not small costs, but as for how they relate to other areas around the country, they are realistic and relatable.

- **Malcolm Taylor, NHRTA**
    - For the Bus on Shoulder options, my highway department contacts say that the breakdown lanes are not up to same design and strength as regular lanes. Also, where would we change flat tires?
        - David Nelson: Bus on Shoulder is operated in 20 states, and they have proven most of the general perceptions to be wrong. Generally we found that the shoulders on I-93 are in good shape and that I-93 south of I-495 in Massachusetts has adequate width. We allocated the generally accepted unit cost of $250,000/mile for improvements to the shoulders where necessary to eliminate rumble strips, drainage structures and improved striping and signage. General purpose traffic already uses breakdown lanes on I-93, and the buses are operated by professional drivers who can pull back in to general purpose lanes to bypass a breakdown or police action. Bus on Shoulder has been very safe, with very few accidents and the generally accepted operating procedure limits use of the shoulders to when speeds in the general purpose lanes drop below 35mph, and buses are only allowed to operate 15mph faster than the general purpose lanes, which increases visibility and safety.

New Hampshire DOT Department of Transportation

NH Capitol Corridor Study PAC Meeting
NHDOT, Concord, NH
November 18, 2014, 1:00 PM

	Name	Agency	Email	Phone
1	EX. COUN. Dave Wheeler	executive Council #5	ECDAVE@miracleacres farm.NET	603-765-2893
2	Dan Kelly	Nashua	DRKMNHP2@AOL.COM	603 883-2965
3	Kenyon F Karl	Sierra Club NH Chapter	Kenyon karl@gmail.com	603-714-7303
4	FRAN TAYLOR	n/A	flht5@juno.com	
5	Malcolm Taylor	NH Rail Transit Auth		
6	Dean Groves	URS Corp	dean.graves@urs.com	857.383.3837
7	THOMAS J. MAHON	NH RAIL TRANSIT AUTH	tjmahon@comcast.net	603-494-2179
8	RONALD GRANDMAISON	NH DOT	RGRANDMAISON@DOT.STATE.NH.US	271-6198
9	EJ Powers	Montague		
10	David Preece	SNHPC	dpreece@SNHPC.ORG	669-4664
11	Adam Hlasny	SNHPC	ahlasny@snhpc.org	" "
12	Dick Cane	NHRTA	RLCANE@AOL.COM	494-6548
13	Jake Berry	US Rep Annie Kuster	jake.berry@mail.house.gov	493-8781
14	MIKE IZBICKI	NHRTA		
15	Ben Blunt	Concord Coach Lines	bblunt@concordcoachlines.com	228-3535
16	Mark Sanborn	Concord Coach Lines	msanborn@concordcoachlines.com	
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New Hampshire DOT
Department of Transportation

NH Capitol Corridor Study PAC Meeting
NHDOT, Concord, NH
November 18, 2014, 1:00 PM

	Name	Agency	Email	Phone
19	Jeff Hocciarone	Montagne	jeff@montagnecom.com	644-3200
20	Anthony Komornick	Merrimack Valley Plang Commission	Akomornick@mvpc.org	978-374-0519
21	Simon Thomson	Sen. Ayotte's Office	simon-thomson@ayotte.senate.gov	880-5335
22	Tom Irwin	CLF	tirwin@clf.org	225-3060
23	Peter Leishman	State Rep	PRLeishman@aol.com	365-0621
24	JOHN D RAY	MASSDOT		
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New Hampshire DOT Department of Transportation

NH Capitol Corridor Study PAC Meeting
NHDOT, Concord, NH
November 18, 2014, 1:00 PM

	Name	Agency	Email	Phone
73	Mike Izbicki	NHRTA	msizbic@comcast.net	603 493-0536
74	Tom Galligani	CITY OF NASHUA	galliganit@nashuanh.gov	603.589.3072
75	Kerrie Diers	NRPC	KerrieD@nashuarpc.org	
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NH Capitol Corridor
Rail & Transit Alternatives Analysis

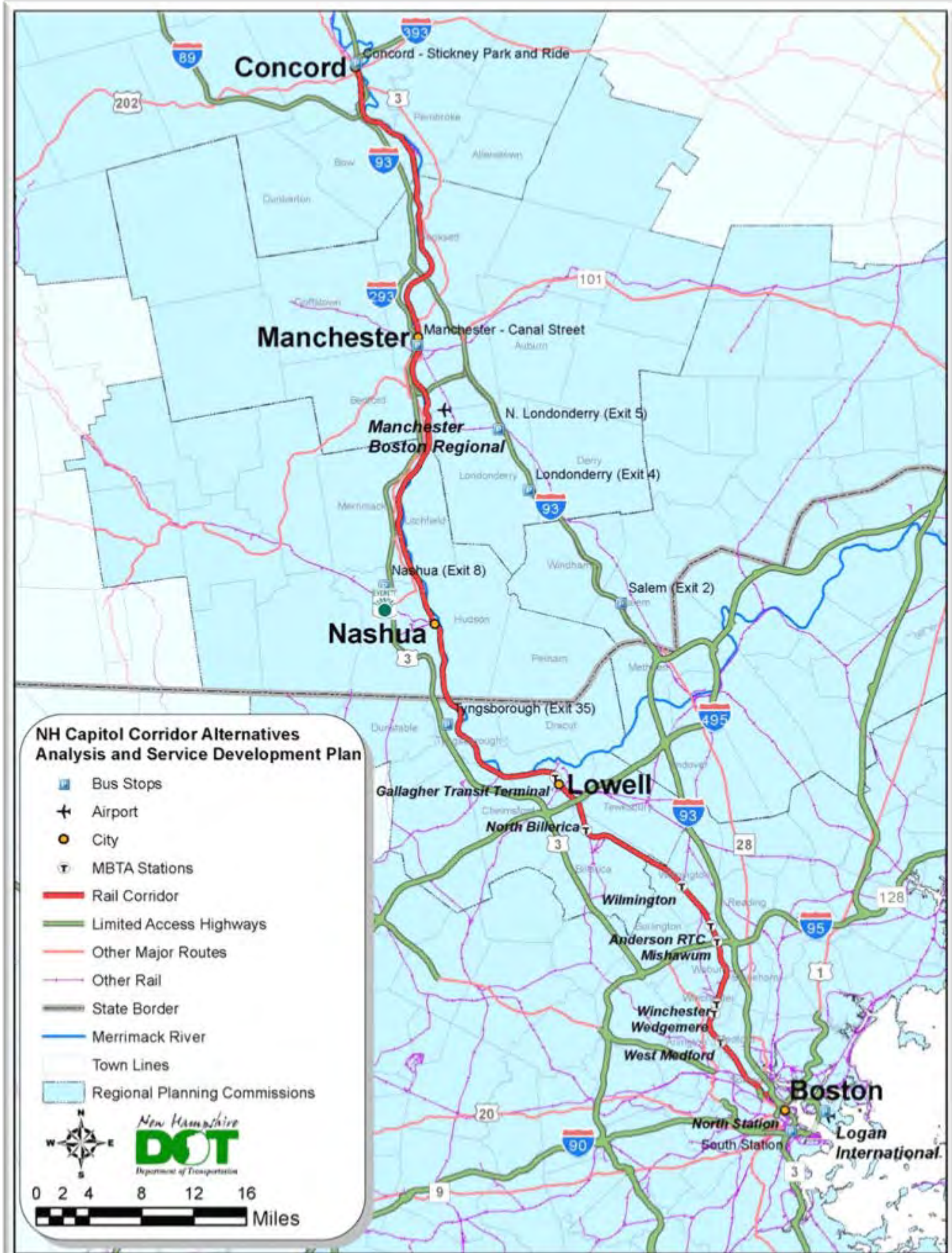
Advisory Committee Meeting

November 18, 2014

New Hampshire DOT
Department of Transportation

Agenda

- Study Overview
- Alternatives Selected for Further Review
- Evaluation Criteria
- Evaluation of Alternatives
- Recommended Investment Strategy


NH Capitol Corridor Alternatives
Analysis and Service Development Plan
Bus Stops
Airport
City
MBTA Stations
Rail Corridor
Limited Access Highways
Other Major Routes
Other Rail
State Border
Merrimack River
Town Lines
Regional Planning Commissions
0 2 4 8 12 16
Miles
Concord
Concord - Stickney Park and Ride
Manchester
Manchester - Canal Street
Manchester Boston Regional
N. Londonderry (Exit 5)
Londonderry (Exit 4)
Nashua (Exit 8)
Nashua
Salem (Exit 2)
Tyngsborough (Exit 35)
Lowell
Gallagher Transit Terminal
North Billerica
Wilmington
Anderson RTC
Mishawum
Winchester
Wedgemere
West Medford
Boston
North Station
South Station
Logan International
89
393
202
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93
293
101
495
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128
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Alternatives Selected for Further Review

- No Build
- Manchester Regional
- Nashua Minimum
- Concord Intercity
- Expanded Bus
- Bus on Shoulder
- Expanded Bus on Shoulder

Evaluation Criteria

- **Costs**: capital and operations
- **Mobility impacts/ridership**: *new* New Hampshire transit riders
- **Environmental impacts** (major)
- **Land use**: compact, sustainable development
- **Economic development**: employment, residential construction, commercial development

In addition, input from public, key stakeholders

Evaluation Matrix

NH Capitol Corridor Rail and Transit Study
Final Screening of Alternatives

Alternative	New NH Transit Passenger Trips	New Corridor Transit Passenger Miles	Economic Benefits - Residential Units	Economic Benefits - Jobs	Total Capital Cost (Millions)	NH Costs after Federal Grants and MA Contribution	Annual Operating Cost (Millions)	Net Operating Cost (Millions)	Annual NH Debt Service (20 year bond)	NH Annual Total Cost (Debt Service and Operating Deficit)	NH Annual Cost per New NH Rider	Ridership New Riders	Cost Capital/ O&M (in millions)	Land Use	Economic Develop-ment
No Build	0	0	0	0	$0	$0	$6	$1	$0	$1	$0	○	●	○	○
Manchester Regional	2,568	90,506	3,600	5,600	$246	$72	$11	$4	$6	$7	$10		◔	◕	◑
Nashua Minimum	670	5,542	600	1,200	$120	$39	$4	$2	$3	$5	$26	◔	◑		
Concord Intercity	946	48,853	2,200	3,700	$256	$128	$8	$5	$10	$15	$61	◑	◔	◔	◔
Expanded Bus	338	15,905	0	0	$10	$10	$3	$2	$1	$3	$36	◔	◕	○	○
Bus on Shoulder	48	2,112	0	0	$7	$1	$0	$0	$1	$1	$68			○	○
Expanded Bus on Shoulder	374	17,495	0	0	$17	$17	$3	$2	$2	$4	$40	◔	◕	○	○

New Hampshire DOT Department of Transportation

Evaluation Matrix – Values

NH Capitol Corridor Rail and Transit Study
Final Screening of Alternatives

Alternative	New NH Transit Passenger Trips	New Corridor Transit Passenger Miles	Economic Benefits - Residential Units	Economic Benefits - Jobs	Total Capital Cost (Millions)	NH Costs after Federal Grants and MA Contribution	Annual Operating Cost (Millions)	Net Operating Cost (Millions)	Annual NH Debt Service (20 year bond)	NH Annual Total Cost (Debt Service and Operating Deficit)	NH Annual Cost per New NH Rider
No Build	0	0	0	0	$0	$0	$6	$1	$0	$1	$0
Manchester Regional	2,568	90,506	3,600	5,600	$246	$72	$11	$4	$6	$7	$10
Nashua Minimum	670	5,542	600	1,200	$120	$39	$4	$2	$3	$5	$26
Concord Intercity	946	48,853	2,200	3,700	$256	$128	$8	$5	$10	$15	$61
Expanded Bus	338	15,905	0	0	$10	$10	$3	$2	$1	$3	$36
Bus on Shoulder	48	2,112	0	0	$7	$1	$0	$0	$1	$1	$68
Expanded Bus on Shoulder	374	17,495	0	0	$17	$17	$3	$2	$2	$4	$40

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NH Capitol Corridor Rail and Transit Study

Final Screening of Alternatives

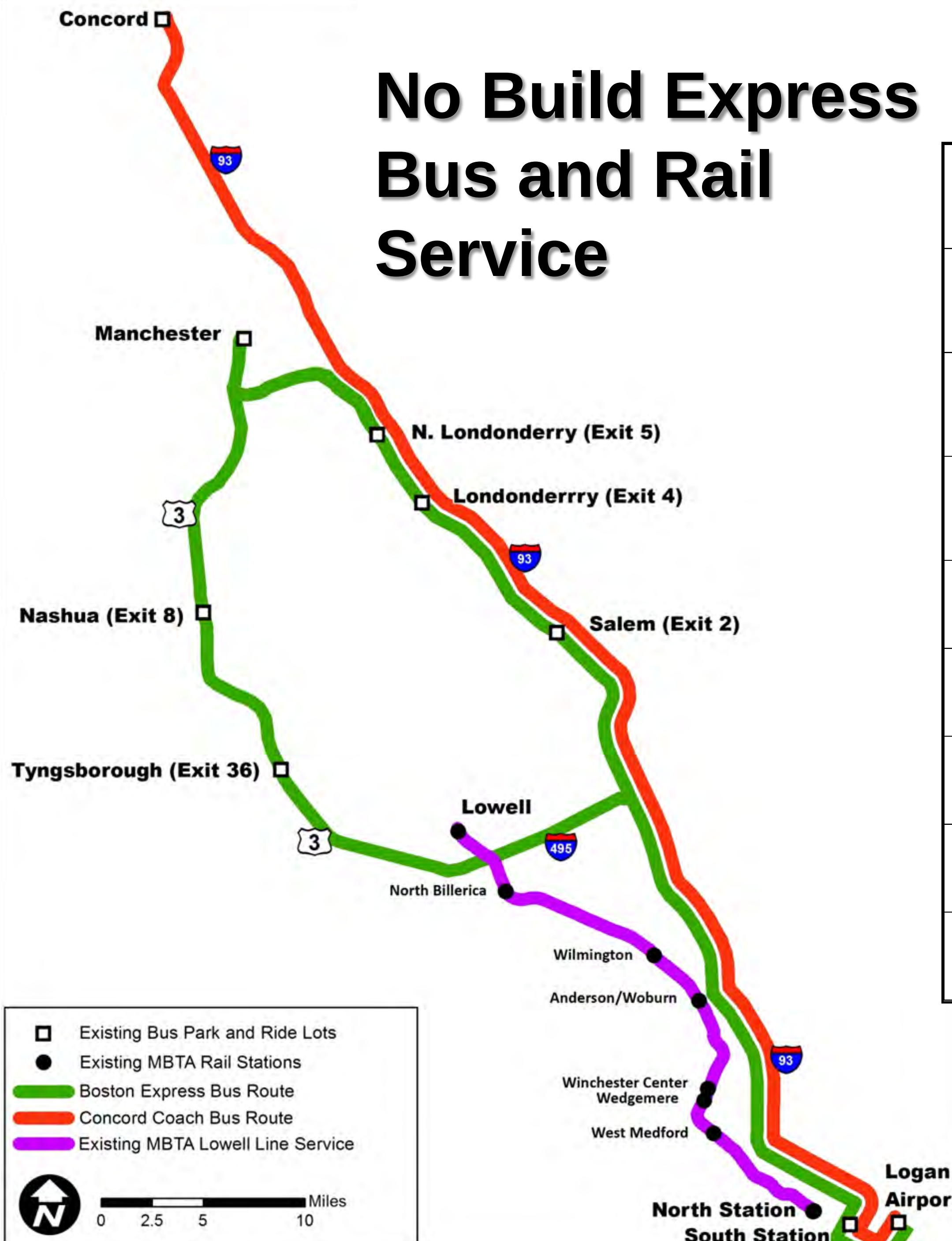
Evaluation Matrix Qualitative

Alternative	Ridership New Riders	Cost Capital/ O&M (in millions)	Land Use	Economic Develop-ment
No Build	○	●	○	○
Manchester Regional	◕	◔	◕	◑
Nashua Minimum	◔	◑	◔	◔
Concord Intercity	◑	◔	◔	◔
Expanded Bus	◔	◕	○	○
Bus on Shoulder	◔	◕	○	○
Expanded Bus on Shoulder	◔	◕	○	○

Recommended Strategy

- Need for more discussion, debate, input
- Retain for further discussion in 2015
  - No Build
  - Manchester Regional Commuter Rail
  - Nashua Minimum Commuter Rail
  - Concord Intercity Service
  - Bus on Shoulder
- Need for credible financial plan

No Build Express Bus and Rail Service



New NH Transit Passenger Trips	0
Economic Benefits - Residential Units	0
Economic Benefits - Jobs	0
Total Capital Cost (Millions)	$0
NH Annual Cost per New NH Rider	N/A
Ridership New Riders	○
Cost (Capital and O&M)	●
Land Use	○
Economic Development	○

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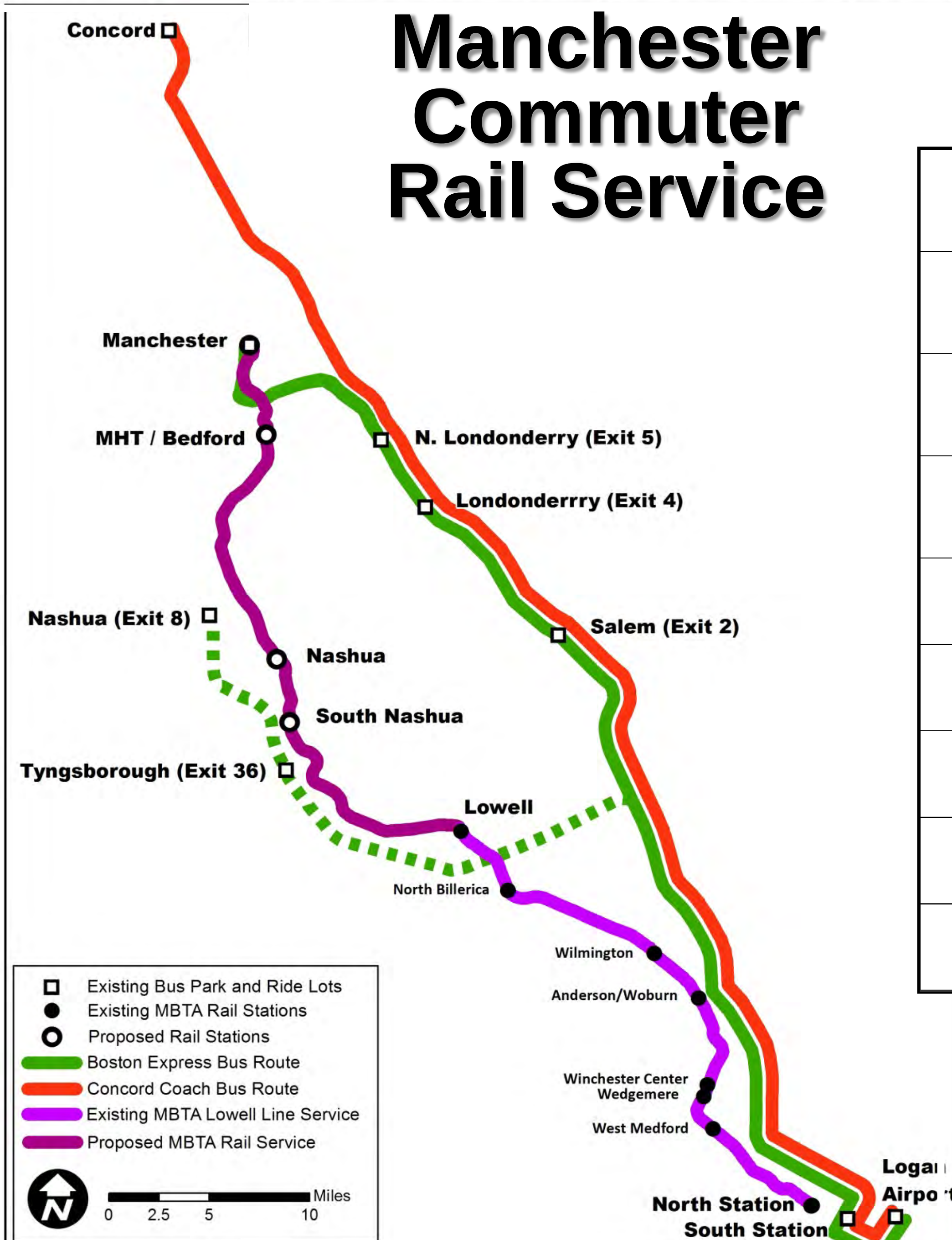
Manchester Commuter Rail Service



New NH Transit Passenger Trips	2,568
Economic Benefits - Residential Units	3,600
Economic Benefits - Jobs	5,600
Total Capital Cost (Millions)	$246
NH Annual Cost per New NH Rider	$10.46
Ridership New Riders	
Cost (Capital and O&M)	
Land Use	
Economic Development	

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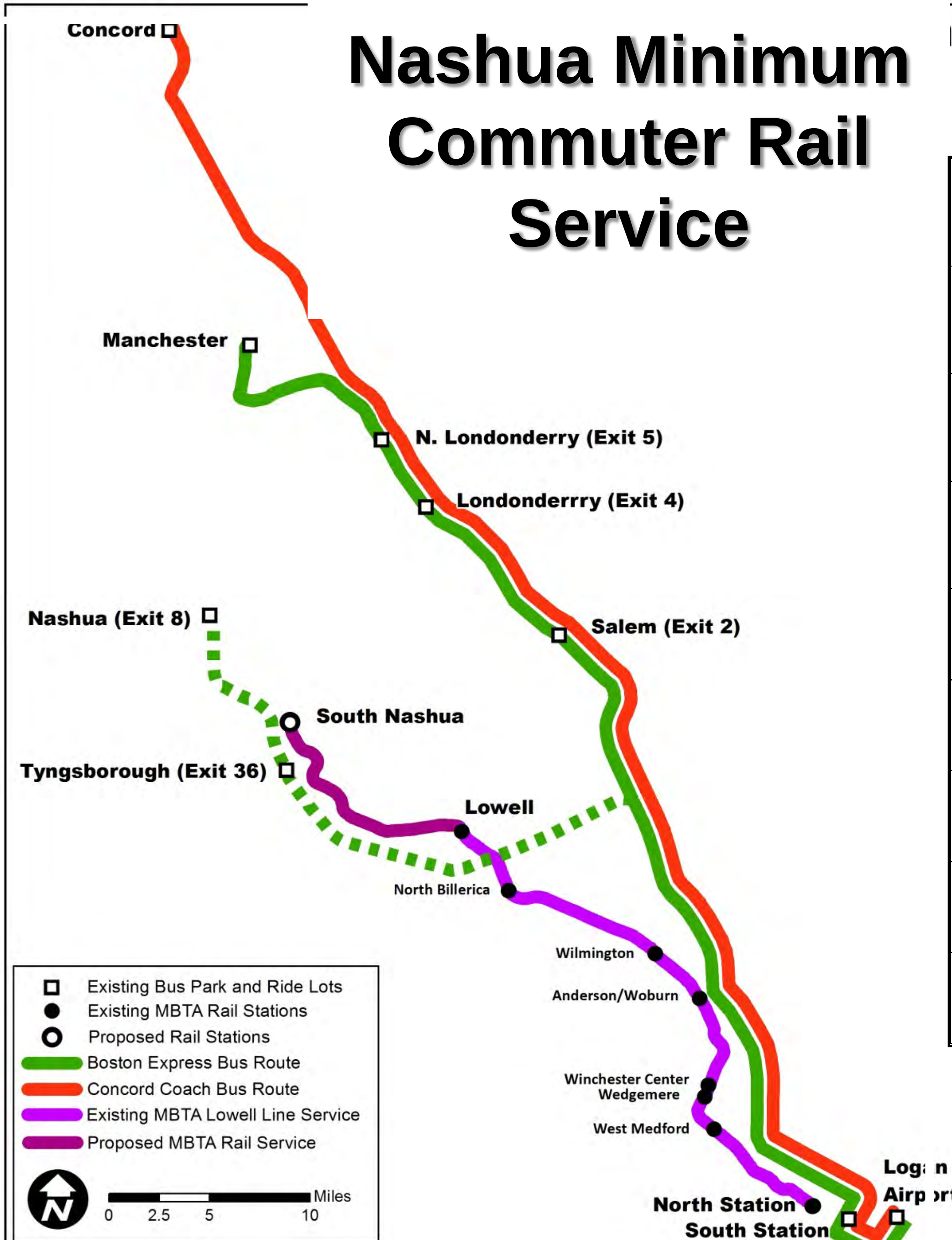
Nashua Minimum Commuter Rail Service



New NH Transit Passenger Trips	670
Economic Benefits - Residential Units	600
Economic Benefits - Jobs	1,200
Total Capital Cost (Millions)	$120
NH Annual Cost per New NH Rider	$26.38
Ridership New Riders	
Cost (Capital and O&M)	
Land Use	
Economic Development	

New Hampshire DOT Department of Transportation

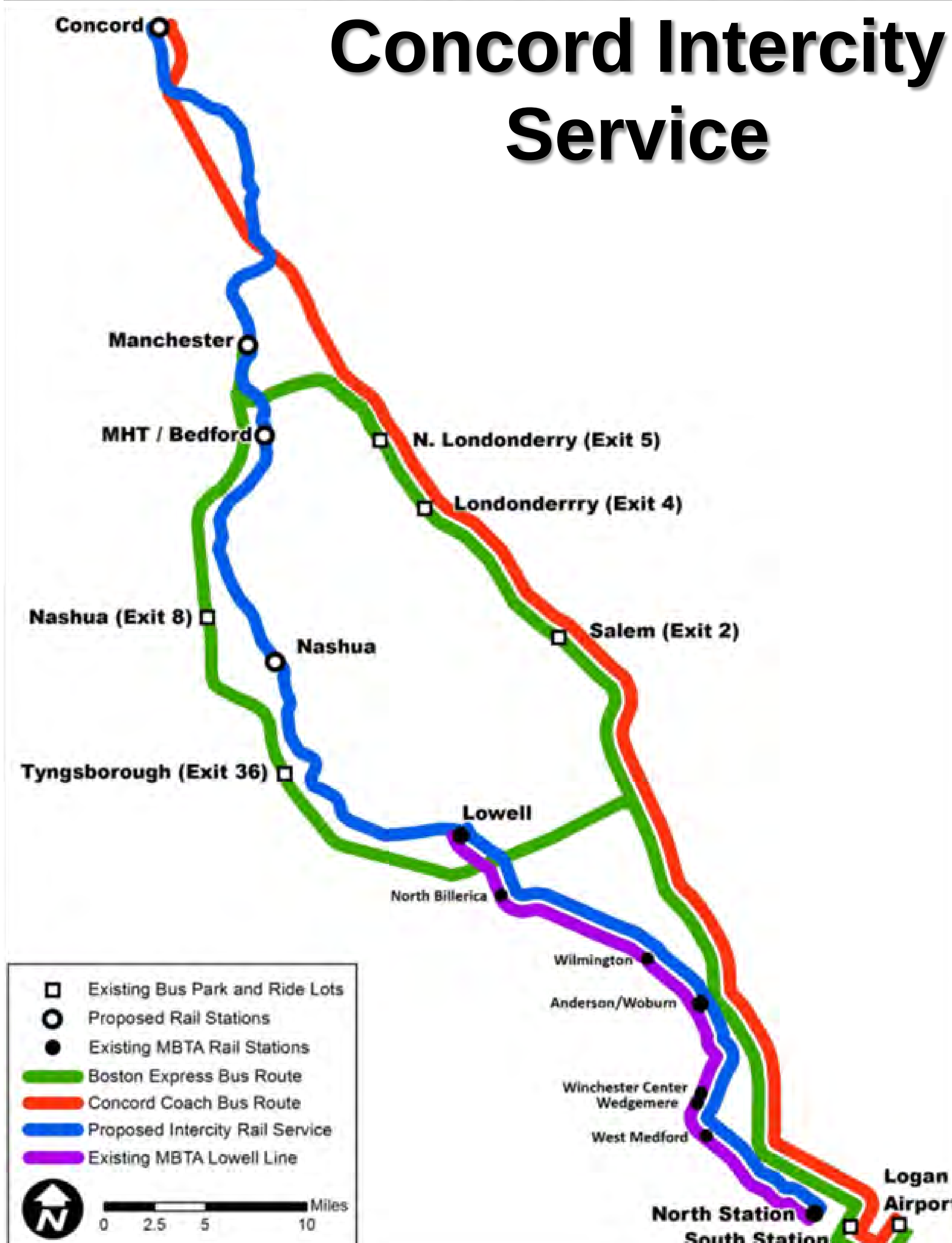
Potential Phasing of Commuter Rail

Single Phase: Manchester	**$246 M**
Phase 1: Nashua	**$120 M**
Phase 2: Manchester	**$153 M**
Total	**$273 M**
Added cost of phasing	**$27 M**

Key Issues

- Federal Funding
- Massachusetts Support
- Benefit Deferral

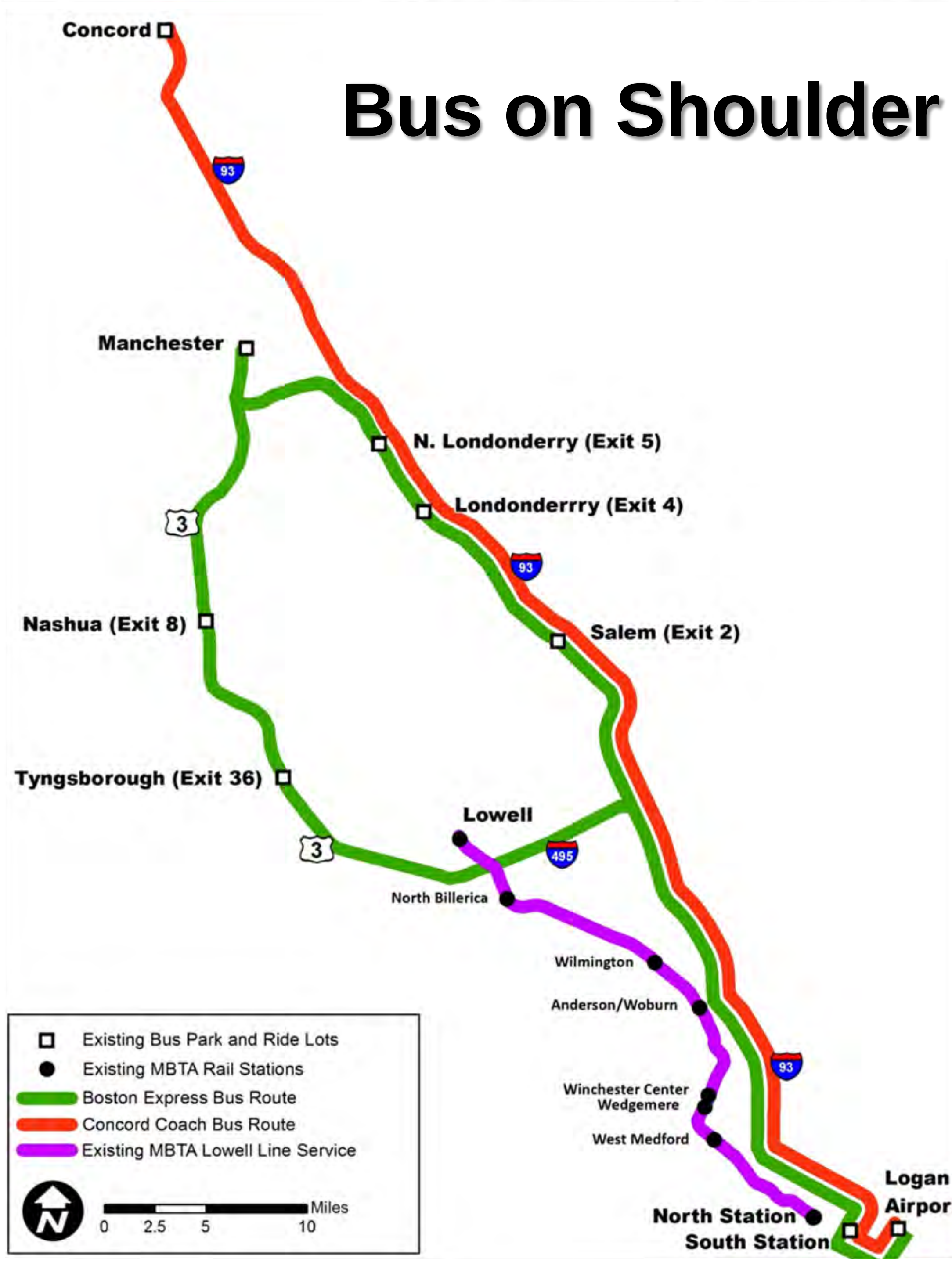
Concord Intercity Service



New NH Transit Passenger Trips	946
Economic Benefits - Residential Units	2,200
Economic Benefits - Jobs	3,700
Total Capital Cost (Millions)	$256
NH Annual Cost per New NH Rider	$61.40
Ridership New Riders	◑
Cost (Capital and O&M)	◔
Land Use	◔
Economic Development	◔

New Hampshire DOT Department of Transportation

Bus on Shoulder



New NH Transit Passenger Trips	48
Economic Benefits - Residential Units	0
Economic Benefits - Jobs	0
Total Capital Cost (Millions)	$7
NH Annual Cost per New NH Rider	$68.37
Ridership New Riders	
Cost (Capital and O&M)	
Land Use	
Economic Development	

New Hampshire
DOT
Department of Transportation

Financial Facts and Assumptions

- **US transit projects:** state and/or local governments
  - State: general funds
  - Local: predominantly sales tax
- **Value capture:** modest revenue; medium- to long-term
- **Capital funding**
  - **Federal**: Typically 50% capital
  - **Massachusetts**: rolling stock, trackage rights
  - **New Hampshire:** remaining balance (no commitments to date)
- **Operating funding**
  - **Passenger Revenue**: 66% to 50%
  - **Federa**l: Limited formula funding
  - **Massachusetts**: “Pilgrim Partnership”
  - **New Hampshire:** remaining balance (no commitments to date)

New Hampshire DOT Department of Transportation

Financial Facts and Assumptions: Funding Options

- State capital program
- Parking fees
- Vehicle registration fees
- Municipal contributions
- Regional Greenhouse Gas Initiative
- Property tax
- Lottery revenues
- Passenger facility charges (airport)
- Value capture/public private partnerships

New Hampshire DOT Department of Transportation

Next Steps

- Publish final report
- Debate investment alternatives
- Possible legislative approval, depending on alternative

http://www.nhcapitolcorridor.com/

New Hampshire DOT Department of Transportation

APPENDIX H

Project Advisory Committee – January 21, 2014

New Hampshire DOT Department of Transportation

Capitol Corridor Rail and Transit Alternatives Analysis

Advisory Committee Meeting #2

January 21, 2014

Southern NH Planning Commission

1. Study overview
2. Preliminary alternatives: rail, bus
3. Objectives/benefits
4. Evaluation criteria, assessment of alternatives
5. Final alternatives
6. Next steps/implementation





NH Capitol Corridor
Rail & Transit Alternatives Analysis

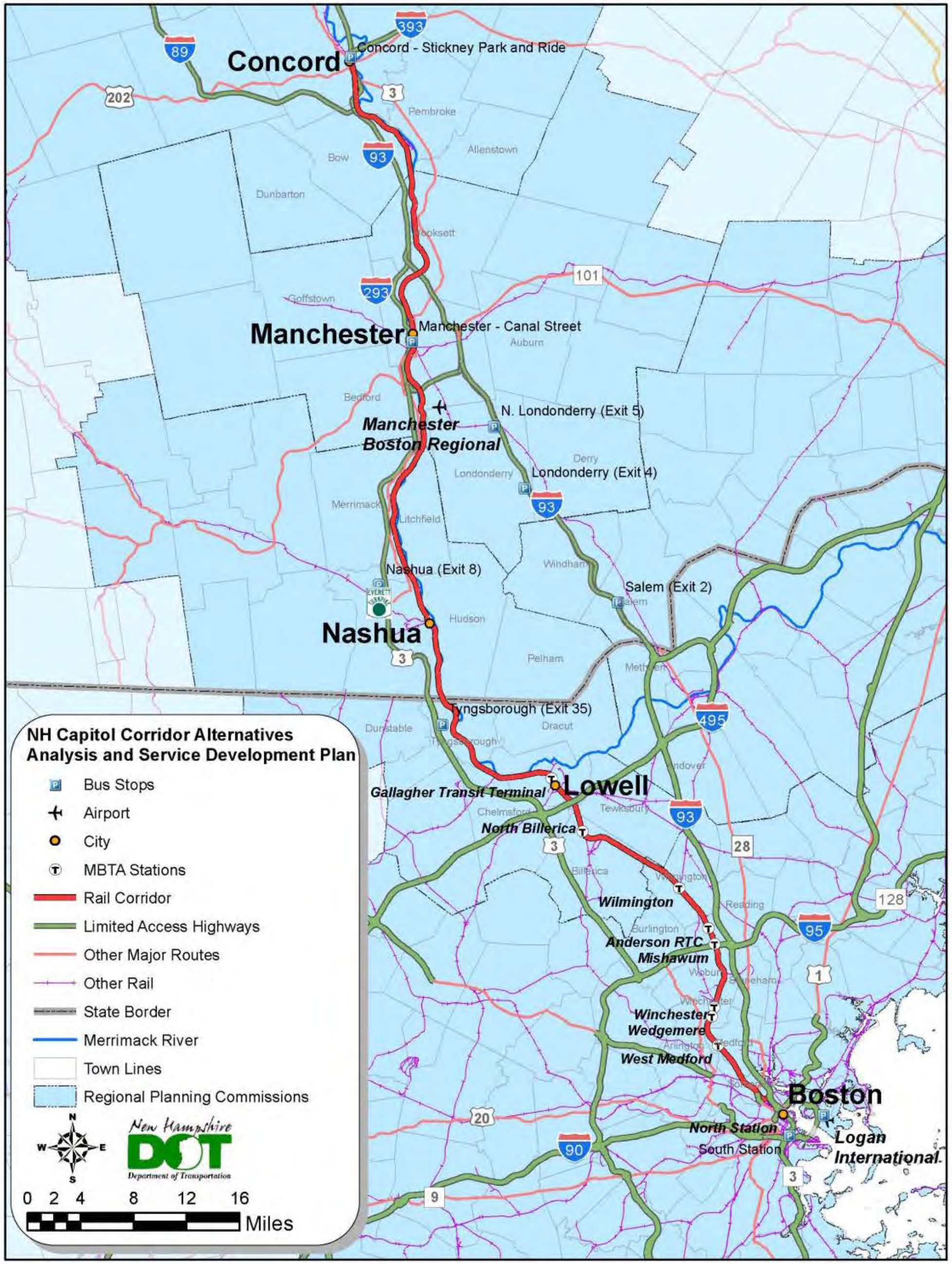
Project Advisory Committee Meeting

January 21, 2014

New Hampshire DOT
Department of Transportation

Agenda

- Study overview
- Preliminary alternatives: rail, bus
- Objectives/benefits
- Evaluation criteria, assessment of alternatives
- Final alternatives
- Next steps/implementation

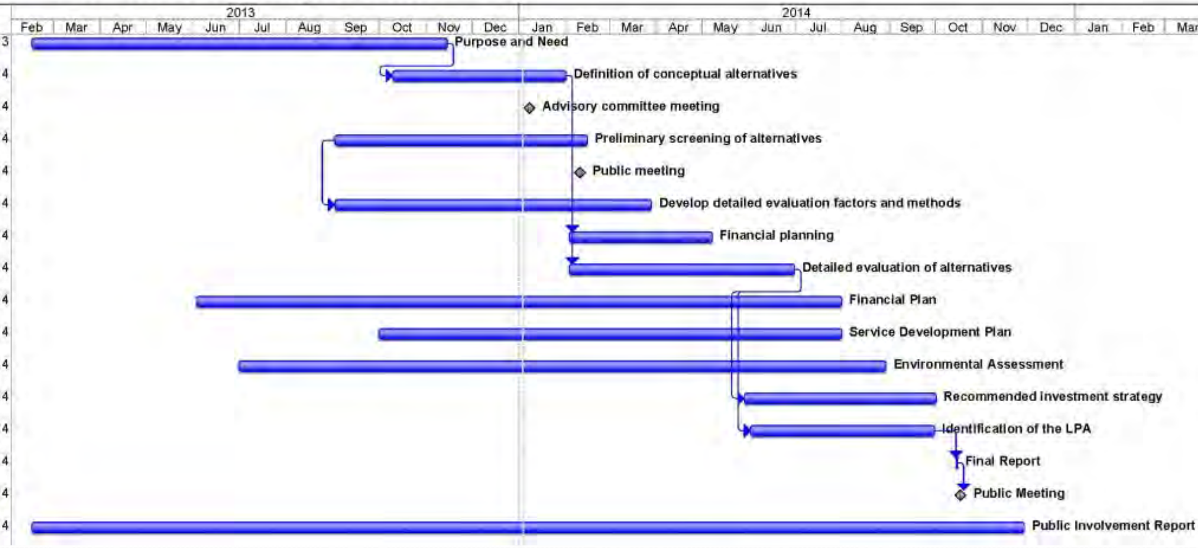


New Hampshire DOT Department of Transportation

Schedule

Alternatives Analysis Timeline

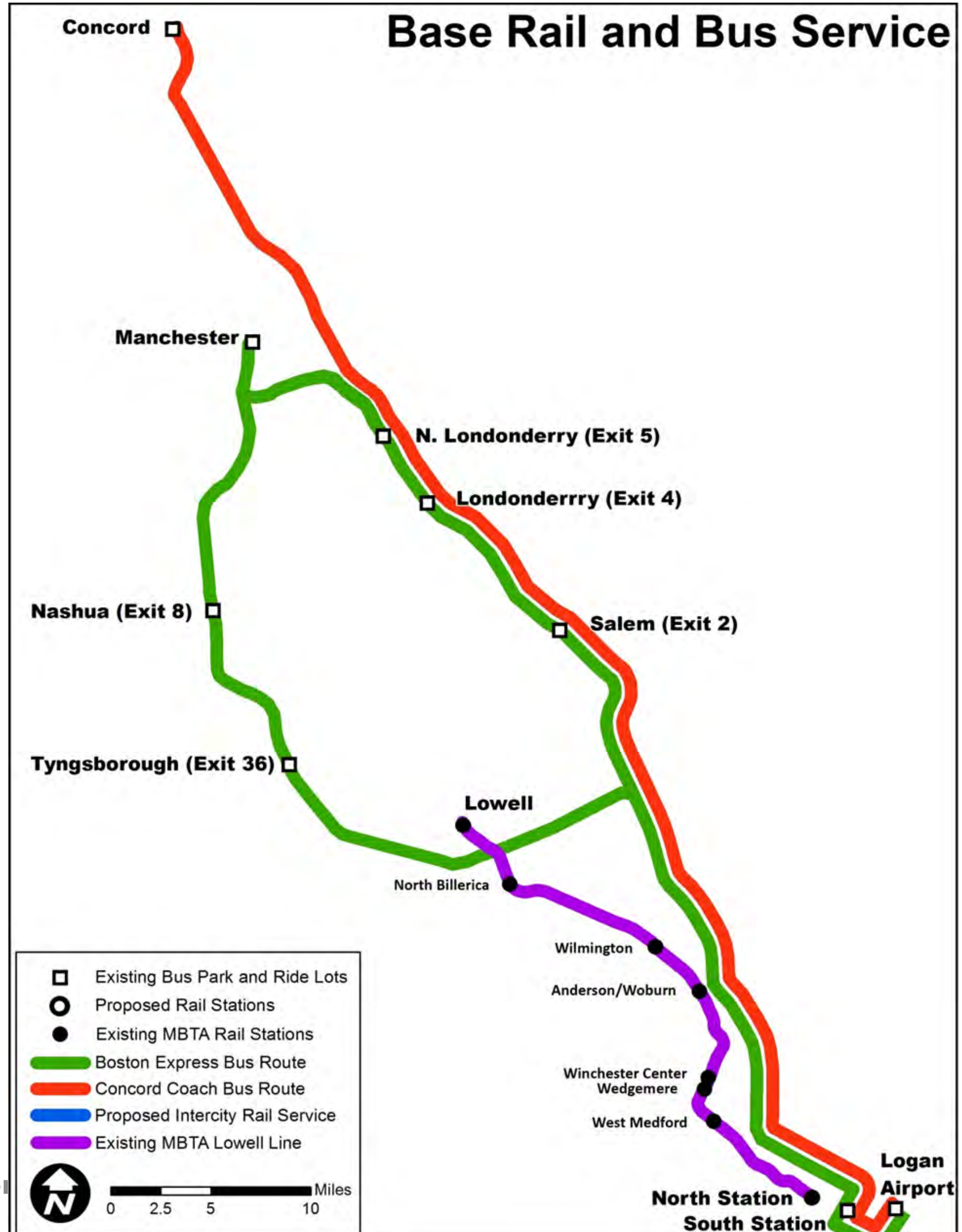
ID	Task Name	Duration	Start	Finish
1	Purpose and Need	9.75 mons	Fri 2/15/13	Thu 11/14/13
2	Definition of conceptual alternatives	4.1 mons	Thu 10/10/13	Fri 1/31/14
3	Advisory committee meeting	0 days	Wed 1/8/14	Wed 1/8/14
4	Preliminary screening of alternatives	6 mons	Mon 9/2/13	Fri 2/14/14
5	Public meeting	0 days	Mon 2/10/14	Mon 2/10/14
6	Develop detailed evaluation factors and methods	7.5 mons	Mon 9/2/13	Fri 3/28/14
7	Financial planning	3.4 mons	Mon 2/3/14	Wed 5/7/14
8	Detailed evaluation of alternatives	5.3 mons	Mon 2/3/14	Mon 6/30/14
9	Financial Plan	15.2 mons	Mon 6/3/13	Thu 7/31/14
10	Service Development Plan	10.9 mons	Tue 10/1/13	Thu 7/31/14
11	Environmental Assessment	15.25 mons	Mon 7/1/13	Fri 8/29/14
12	Recommended investment strategy	4.5 mons	Thu 5/29/14	Wed 10/1/14
13	Identification of the LPA	4.35 mons	Mon 6/2/14	Tue 9/30/14
14	Final Report	1 day?	Wed 10/15/14	Wed 10/15/14
15	Public Meeting	0 days	Fri 10/17/14	Fri 10/17/14
16	Public Involvement Report	23.3 mons	Fri 2/15/13	Fri 11/28/14



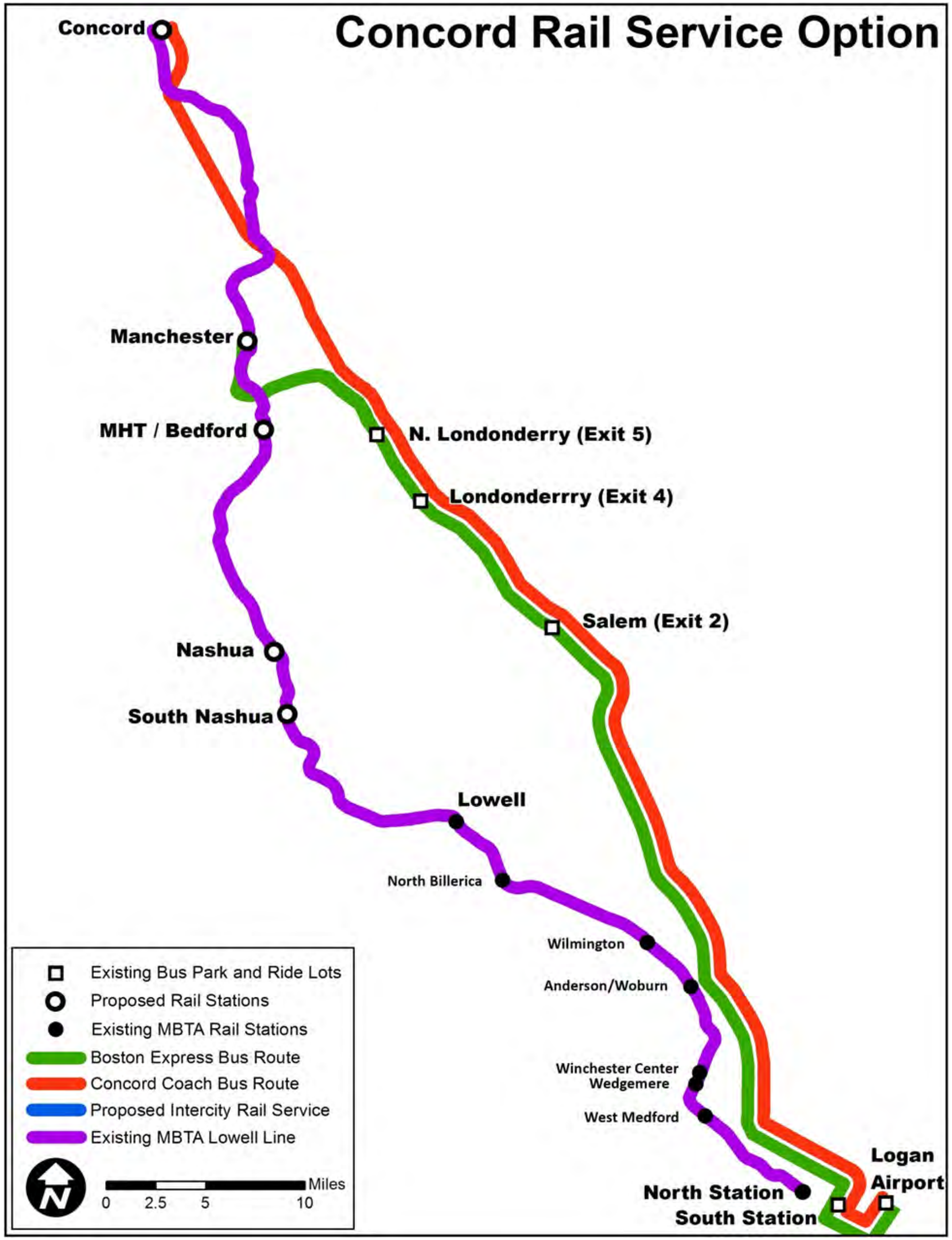
MBTA Commuter Rail: Thirty Five Years of Expansion

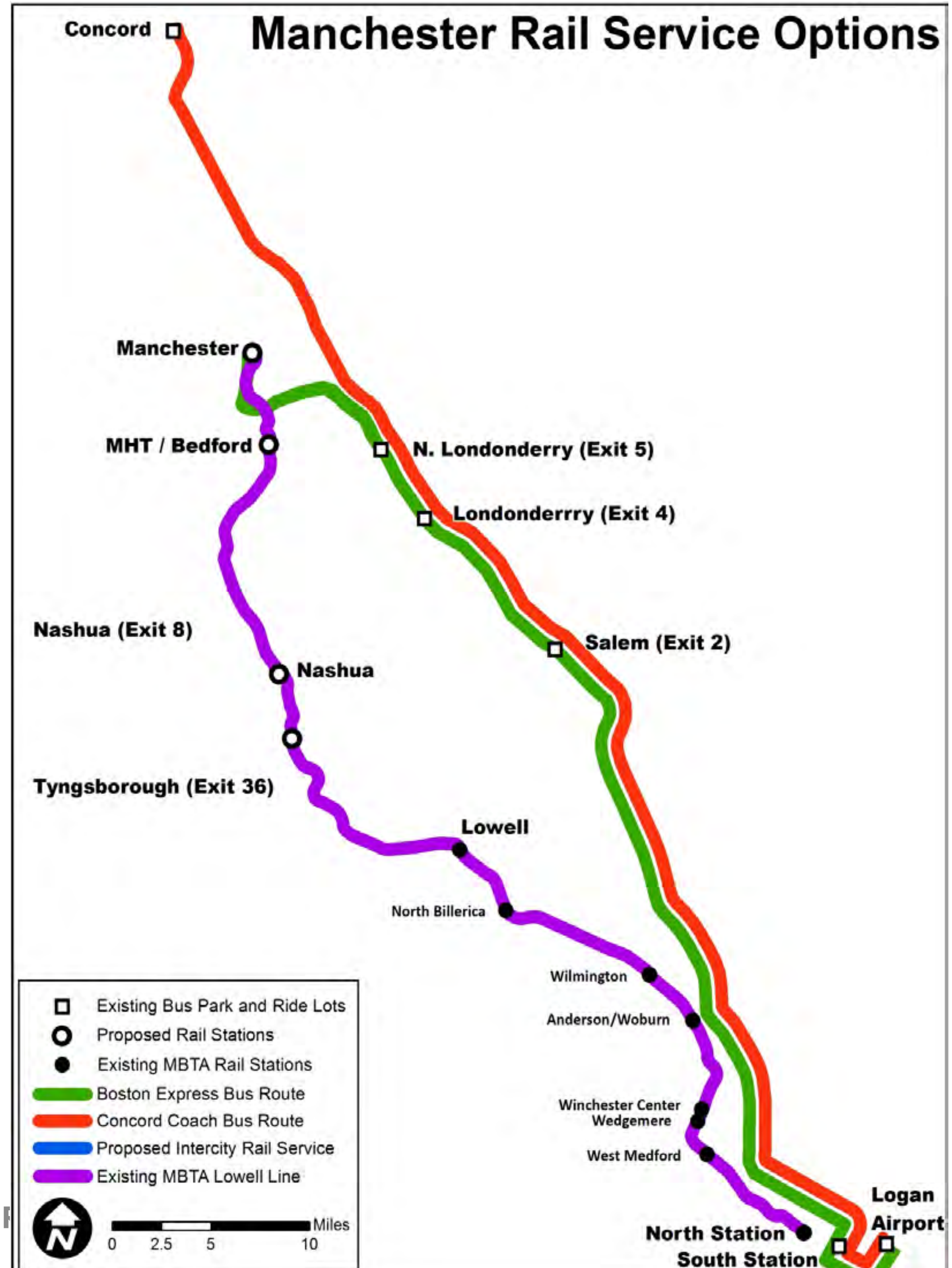
Commuter Rail Service Options

Options	Weekday Revenue Trains				Route Miles	Station	Wkday Train Miles
	Lowell	Nashua	Manch	Concord			
1. Concord Regional	44	30	8	8	73	14	1,957
2. Concord Commuter	44	26	22	18	73	14	2,374
3. Manchester Regional	44	34	16	0	56	13	2,068
4. Manchester Commuter	44	30	20	0	56	13	2,091
5. Nashua Commuter	44	34	0	0	39	11	1,888
6. Nashua Minimum	44	16	0	0	35	11	1,496

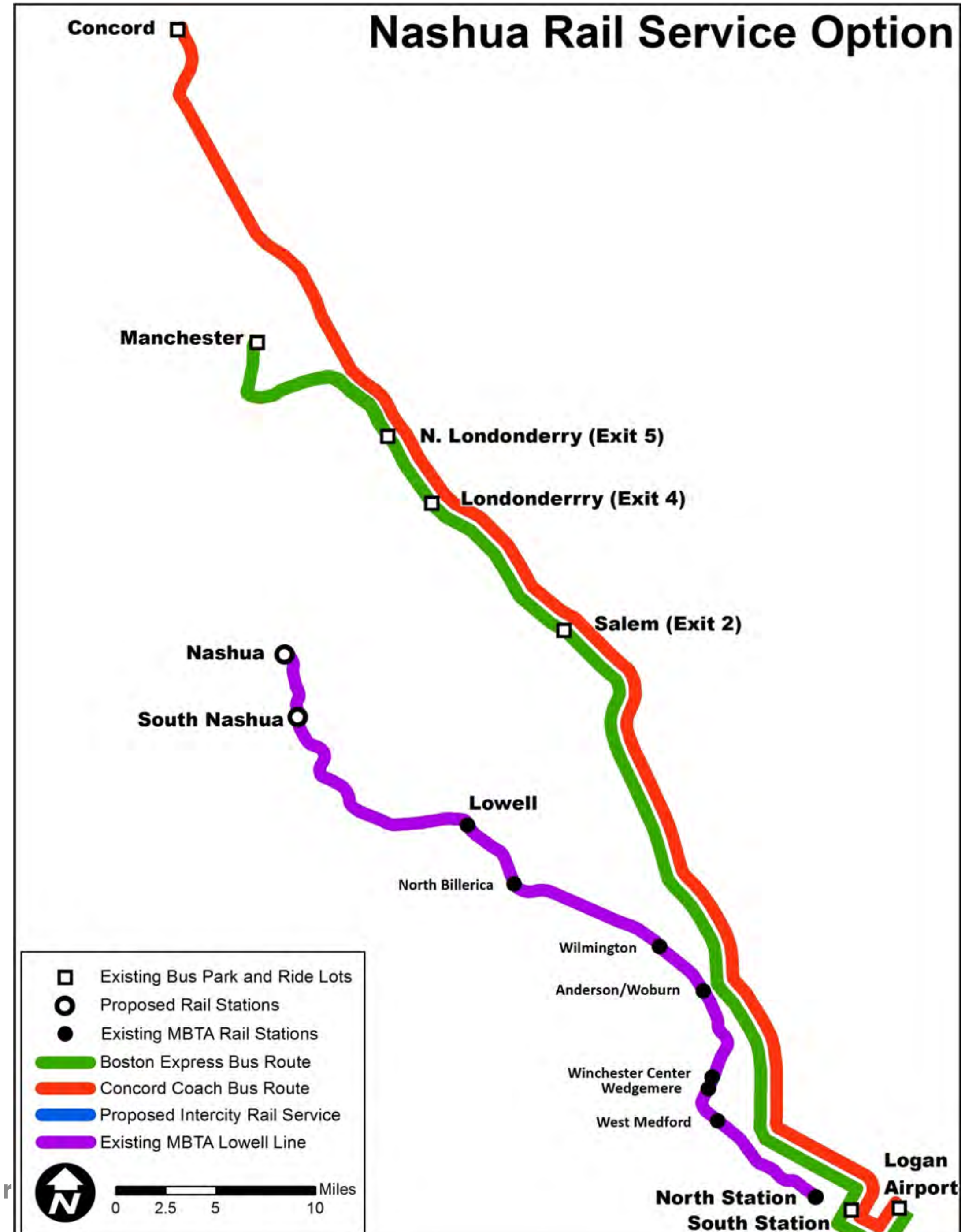


New Hampshire DOT
Department of Transportation


Concord Rail Service Option
Concord
Manchester
MHT / Bedford
N. Londonderry (Exit 5)
Londonderrry (Exit 4)
Salem (Exit 2)
Nashua
South Nashua
Lowell
North Billerica
Wilmington
Anderson/Woburn
Winchester Center
Wedgemere
West Medford
North Station
South Station
Logan
Airport
Existing Bus Park and Ride Lots
Proposed Rail Stations
Existing MBTA Rail Stations
Boston Express Bus Route
Concord Coach Bus Route
Proposed Intercity Rail Service
Existing MBTA Lowell Line
Miles
0
2.5
5
10
N



New Hampshire DOT Department of Transportation



NH Capitol Corridor

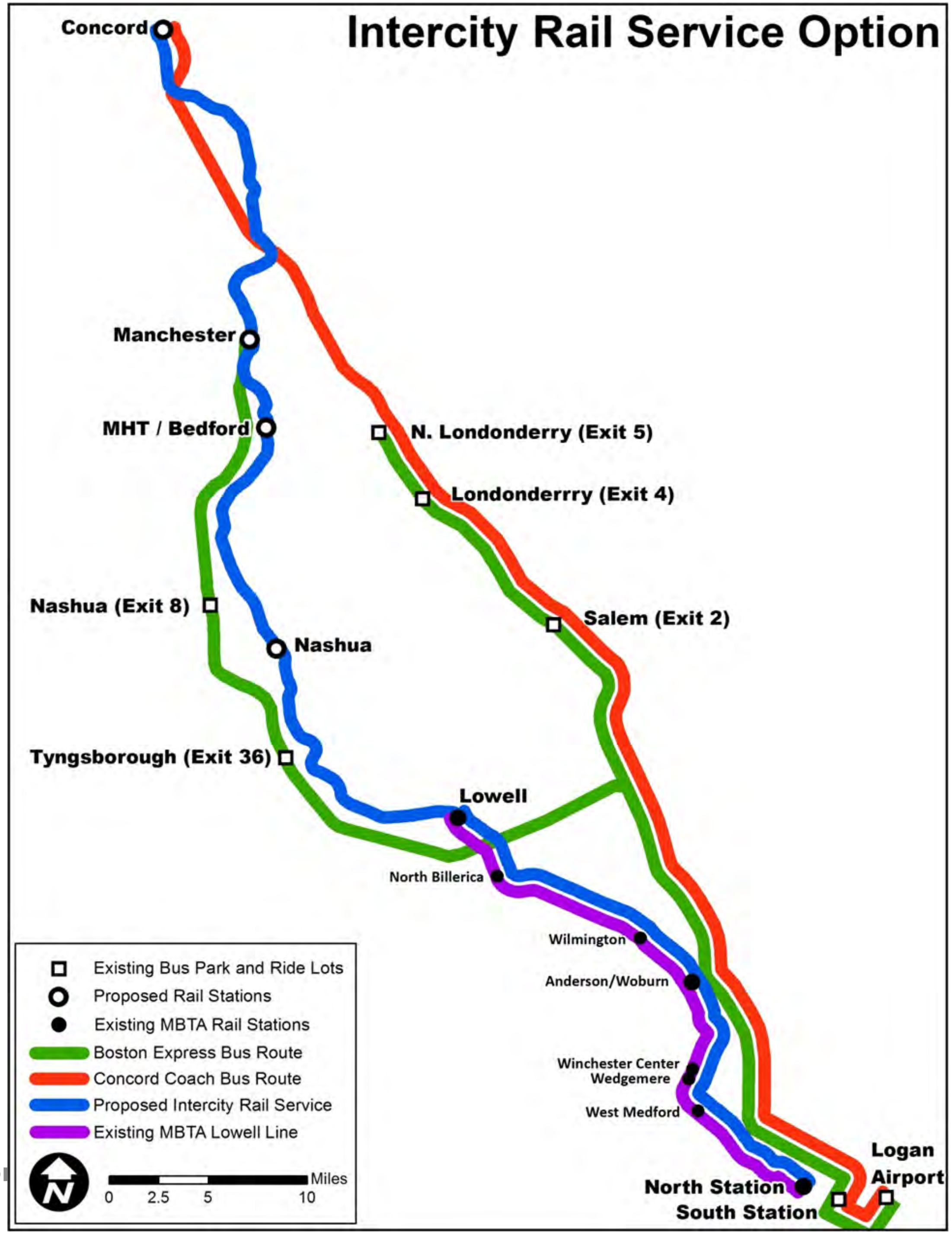
New Hampshire DOT Department of Transportation

Conceptual Stations

Station	Miles to Boston	Max Time to Boston	Min Time to Boston
Concord	73.4	1:54	1:46
Manchester	55.5	1:32	1:25
MHT / Bedford	50.1	1:24	1:17
Nashua	38.8	1:14	1:02
South Nashua	35.2	1:08	0:54

Intercity Rail Service Options

Options	Weekday Revenue Trains			Route Miles	Stations	Wkday Train Miles
	Nashua	Manchester	Concord			
1. Intercity 8	8	8	8	73	12	2,038
2. Intercity 12	12	12	12	73	12	2,332
3. Intercity 18	18	18	18	73	12	2,771



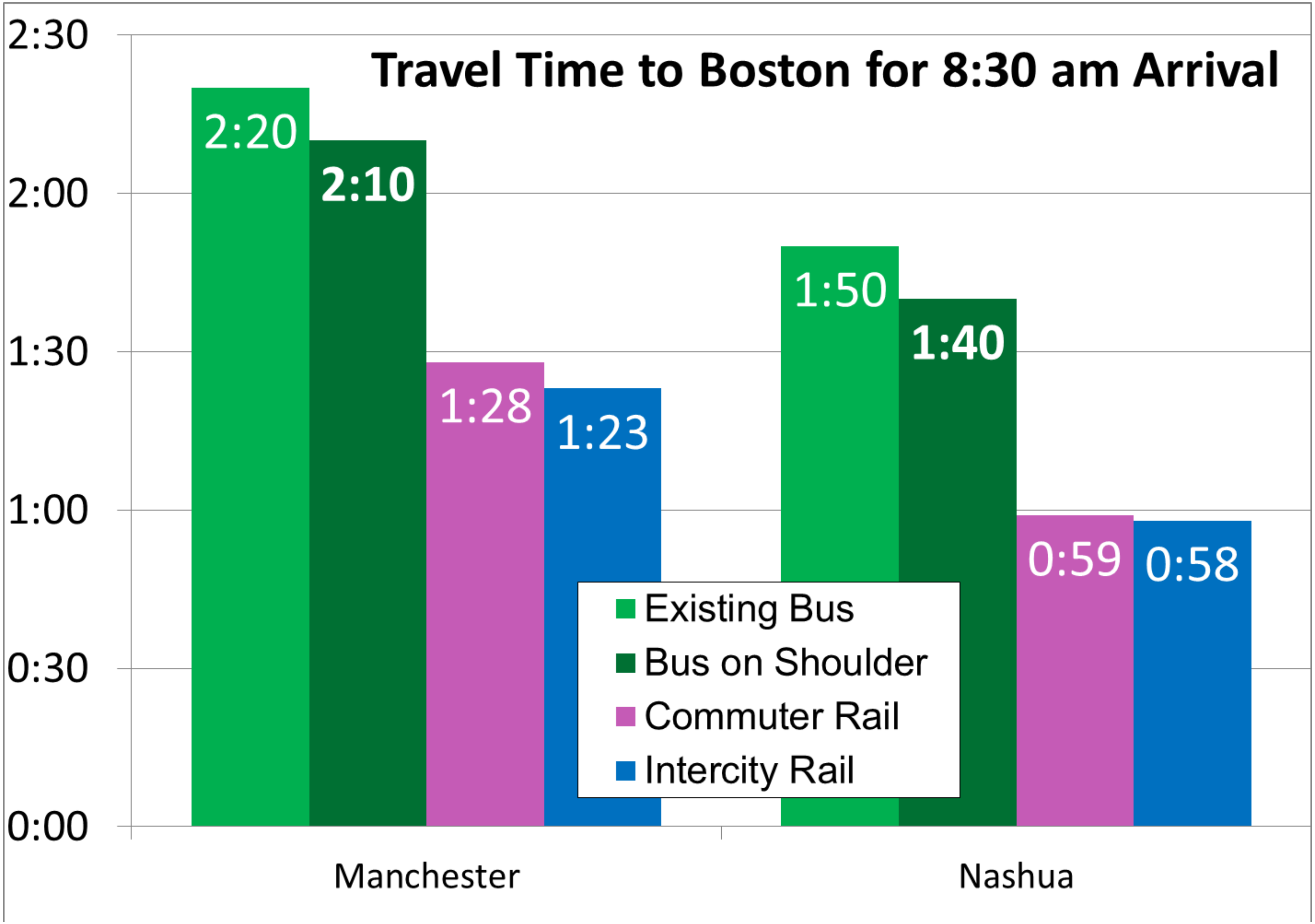
New Hampshire DOT Department of Transportation

Conceptual Intercity Stations

Stations	Miles to Boston	Intercity Time to Boston	Min CR Time to Boston	Max CR Time to Boston
Concord	73.4	1:36	1:46	1:54
Manchester	55.5	1:22	1:25	1:32
MHT / Bedford	50.1	1:09	1:17	1:24
Nashua	38.8	0:56	1:02	1:14
Lowell	25.5	0:38	0:44	0:49

Express Bus Options

- Bus on Shoulder for Existing Service
  - 80 weekday buses
  - 8-12 minute savings for 16 am peak southbound buses
  - Afternoon savings are less
- Bus on Shoulder for Enhanced Service
  - Approximately 120 weekday buses
  - 8-12 minute peak savings over current travel times
  - 30-minute peak headway; 60-minute off-peak
  - All peak buses offer non-stop service to Boston

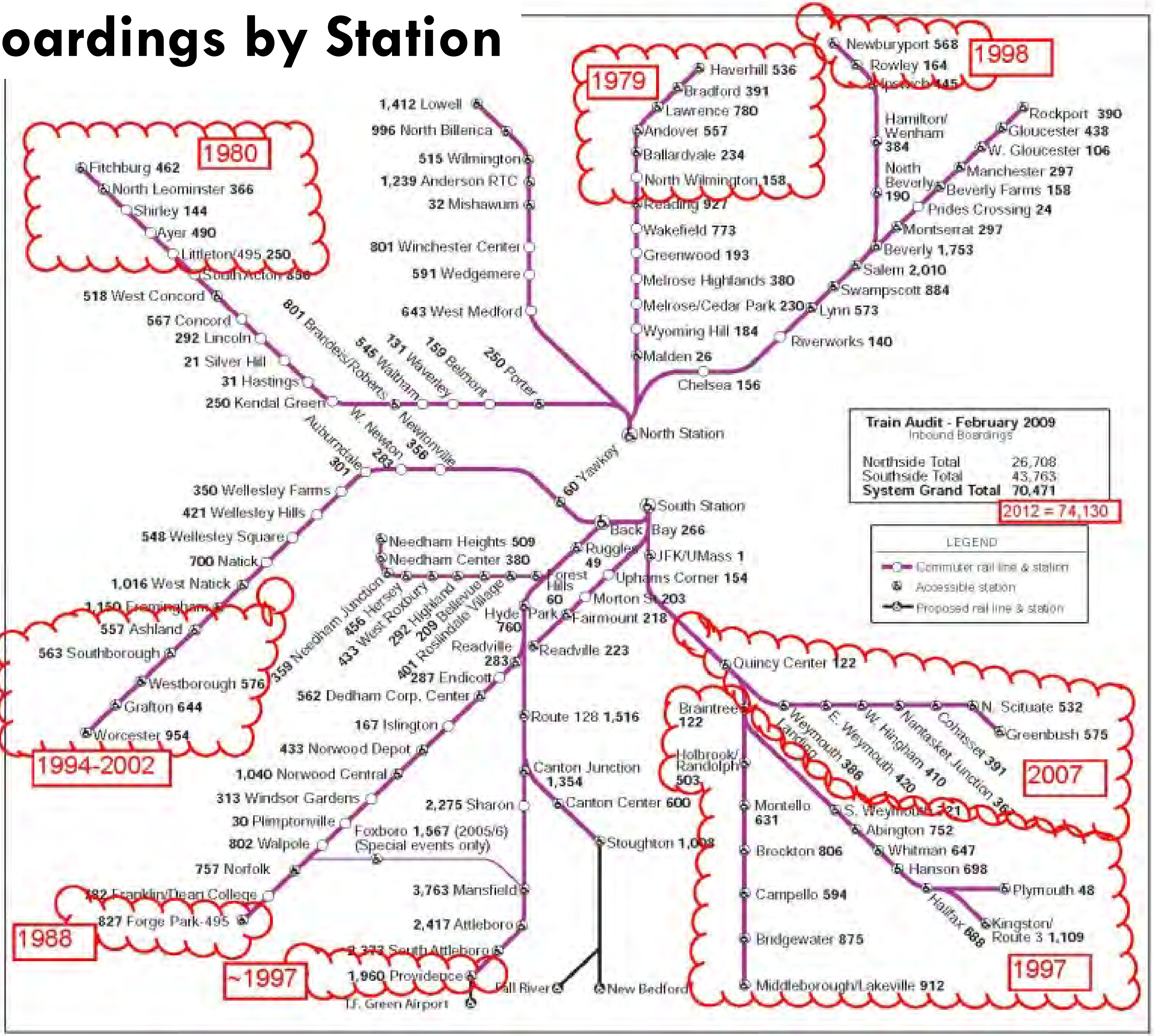


BOS running times under review with bus operators

Rail Ridership

- Up to 3,100 total boardings per weekday
- Boston-Manchester
  - 16 trains to Manchester
  - 34 trains to Concord
- Existing bus service on I-93

MBTA Boardings by Station



Benefits/Objectives

- Address the congestion issue at southern end of the corridor, thereby reducing trip times and providing a wider set of alternatives to the automobile.
- Improve access to higher-paying jobs in greater Boston. Commute from New Hampshire; return money to New Hampshire.
- Improve access to other tourism, recreation and cultural attractions in both greater Boston and in New Hampshire.
- Attract and retain population in New Hampshire, especially younger, highly-educated professionals.

Benefits/Objectives

- Build that employee base to attract new businesses and grow existing ones in New Hampshire.
- Promote concentrated development (TOD) to mitigate sprawl development patterns, help accommodate residents seeking additional lifestyle choices and to reduce vehicle miles travelled.
- Attract federal transportation investment dollars by leveraging existing transportation infrastructure.
- Improve the potential for additional rail freight business.
- Provide additional transit service to the Manchester-Boston Regional Airport.

NH Capitol Corridor Rail and Transit Study

Preliminary Screening of Conceptual Alternatives

Alternative	Cost	NH Ridership	Land Use/ Economic Development	Environmental **Fatal Flaw ONLY**
No Build / No Transit Improvement	○	○	○	●
Concord Regional	◔	◑	◕	●
Concord Commuter	◔	◑	◕	●
Manchester Regional	◑	◑	◑	●
Manchester Commuter	◑	◑	◑	●
Nashua Commuter	◕	◔	◔	●
Nashua Minimum	◕	◔	◔	●
Intercity 8	◑	◔	◔	●
Intercity 12	◔	◔	◑	●
Intercity 18	◔	◔	◕	●
BOS	●	◔	○	●
BOS +	◕	◔	○	●

Federal Evaluation Process

- New/Small Starts: six evaluation criteria

Land Use
Mobility Improvements
Environmental Benefits
Congestion Relief
Cost Effectiveness
Economic Development

  – Economic development and land use: the two criteria local communities can control

Land Use

- FTA evaluation: existing corridor and station area development, character, pedestrian facilities, parking supply and affordable housing
- Station area: half-mile around station
- FTA rates station areas by breakpoints
  - Employment served
  - Population density
  - Cost of parking in the CBD
  - Parking supply in CBD per employee
  - % of affordable housing units

Economic Development

- FTA focus on whether city/regional plans and policies allow for growth of transit system, and for transit-oriented development
  - Transit-supportive corridor policies
  - Supportive zoning near transit
  - Tools to implement transit-supportive plans and policies
  - Performance of transit-supportive plans and policies
  - Potential impact of transit project on regional development
  - Plans and policies to maintain of increase affordable housing in the corridor

Summary Findings: Land Use

- Urban stations generally have transit-supportive character and pedestrian amenities
- Population density on lower end of FTA scale
- Employment density supported by Boston
- Comparatively low-cost parking a negative
- Good supply of affordable housing; need to perform corridor analysis

Summary Findings: Economic Development

- Concord, Manchester and Nashua: transit-supportive existing zoning, land use, plans and policies
  – Varying degrees
  – Opportunities for improvement
- Urban stations poised for transit growth and TOD
- Park-and-ride stations need better definition of site access

NH Capitol Corridor Rail and Transit Study

Preliminary Screening of Conceptual Alternatives

Alternative	Cost	NH Ridership	Land Use/ Economic Development	Environmental **Fatal Flaw ONLY**
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Concord Regional	◔	◑	◕	●
Concord Commuter	◔	◑	◕	●
Manchester Regional	◑	◑	◑	●
Manchester Commuter	◑	◑	◑	●
Nashua Commuter	◕	◔	◔	●
Nashua Minimum	◕	◔	◔	●
Intercity 8	◑	◔	◔	●
Intercity 12	◔	◔	◑	●
Intercity 18	◔	◔	◕	●
BOS	●	◔	○	●
BOS +	◕	◔	○	●

● ⟷ ○

better worse

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Alternative Definition and Selection: What Makes a Big Difference

- Rail capital costs are much greater than bus
- Land use/development/TOD
  - Bus, rail both can have development impacts – just very different
- Ridership
  - Stronger markets closer to Boston
  - Park-and-ride vs. center city stations; importance of drive access
  - Rail ridership forecasts higher than bus

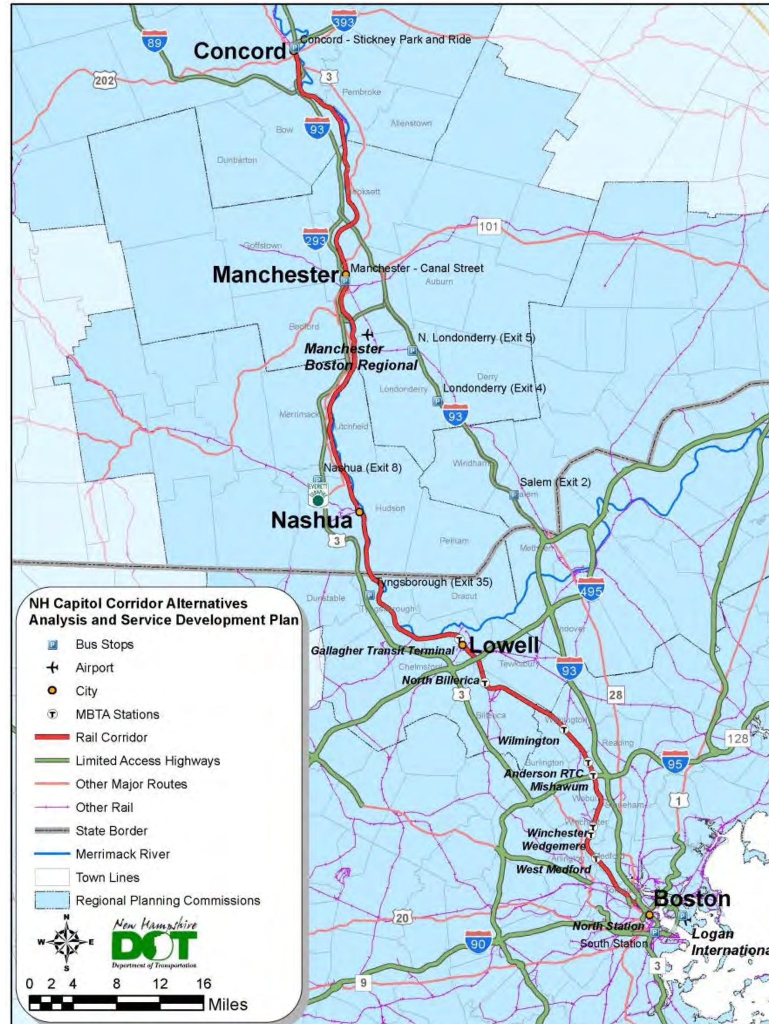
Bottom Line Questions

#1: What does rail do best?

#2: What does express bus do best?

Bottom Line Questions

#3: Can we do it all? The transit *system* strategy.



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Bottom Line Questions

#4: Can we get 50 percent of capital from the federal government?

Bottom Line Questions

#5: What is the state/local annual financial requirement – after federal support, fares?

- $8 - $10 million per year
- Source(s): TBD

Alternatives Advanced for More Detailed Evaluation

- No Build
- Bus on Shoulder
- Enhanced Bus on Shoulder
- Nashua Commuter Rail Minimum – plus bus
- Manchester Regional Rail – plus bus
- Concord 8 Intercity Rail – plus bus

- Next phase: fare sensitivity analysis
- Next phase: ridership system sensitivity

Next Steps

Alternatives Analysis Timeline

ID	Task Name	Duration	Start	Finish
1	Purpose and Need	9.75 mons	Fri 2/15/13	Thu 11/14/13
2	Definition of conceptual alternatives	4.1 mons	Thu 10/10/13	Fri 1/31/14
3	Advisory committee meeting	0 days	Wed 1/8/14	Wed 1/8/14
4	Preliminary screening of alternatives	6 mons	Mon 9/2/13	Fri 2/14/14
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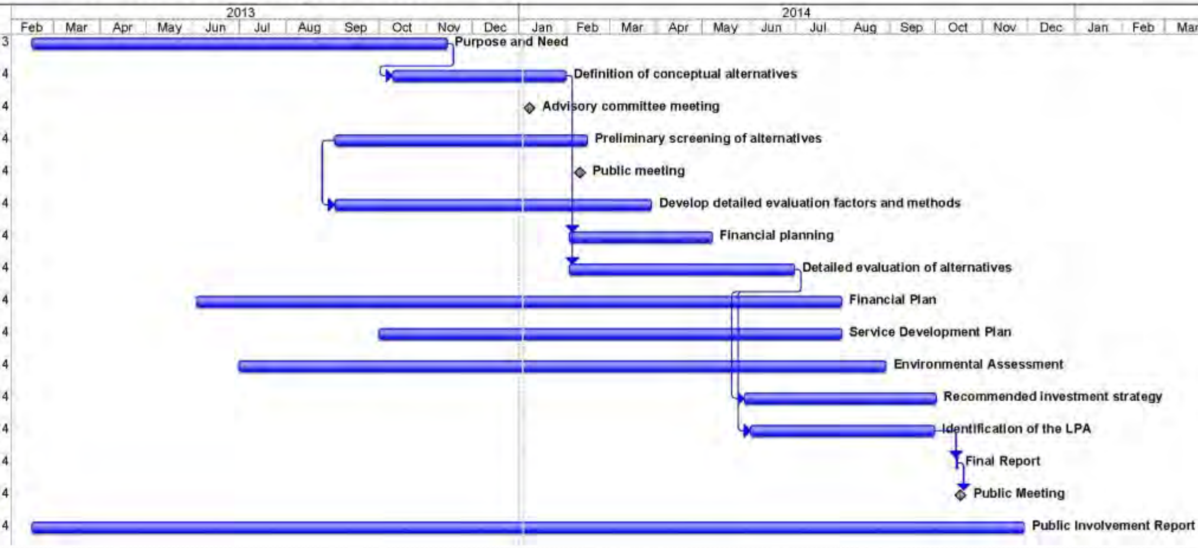
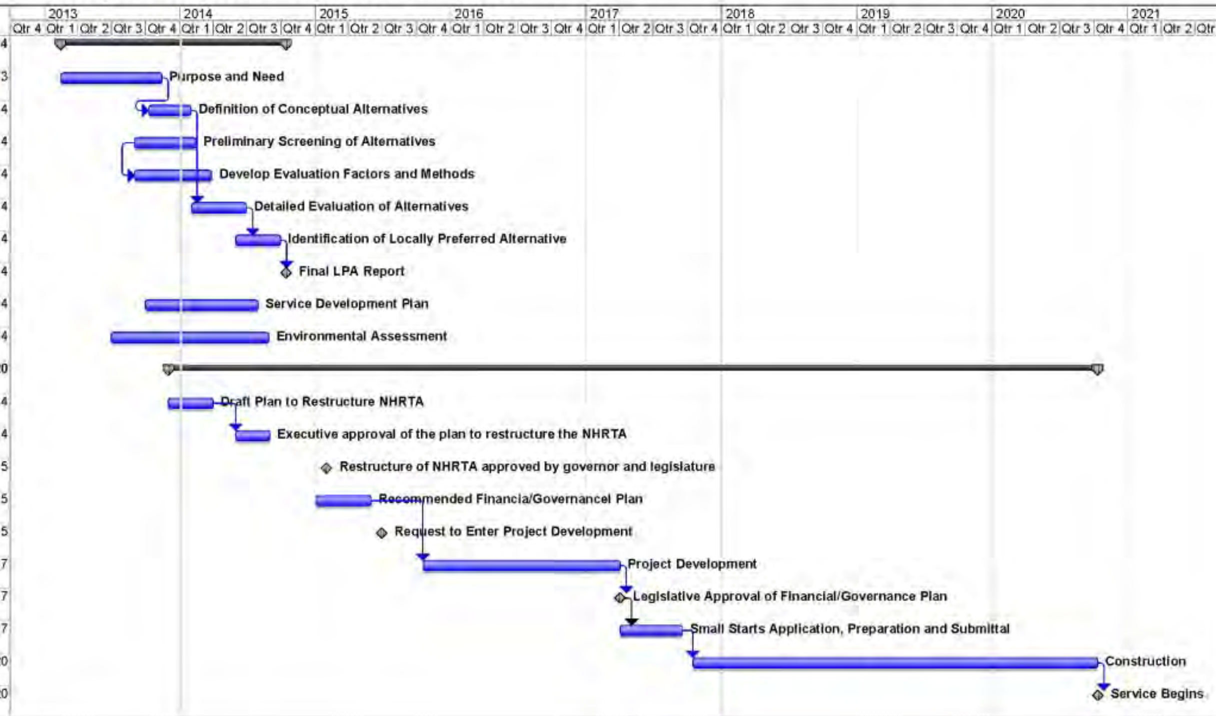
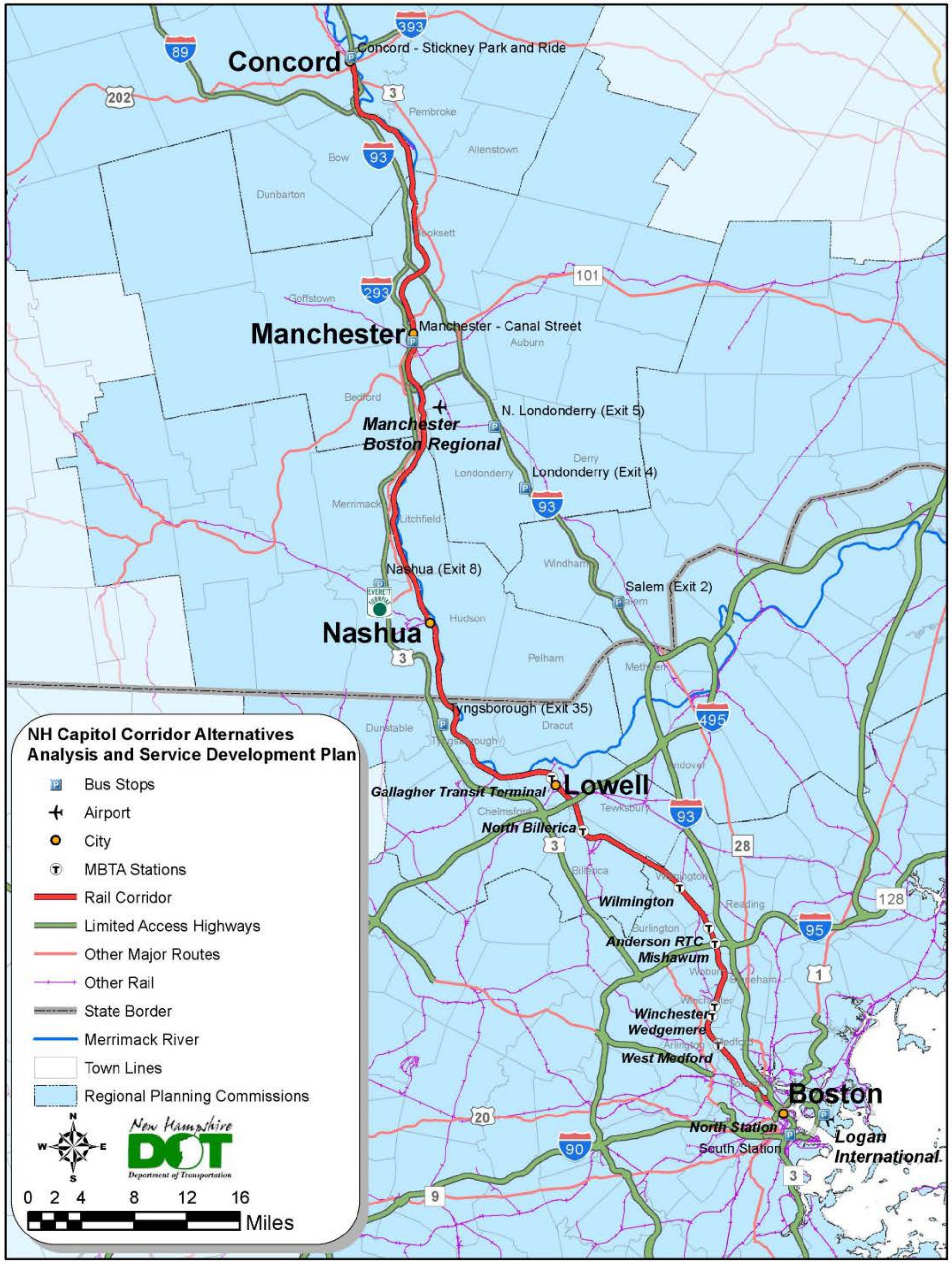


Project Implementation

Project Implementation Timeline

ID	Task Name	Duration	Start	Finish
1	**NH Capitol Corridor Study**	**434 days**	**Fri 2/15/13**	**Wed 10/15/14**
2	Purpose and Need	9.75 mons	Fri 2/15/13	Thu 11/14/13
3	Definition of Conceptual Alternatives	4.1 mons	Thu 10/10/13	Fri 1/31/14
4	Preliminary Screening of Alternatives	6 mons	Mon 9/2/13	Fri 2/14/14
5	Develop Evaluation Factors and Methods	7.5 mons	Mon 9/2/13	Fri 3/28/14
6	Detailed Evaluation of Alternatives	5.3 mons	Mon 2/3/14	Mon 6/30/14
7	Identification of Locally Preferred Alternative	4.35 mons	Mon 6/2/14	Tue 9/30/14
8	Final LPA Report	0 days	Wed 10/15/14	Wed 10/15/14
9	Service Development Plan	10.9 mons	Tue 10/1/13	Thu 7/31/14
10	Environmental Assessment	15.25 mons	Mon 7/1/13	Fri 8/29/14
11	**Project Implementation**	**1791 days**	**Mon 12/2/13**	**Mon 10/12/20**
12	Draft Plan to Restructure NHRTA	4.35 mons	Mon 12/2/13	Tue 4/1/14
13	Executive approval of the plan to restructure the NHRTA	3.3 mons	Mon 6/2/14	Mon 9/1/14
14	Restructure of NHRTA approved by governor and legisla	0 days	Mon 2/2/15	Mon 2/2/15
15	Recommended Financia/Governancel Plan	5.3 mons	Mon 1/5/15	Mon 6/1/15
16	Request to Enter Project Development	0 days	Wed 7/1/15	Wed 7/1/15
17	Project Development	19 mons	Tue 10/20/15	Mon 4/3/17
18	Legislative Approval of Financial/Governance Plan	0 days	Mon 4/3/17	Mon 4/3/17
19	Small Starts Application, Preparation and Submittal	6 mons	Tue 4/4/17	Mon 9/18/17
20	Construction	39 mons	Tue 10/17/17	Mon 10/12/20
21	Service Begins	0 days	Mon 10/12/20	Mon 10/12/20




NH Capitol Corridor Alternatives Analysis and Service Development Plan
Bus Stops
Airport
City
MBTA Stations
Rail Corridor
Limited Access Highways
Other Major Routes
Other Rail
State Border
Merrimack River
Town Lines
Regional Planning Commissions
New Hampshire DOT Department of Transportation
0 2 4 8 12 16
Miles
Concord
Concord - Stickney Park and Ride
Manchester
Manchester - Canal Street
Manchester Boston Regional
N. Londonderry (Exit 5)
Londonderry (Exit 4)
Nashua (Exit 8)
Nashua
Salem (Exit 2)
Tyngsborough (Exit 35)
Gallagher Transit Terminal
Lowell
North Billerica
Wilmington
Anderson RTC
Mishawum
Winchester
Wedgemere
West Medford
Boston
North Station
South Station
Logan International

APPENDIX H

Project Advisory Committee – May 14, 2013

New Hampshire DOT Department of Transportation

BLNMC Advisory Committee

May 14, 2013

10:00-12:00

- **Welcome, committee role(s)**
- **Study corridor (map)**
- **Scope outline**
- **Schedule**
- **Case for transit**
- **Planning principles/guidelines**
- **Decision making: process, guidelines**
- **Critical issues**
- **Financial expectations**
- **Discussion**
- **Next meeting(s)**

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Advisory Committee Meeting #1

Date: 05/14/2013 **Time:** 10:00am **Location:** NHDOT - Concord, NH

Project Team:

Mark Sanborn (NHDOT)	Ken Kinney (URS)
Patrick Herlihy (NHDOT)	Russell Wilder (URS)
	David Nelson (Jacobs)
	Ryan Harris (Jacobs)
	Laurie Hussey (CamSys)

Attendees/Distribution:

Name (Affiliation)	Email
Bill Hollister - Amtrak	hollisw@amtrak.com
Caroline Mael – Amtrak	caroline.mael@amtrak.com
Mike Whitten – Manchester Transit Authority	mwhitten@mtabus.org
Joe Cosgrove – MBTA	jcosgrove@mbta.com
Mark Brewer – Manchester–Boston Airport	mbrewer@flymanchester.com
Jim Jalbert – C&J	jimj@ridecj.com
Harry Blunt – Boston Express	hblunt@bostonexpress.com
Tom Galligani – City of Nashua	galliganit@nashuanh.gov
Carlos Baia – City of Concord	cbaia@concordnh.gov
Beverly Woods – NMCOG	bwoods@nmcog.org
Andy Leach – Senator Ayotte	andy_leach@ayotte.senate.giv
David Preece – Southern NH Planning Council	dpreece@snhpc.org
Mike Tardiff – Central NH Regional Planning Council	mtardiff@cnhrpc.org
Will Stewart – Manchester Chamber of Commerce	wills@manchesterchamber.org
Mike Izbicki – NH Rail Transit Authority	msizbic@comcast.net
Tom Mahon - NH Rail Transit Authority	tjmahon@comcast.net
Tom Irwin – Conservation Law Foundation	tirwin@clf.org
Kerrie Diers – Nashua Regional Planning Council	kerried@nashuarpc.org
Sean Downey – U.S. Representative Kuster	sean.downey@mail.house.gov
Shelley Winters – NHDOT	swinters@dot.state.nh.us
Todd Fontanella – Merrimack Valley Planning Council	tfontanella@mvpc.org
Tony Komornick – Merrimack Valley Planning Council	tkomornick@mvpc.org
Chris Williams – Nashua Chamber of Commerce	cwilliams@nashuachamber.com
Rob Cullerford – PanAm Railways	

Patrick Herlihy and Mark Sanborn welcomed the Advisory Committee members to the meeting and discussed the role and schedule for the committee. Ken Kinney gave introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process. David Nelson discussed the existing transit conditions and discussed some preliminary options that will be evaluated in the study. Laurie Hussey provided and overview of the financial planning process and Russ Wilder briefly discussed the various environmental attributes that would be evaluated.

Mark Brewer asked if the project would progress only if it was economically viable. Ken Kinney responded at the study will be quantifying both the costs and the benefits to provide a clearer picture of project viability and to justify the financial plan.

Joe Cosgrove suggested that the study should be careful when discussing the role of transit with respect to congestion relief and that perhaps it would be better to promote any potential improvements as a mobility tool and not as a solution to congestion. David Nelson responded that yes, the focus should be to avoid congestion, by isolating transit vehicles and their passengers from existing and future congestion. Laurie Hussey added that the cost/benefit analysis that is part of MAP-21 funding allocations includes evaluating project benefits related to congestion.

Beverly Woods asked whether proposed stations south of the border were to be evaluated in the study, and was told that they were and that the study team is aware of the advocacy for stations in North Chelmsford and at UMass-Lowell.

Caroline Mael discussed a major concern for rail transit providers in addressing the last mile issue between stations and final destinations. She suggested that park and ride lots may not be the answer as young people seem to be driving less and added that New Hampshire needs a comprehensive transit system, not a trunk line with no branches.

Harry Blunt cautioned the study team to account for the different destinations and travel times provided by the existing rail and bus network. Commuter rail from Lowell terminates at North Station, often requiring passengers to walk or transfer to subway or bus to reach the dominant business districts further south. Buses currently provide direct service to downtown, the financial district and South Station. He also asked that the environmental analysis evaluate the length of time that trains idle, because bus engines are held to higher environmental standards and must limit their idling time.

Jim Jalbert added that he doubts that people choose to drive rather than take the bus due to a perceived longer travel time, but rather that they do so because of job sprawl and the difficulty of transit to serve far-flung workplaces. He also questioned whether TOD would work in New Hampshire and that perhaps a better goal would be to maintain and grow the local job base. He implored the study team to focus on a systems approach that includes both rail and bus improvements, but questioned whether the study would actually evaluate feasibility or just figure out how to build rail for the sake of rail.

Mark Sanborn replied that the study will focus on feasibility and that it will provide an objective quantitative analysis on costs and benefits. The study will aim to develop an intermodal systems approach and would include both capital and operating cost forecasts for all operations including terminal and layover facilities.

Chris Williams added that the advisory committee and the study team are not just working to build a case for rail, but to formulate a solid answer as to the need and the viability of transit improvements within the corridor. He added that another benefit of improved transit is the ability to attract workers to the hundreds of high-paying jobs in New Hampshire that are currently sitting unfilled. He also suggested that the study team to not just speak to the largest employers, but to speak with smaller, growing and startup businesses and to hear about their needs with respect to attracting talent. He then said that the Nashua Aldermen are interested in studying the potential economic impacts of rail and asked how to best plug them in to the planning process. Mark Sanborn replied that the study team was considering holding TOD workshops with stakeholders to help the local communities start planning for improved transit.

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Advisory Committee Meeting #1

Date: 05/14/2013 **Time:** 10:00am **Location:** NHDOT - Concord, NH

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Will Stewart – Manchester Chamber of Commerce	wills@manchesterchamber.org
Mike Izbicki – NH Rail Transit Authority	msizbic@comcast.net
Tom Mahon - NH Rail Transit Authority	tjmahon@comcast.net
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Shelley Winters – NHDOT	swinters@dot.state.nh.us
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Chris Williams – Nashua Chamber of Commerce	cwilliams@nashuachamber.com
Rob Cullerford – PanAm Railways	

Patrick Herlihy and Mark Sanborn welcomed the Advisory Committee members to the meeting and discussed the role and schedule for the committee. Ken Kinney gave introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process. David Nelson discussed the existing transit conditions and discussed some preliminary options that will be evaluated in the study. Laurie Hussey provided and overview of the financial planning process and Russ Wilder briefly discussed the various environmental attributes that would be evaluated.

Mark Brewer asked if the project would progress only if it was economically viable. Ken Kinney responded at the study will be quantifying both the costs and the benefits to provide a clearer picture of project viability and to justify the financial plan.

Joe Cosgrove suggested that the study should be careful when discussing the role of transit with respect to congestion relief and that perhaps it would be better to promote any potential improvements as a mobility tool and not as a solution to congestion. David Nelson responded that yes, the focus should be to avoid congestion, by isolating transit vehicles and their passengers from existing and future congestion. Laurie Hussey added that the cost/benefit analysis that is part of MAP-21 funding allocations includes evaluating project benefits related to congestion.

Beverly Woods asked whether proposed stations south of the border were to be evaluated in the study, and was told that they were and that the study team is aware of the advocacy for stations in North Chelmsford and at UMass-Lowell.

Caroline Mael discussed a major concern for rail transit providers in addressing the last mile issue between stations and final destinations. She suggested that park and ride lots may not be the answer as young people seem to be driving less and added that New Hampshire needs a comprehensive transit system, not a trunk line with no branches.

Harry Blunt cautioned the study team to account for the different destinations and travel times provided by the existing rail and bus network. Commuter rail from Lowell terminates at North Station, often requiring passengers to walk or transfer to subway or bus to reach the dominant business districts further south. Buses currently provide direct service to downtown, the financial district and South Station. He also asked that the environmental analysis evaluate the length of time that trains idle, because bus engines are held to higher environmental standards and must limit their idling time.

Jim Jalbert added that he doubts that people choose to drive rather than take the bus due to a perceived longer travel time, but rather that they do so because of job sprawl and the difficulty of transit to serve far-flung workplaces. He also questioned whether TOD would work in New Hampshire and that perhaps a better goal would be to maintain and grow the local job base. He implored the study team to focus on a systems approach that includes both rail and bus improvements, but questioned whether the study would actually evaluate feasibility or just figure out how to build rail for the sake of rail.

Mark Sanborn replied that the study will focus on feasibility and that it will provide an objective quantitative analysis on costs and benefits. The study will aim to develop an intermodal systems approach and would include both capital and operating cost forecasts for all operations including terminal and layover facilities.

Chris Williams added that the advisory committee and the study team are not just working to build a case for rail, but to formulate a solid answer as to the need and the viability of transit improvements within the corridor. He added that another benefit of improved transit is the ability to attract workers to the hundreds of high-paying jobs in New Hampshire that are currently sitting unfilled. He also suggested that the study team to not just speak to the largest employers, but to speak with smaller, growing and startup businesses and to hear about their needs with respect to attracting talent. He then said that the Nashua Aldermen are interested in studying the potential economic impacts of rail and asked how to best plug them in to the planning process. Mark Sanborn replied that the study team was considering holding TOD workshops with stakeholders to help the local communities start planning for improved transit.

Sign-In Sheet for May 14th NH Capitol Corridor Study Advisory Committee Meeting

Name	Organization	E-mail Address
Bill Hollister	Amtrak	Holliswl@Amtrak.com
Caroline Mael	Amtrak	caroline.mael@Amtrak.com
Mike Whitten	MTA	mwhitten@mtabus.org
Joe Cosgrove	MBTA	Jcosgrove@mbta.com
Mark Brewer	MHT Airport	mbrewer@flymanchester.com
[illegible]	[illegible]	[illegible]
Tom Galligani	City of Nashua	#galliganit@nashuanh.gov
Carlos Baia	City of Concord	cbaia@concordnh.gov.
Beverly Woods	Northern Middlesex COG	bwoods@nmcog.org
Andy Leach	Senator Ayotte	Andy_Leach@Ayotte.Senate.gov
David Preece	SNHPC	dpreece@SNHPC.ORG
Mike Tardiff	CNHRPC	mtardiff@cnhrpc.org
Will Stewart	Manch. Chamber	wills@manchester-chamber.org

Sign-In Sheet for May 14th NH Capitol Corridor Study Advisory Committee Meeting

Name	Organization	E-mail Address
Mike Izbicki	NHRTA	msizbic@comcast.net
Tom Mahon	NHRTA	tjmahon@comcast.net
Tom Irwin	CLF	tirwin@clf.org
Kerrie Diers	NRPC	
Sean Downey	U.S. Rep Kuster	Sean.Downey@mail.house.gov
Shelley Winters	NH DOT	swinters@dot.state.nh.us
TODD FONTANELLA	MVRPC	
TONY KOMORNICK	MVRPC	
JIM JALBERT	C&J	
HARRY BLUNT	BOSTON EXPRESS	
CHRIS WILLIAMS	NASHUA CHAMBER	
ROB CULLERFORD	PAN AM	

Boston-Lowell-Nashua-Manchester-Concord Rail & Transit Alternatives Analysis

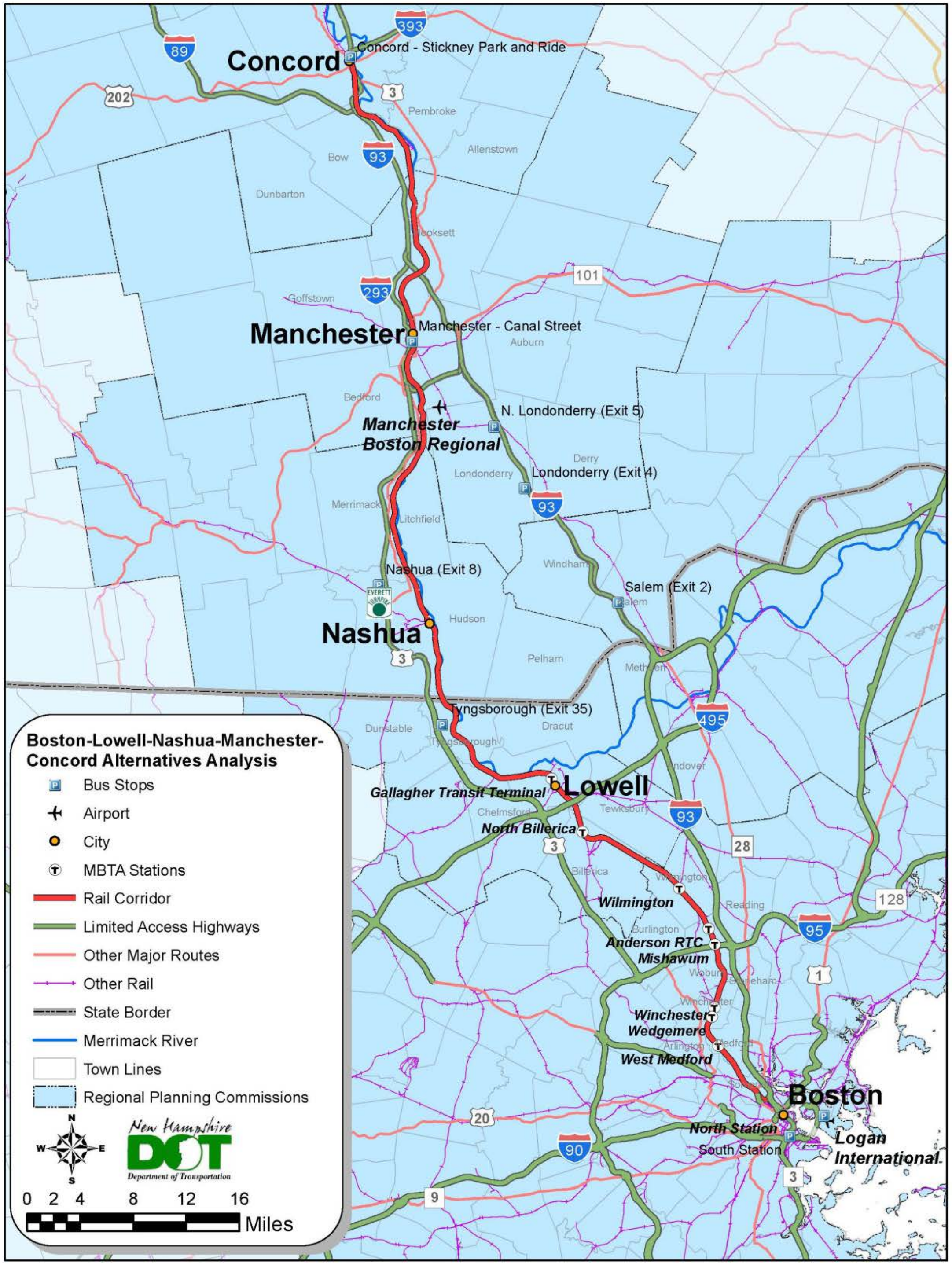
Project Advisory Committee Meeting

May 14, 2013

New Hampshire DOT
Department of Transportation

Agenda

- Welcome, committee role(s)
- Study corridor
- Scope outline
- Schedule
- Case for transit
- Decision making: process, guidelines
- Transit service overview
- Critical issues
- Financial expectations
- Environmental documentation
- Discussion
- Next meeting(s)



New Hampshire DOT
Department of Transportation

Scope Outline

- Public and Stakeholder Involvement
- Purpose & Need
- Financial Planning
- Definition of Alternatives
- Preliminary Screening
  - Environmental impacts
  - Land use, development
  - Transportation: ridership, travel times, freight
  - Costs: capital, operating
- Evaluation Criteria
- Evaluation of Alternatives

Scope Outline
(*continued*)

- Locally Preferred Alternative
  - Ridership
  - Costs: capital, operating
  - Environmental impacts (EA)
  - Environmental justice
  - Cost effectiveness
  - Transit-supportive land use, economic development
- Service Plan Development
- Environmental Assessment
- New Starts Submittal ("if determined eligible")

Boston-Lowell-Nashua-Manchester-Concord Alternatives Analysis

Draft 5.8.2013

Project Schedule

	2013										2014										
Tasks	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Alternatives Analysis Development Steps and Tasks	*Initiation*		*Development and Refinement of Alternatives*					*Analysis and Evaluation*									*Selection of Locally Preferred Alternative*				
PM Team Meetings (weekly to bi-weekly)	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
Advisory Committee Meetings (quarterly)			x			x			x			x			x			x			x
Public Meetings				x				x									x				
Ongoing Public Engagement																					
Stakeholder Interviews	XXXX	XXXX	XXXX											XXXX	XXXX	XXXX					
Website	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
1.0 Public Involvement Plan, Establish Stakeholder Group																					
2.0 Develop Purpose & Need Statement, Goals & Objectives, Evaluation Factors																					
3.0 Financing and Funding Scenarios																					
4.0 Definition of Alternatives																					
5.0 Preliminary Screening of Alternatives																					
6.1 Development of Evaluation Criteria for Alternatives																					
6.2 Establishment of Evaluation Factors and Methodologies																					
7.0 Detailed Evaluation of Alternatives																					
8.1 Selection of Locally Preferred Alternative																					
8.2 Final Locally Preferred Alternative Report																					
9.0 Service Development Plan																					
10.1 Environmental Assessment																					
10.2 Draft and Final Environmental Assessment																					
11.0 New Starts Submittal																					

The Case for Transit

- Expanding Boston commuter market
- Congestion in BLNMC: South, 128, I-93, Rte 3
- Residential suburbanization: VMT impact
- Slower business development, job creation, especially high-tech: VMT impact

The Case for Transit
(continued)

- New Hampshire “brain drain”
- Aging New Hampshire population: mobility options
- Strong existing intercity bus service: Boston markets
- Park-and-ride strategy: little development impact

The Case for Transit
(continued)

- THEREFORE: need for transit investment strategy:
  - Increases transit ridership
  - Addresses congestion problem near Boston
  - Promotes compact, sustainable development
  - Contributes to economic development strategy stressing high-tech jobs and those attracted to them

Managing the Decision Making Process

- The Postulates: share the facts of life
- Focus on big differentiators, not everything
- Bury the dead: one fatal flaw is sufficient
- Avoid answers in search of problems: back to markets
- 90 percent is victory
- Victory is final
- Decide who decides – and let people know
- Don't vote – achieve consensus
- We all like pictures
- We all like to have fun

Plan Options

Core Values/Evaluation Criteria

Transit Options	Expands service area/transit market	Improves image as regional asset	Enhances mobility for transit-dependent	Attracts federal funding	Impacts/ supports development	Protects natural environment	Strengthens Regional core	Cost effective-ness	Time to implement
Light Rail Transit									
Clayton to Westport	◕	●	◑	◔	◑	◑	◑	◔	◔
Madison County Tri-Cities	◔	●	◕	◑	◕	◑	◕	◔	◔
MetroNorth to Florissant	◑	◕	◑	◔	◑	◑	◑	◔	◔
MetroSouth	◕	●	◕	◑	◔	◑	◕	◔	◑
Northside-Southside Full Build	◑	●	●	◑	●	◑	●	◔	◔
Northside-Southside MOS	◔	◑	●	◕	●	◑	●	◑	◑
St. Charles County (I-70)	◕	●	◑	○	◔	◔	○	○	◔
Bus Rapid Transit									
Grand Avenue	◑	◕	●	●	◔	◔	◕	◕	◕
I-70	●	◕	◑	◑	○	◔	◔	◑	◕
I-64	◕	◕	◑	◑	○	◔	◔	◑	◕
I-55	◕	◕	◑	◑	○	◔	◔	◑	◕
I-44	◕	◕	◑	◑	○	◔	◔	◑	◕
Commuter Rail									
Alton, IL	●	◑	○	◑	◑	◔	◑	◕	◔
Eureka/Pacific	●	◑	○	◑	◑	◔	◑	◕	◔
Bus Service/Technology									
Bus passenger amenities	◔	◕	●	◕	○	◔	◔	◕	●
Bus service improvements	◑	◑	●	○	○	◔	◔	◕	●
Intelligent Transportation Systems	◔	◕	◑	◕	○	◔	○	●	◕
Flex routes	◔	◔	◔	○	○	◔	○	◔	◕

Legend

○ ◔ ◑ ◕ ●

Weakest ↔ Strongest

Focus on What is Important

Core Values/Evaluation Criteria

Transit Options	Expands service area/transit market	Improves image as regional asset	Enhances mobility for transit-dependent	Attracts federal funding	Impacts/ supports development	Protects natural environment	Strengthens Regional core	Cost effective-ness	Time to implement
Light Rail Transit									
Clayton to Westport	◕	●	◑	◔	◑	◑	◑	◔	◔
Madison County Tri-Cities	◔	●	◕	◑	◕	◑	◕	◔	◔
MetroNorth to Florissant	◑	◕	◑	◔	◑	◑	◑	◔	◔
MetroSouth	◕	●	◕	◑	◔	◑	◕	◔	◑
Northside-Southside Full Build	◑	●	●	◑	●	◑	●	◔	◔
Northside-Southside MOS	◔	◑	●	◕	●	◑	●	◑	◑
St. Charles County (I-70)	◕	●	◑	○	◔	◔	○	○	◔
Bus Rapid Transit									
Grand Avenue	◑	◕	●	●	◔	◔	◕	◕	◕
I-70	●	◕	◑	◑	○	◔	◔	◑	◕
I-64	◕	◕	◑	◑	○	◔	◔	◑	◕
I-55	◕	◕	◑	◑	○	◔	◔	◑	◕
I-44	◕	◕	◑	◑	○	◔	◔	◑	◕
Commuter Rail									
Alton, IL	●	◑	○	◑	◑	◔	◑	◕	◔
Eureka/Pacific	●	◑	○	◑	◑	◔	◑	◕	◔
Bus Service/Technology									
Bus passenger amenities	◔	◕	●	◕	○	◔	◔	◕	●
Bus service improvements	◑	◑	●	○	○	◔	◔	◕	●
Intelligent Transportation Systems	◔	◕	◑	◕	○	◔	○	●	◕
Flex routes	◔	◔	◔	○	○	◔	○	◔	◕

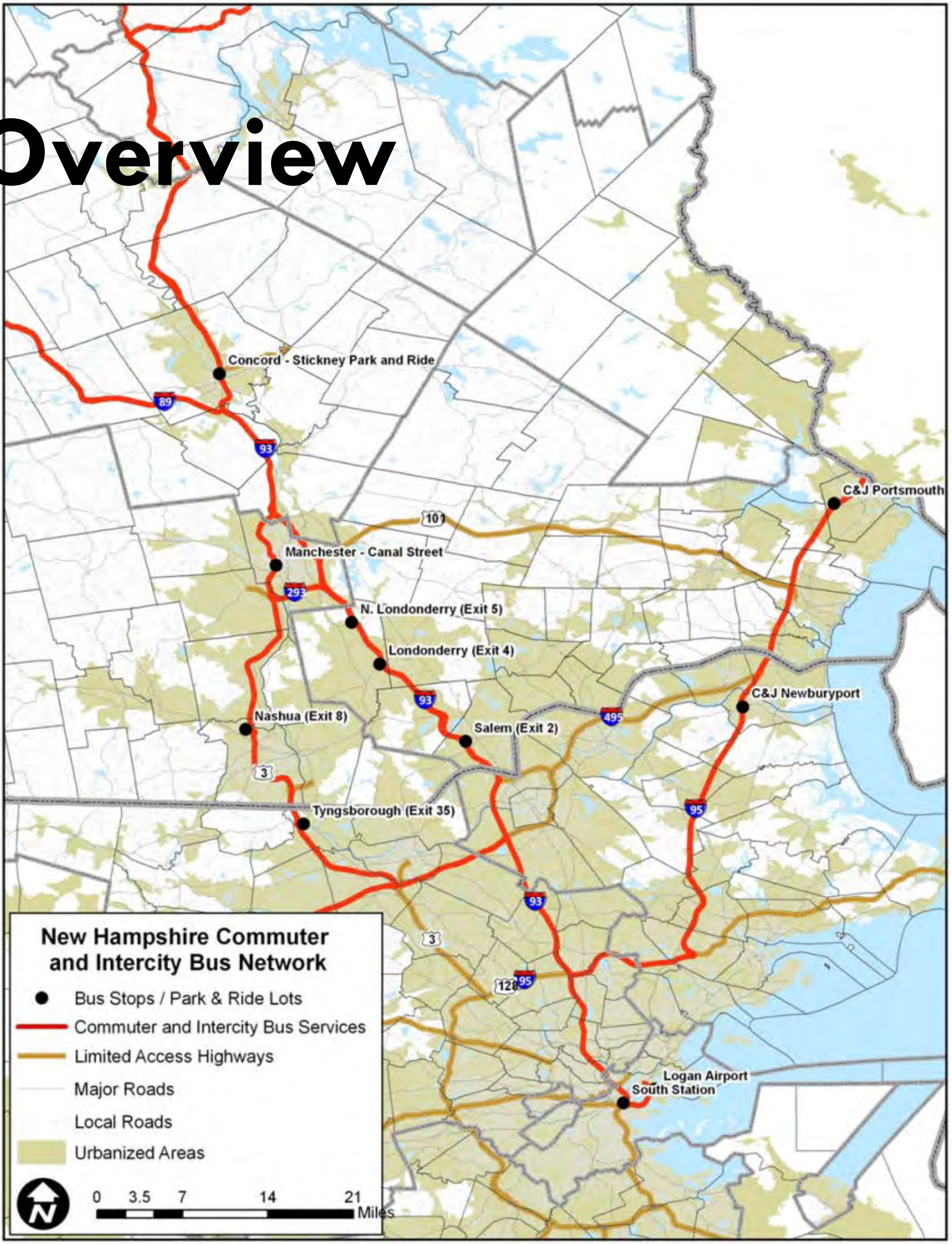
Legend

○ ◔ ◑ ◕ ●

Weakest ⟷ Strongest

Transit Service Overview

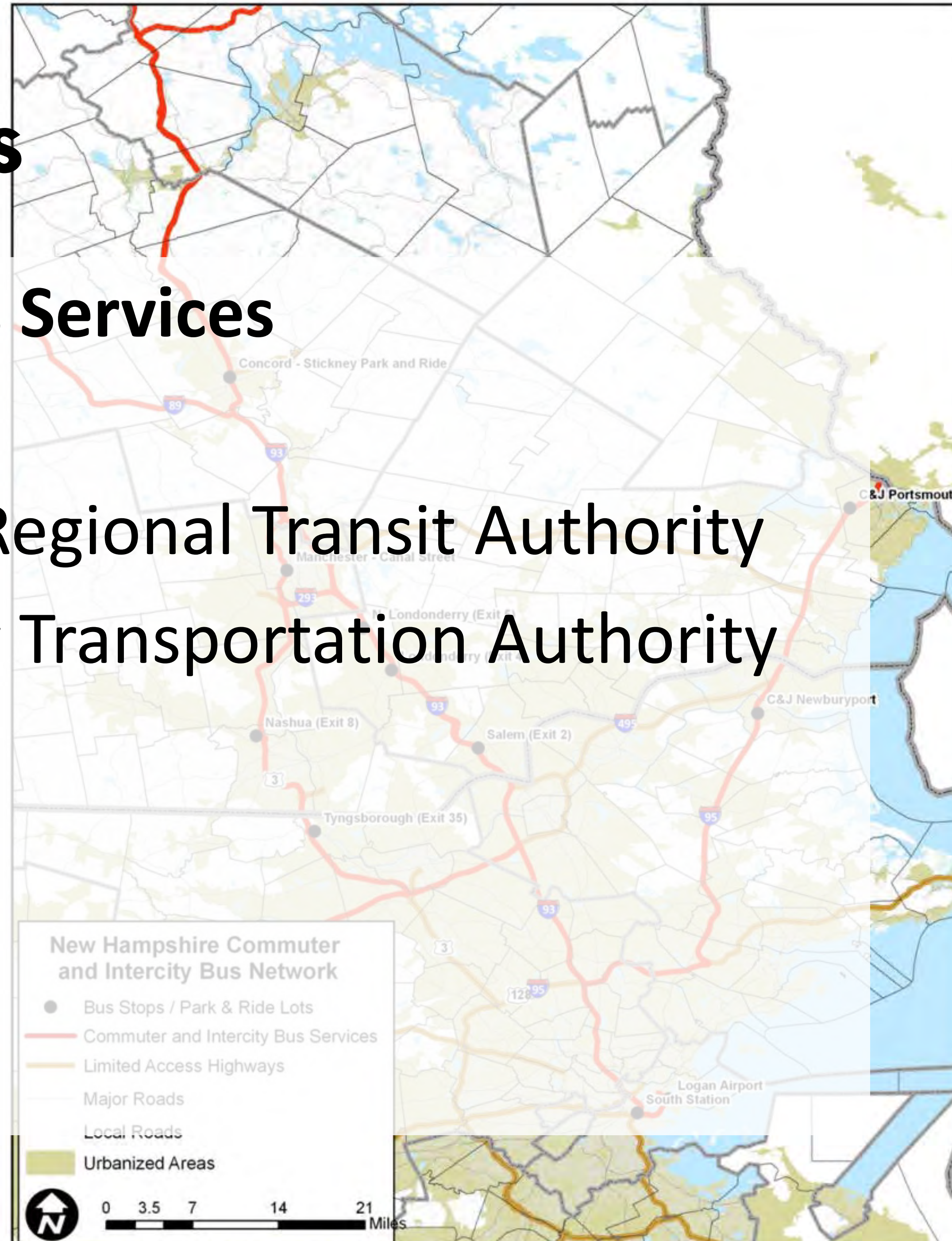
- Existing Services
- Conceptual Improvement Options



Existing Services

Corridor Express Bus Services

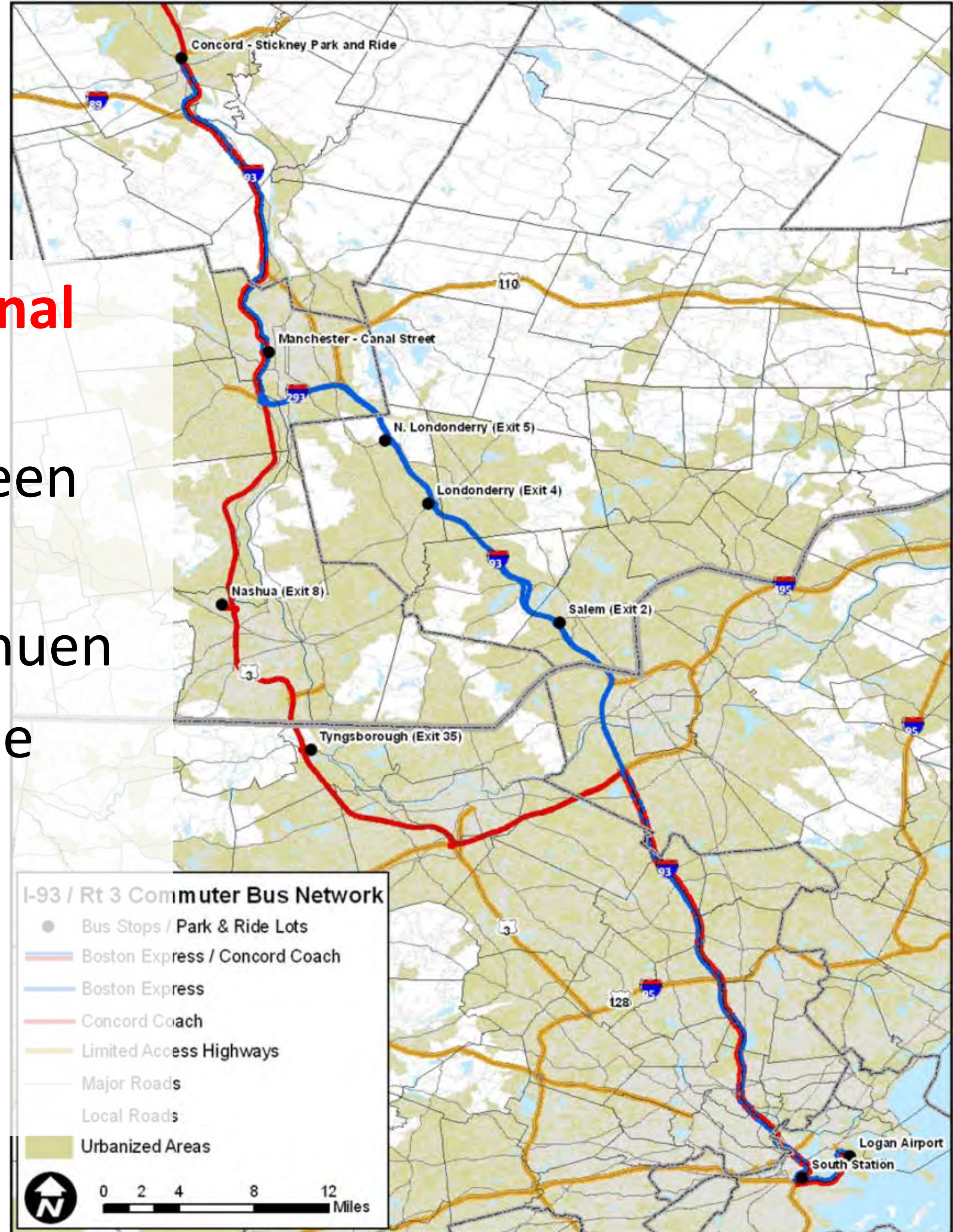
- Concord Coach
- Merrimack Valley Regional Transit Authority
- Massachusetts Bay Transportation Authority
- Boston Express



- 22 weekday trips
- 80 to 110 minutes Concord to Boston
- $0.21 to $0.22 per mile
- Limited service to other intermediate stops
- 4 trips to Littleton
- 2 trips extend to Berlin

Merrimack Valley Regional Transit Authority

- 8 weekday trips between Methuen and Boston
- 95 minutes from Methuen
- $0.14 to $0.17 per mile from Methuen
- 3 stops in Lawrence
- 3 stops in Andover



Massachusetts Bay Transportation Authority

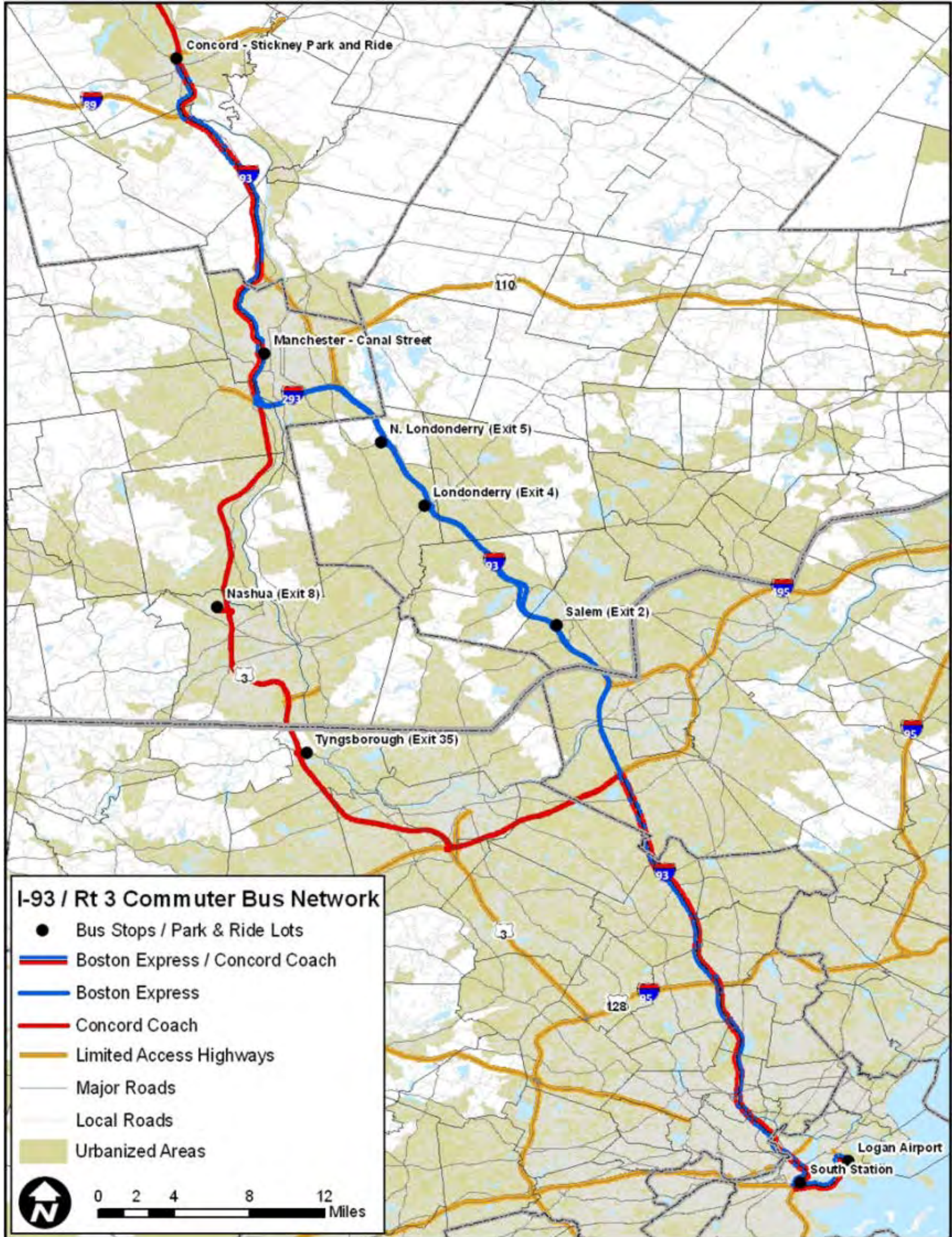
Four T routes use I-93

Burlington
- 38 trips
- 754 passengers

Woburn
- 23 trips
- 377 passengers

Medford (2 routes)
- 60 trips
- 792 passengers

Total (4 routes)
- 121 trips
- 1,923 passengers



80 Weekday Bus Trips

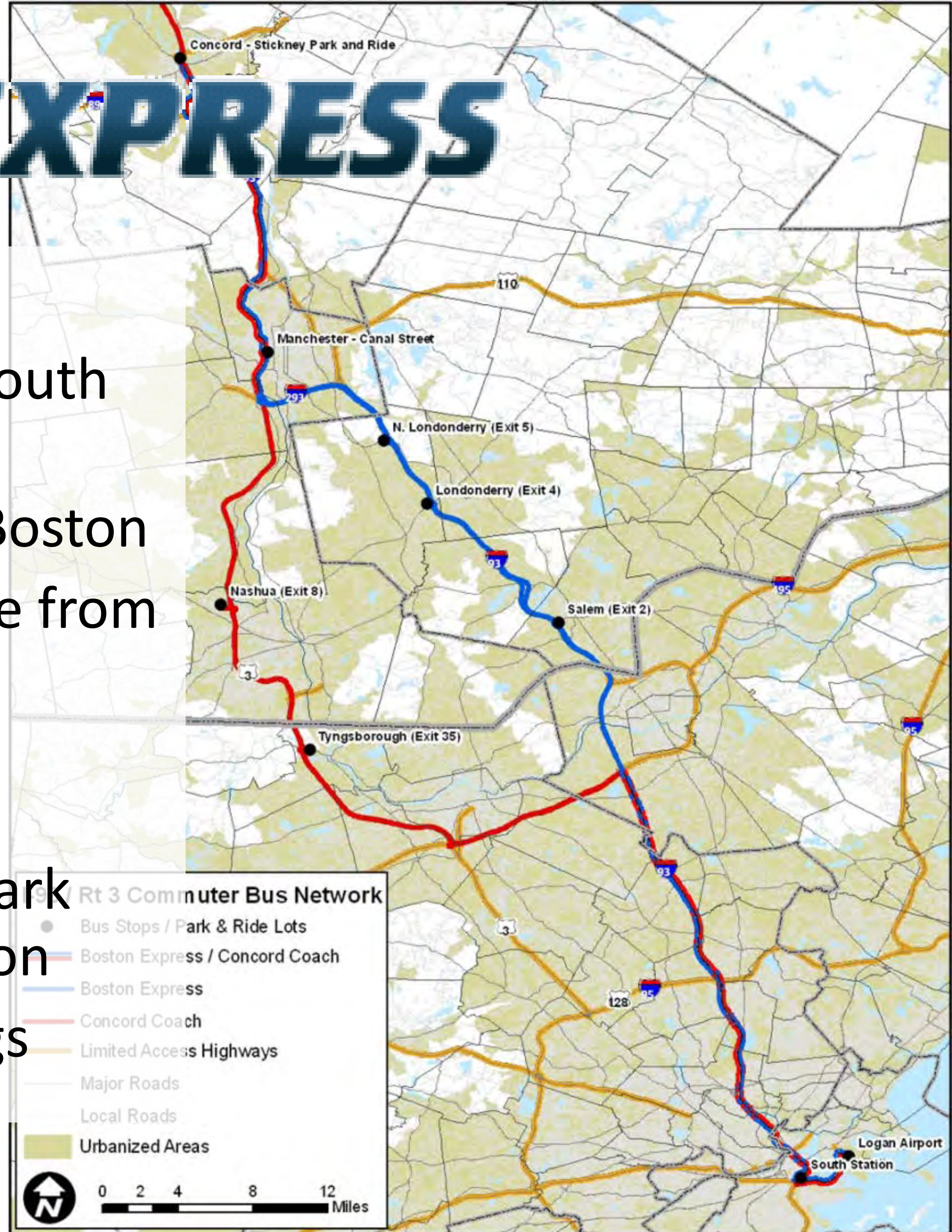
1,200 Weekday Boardings

- Manchester
- Nashua
- Londonderry
- Salem
- Tyngsboro (MA)

BOSTON EXPRESS

Everett Turnpike

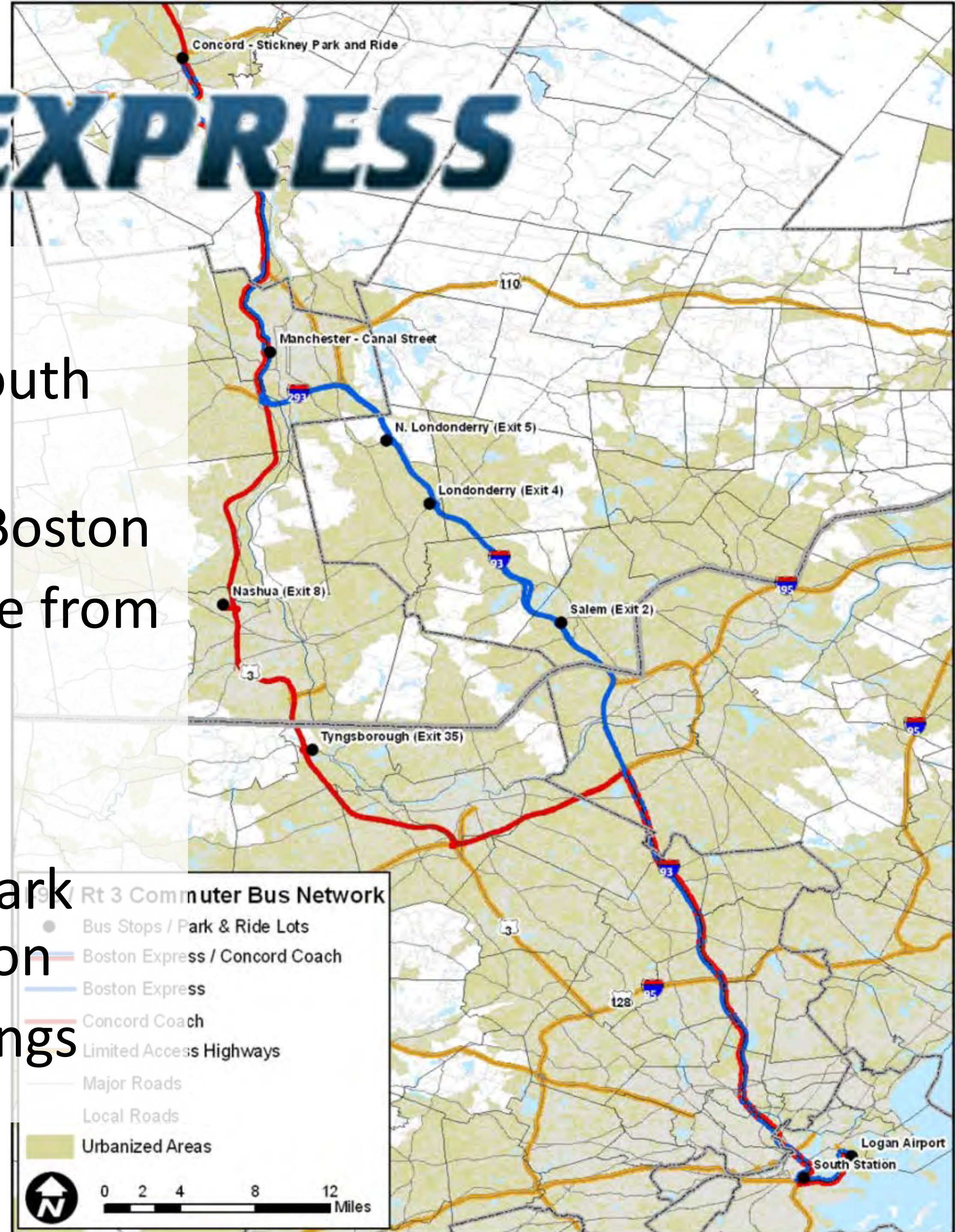
- 24 weekday trips for South Station
- 65 to 105 minutes to Boston
- $0.16 to $0.25 per mile from Nashua
- Serves Manchester (9), Nashua, Tyngsboro, Government Center, Park Street and South Station
- 600 weekday boardings



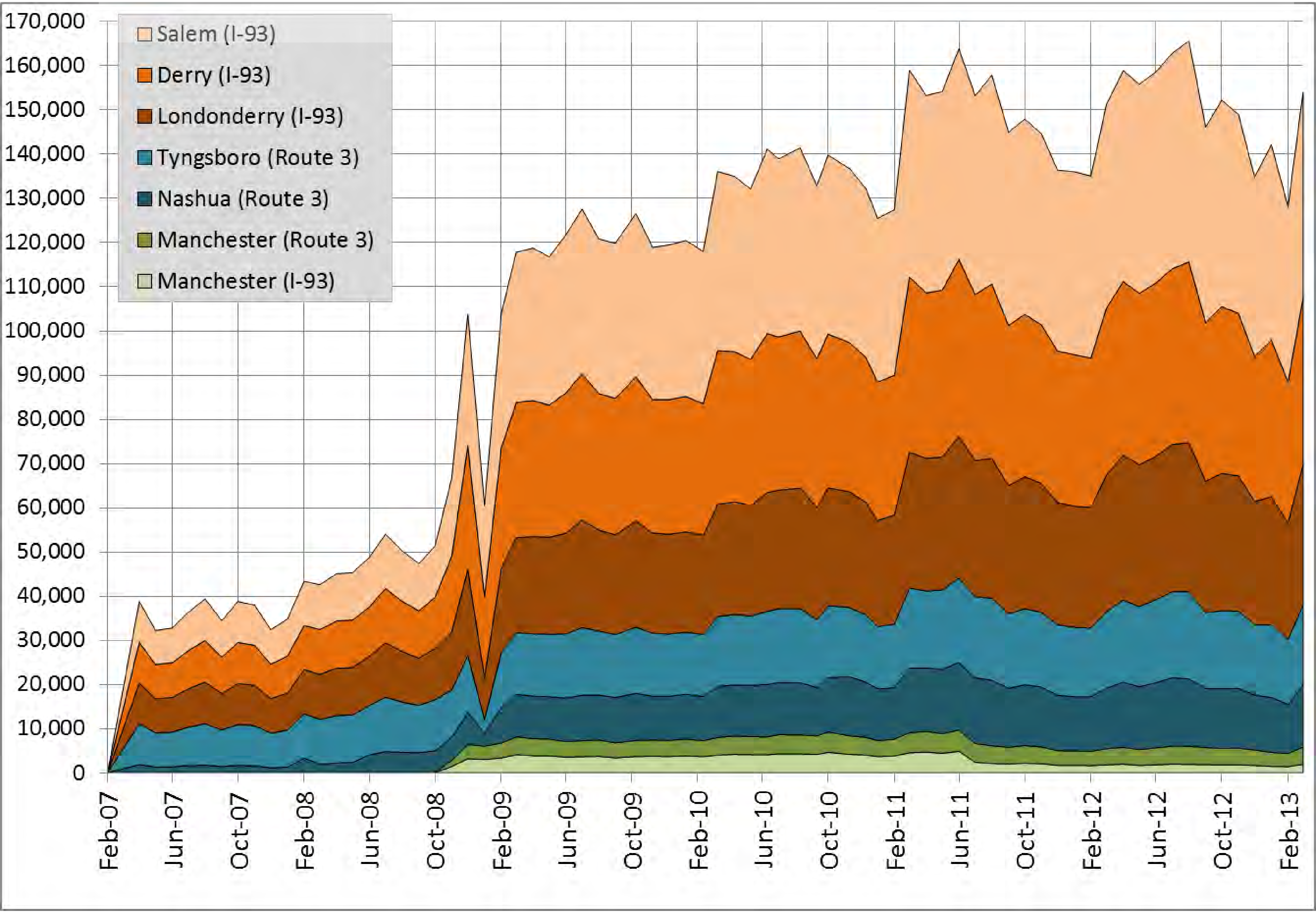
BOSTON EXPRESS

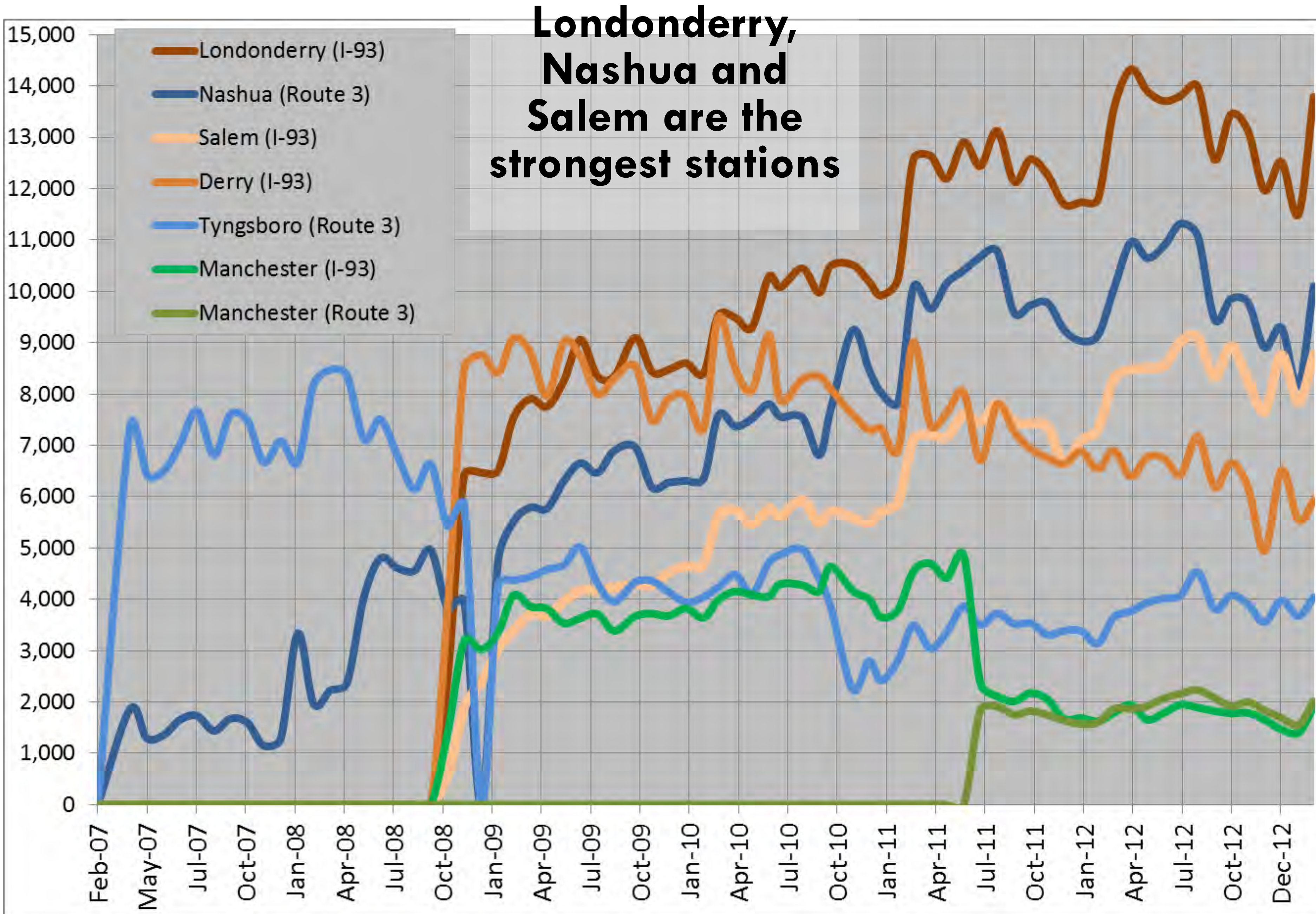
I-93 Service

- 56 weekday trips to South Station
- 65 to 100 minutes to Boston
- $0.18 to $0.25 per mile from Londonderry
- Serves Manchester (9), Londonderry. Salem, Government Center, Park Street and South Station
- 1,200 weekday boardings



Boston Express: Six Years of Ridership Growth





Londonderry, Nashua and Salem are the strongest stations
Londonderry (I-93)
Nashua (Route 3)
Salem (I-93)
Derry (I-93)
Tyngsboro (Route 3)
Manchester (I-93)
Manchester (Route 3)
15,000
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Feb-07
May-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
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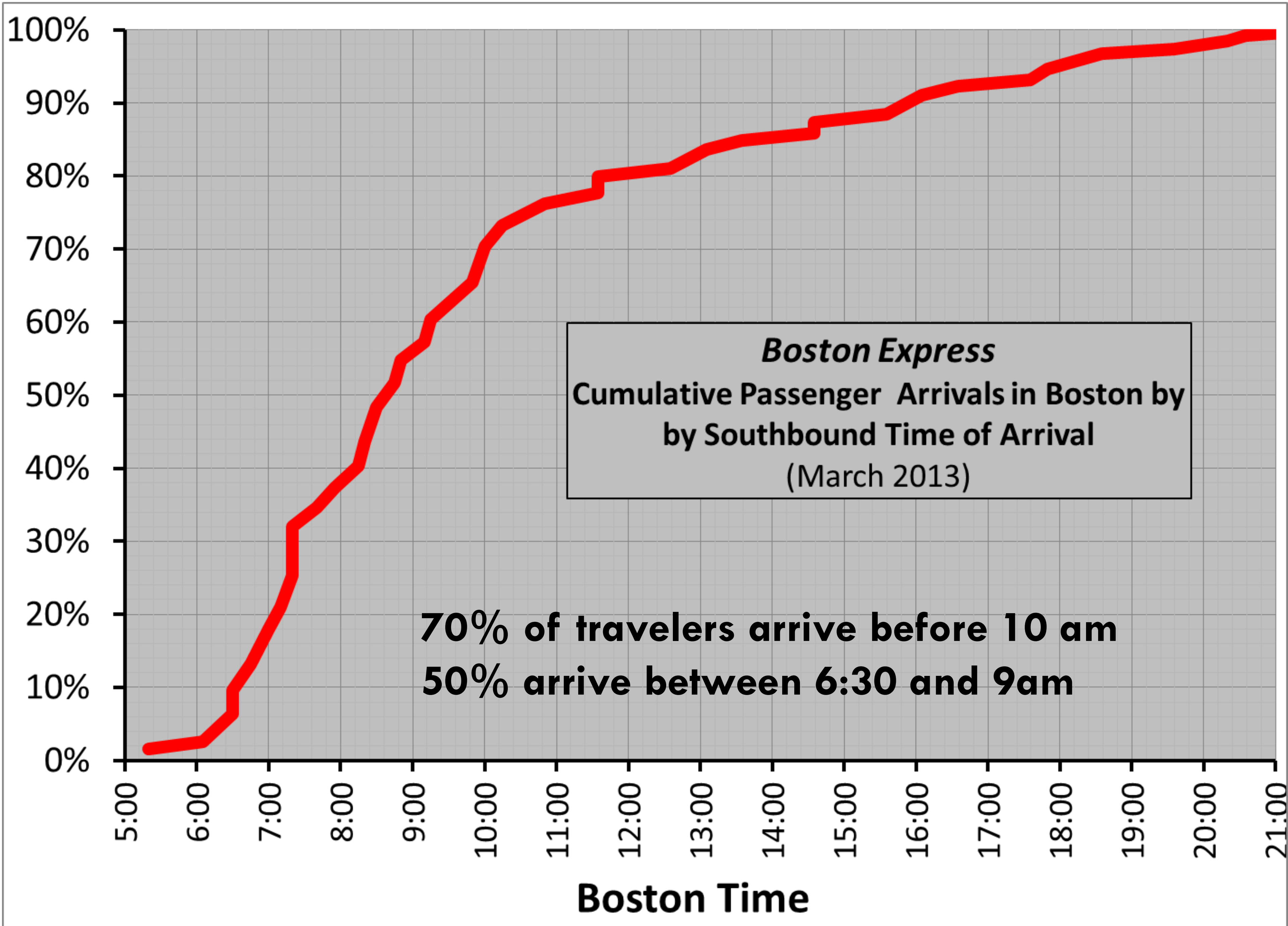
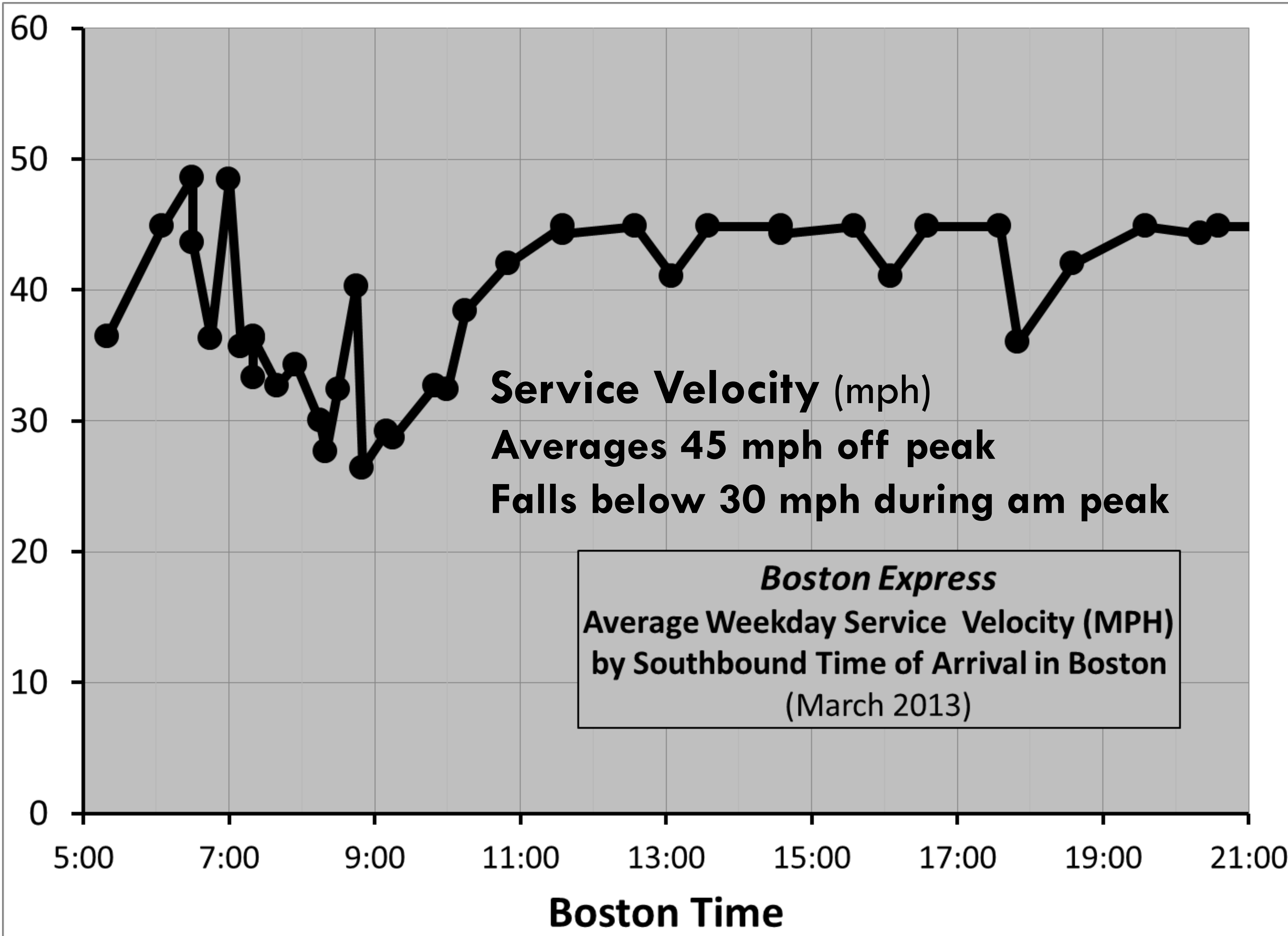
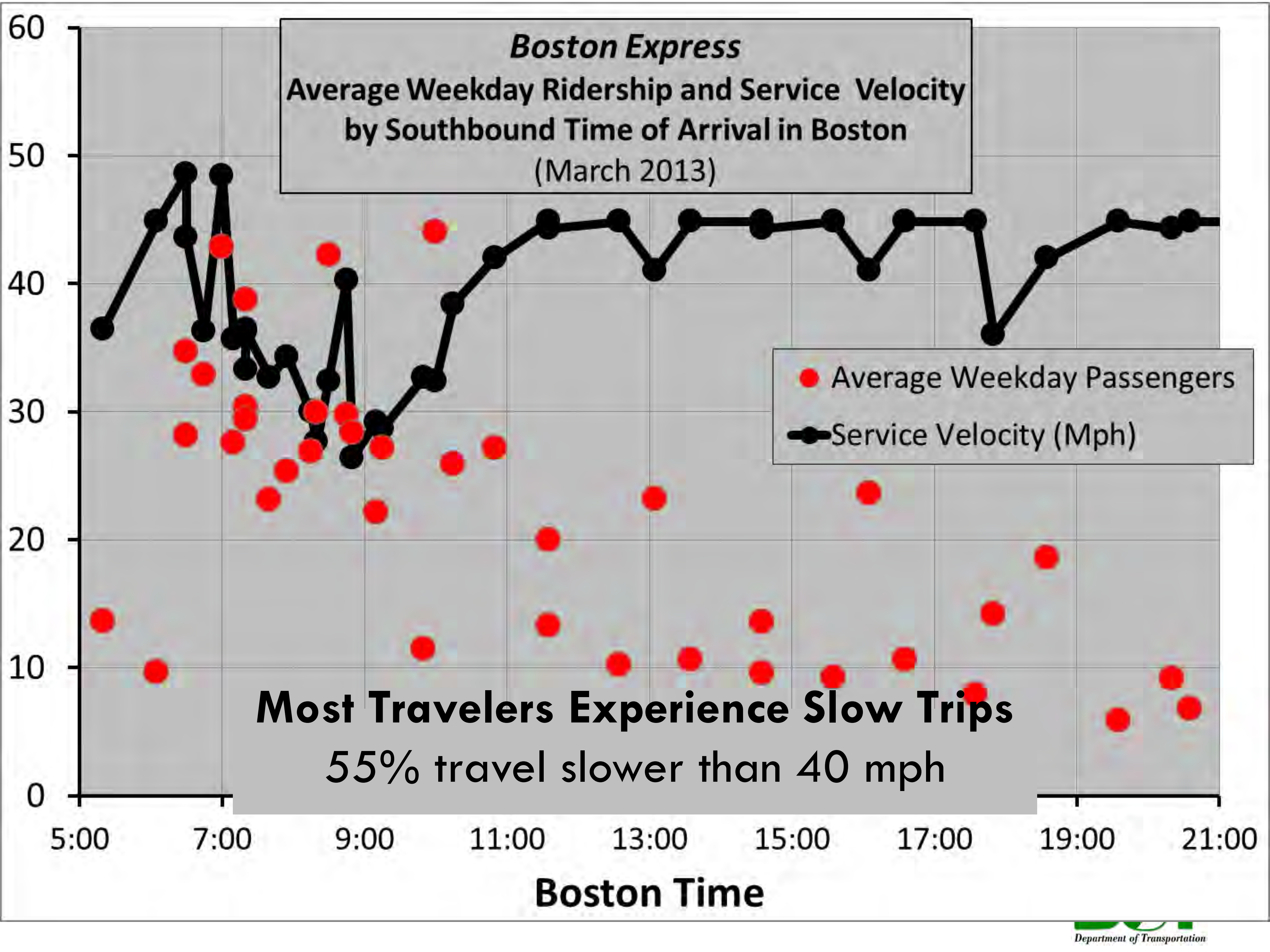
Apr-12
Jul-12
Oct-12
Dec-12

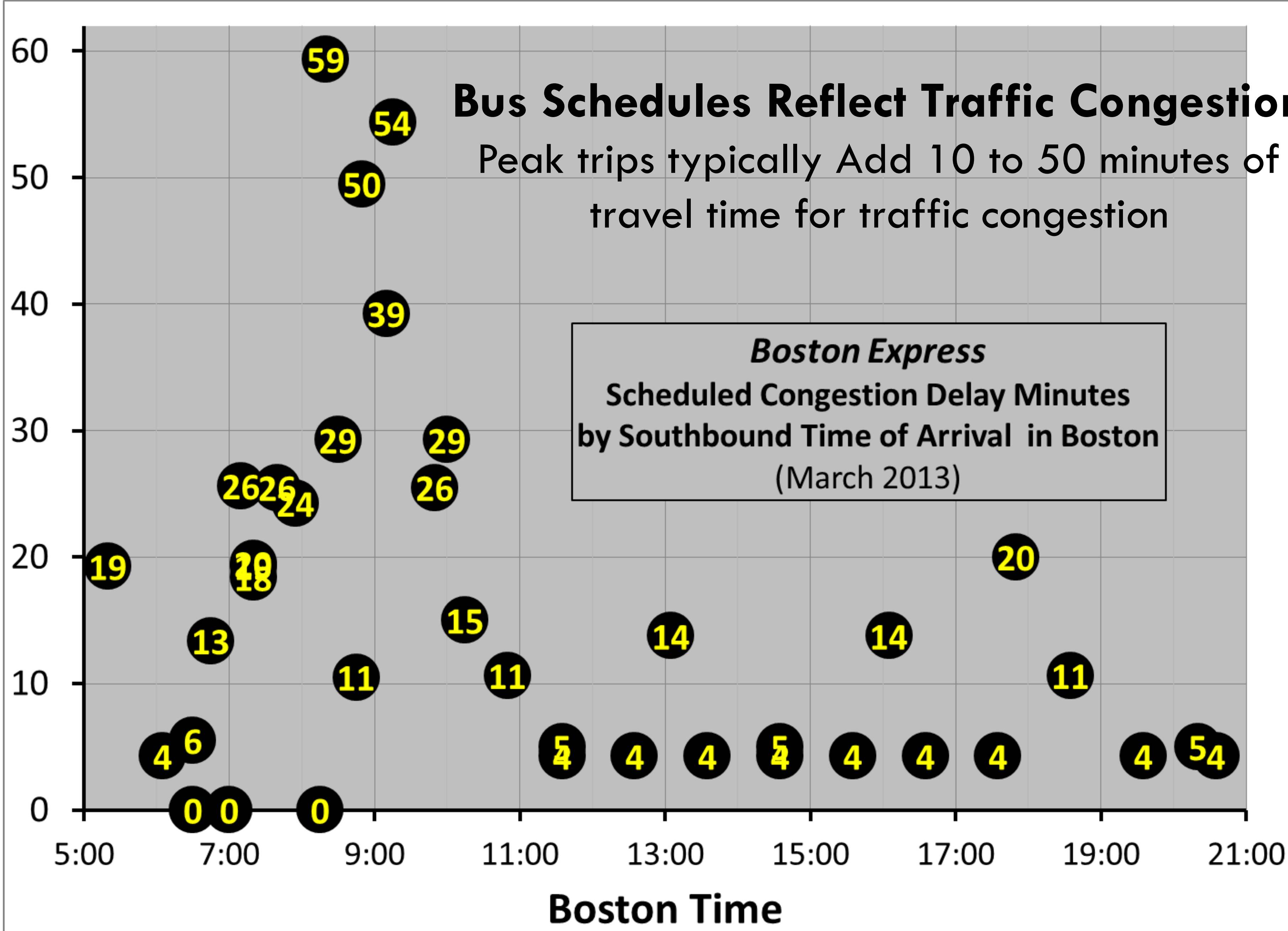


Department of Transportation

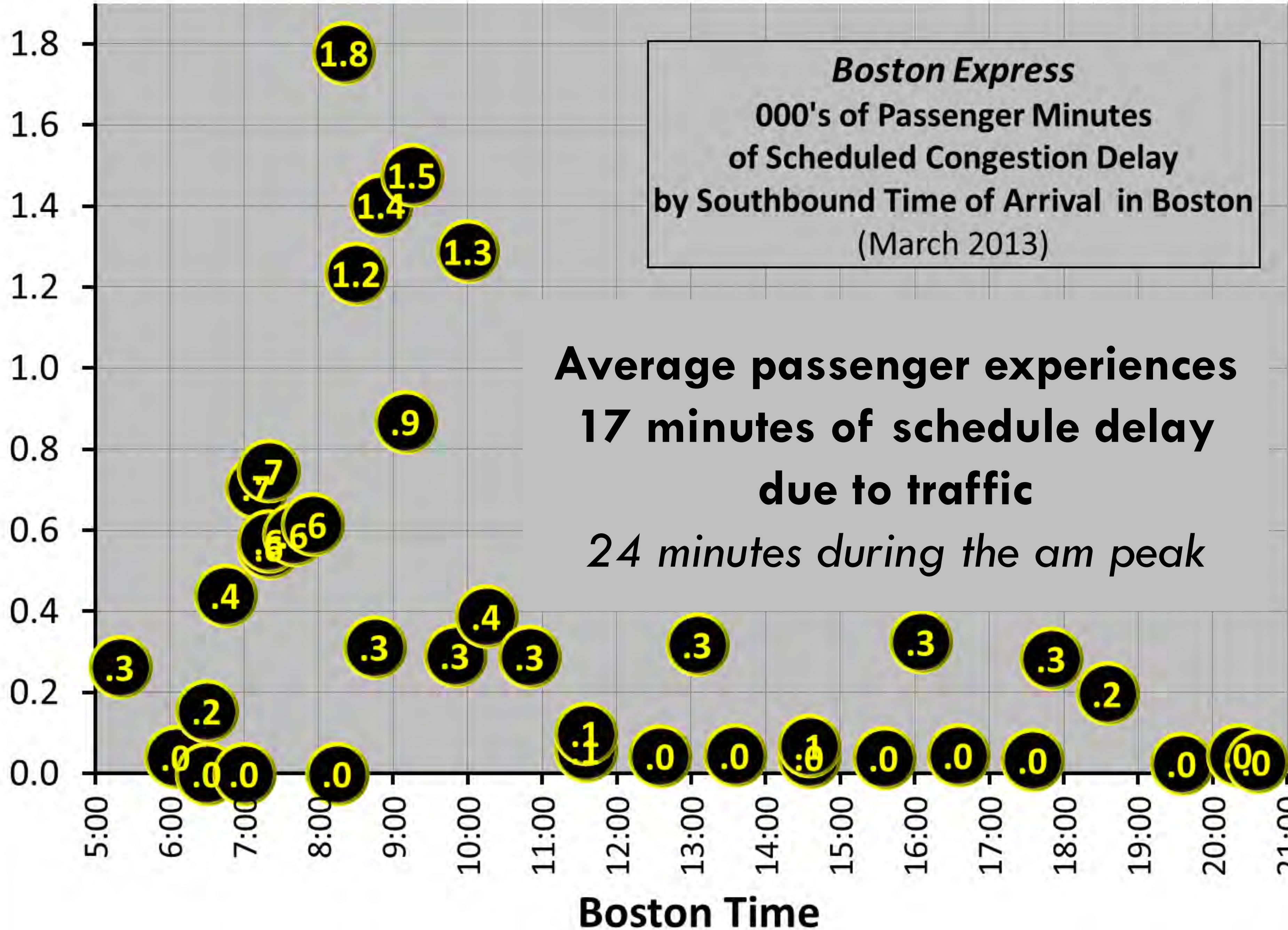


Department of Transportation


Boston Express
Average Weekday Ridership and Service Velocity
by Southbound Time of Arrival in Boston
(March 2013)
Average Weekday Passengers
Service Velocity (Mph)
Most Travelers Experience Slow Trips
55% travel slower than 40 mph
0
10
20
30
40
50
60
5:00
7:00
9:00
11:00
13:00
15:00
17:00
19:00
21:00
Boston Time
Department of Transportation



New Hampshire DOT Department of Transportation



Department of Transportation

Concerning Bus Service

~5,000 daily bus passengers from NH and MA are slowed by highway traffic on I-93 every day

Many “choice riders” avoid the bus because its no faster than driving

What can be done?

1. Isolate buses from traffic congestion
2. Exploit an alternative route that is free of traffic

Isolating Buses from Traffic Congestion

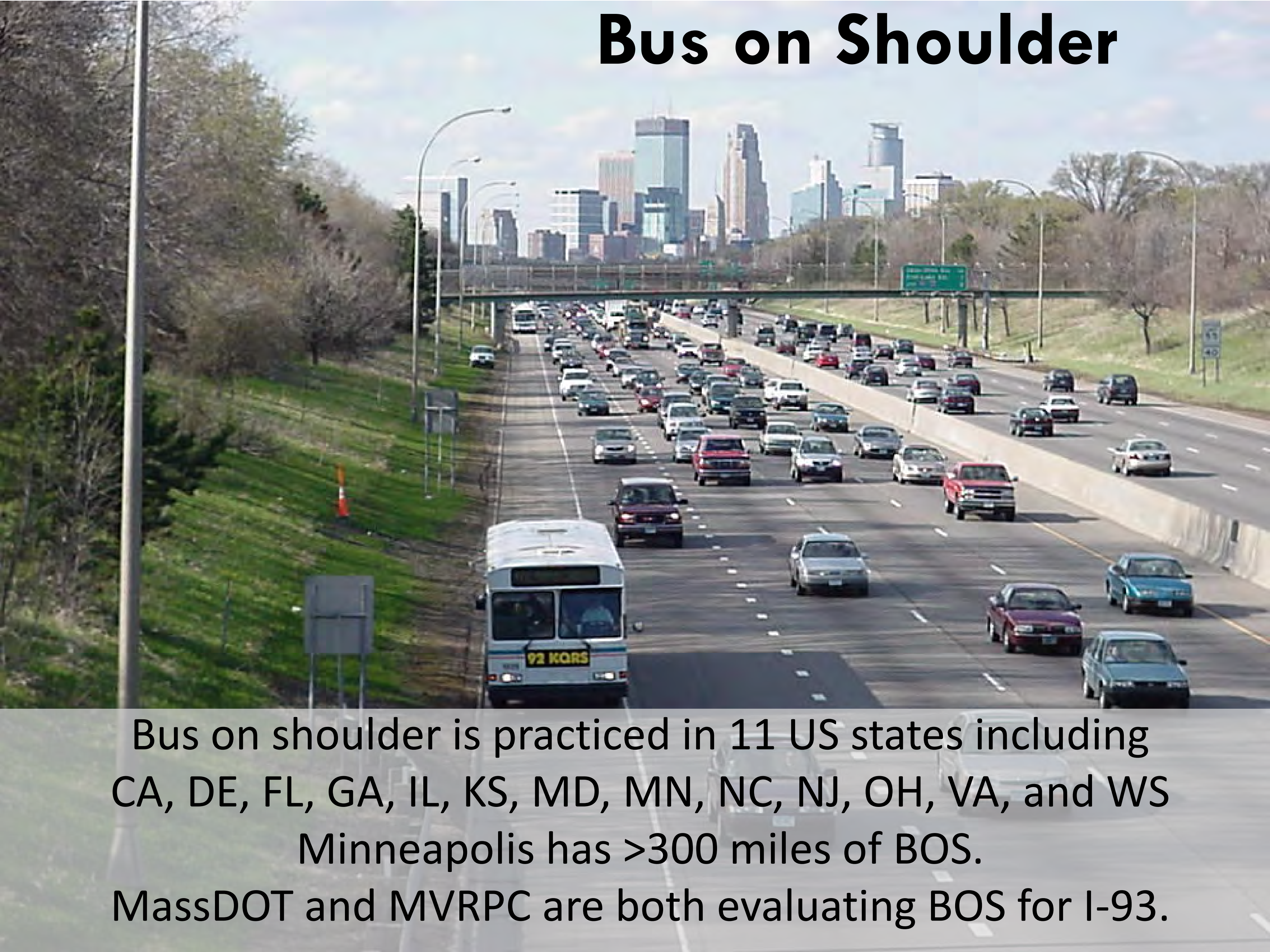
Bus on Shoulder

Allow buses to drive on the shoulder of the highway to avoid traffic jams

Buses on Shoulder

Bus on shoulder operation allows buses to bypass traffic, maintain schedules and enhance velocity

Bus on Shoulder



Bus on shoulder is practiced in 11 US states including CA, DE, FL, GA, IL, KS, MD, MN, NC, NJ, OH, VA, and WS

Minneapolis has >300 miles of BOS.

MassDOT and MVRPC are both evaluating BOS for I-93.

Exploiting a traffic-free route

Commuter Rail

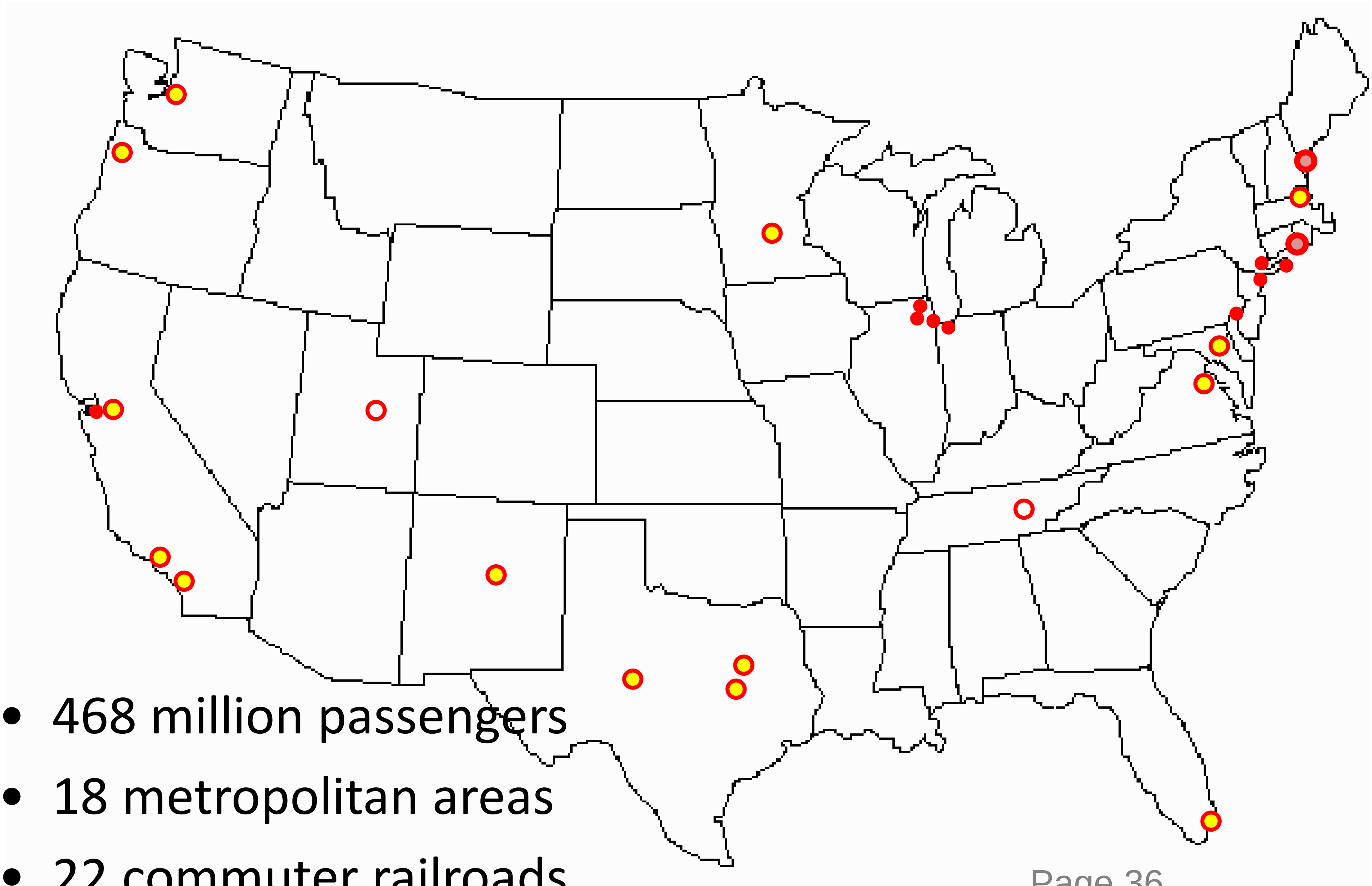
Uses conventional railway tracks to offer local passenger service in urban areas

Commuter Rail
Fastest Growing Transit Mode in the USA

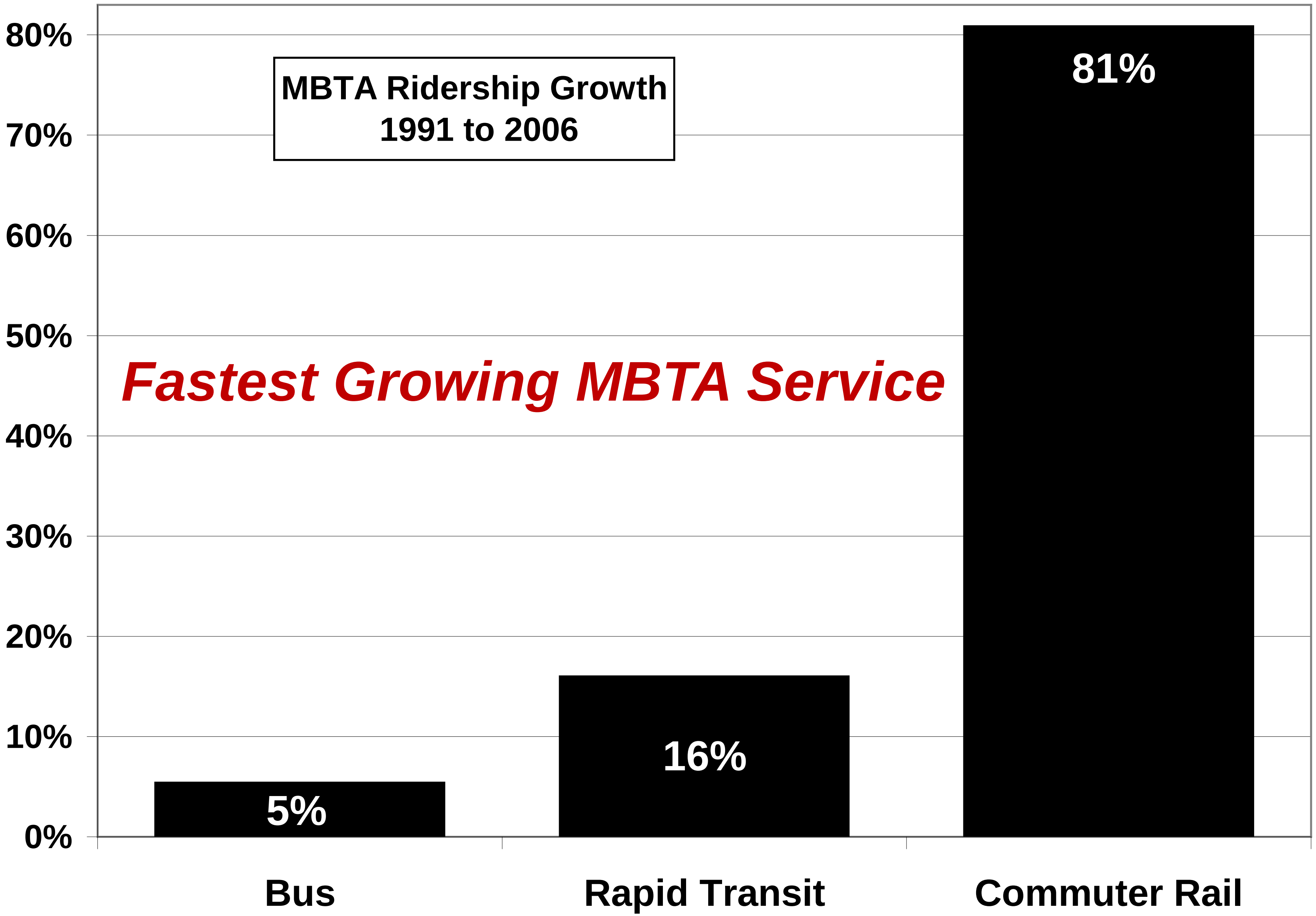
US Commuter Railroads: 1980

- 280 million passengers
- 8 metropolitan areas
- ~14 commuter railroads

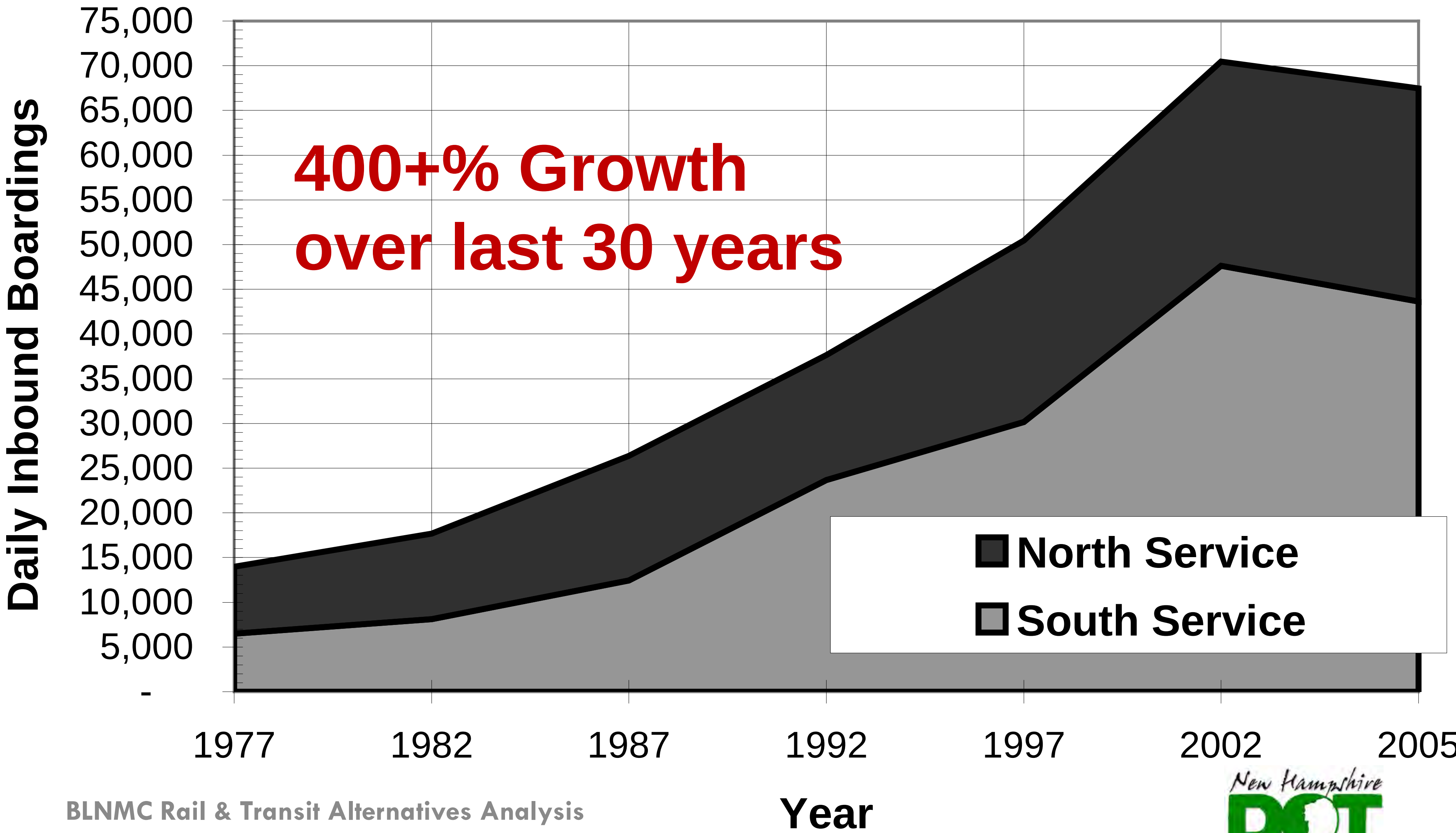
US Commuter Railroads: 2012



- 468 million passengers
- 18 metropolitan areas
- 22 commuter railroads


MBTA Ridership Growth
1991 to 2006
Fastest Growing MBTA Service
80%
70%
60%
50%
40%
30%
20%
10%
0%
5%
16%
81%
Bus
Rapid Transit
Commuter Rail

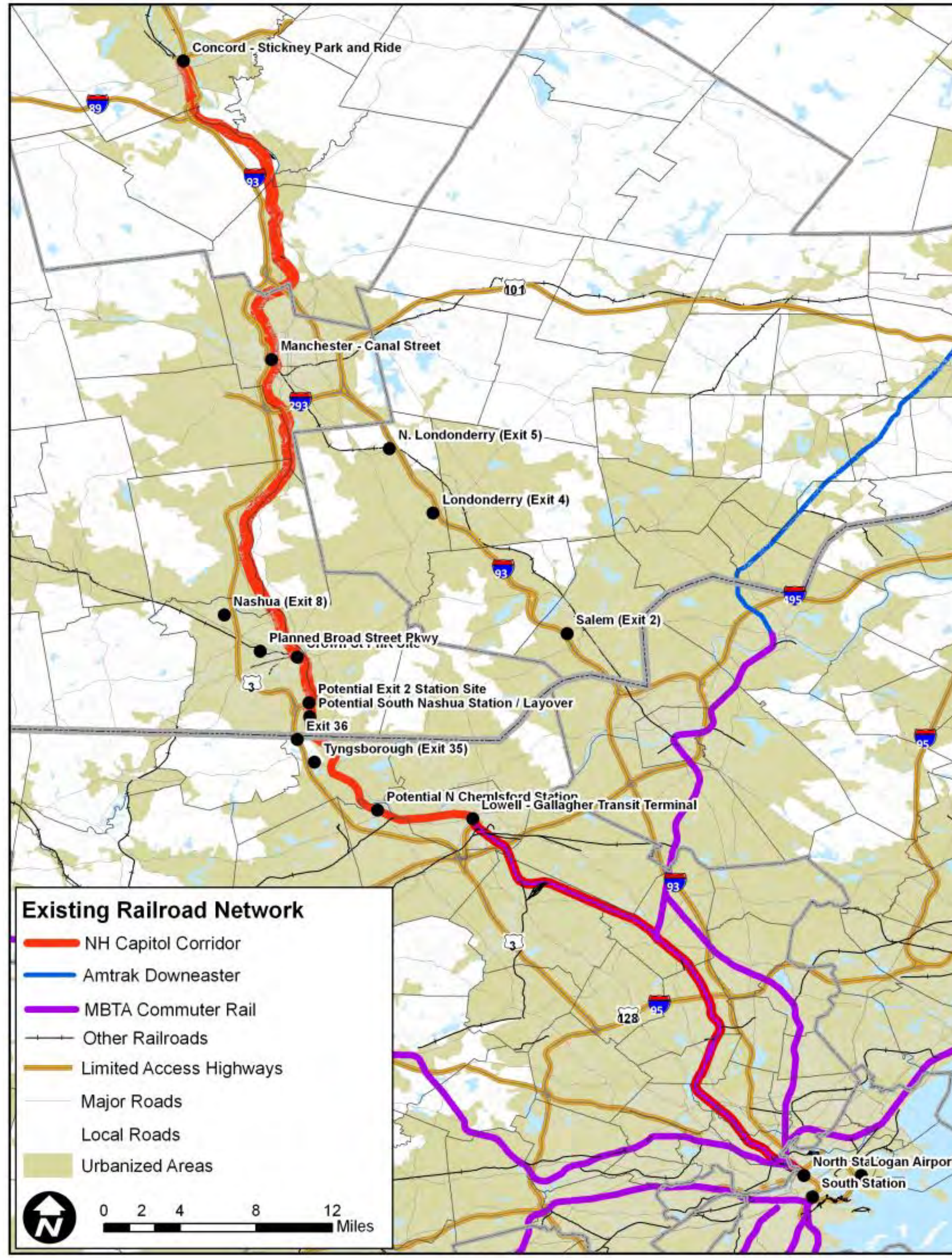
MBTA Commuter Rail Service
30 Year Ridership Growth Trends



MBTA Commuter Rail: Thirty Five Years of Expansion

New Hampshire Main Line (NHML)

- Opened in Oct 1838
- 175 years of continuous service
- Passenger service north of Lowell abandoned in 1967
- Passenger service briefly restored in 1980



New Hampshire Main Line (NHML)

Passenger Service Presently Runs North to Lowell

- 68 weekday passenger trains to North Station
- 10 Amtrak Portland Trains via Woburn (1,400 daily passengers)
- 44 MBTA Trains to/from Lowell (17,500 weekday passengers)

New Hampshire Main Line: Current Schedule of Weekday Passenger Trains

READ DOWN		302	304	352	306	208	680	308	310	212	356	312	358	314	682	316	318	320	322
Concord NH	73.3																		
Manchester NH	55.7																		
MHT Airport (Goff's Falls)	52.0																		
Nashua Crown St	39.0																		
Nashua Spitbrook	35.2																		
Tyngsboro	32.1																		
No Chelmsford	28.9																		
Lowell	25.5	5:35	6:18		6:51			7:18	7:46			8:25		9:15		10:15	11:15	12:15	13:15
North Billerica	21.8	5:43	6:26		6:59			7:26	7:54			8:33		9:23		10:23	11:23	12:23	13:23
Wilmington	15.2	5:51	6:34		7:06	7:22		#N/A	#N/A	8:07		8:41		9:31		10:31	11:31	12:31	13:31
Anderson/ Woburn	12.6	5:55	6:38	6:55	7:13	#N/A	*7:31*	7:38	8:05	8:12	8:30	8:45	9:15	9:35	*10:04*	10:35	11:35	12:35	13:35
Winchester Center	7.8	6:02	6:46	7:04	7:21	#N/A	#N/A	7:46	#N/A	8:20	8:39	8:52	9:23	9:42	#N/A	10:42	11:42	12:42	13:42
Wedgemere	7.3	6:04	6:49	7:06	7:24	#N/A	#N/A	7:49	#N/A	8:23	8:41	8:54	9:26	9:44	#N/A	10:44	11:44	12:44	13:44
West Medford	5.5	6:08	6:53	7:10	7:28	#N/A	#N/A	7:53	#N/A	8:27	8:45	8:58	9:30	9:48	#N/A	10:48	11:48	12:48	13:48
North Station	0.0	6:22	7:05	7:22	7:40	7:48	*7:55*	8:05	8:26	8:39	8:57	9:10	9:42	9:59	*10:30*	10:59	11:59	12:59	13:59

READ DOWN		222	324	684	326	328	686	360	232	330	334	336	236	338	340	342	688	344	346
Concord NH	73.3																		
Manchester NH	55.7																		
MHT Airport (Goff's Falls)	52.0																		
Nashua Crown St	39.0																		
Nashua Spitbrook	35.2																		
Tyngsboro	32.1																		
No Chelmsford	28.9																		
Lowell	25.5		14:15		15:15	16:15				17:10	17:45	18:10		18:55	19:25	20:30		21:30	22:35
North Billerica	21.8		14:23		15:23	16:23				17:18	17:53	18:18		19:03	19:33	20:38		21:38	22:43
Wilmington	15.2	13:37	14:31		15:31	16:31				17:26	18:01	18:26	19:00	19:11	19:41	20:46		21:46	22:51
Anderson/ Woburn	12.6	13:43	14:35	*14:54*	15:35	16:35	*16:39*	16:55	17:11	17:30	18:05	18:30	19:04	19:15	19:45	20:50	*20:59*	21:50	22:55
Winchester Center	7.8	13:50	14:42	#N/A	15:42	16:42	#N/A	#N/A	#N/A	17:37	18:12	18:37	#N/A	19:22	19:52	20:57	#N/A	21:57	23:02
Wedgemere	7.3	13:52	14:44	#N/A	15:44	16:44	#N/A	#N/A	#N/A	17:39	18:14	18:39	#N/A	19:24	19:54	20:59	#N/A	21:59	23:04
West Medford	5.5	13:56	14:48	#N/A	15:48	16:48	#N/A	#N/A	#N/A	17:43	18:18	18:43	#N/A	19:28	19:58	21:03	#N/A	22:03	23:08
North Station	0.0	14:07	14:59	*15:15*	15:59	16:59	*17:05*	17:15	17:32	17:56	18:31	18:54	19:25	19:41	20:09	21:14	*21:20*	22:14	23:20

READ UP		301	351	305	307	355	309	357	681	311	315	317	683	319	321	323	325
Concord NH	73.3																
Manchester NH	55.7																
MHT Airport (Goff's Falls)	52.0																
Nashua Crown St	39.0																
Nashua Spitbrook	35.2																
Tyngsboro	32.1																
No Chelmsford	28.9																
Lowell	25.5	6:29		7:30	8:11		8:56			9:54	10:54	11:54		12:54	13:54	14:54	15:54
North Billerica	21.8	6:22		7:21	8:02		8:47			9:47	10:47	11:47		12:47	13:47	14:47	15:47
Wilmington	15.2	6:14		7:13	7:54		8:39			9:39	10:39	11:39		12:39	13:39	14:39	15:39
Anderson/ Woburn	12.6	6:10	6:45	7:08	7:50	8:17	8:35	9:02	*9:23*	9:35	10:35	11:35	*11:53*	12:35	13:35	14:35	15:35
Winchester Center	7.8	6:03	#N/A	7:01	7:43	#N/A	8:28	#N/A	#N/A	9:28	10:28	11:28	#N/A	12:28	13:28	14:28	15:28
Wedgemere	7.3	6:01	#N/A	#N/A	7:41	#N/A	8:26	#N/A	#N/A	9:26	10:26	11:26	#N/A	12:26	13:26	14:26	15:26
West Medford	5.5	5:57	#N/A	6:57	7:37	#N/A	8:22	#N/A	#N/A	9:22	10:22	11:22	#N/A	12:22	13:22	14:22	15:22
North Station	0.0	5:45	6:25	6:45	7:25	7:55	8:10	8:40	*9:05*	9:10	10:10	11:10	*11:35*	12:10	13:10	14:10	15:10

READ UP		327	359	359	685	331	333	335	337	687	237	339	341	343	345	689	347
Concord NH	73.3																
Manchester NH	55.7																
MHT Airport (Goff's Falls)	52.0																
Nashua Crown St	39.0																
Nashua Spitbrook	35.2																
Tyngsboro	32.1																
No Chelmsford	28.9																
Lowell	25.5	16:58		17:31		17:59	18:10	18:39	19:12			20:15	21:14	22:24	23:24		0:54
North Billerica	21.8	16:51		17:21		17:52	18:03	18:32	19:05			20:08	21:07	22:17	23:17		0:47
Wilmington	15.2	16:43		17:13		17:43	17:55	18:23	18:57		19:23	20:00	21:00	22:09	23:09		0:39
Anderson/ Woburn	12.6	16:38	16:45	17:08	*17:18*	17:38	17:50	18:18	18:52	*19:03*	19:19	19:55	20:55	22:05	23:05	*23:18*	0:35
Winchester Center	7.8	16:30	16:38	17:00	#N/A	17:30	#N/A	18:10	18:44	#N/A	19:12	19:48	20:48	21:58	22:58	#N/A	0:28
Wedgemere	7.3	16:27	16:36	16:57	#N/A	17:27	#N/A	18:07	18:41	#N/A	19:10	19:46	20:46	21:56	22:56	#N/A	0:26
West Medford	5.5	16:23	16:32	16:53	#N/A	17:23	#N/A	18:03	18:37	#N/A	19:06	19:42	20:42	21:52	22:52	#N/A	0:22
North Station	0.0	16:10	16:20	16:40	*17:00*	17:10	17:30	17:50	18:25	*18:45*	18:55	19:30	20:30	21:40	22:40	*23:00*	0:10

New Hampshire DOT Department of Transportation

MBTA NHML Service, Ridership and Revenue Statistics

Station	Mile Post	Weekday Revenue Trains		Typical Weekday Passengers On or Off (MBTA Only)	MBTA Cash Fare	Average Revenue per Passenger Boarding (MBTA Only)	Typical Total Weekday Passenger Revenue (MBTA Only)
		MBTA	Amtrak				
Lowell	25.5	44		4,282	$6.75	$6.67	$28,566
North Billerica	21.8	44		2,854	$6.25	$6.38	$18,195
Wilmington	15.2	47		1,516	$5.25	$5.09	$7,711
Woburn	12.6	57	10	3,486	$4.75	$4.77	$16,640
Mishawum	11.9	6		100	$4.75	$4.95	$495
Winchester	7.8	49		2,004	$4.25	$4.34	$8,701
Wedgemere	7.3	48		1,480	$4.25	$4.36	$6,459
W. Medford	5.5	49		1,768	$1.70	$1.83	$3,244
North Station	0	58	10				
Totals		58	10	17,490		$5.15	$90,011

Source: MBTA Conductor's Audit Reports Thursday - February 9, 2012 and Jacobs Analysis

Four Preliminary Service Options

Option	Weekday Revenue Trains			Route Miles	Track Miles	Stations	Weekday Train Miles
	Nashua	Manchester	Concord				
1. Concord Regional	30	8	8	73	115	14	1,957
2. Manchester Regional	34	16		56	98	13	2,068
3. Nashua Commuter	34			39	80	11	1,888
4. Nashua Minimum	16			39	80	11	1,566
Base				26	53	8	1,452

Extend Existing MBTA Service

Generally Transparent to Existing MBTA Customers

No Impacts on Amtrak Service

Double Track to Nashua: Single Track with Sidings to the North

Four Preliminary Service Options

Option	Weekday Revenue Trains			Minutes to Boston		
	Nashua	Manchester	Concord	Nashua	Manchester	Concord
1. Concord Regional	30	8	8	~70	~90	~110
2. Manchester Regional	34	16		~70	~90	
3. Nashua Commuter	34			~70		
4. Nashua Minimum	16			~70		

What's Next for Service Design?

- Feedback on MBTA Conceptual Options
- Develop Amtrak Options
- Develop Rail/Bus Options
  - Subsets of Concord Regional and Nashua Commuter Service with complementary bus service
  - Bus only options with Bus On Shoulder operations
- Confirm Railway Assumptions
  - Railway Engineering and Simulation
- Preliminary estimates of costs and revenues to guide financial planning and service refinements

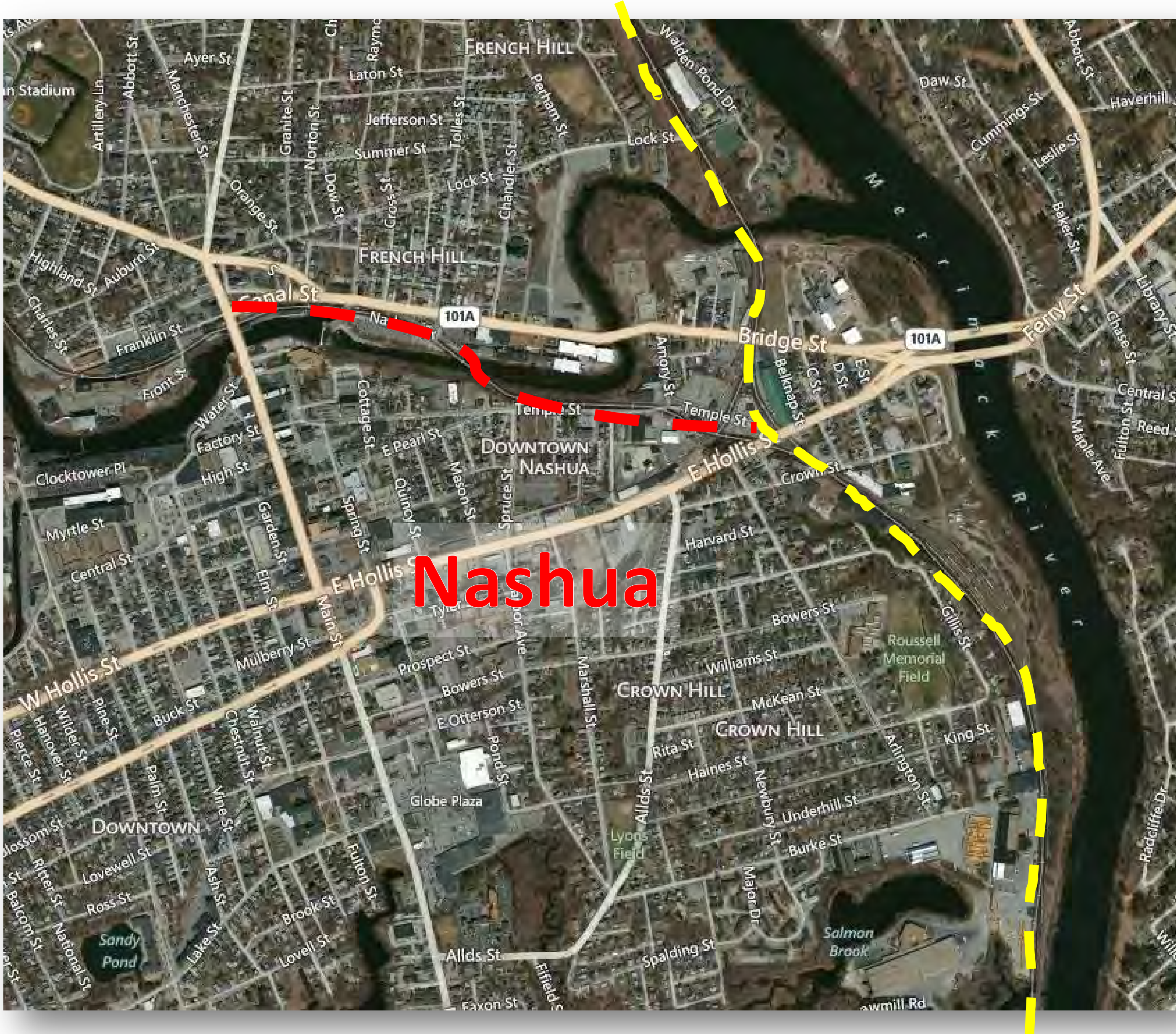
Critical Issues

- Most frequently identified benefit: attracting/retaining talented young professionals; importance of connection to Boston
- Markets that will drive success
  - Boston
  - All the rest
- Best “natural” transit market: South of Nashua
- Best “natural” TOD locations: Manchester, Concord
- Nashua station location(s)
- Manchester station location

New Hampshire DOT Department of Transportation


Concord
Civic District
Downtown
Merrimack River
White Park
Loudon Rd
Gully Hill Rd
Stickney Ave
N Main St
S Main St
N State St
S State St
Pearl St
Chapel St
Union St
N Spring St
Centre St
Washington St
Essex St
White St
Beacon St
Rumford St
Lyndon St
Jackson St
Church St
Highland St
Albin St
Green St
Storrs St
Blake St
Pleasant St
Warren St
Summit St
Tahanto St
Pine St
Holt St
Orchard St
Fayette St
Thompson St
Concord St
Monroe St
Thorndike St
Laurel St
Perley St
Downing St
Pelley St
South St
S Spring St
Industrial Dr
Dolloff Dr
Tobey Rd
Orchard Dr
93
202
3
9
13
14
15E


Manchester
Downtown
Riverwalk Place
Merrimack River
Everett Tpke
Verizon Wireless Arena
Northeast Delta Dental Stadium
Valley Cemetery
Gill Stadium
Elm St
Varney St
W Hancock St
Queen City Ave


Nashua
French Hill
French Hill
Downtown Nashua
Crown Hill
Crown Hill
Downtown
Canal St
Bridge St
101A
101A
Ferry St
E Hollis St
W Hollis St
Temple St
Ayer St
Laton St
Jefferson St
Summer St
Lock St
Lock St
Walden Pond Dr
Perham St
Chandler St
Tolles St
Gross St
Dow St
Norton St
Granite St
Orange St
Manchester St
Abbott St
Artillery Ln
Highland St
Auburn St
Charles St
Franklin St
Front St
Water St
Factory St
High St
Clocktower Pl
Myrtle St
Central St
Garden St
Elm St
Main St
Cottage St
E Pearl St
Spring St
Quincy St
Mason St
Spruce St
Armory St
Belknap St
C St
D St
E St
Crown St
Harvard St
Bowers St
Williams St
McKean St
King St
Arlington St
Gillis St
Roussel Memorial Field
Merrimack River
Daw St
Cummings St
Leslie St
Haverhill St
Baker St
Library St
Chase St
Central St
Fulton St
Reed St
Maple Ave
Radcliffe Dr
Mulberry St
Prospect St
Bowers St
E Otterson St
Pond St
Marshall St
Allds St
Rita St
Haines St
Newbury St
Underhill St
Burke St
Major Dr
Spalding St
Salmon Brook
Lyons Field
Globe Plaza
Allds St
Faxon St
Buck St
Pine St
Wilder St
Hanover St
Pierce St
Palm St
Chestnut St
Walnut St
Vine St
Ash St
Fulton St
Brook St
Lovell St
Lake St
Lovewell St
Ross St
Ritter St
Balcom St
National St
Sandy Pond

Critical Issues
(continued)

- Making the *transportation* case
- Biggest transportation problem: congestion in Massachusetts
- Making the financial and management case – early
- "Solid case for economic benefits;" honestly quantifying them
- Value-capture financing (free-lunch problem); need dedicated funding source? (tax problem)

Critical Issues

(continued)

- "Zero net cost to MA"
- No impact on existing MBTA customers
- Making the MBTA/MassDOT case
- Rail freight benefits
- Airport benefits

BLNMC Corridor Financial Approach

- Financial plan describing project costs and sources of revenues
- Financial plan must correspond to governance plan, ie., how service is operated/by whom

BLNMC Corridor Financial Approach
(*continued*)

- Project costs include:
  - Capital – one-time costs to construct, plus replacement costs in the future
  - Operating and maintenance (O&M) – ongoing costs to operate and maintain the system in a state of good repair

How does the plan get developed?

- First: Identify project costs, both capital and O&M
  - Several alternatives to be considered: costs will be a consideration in the evaluation of alternatives
  - Forecast costs over time (Year of Expenditure $)

New Hampshire DOT Department of Transportation

How does the plan get developed? (*continued*)

- Second: Identify available sources of capital and O&M funds
  - Federal grants
  - Fares
- Next: Quantify gap between annual costs and net annual revenue needs

Next steps

- Quantify costs for each alternative
- Assemble and assess non-federal sources of funds, existing and new
  - Yield
  - Implementation issues
- Engage with financial subcommittee on funding options

Environmental Assessment

- Wetlands Mapping
- Threatened and Endangered Species
- Contamination Inventory
- Noise & Vibration Assessment
- Cultural Resources Assessment
- Air Quality Assessment (Emissions)
- Environmental Justice

Next PAC Meeting(s)

- Quarterly
- Next meeting: August 2013

APPENDIX H

Capitol Corridor Public Meetings

New Hampshire DOT
Department of Transportation

APPENDIX H

Capitol Corridor Public Meetings – November 20, 2014

New Hampshire DOT Department of Transportation

Boston-Lowell-Nashua-Manchester-Concord (BLNMC)
Rail & Transit Alternatives Analysis Legal Notice

The New Hampshire Department of Transportation will hold a public meeting on November 20th in Nashua at the City Hall from 7:00 pm to 8:30 pm. The public is encouraged to attend and provide the Department with input on the final set of transportation alternatives for solutions to transportation problems that involve transit (bus and rail) and intercity rail options in the 73-mile corridor between Boston, MA and Concord, NH. This meeting will also provide the public with an opportunity to consider issues and concerns in the Environmental Assessment that is being prepared as part of the alternatives analysis.

The New Hampshire Department of Transportation is evaluating opportunities to improve inter-city rail and transit service in the corridor through a study jointly funded by the Federal Transit Administration (FTA) and the Federal Railroad Administration (FRA) that was approved by the Executive Council in February 2013. The study is an alternatives analysis with an environmental assessment that will examine rail and bus transit options, as well as intercity rail alternatives, to address transportation, economic development, sustainability, quality of life and environmental issues along the I-93 and Everett Turnpike corridors from Concord to Nashua with connections to Boston. Increasing transportation demand and growing concerns about mobility, economic development and quality of life have led citizens and officials in New Hampshire and Massachusetts to explore options to improve transit service between southern New Hampshire and Boston. The study evaluates a diverse set of rail and bus options for improving transportation by leveraging existing infrastructure, including the existing rail line, US Route 3 and I-93.

Thursday November 20, 2014
7:00PM – 8:30PM
Nashua Public Library, NPL Theater
2 Court Street, Nashua, NH 03060

Press Release

FOR IMMEDIATE RELEASE

November 20, 2014

Contact:
E.J. Powers
603.644.3200x11
epowers@montagnecom.com

Initial Capitol Corridor Rail Study Results Show Substantial Economic Impact for New Hampshire

Commuter rail expansion from Boston to Manchester could generate thousands of new jobs and residential units; provide boost to New Hampshire's economy

Nashua, NH – Preliminary results of the two-year study on the expansion of passenger rail service along the 73 mile stretch from Boston to Concord known as the NH Capitol Corridor are in - and the benefits to New Hampshire's economy are significant. According to initial study findings, establishing four commuter rail stops between Lowell, MA and downtown Manchester (known as the Manchester Regional Rail alternative) would draw a minimum of 668,000 riders a year, leading to the creation of 5,600 jobs supporting 3,600 new residential units along the corridor. The preliminary study findings can be found at www.nhrta.org.

The New Hampshire Department of Transportation (NHDOT) held the final public meeting tonight at the Nashua Public Library to collect community input and discuss the latest findings of the NH Capitol Corridor Study. The study team lead by URS Corporation presented several options focused on the commuter and intercity rail alternatives at seven potential stations between Nashua and Concord, considered bus improvements and examined a no-build scenario.

According to the analysis, the Manchester Regional Rail alternative serving four stations in Nashua – one stop at Crown Street and one stop at either Spit Brook Road or Pheasant Lane Mall and Manchester – stops at Granite Street and Manchester-Boston Regional Airport – would have an annual ridership of 668,000 and offer the greatest economic benefits with moderate construction impacts.

"There is simply no economic development opportunity on the horizon that could transform New Hampshire's economy like the expansion of passenger rail could offer," said Thomas Mahon, chair of the New Hampshire Rail Transit Authority. "While preliminary, these initial results demonstrate the positive impact rail could deliver to New Hampshire. Once the final report is submitted in December, policy makers will have all the evidence they need to make a choice. We firmly believe that the options are clear - invest in passenger rail or choose the status quo and face the negative consequences associated with our young people fleeing the state while our existing population ages and in-migration continues to decline."

The study team also identified preliminary costs associated with developing the various alternatives. According to the report, the total capital cost to extend passenger rail to Manchester is estimated at $246 million. The final version of the study, due out in December, will have more precise costs as well as financing options, including the potential for federal grants for up to half of the capital costs, and bonding recommendations.

Rail continues to maintain strong public support in the Granite State. A February 2014 University of New Hampshire survey commissioned by the Greater Nashua Chamber of Commerce found that 68% of New Hampshire residents favor the extension of passenger rail service. Governor Hassan stated that rail was needed to position our state for the future in her recent victory speech.

According to Mahon, once the final report is received in December, the NHRTA board will evaluate the findings and develop a strategy for addressing the next step in this process – beginning the critical project development phase. This stage is crucial to the future of passenger rail service and consists developing a detailed financial plan, final engineering, and preparation of funding applications for submission to the Federal Rail Administration and the Federal Transit Administration. Assuming NHRTA obtains the needed $4 million in funding to conduct the project development phase, work could conceivably kick off in the spring or summer of 2015 depending on what option is chosen.

"These facts cited in the initial study findings illustrate that passenger rail fosters development, jobs and increased community investment," said David Preece, Executive Director & CEO of the Southern New Hampshire Planning Commission and NHRTA board member. "There is no denying that rail serves as a catalyst for the type of smart development and multi-modal transportation options that will attract businesses and talented young professionals to the state, not to mention generating critical tax revenue. The only question is whether New Hampshire is ready to grasp this opportunity."

According to Preece, now is the time for business leaders and the public to have their voices by heard by support rail at www.nhrta.org.

About the NH Rail Transit Authority

The **NH Rail Transit Authority (NHRTA)** was established in 2007 and is tasked with encouraging and overseeing the redevelopment of passenger rail services throughout New Hampshire with an initial emphasis on the NH Capitol Corridor. The NHRTA is administratively attached to the New Hampshire Department of Transportation and has broad based membership from 11 cities and towns, 7 regional planning commissions, two state senators and two state representatives, the NHDOT, the Manchester-Boston Regional airport, and four appointees by the governor. Learn more at www.nhrta.org.

New Hampshire DOT Department of Transportation

NH Capitol Corridor Study Public Meeting
Nashua Public Library, Nashua, NH
November 20, 2014, 7:00 PM

	Name	Agency	Email	Phone
1	Rep. Marty Jack	NH House	martin.jack@leg.state.nh.us	603 318 0457
2	Thomas J. Mahon	NH Rail Transit Auth		
3	Laurence Ayer		layer492@comcast.net	603 881-5674
4	Mark Hill	Alstom Transport	mark.hill@transport.alstom.com	585-279-1448
5	Mike Izbicki	NHRTA	msizbic@comcast.net	603-493-0536
6	Walter Wuorianen		wkw49@comcast.net	603-321-2576
7	Jeff Mucciarone	Montagne	jeff@montagnecom.com	603-644-3200
8	Michael Thomas	GVT Rail System	~~MThomas@~~ Michael.Thomas@GVTrail.com	603-494-2059
9	Mike Cashion	NH Transit /	Mike.cashion03@gmail.com	603.856.3014
10	Catherine Mellen		zekezel@gmail	603 687 3507
11	Jim Webber		jbw1026@aol.com	669-9975
12	Dick Joos	Northeast RR Repair	JJoos.aol.com	224-4253
13	Ron O'Blenis	Resident	rdoiii@fastmail.fm	
14	Jonathan Bruneau	resident		
15	Ken Siegel	Alderman		
16	Matt Whitehead	Resident	matthew.d.whitehead@gmail.com	
17	Patrick Queenan	resident	patrick.j.queenan@gmail.com	

New Hampshire DOT Department of Transportation

NH Capitol Corridor Study Public Meeting
Nashua Public Library, Nashua, NH
November 20, 2014, 7:00 PM

	Name	Agency	E-Mail	Phone
19	Gene Harrington	NHAEGP	nashuafarmers@myfairpoint.net	
20	David Preece	SNHPC	dpreece@snhpc.org	—
21	Dan Kelly	NRPC	DRKNNH92@aol	883-2965
22	[illegible]	NCI	[illegible]@gmail.com	617-269 5478
23	Diane Sheehan	City Nashua Alderman	dianesheehan10@gmail.	
24	Bill Perry (Joe Casey)	IBEW	ibewlu490@[illegible].com	(603) 224-4239
25	Tim Roache	NRPC	TimR@NASHUARPC.org	424-2240
26	CHARLES MATTHEWS		CEMATTHEWS@COMCAST.NET	880-1635
27	James Battis	Hudson Con. Com.	battis.HCC@comcast.net	603 881-5781
28	Peggy Gilmour	NH Senate	peggilmour@aol.com	465-2336
29	Steve Laborte	Cotton Valley Rail Trail Support the Capt Corridor	mv_jc@yahoo.com	
30	BEVERLY PRICE	—		—
31	PATRICK MORRISON		LiMULUS99@Gmail.com	603-402-9108
32	Robert Baker		rtb.bike@gmail.com	
33	Kitty Hok		rhok@comcast.net	603 224-7272
34	DICK GILLESPIE	NONE	[illegible]@comcast	
35	Rosemary Russell		Russellrmrg@comcast.net	

New Hampshire DOT
Department of Transportation

NH Capitol Corridor Study Public Meeting
Nashua Public Library, Nashua, NH
November 20, 2014, 7:00 PM

	Name	Agency	E-Mail	Phone
36	Phyllis Brooks	Granite State Ind. Living	pbrooks@gsil.org	
37	MARK RICHARDSON	ORBIAL, INC.	mark..richardson@comcast.net	
38	Peter Eriksson	NGHG RR		878-2946
39	William Soubosky	—	SOBESDAD@comcast.net	305-1587
40	Ted Combes	Londonderry Budget Comm. NH Building Trades	edwardcombes@gmail.com	603-867-2017
41				
42	Jim Dorchess	Nashua	jim@jimdorchess.com	
43	Joe Imhof		cjicollect@aol.com	
44	Robert Penttila		Pentt264@Gmail.com	
45	ED POIRIER	—	EDJPOIRIER@Gmail.com	978 621 8528
46	Joel Preminger	—	joel.preminger@gmail.com	
47	Barry C Weinstein	—	—	—
48	Raymond Guerin		ray271963@myfairpoint.net	
49	Felice Janelle	NH DES	felice.janelle@des.nh.gov	682 9406
50	Peter Flora		pff2000@comcast.net	
51	Michael O'Brien	NH House Nashua	OBNFD@COMCAST.NET	305-6368
52	CASEY HOLT	IDEABENDERS LLC	THEIDEABENDERS@GMAIL	—

New Hampshire DOT Department of Transportation

NH Capitol Corridor Study Public Meeting
Nashua Public Library, Nashua, NH
November 20, 2014, 7:00 PM

	Name	Agency	E-Mail	Phone
53	PICK BARRY	STATE REP	✓	✓
54	C. Williams	GNCP	–	–
55	S. Mclaughlin	GNCC	✓	✓
56	Walter Fabian	Self		
57	Marianne Fabian	self		
58	Liam Mike	Self		
59	Jetta Darrow		JettaD@aol.com	
60	Dan McMurdy	Self		
61	Steve Pesci	UNH	spesci@unh.edu	
62	Gerard Langlois	self	glanglois41@comcast.net	
63	Allen Mello		allenjmello@comcast.net	
64	Mike Fimbel	self & NRPC	moxiesix@aol	
65	Paul Shea	Self	paulwshea@gmail	603-508-0687
66	Hannah Bassett	Rep. Annie Kuster	hannah.bassett@mail.house.gov	603-595-2006
67	Robert McIntosh	Self	Rmcintosh92@comcast.net	603-882-2092
68	Sarah Marchant	City of Nashua	marchants@nashuanh.gov	
69	Loring M. Lawrence	Ascutney Travel	tours04@raillynx.com	

New Hampshire DOT
Department of Transportation

NH Capitol Corridor Study Public Meeting
Nashua Public Library, Nashua, NH
November 20, 2014, 7:00 PM

	Name	Agency	E-Mail	Phone
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73	Michael A. Pignatelli	private citizen	map@rathlaw.com	
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82	Tom Barrington	NONE	NHDOT@THATTALLGUY.NET	4329816
83	Dan Brown (cad/rep)	Aldermen & State Rep	DAN.BROWN@LEG.STATE.NH.GOV.	
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85	Melli Annamalai		melliyal@hotmail.com	
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New Hampshire DOT Department of Transportation

NH Capitol Corridor Study Public Meeting
Nashua Public Library, Nashua, NH
November 20, 2014, 7:00 PM

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87	Kim Haughton	Union Leader	Kimhoughton1@comcast.net	2362077
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90	Bob Sammonds		RSAMMONDS@aol.com	603-672-0881
91	MIKE BRODERICK		[illegible]	603-[illegible]
92	Matt Cosgro	—	mcosgro@comcast.net	603-305-4908
93	Anthony Mahar	—	anspmahar@gmail.com	603 440 9701
94	[illegible] Johnson		pjj53@aol.com	603-881-8705
95	Sam Evans-Brown	NHPR	sevans-brown@nhpr.org	498-3844
96	STEPHEN PIPER	TRAINRIDERS NE, NHRRA	MAKE_TRACKS@COMCAST.NET	603 312 0342
97	WAYNE DAVIS	TRAINRIDERS NORTHEAST	WEDAVIS@TRAINRIDERSNE.ORG	
98	Manjari Yalavarthy	—	ymyshop@gmail.com	603-888-0403
99	Sheryl Rich-Kern	resident		
100	Michael Dell'Orfano	NRPC	MikeD@Baseline.net	672-9100
101	LINDA + TIM TWOMBLY (ST REP)		LTWOMBLY4466@comcast.net	6038884466
102	[illegible]			
103	MARK CONNORS	NRPC	MarkC@nashuarpc.org	424-2240

New Hampshire DOT Department of Transportation

NH Capitol Corridor Study Public Meeting
Nashua Public Library, Nashua, NH
November 20, 2014, 7:00 PM

	Name	Agency	E-Mail	Phone
104	Timothy Twombly	State Rep	ttwombly@comcast.net	888-4466
105	Mike Whitten	MTA	mwhitten@mtabus.org	623-8801
106	Nola Hesbry		nolah24@gmail.com	
107	Beth Keltz		beth@bethkeltz.com	603-930-3136
108	FABIO ESPOSITO		FESPOSITO@SOLID-SCAPE.COM	603.377.0816
109	Al Sewell		alan_js@msn.com	
110	Robert O'Brien		rvobrien@gmail.com	
111	LOUIS JURIS		LJURIS@MBTA.COM	617 293 2083
112	HOWARD COFFMAN		HCOFFMAN_DX@yahoo.com	
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New Hampshire DOT
Department of Transportation

NH Capitol Corridor Study Public Meeting
Nashua Public Library, Nashua, NH
November 20, 2014, 7:00 PM

	Name	Agency	E-Mail	Phone
121	Mike Monks		monksco@comcast.net	
122	WAYNE GAGNON	B+MRRHS/FYRG		
123	Jim Medlock			
124	[illegible]			
125				
126	Kelli Kelley		kellikelley13@gmail.com	
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NH Capitol Corridor Study
Public Meeting #3
AGENDA

November 20, 2014 @ 7:00 PM
Nashua Public Library – NPL Theatre
2 Court St, Nashua, NH

- **Study Overview**
- **Alternatives Selected for Further Review**
- **Evaluation Criteria**
- **Evaluation of Alternatives**
- **Recommended Strategy**

Public Meeting #3, NHDOT
November 20, 2014

- **Ken Siegel, Alderman, Nashua**
  - This project is not going to get any money from the state, considering the make-up of the incoming executive council. Using local taxes and lottery revenues would require changes in city of Nashua code. But why do we need to find money to bring trains here when Nashua is a good customer for the MBTA and they want to serve us. A station in Tyngsboro would be cheap, and Tyngsboro wants to be better connected with us. Tyngsboro wants sewer line capacity and Nashua could provide that as a swap. We would have to complete Exit 36, of course, but we could get the benefit of rail without the cost.

- **Jim Donchas, Alderman**
  - Crown St was not shown on the slide detailing positive land use impacts. We see that as an underdeveloped area and think of it as a prime development opportunity. Why is that not the list for development?
    - Julia Suprock: It was included in the study, but was not considered as one of the top opportunities that were shown on the slide.

- **John Carrol**
  - There is nothing more discouraging to potential rail passengers than getting stuck in traffic and arriving at the station just as the train pulls out. If we build a station at the Pheasant Lane Mall and with a new Exit 36, it should include an underpass under Danny Webster Hwy. Additionally, the parking lot should be laid out so that cars entering and exiting will not conflict with each other.
  - Putting a station at Spit Brook Rd won't work since traffic is too bad on Spit Brook and Danny Webster Hwy during peak hours.
  - The site could be developed if a new ramp was built off of Exit 2. It would require tunneling under the embankment, but there is enough room between the development and the tracks to access the north end of the former Dow Chemical site.
  - A train station at MHT would be great, but would require long term parking at other stations so passengers could park and ride to the airport. When going to Logan or Amtrak, the long term parking at Boston Express park and ride lots is great, because the MBTA doesn't allow long term parking in Lowell or Billerica.
  - Has the study identified costs that would not be incurred, such as eliminating the need for new lanes, or the cost of avoided congestion?

- **Dan Moriaty, Nashua alderman**
  - Don't overlook Exit 2 as it is very close to the existing railroad. An ramp off of Exit 2 could open up the possibility for building a north-south road parallel to Danny Webster

Hwy but closer to the river. Exit 2 also provides direct access to Hudson and communities east of the river.
  - There have been three previous Capitol Corridor studies, what did you learn that we did not know from before, how have the fares, ridership and residual O&M changed? One difference from previous studies is that they said 1,000 jobs would be generated which would equate to about $120m in new economic activity and would require $10m O&M each year. But this study says 5,000 jobs, what is the basis of that 5,000 jobs vs 1,000 before? Should we assume then that this train would now generate $5,000m in economic activity per year? And if so, how do you substantiate that number and how do we communicate that to the public?
    - David Nelson: TIF is a tricky subject since you pay the bills now to receive the benefit later.

- **Ty Combs**
  - I was looking at the station boards and I noticed that the Bedford station, only has 177 parking spots. Why are there so few, especially with all the new development going on?
    - David Nelson: The parking lots were sized based on the ridership projections, and there is sufficient parking for the people forecast to board there. More boardings are projected to occur in downtown Manchester
    - Dan Tempesta: The ridership projections at Manchester and Bedford are actually about 500 daily riders, but that is both boardings and alightings
    - Ken Kinney: As the project moves further in to engineering, the number of parking spaces can change and adapt to any updated development.

- **Alise McDonald**
  - I am a longtime Boston Express bus user along with the MBTA Lowell and Lawrence lines. The trip from Nashua to Lowell is very unpredictable and can change +/- 30 minutes. I've found that driving through the country to Lawrence is much more predictable with only +/- 5 minutes of variation.
  - If we can't get Manchester service, then Tyngsboro would be great.
  - Cited MBTA Wachusett extension built as a park and ride right on Route 2.
  - Overnight parking is very important.
  - Started a Facebook group Citizens for NH Capitol Corridor where said that the train will not pay for itself but, neither do any highways.

- **Diane Scheenan, Alderman**
  - Need to illustrate the larger economic lift and what happens to property values and the impact to individual property owners.
  - Increased property values would mean more taxes would be paid in the south of the state, so there would be less of a burden to northern communities.
  - If we do not build a station at MHT, then what is the impact to the airport? Cited that an international carrier walked away from serving the airport because of lack of rail.

- Please be sure to detail what the total economic lift would be to the state.

- **Howard Kaufman**
  - If service to Tyngsboro can happen, then why should we incur that cost? The state is already $200m in debt, not including the potential costs for Medicare from Obamacare. We should focus on building our infrastructure in a modern sense, like broadband considering the growth of people working at home. Rail got us through the 19th century, but businesses will rely more on broadband than trains to a congested city, because people are leaving the city, that's why we came to New Hampshire.

- **Chris Williams, Nashua Chamber**
  - This is a positive, feasible project. This is not just about getting people off the road, it's not just friendly to the environment and not just about moving the economy forward. With 5,600 new jobs is more than BAE or Fidelity or both Nashua hospitals, that's what we need to move the NH economy forward.
  - My question to state elected officials is, are you willing to have an open conversation to discuss the project in order to achieve the rewards we have seen put forth in this study? (applause). We elected you to lead, now take up the task.

- **Paula Johnson, former Alderman**
  - We did this study before, but the cost of the service needs to be reasonable
  - If we're able to get rail to Nashua, then we need to go all the way to Manchester
  - We need to ensure that we have walkable communities
  - We need to bring businesses to Nashua
  - People come here to live, but to work in Boston
  - Why are jobs going to Texas (with a Republican governor) or New York (with a Democratic governor) instead of New Hampshire? It's not a partisan thing.
  - If Crown St happens, that whole neighborhood will be bulldozed.
  - Who will work on the trains and stations?
    - David Nelson: MBTA will handle crewing.

- **Mike Cashin**
  - There aren't many 20 and 30 year olds in New Hampshire
  - Fidelity just opened a new office in Denver off their expanding commuter rail system
  - No business wants to come here if there aren't any young people.
  - We're one of the oldest states in the US
  - People talk about how we shouldn't have to bear the burden of the cost. The Downeaster was paid for by Maine but it is a great benefit to the Seacoast.
  - Young people seek out the Seacoast where they have ease of access. Why should we just expect to get these things for free and not invest in our own future?

- **Michael Thomas**
  - You mentioned that MBTA has trackage rights, has PanAm placed caveats on the MBTA? Would the MBTA be responsible for maintaining track above a certain standard?
    - ➢ David Nelson: Yes we have the trackage agreement. The track is in very surprisingly good shape. PanAm operates 100 coal trains per year and they need to maintain the track to keep maintenance costs at a reasonable level.
    - ➢ David Nelson: Also to note, that the FTA requires that we include a 35% contingency cost above all of our best estimates because it is their standard. We should be able to find ways to make it cheaper than the costs we have reported, but we don't want to lowball the costs and end up with surprises later.
  - Have you looked at how other operators handle intrastate commuter operation?
    - ➢ David Nelson: Yes, we closely following the Pilgrim Partnership between the MBTA and RIDOT. Their arrangement is that the MBTA keeps the fares and pays for the operations with RIDOT paying for any overages with conveyance of capital funds. Also, this is reflected in the relatively expensive tickets for a short service that is really just extending Lowell trains.

- **Mike Whitten**
  - If we're losing young people, what is the opportunity cost of the No Build? We have companies with open jobs that can't find employees.
    - ➢ Ken Kinney: Yes, that is one of the most important opportunity costs in the No Build. The ability to attract young employees is considered as one of the benefits of rail.
  - Our state has been aging for years. If we just try to build to Tyngsboro and Massachusetts pays the costs and NH gets the benefit, then why didn't they do this decades ago? Why would they do it now if just we ask nicely?

- **Peter Griffin, NH Rail Revitalization**
  - A balanced transportation system is key to economy of the state. In 1970, the MA governor pulled plug on highway expansion and focused on a balanced system.
  - The estimated cost of I-93 is $700m, and that will not solve our transportation problems.
  - Boston is a job, medical, cultural destination, and it would be a marketing tool to offer easy access to Boston.
  - The reverse commute to Stamford and White Plains has skyrocketed, and they are able attract business because of the existence of strong transportation links to New York.
  - NH has the same relationship to Boston as Stamford has to New York.
  - Why won't NH invest in its infrastructure? If layperson says that is a problem, then what are businesses thinking? They probably say that if the residents don't value their state enough to invest in it, then why should we?

- **Mark Richardson**
    - We've been trying to move this project forward for years, and this is a project for the entire state, not just Nashua. We don't have to get the taxpayers to pay for everything, but we do need to pay our way.
    - The Downeaster has way exceeded ridership projections, and the small O&M cost that we would incur on the Capitol Corridor is worth the benefit.
    - Some have said they couldn't support rail because it would send jobs out of state, but Boston doesn't exist because it is close to NH. We should support NH residents taking six figure jobs in Boston and bringing 90% of that money home to spend here.

- **Paul Toles**
    - Attended a MAP-21 conference, and in order to get federal funding we need to have a sound plan. This presentation looks good, so the next step would be a financial plan. Who would be responsible for that?
        - Patrick Herlihy: The policy makers need to decide what alternative makes sense for us to move forward with. Then it needs to go through the legislative process, and the governor needs to sign it. NHDOT and NHRTA will then look at the various financing options and then apply to the federal government.

- **Atolio Mangoni**
    - Boston and Cambridge are different from the Route 128 corridor. You can drive to Route 128, but driving to Boston is almost impossible. There are companies that want to move out of the Route 128 area and we need to distinguish about what jobs we can import.
    - To what degree is the bus service subsidized?
        - Patrick Herlihy: Yes, Boston Express is a subsidized operation by NHDOT

- **Michael O'Brien – State Rep, Vice Chair of Transportation**
    - We heard very little negativity on this project tonight, and we need to invest in the future as this will be our legacy.
    - I will promise to work hard on this, but everyone in here needs to contact your politicians who are not in favor. It's time to get this to the next step.
    - Whether we are concerned about jobs up here and jobs in MA, the flow of money will go both ways.

- **Colin van Ostern, State Rep for Concord Area**
    - I believe this is a state issue, not just a regional issue. The businesses I've worked at are starving for young professionals, and passenger rail holds tremendous promise to attracting those workers.
    - It will be a lifesaver for commuters, and a justifiable benefit for a stronger economy.
    - I serves the City of Concord, and even if we can't get it directly there, it looks like getting it to Manchester is the biggest bang for our buck, and I worry about the state of our economy if we don't take steps to move this forward.

- **Stephen Pesci, UNH**
    - President Huddleston, wrote a letter in support of the project.
    - We've announced an expansion of the university in Manchester and the law school in Concord.
    - UNH relies on connections to Boston and we support rail expansion and feel it is essential to NH and the success of UNH.
    - Long term trends support and improving connections to Boston
    - UNH has benefited from 13 years of Downeaster service, and it has become essential for the university and for the town of Durham.
    - The Downeaster has put us on the map with direct connections north and south.
    - It has become a competitive benefit for admissions and we look forward to having rail adjacent to our campus in Manchester and Concord.

- **Casey Holt**
    - Lives part time in Prague, and knows how important good transit is
    - We do need better internet, but suburban flight is over and more people are coming back to urban areas, and more companies are bringing people back to the office
    - When people live and work together they work better and are more productive
    - If we build this, will they come? I think they will

- **Wayne Gaggan**
    - Ove 140 years of rail in my family.
    - You can take the train from Nashua to Boston, and be back for dinner
    - South Nashua and Manchester yards can be used for layover of trains.





NH Capitol Corridor
Rail & Transit Alternatives Analysis

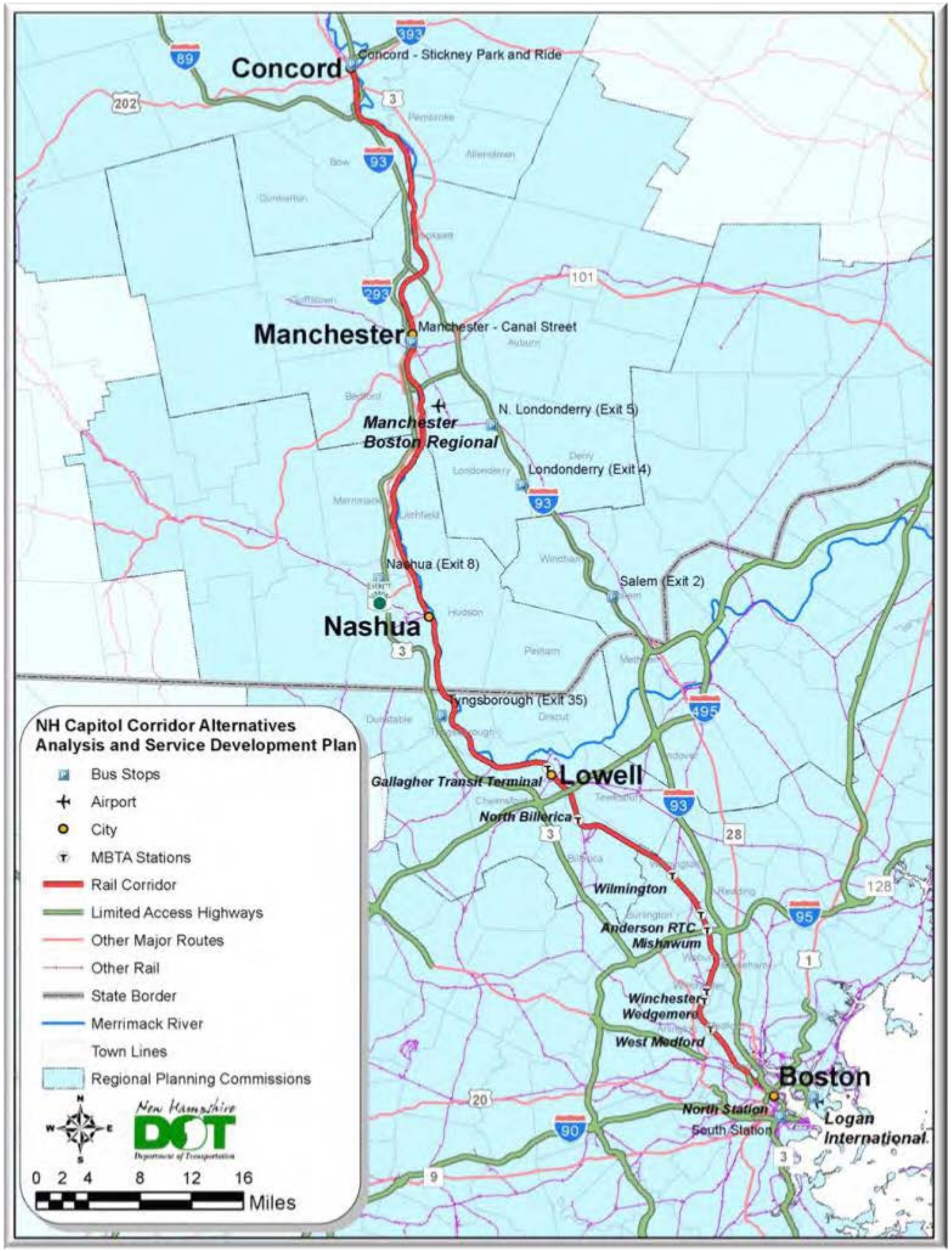
Public Meeting

November 20, 2014

New Hampshire DOT Department of Transportation

Agenda

- Study Overview
- Alternatives Selected for Further Review
- Evaluation Criteria
- Evaluation of Alternatives
- Recommended Strategy



Concord
Concord - Stickney Park and Ride
Manchester
Manchester - Canal Street
Manchester Boston Regional
N. Londonderry (Exit 5)
Londonderry (Exit 4)
Nashua (Exit 8)
Nashua
Salem (Exit 2)
Tyngsborough (Exit 35)
Lowell
Gallagher Transit Terminal
North Billerica
Wilmington
Anderson RTC
Mishawum
Winchester
Wedgemere
West Medford
Boston
North Station
South Station
Logan International
NH Capitol Corridor Alternatives Analysis and Service Development Plan
Bus Stops
Airport
City
MBTA Stations
Rail Corridor
Limited Access Highways
Other Major Routes
Other Rail
State Border
Merrimack River
Town Lines
Regional Planning Commissions
0 2 4 8 12 16
Miles

Alternatives Selected for Further Review

- No Build
- Manchester Regional
- Nashua Minimum
- Concord Intercity
- Expanded Bus
- Bus on Shoulder
- Expanded Bus on Shoulder

Evaluation Criteria

- **Costs**: capital and operations
- **Mobility impacts/ridership**: *new* New Hampshire transit riders
- **Environmental impacts** (major)
- **Land use**: compact, sustainable development
- **Economic development**: employment, residential construction, commercial development

In addition, input from public, key stakeholders

Economic Development Impacts

- Regional benefits
  - Travel time savings
  - Congestion reduction
  - Expanded access to jobs, workforce
  - New development near stations
- Methodology
  - Regional, national experience
  - Regional model: IMPLAN
  - NH interviews
- Results
  - New residential units
  - Commercial development (square feet)
  - New jobs by 2030

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Economic Development Impacts (cont.)

- Short-term: spending on rail construction
- Long-term: attraction of residents, jobs
  (example: Manchester Regional: 230 vs. 5600 jobs)
- Variables:
  - Service frequency
  - Mode
  - Development attractiveness
    - Big Three: Downtown Manchester, Spit Brook Road, Concord

Evaluation Matrix

NH Capitol Corridor Rail and Transit Study
Final Screening of Alternatives

Alternative	New NH Transit Passenger Trips	Economic Benefits - Residential Units	Economic Benefits - Jobs	Total Capital Cost (Millions)	NH Costs after Federal Grants and MA Contribution	Annual Operating Cost (Millions)	Net Operating Cost (Millions)	Annual NH Debt Service (20 year bond)	NH Annual Total Cost (Debt Service and Operating Deficit)	NH Annual Cost per New NH Rider	Ridership New Riders	Cost Capital/ O&M (in millions)	Land Use	Economic Develop-ment
No Build	0	0	0	$0	$0	$6	$1	$0	$1	$0	○	●	○	○
Manchester Regional	2,568	3,600	5,600	$246	$72	$11	$1	$6	$7	$10	◕	◔	◕	◑
Nashua Minimum	670	600	1,200	$120	$39	$4	$1	$3	$4	$22	◔	◑	◔	◔
Concord Intercity	946	2,200	3,700	$256	$128	$8	$5	$10	$15	$61	◑	◔	◔	◔
Expanded Bus	338	0	0	$10	$10	$3	$2	$1	$3	$32	◔	◕	○	○
Bus on Shoulder	48	0	0	$7	$1	$0	$0	$1	$1	$68	◔	◕	○	○
Expanded Bus on Shoulder	374	0	0	$17	$17	$3	$2	$2	$4	$37	◔	◕	○	○

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better — worse

Evaluation Matrix – Values

NH Capitol Corridor Rail and Transit Study
Final Screening of Alternatives

Alternative	New NH Transit Passenger Trips	Economic Benefits - Residential Units	Economic Benefits - Jobs	Total Capital Cost (Millions)	NH Costs after Federal Grants and MA Contribution	Annual Operating Cost (Millions)	Net Operating Cost (Millions)	Annual NH Debt Service (20 year bond)	NH Annual Total Cost (Debt Service and Operating Deficit)	NH Annual Cost per New NH Rider
No Build	0	0	0	$0	$0	$6	$1	$0	$1	$0
Manchester Regional	2,568	3,600	5,600	$246	$72	$11	$1	$6	$7	$10
Nashua Minimum	670	600	1,200	$120	$39	$4	$1	$3	$4	$22
Concord Intercity	946	2,200	3,700	$256	$128	$8	$5	$10	$15	$61
Expanded Bus	338	0	0	$10	$10	$3	$2	$1	$3	$32
Bus on Shoulder	48	0	0	$7	$1	$0	$0	$1	$1	$68
Expanded Bus on Shoulder	374	0	0	$17	$17	$3	$2	$2	$4	$37

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NH Capitol Corridor Rail and Transit Study

Final Screening of Alternatives

Evaluation Matrix Qualitative

Alternative	Ridership New Riders	Cost Capital/ O&M (in millions)	Land Use	Economic Develop-ment
No Build	○	●	○	○
Manchester Regional	◕	◔	◕	◑
Nashua Minimum	◔	◑	◔	◔
Concord Intercity	◑	◔	◔	◔
Expanded Bus	◔	◕	○	○
Bus on Shoulder	◔	◕	○	○
Expanded Bus on Shoulder	◔	◕	○	○

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Recommended Strategy

- Need for more discussion, debate, input
- Retain for further discussion in 2015
  - No Build
  - Manchester Regional Commuter Rail
  - Nashua Minimum Commuter Rail
  - Concord Intercity Service
  - Bus on Shoulder
- Need for credible financial plan

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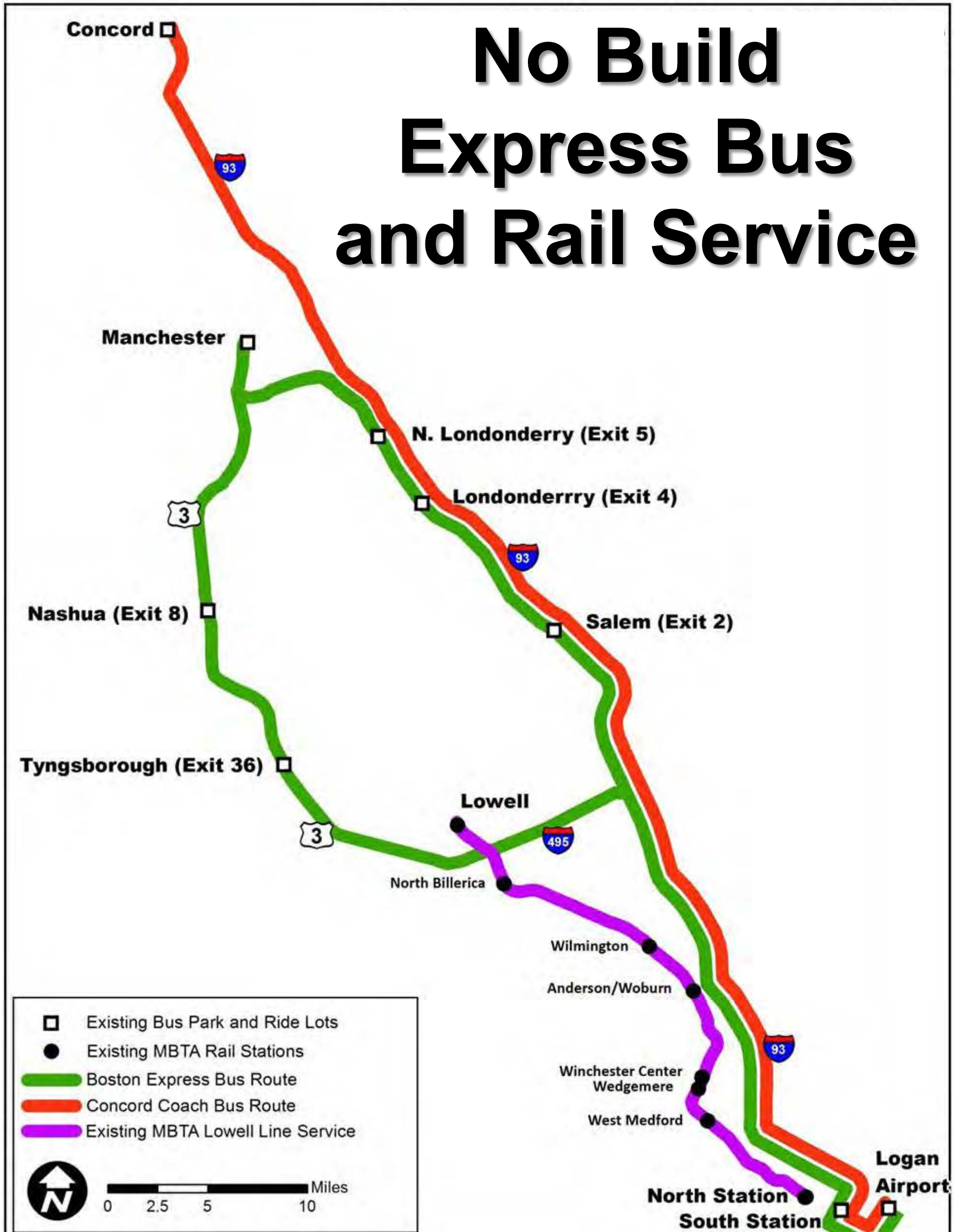
No Build Express Bus and Rail Service



New NH Transit Passenger Trips	0
Economic Benefits - Residential Units	0
Economic Benefits - Jobs	0
Total Capital Cost (Millions)	$0
NH Annual Cost per New NH Rider	N/A
Ridership New Riders	○
Cost (Capital and O&M)	●
Land Use	○
Economic Development	○

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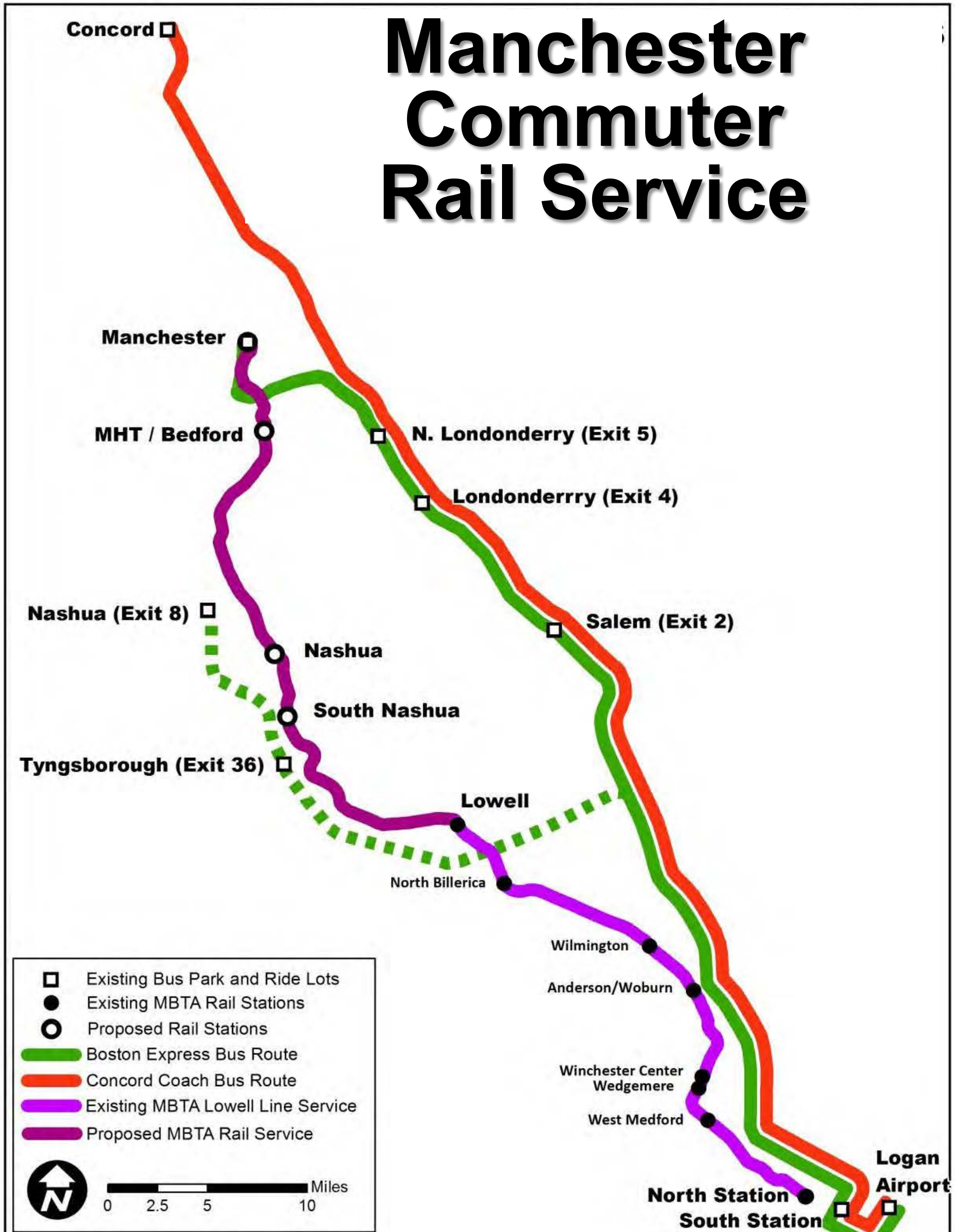
Manchester Commuter Rail Service



New NH Transit Passenger Trips	2,568
Economic Benefits - Residential Units	3,600
Economic Benefits - Jobs	5,600
Total Capital Cost (Millions)	$246
NH Annual Cost per New NH Rider	$10.46
Ridership New Riders	
Cost (Capital and O&M)	
Land Use	
Economic Development	

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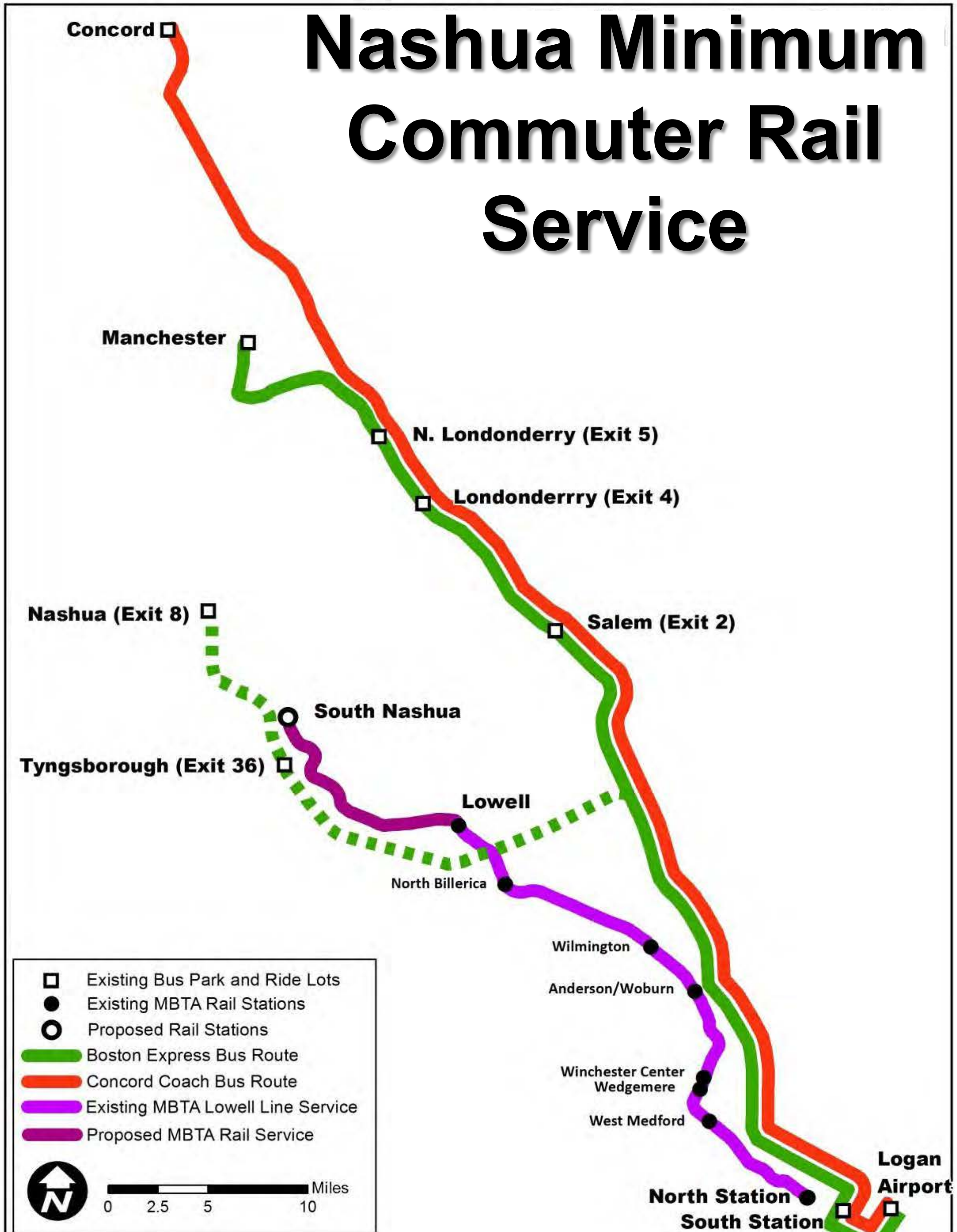
Department of Transportation

Nashua Minimum Commuter Rail Service



New NH Transit Passenger Trips	670
Economic Benefits - Residential Units	600
Economic Benefits - Jobs	1,200
Total Capital Cost (Millions)	$120
NH Annual Cost per New NH Rider	$26.38
Ridership New Riders	
Cost (Capital and O&M)	
Land Use	
Economic Development	

New Hampshire DOT
Department of Transportation

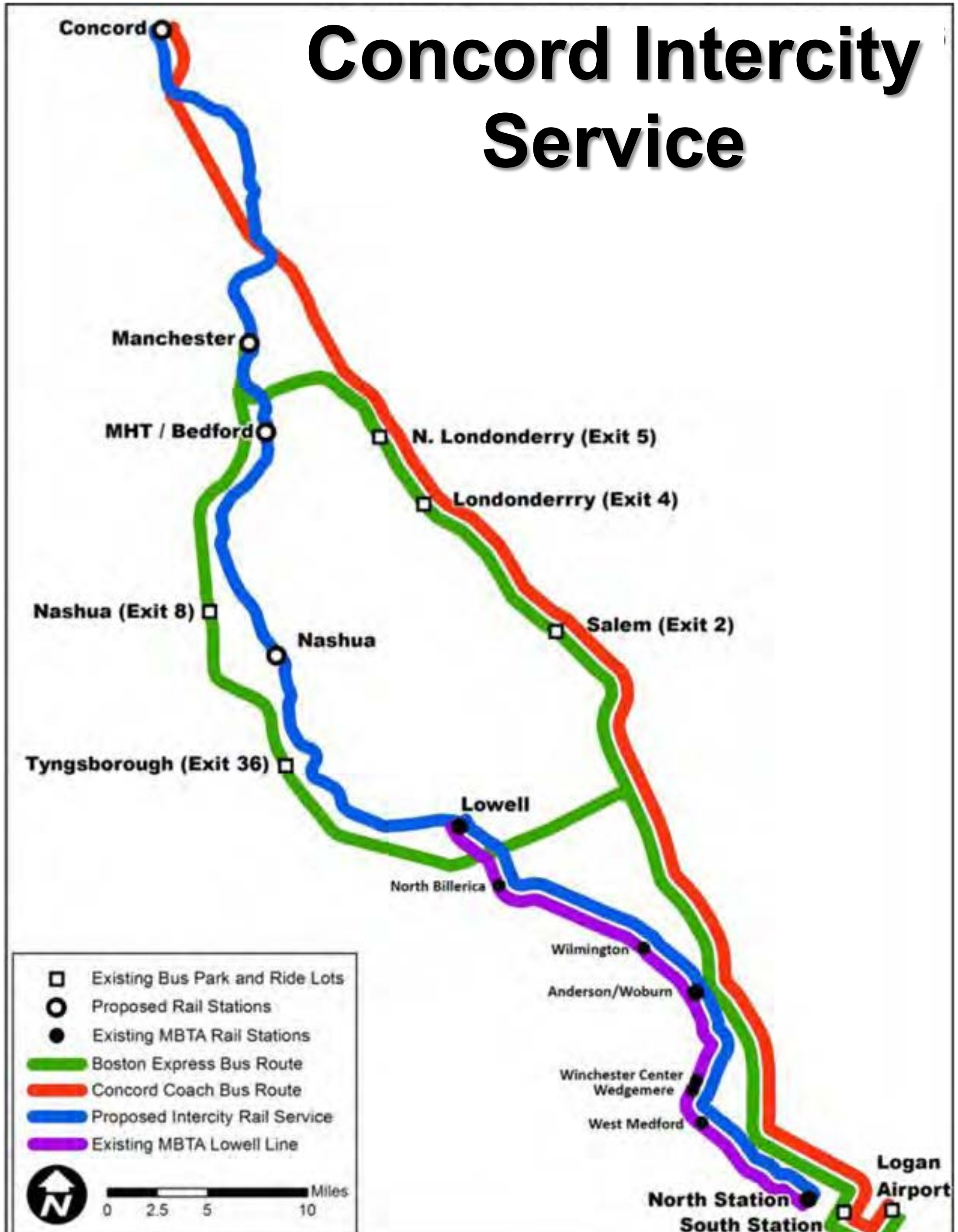
Potential Phasing of Commuter Rail

Single Phase: Manchester	**$246 M**
Phase 1: Nashua	**$120 M**
Phase 2: Manchester	**$153 M**
Total	**$273 M**
Added cost of phasing	**$27 M**

Key Issues

- Federal Funding
- Massachusetts Support
- Benefit Deferral

Concord Intercity Service



New NH Transit Passenger Trips	946
Economic Benefits - Residential Units	2,200
Economic Benefits - Jobs	3,700
Total Capital Cost (Millions)	$256
NH Annual Cost per New NH Rider	$61.40
Ridership New Riders	
Cost (Capital and O&M)	
Land Use	
Economic Development	

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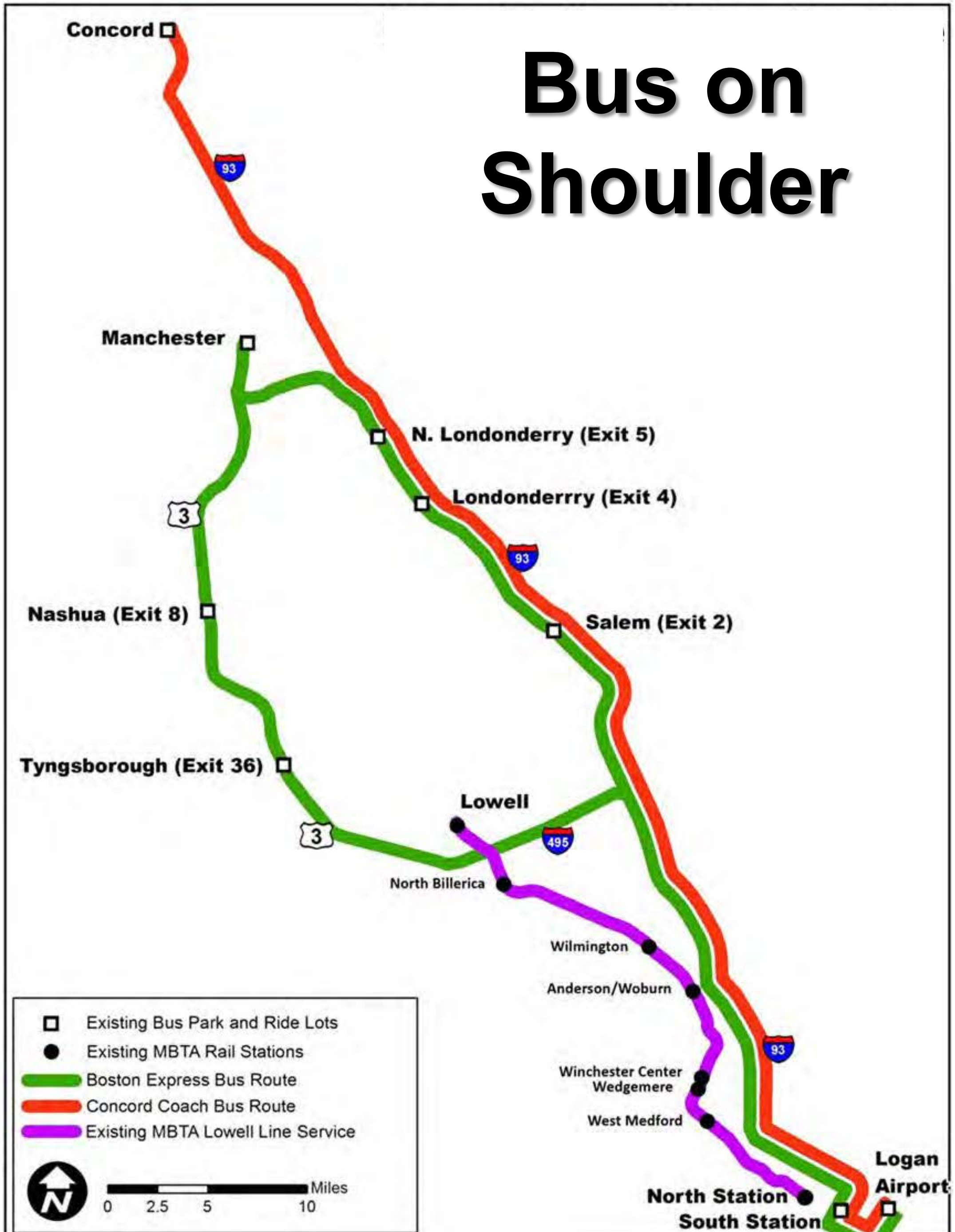
Bus on Shoulder



New NH Transit Passenger Trips	48
Economic Benefits - Residential Units	0
Economic Benefits - Jobs	0
Total Capital Cost (Millions)	$7
NH Annual Cost per New NH Rider	$68.37
Ridership New Riders	
Cost (Capital and O&M)	
Land Use	
Economic Development	

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Financial Facts and Assumptions

- **US transit projects:** state and/or local governments
  - State: general funds
  - Local: predominantly sales tax
- **Value capture:** modest revenue; medium- to long-term
- **Capital funding**
  - **Federal**: Typically 50% capital
  - **Massachusetts**: rolling stock, trackage rights
  - **New Hampshire:** remaining balance (no commitments to date)
- **Operating funding**
  - **Passenger Revenue**: 66% to 50%
  - **Federa**l: Limited formula funding
  - **Massachusetts**: “Pilgrim Partnership”
  - **New Hampshire:** remaining balance (no commitments to date)

New Hampshire DOT Department of Transportation

Financial Facts and Assumptions: Funding Options

- State capital program
- Parking fees
- Vehicle registration fees
- Municipal contributions
- Regional Greenhouse Gas Initiative
- CMAQ
- Property tax
- Lottery revenues
- Passenger facility charges (airport)
- Value capture/public private partnerships

Next Steps

- Publish final report
- Debate investment alternatives
- Possible legislative approval, depending on alternative

New Hampshire DOT Department of Transportation

http://www.nhcapitolcorridor.com/

University of
New Hampshire

Office of the President

105 Main Street
204 Thompson Hall
Durham, NH 03824

V: 603.862.2450
F: 603.862.3060
TTY: 7.1.1 (Relay NH)

presidents.office@unh.edu

November 20, 2014

Patrick Herlihy, Director of Aeronautics, Rail and Transit
New Hampshire Department of Transportation
PO Box 483, Hazen Drive
Concord, New Hampshire 03302

Dear Mr. Herlihy:

The University of New Hampshire supports a thorough and expedited completion of the FTA and FRA funded corridor transit and environmental analyses being undertaken by your department in coordination with the New Hampshire Rail Transit Authority.

The I-93 corridor from Boston to Concord is a vital economic lifeline for New Hampshire. Improved transportation choices – through proposed intercity rail, bus and multimodal connections--leverage planned highway investments and improve mobility. These connections enhance our quality of life, our economic development potential and our educational opportunities.

We have recently announced an expansion of our campus in downtown Manchester and we now also have a law school in Concord. Like many other organizations in the Merrimack Valley, the university depends on efficient connections between the Boston metro area and the core of our state. The University supports transportation investments that connect our campuses to the region and connect New Hampshire citizens to our institution.

We believe the long-term plans for the New Hampshire Capital Corridor service, along with integrated regional bus service, are essential to our success and New Hampshire's success. Long term demographic and transportation trends suggest that more transit options providing improved access to higher education and high quality jobs will be essential to maintaining and growing a strong economy in the state.

The University's Durham campus has benefited from 13 years of daily Amtrak Downeaster service which has carried almost 600,000 passengers directly to our core campus. The Downeaster is essential transportation for our community and puts UNH and Durham on the map with a direct connection to Boston, Portland and now Freeport. Rail service has proven to be a key admissions advantage over comparator institutions. We look forward to our downtown rail-side campus in Manchester and our I-93/Capital Corridor adjacent campus in Concord having that same level of quality transit access.

Sincerely,

Mark W. Huddleston
President

Cc: Christopher Clement, Commissioner, NHDOT
Jeff Brillhart, Assistant Commissioner, NHDOT
Dick Cannon, Vice President Finance and Administration, UNH

Room is filled to capacity. We apologize for the inconvenience.

APPENDIX H

Capitol Corridor Public Meetings – June 5, 2013

New Hampshire DOT
Department of Transportation

Boston-Lowell-Nashua-Manchester-Concord (BLNMC) Rail & Transit Alternatives Analysis
Legal Notice

The New Hampshire Department of Transportation will hold a public meeting on June 5th in Manchester at the City Hall from 7 pm to 9 pm. The public is encouraged to attend and provide the Department with input on transportation needs and preferences for solutions to transportation problems that involve transit and rail options in the 73-mile corridor between Boston, MA and Concord, NH. This meeting will provide the public with an early opportunity to identify issues and concerns for consideration in the Environmental Assessment that will be prepared as part of the alternatives analysis.

The New Hampshire Department of Transportation is evaluating opportunities to improve inter-city transit service in corridor through a study jointly funded by the Federal Transit Administration (FTA) and the Federal Railroad Administration (FRA) that was approved by the Executive Council this past February. The study is an alternatives analysis with an environmental assessment that will examine rail and bus options to address transportation, economic development, sustainability, quality of life and environmental issues along the I-93 and Everett Turnpike corridors from Concord to Nashua with connections to Boston. Increasing transportation demand and growing concerns about mobility, economic development and quality of life have led citizens and officials in New Hampshire and Massachusetts to explore options to improve transit service between southern New Hampshire and Boston. The study will evaluate a diverse set of rail and bus options for improving transportation by leveraging existing infrastructure, including the existing rail line, US Route 3 and I-93.

Wednesday June 5th, 2013
7:00PM – 9:00PM
Manchester City Hall
Aldermanic Chambers (3rd Floor)
1 City Hall Plaza, Manchester, NH 03101

Monday, May 27, American Legion parade starts at 2 p.m. at the Hannaford Plaza on Derry Road. It stops at the gazebo in the center of town for a small ceremony, then marches to the Legion, 1 Fulton St., for refreshments for the participants.

Litchfield

Monday, May 27, parade starts at the Litchfield Middle School. Anywbody who wants to participate should meet at 9:30 am. The parade steps off at 10:00 am and proceeds to the Historical Society Building (the Old Town Hall) for a program including the Campbell High School Band and Chorus.

Lyndeborough

Sunday, May 26:

9:30 a.m. –The Lafayette Artillery Co. at Lyndeborough Center Church.

10:45 a.m. – Procession to Center Cemetery for memorial service, prayers and rifle salutes.

11:15 a.m. – Procession to South Cemetery for memorial service, prayers and rifle salutes.

1 p.m. – Memorial Day procession and parade in South

transit and rail options in the 73-mile corridor between Boston, MA and Concord, NH. This meeting will provide the public with an early opportunity to identify issues and concerns for consideration in the Environmental Assessment that will be prepared as part of the alternatives analysis.

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ET – 5/24/13

COMMONWEALTH OF MASSACHUSETTS THE TRIAL COURT PROBATE AND FAMILY COURT

Essex Division
36 Federal Street
Salem, MA 01970
(978) 744-1020

certain mortgage given by William C. Hale, Sr. to Option One Mortgage Corporation, dated April 3, 2006 and recorded at Essex County (Northern District) Registry of Deeds in Book 10113, Page 240 of which mortgage Deutsche Bank National Trust Company, as Trustee for Soundview Home Loan Trust 2006-OPT5, Asset-Backed Certificates, Series 2006-OPT5 is the present holder by assignment from Sand Canyon Corporation f/k/a Option One Mortgage Corporation to Deutsche Bank National Trust Company, as Trustee for Soundview Home Loan Trust 2006-OPT5, Asset-Backed Certificates, Series 2006-OPT5 dated November 9, 2012 recorded at Essex County (Northern District) Registry of Deeds in Book 13248, Page 83, for breach of conditions of said mortgage and for the purpose of foreclosing the same, the mortgaged premises located at 5 Meadow Street, Lawrence, MA 01841 will be sold at a Public Auction at 12:00PM on June 14, 2013, at the mortgaged premises, more particularly described below, all and singular the premises described in said mortgage, to wit: The remainder of the land in Lawrence, Essex County, Massachusetts, with all buildings thereon, being a part of Lots numbered 82 and 83 on Plait of Land called "Columbia Park" which Plan is recorded with Essex North District Registry of Deeds, Book 127, Page 600, and which parcel of land is bounded: NORTHERLY sixty-five (65) feet a part of lots numbered 27 and 10 on said Plan; WESTERLY fifty (50) feet by a part of lot numbered 82 on said Plan; SOUTHERLY sixty-five (65) feet by Meadow Street; and EASTERLY FIFTY (50) feet by land now or formerly of Albert Legros. For mortgagor's title see deed recorded with the Essex County (Northern District) Registry of Deeds in Book

ance and objection followed by an Affidavit of Objections within thirty (30) days of the return date, action may be taken without further notice to you.

The estate is being administered under formal procedure by the Personal Representative under the Massachusetts Uniform Probate Code, without supervision by the Court. Inventory and accounts are not required to be filed with the Court, but recipients are entitled to notice regarding the administration from the Personal Representative and can petition, the Court in any matter relating to the estate, including distribution of assets and expenses of administration.

WITNESS, Hon. Mary Anne Sahagian, First Justice of this Court.

Date: April 30, 2013

Pamela Casey O'Brien
Register of Probate

ET – 5/24/13

COMMONWEALTH OF MASSACHUSETTS THE TRIAL COURT PROBATE AND FAMILY COURT

Essex Probate and Family Court
36 Federal Street
Salem, MA 01970
(978) 744-1020
Docket No. ES13P1330EA

CITATION ON PETITION FOR FORMAL ADJUDICATION

Estate of: Priscilla A Watson
Also known as: Priscilla P Watson
Date of Death: 02/05/2013

To all interested persons:
A Petition has been filed by:
William A Watson Jr. of Cape Coral FL
requesting that the Court enter a formal Decree and Order of testacy

authority to foreclose said mortgage in the manner following: by entry on and possession of the premises therein described and by exercise of the power of sale contained in said mortgage.

If you are entitled to the benefits of the Service Members' Civil Relief Act of 1940 as amended, and you object to such foreclosure you or your attorney should file a written appearance and answer in said court in said County on or before 06/17/2013 or you may be forever barred from claiming that such foreclosure is invalid under said Act.

Witness, Barbara J. Rouse, Esquire, Chief Justice of the Superior Court, at Lawrence, Massachusetts, this 3rd day of May, 2013.

Thomas H. Driscoll Jr.,
Clerk of the Courts

ET – 5/24/13

COMMONWEALTH OF MASSACHUSETTS THE TRIAL COURT PROBATE AND FAMILY COURT

Essex Probate and Family Court
36 Federal Street
Salem, MA 01970
(978) 744-1020
Docket No. ES13P1209EA

CITATION ON PETITION FOR FORMAL ADJUDICATION

Estate of: Robert M Vanderhoven
Also known as: Robert Vanderhoven
Date of Death: 06/08/2012

to all interested persons:
A Petition has been filed by:
Julie M Smith of **North Andover MA**
requesting that the Court enter a formal Decree and Order of testacy

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and the time[…]
for payment[…]
the goods w[…]
tion at the b[…]
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posed of or[…]
2013, at 1[…]
Valley St., […]
978-557-97[…]
Yohanna[…]
Stereo Equ[…]
Jasmin[…]
Furn, Box[…]
Kelly C[…]
es, Tools, […]
Ivette C[…]
Boxes
Jennife[…]
Furn, Box[…]
Robin
Furn, Box[…]
Equip
Jeffrey
Carme[…]
Furn, Bo[…]
TV/Stere[…]
ET – 5/24[…]

RE: Th[…]
fka The[…]

TO: […]
Torres, […]
Essex; […]
AND
TITLED
SERVIC[…]

UNION LEADER CORPORATION

RECEIVED
MAY 29 2013
URS
BOSTON

P O BOX 9513
MANCHESTER, NH 03108

0000114992
LEGAL PREPAID ACCOUNTS
***
MANCHESTER NH 03109

I hereby certify that the legal notice: (0000686490) BLNMC RAIL & TRANSIT ALTERNATI
was published in the New Hampshire Union Leader
printed at Manchester, NH by the Union Leader Corp.
On:
05/23/2013.

State of New Hampshire
Hillsborough County

Subscribed and sworn to before me this

23 **day of** May 2013

Phyllis E Manning
Notary Public

PHYLLIS E. MANNING
MY COMMISSION EXPIRES MAR. 10, 2015
NOTARY PUBLIC
NEW HAMPSHIRE

that every row, every column and every 3x3 grid contains the digits 1 through 9. That means that no number is repeated in any row, column or grid. Shown at right is the answer to the previous day's puzzle.

9	3	5	8	2	7	1	4	6
1	4	6	3	9	5	7	8	2
4	5	2	6	7	9	8	3	1
3	7	1	4	8	2	9	6	5
6	9	8	5	3	1	2	7	4
5	1	3	2	6	8	4	9	7
2	8	9	7	5	4	6	1	3
7	6	4	9	1	3	5	2	8

Adult, Ages, Algae, Anapsida, Ants, Atlantic, Beetles, Calm, Caretta, Coastal, Color, Eggs, Family, Feed, Fishing, Flies, Gender, Grown, Habitats, Hard, Head, Jaws, Leafhoppers, Marine, Mature, Nature, Nesting, Oceanic, Power, Predators, Prey, Salt, Sargassum, Seals, Season, Shell, Strength, Swim, Tails, Temperatures, Tuna, Turtle, Water, Waves, World, Yellow

Yesterday's Answer: Caquelon

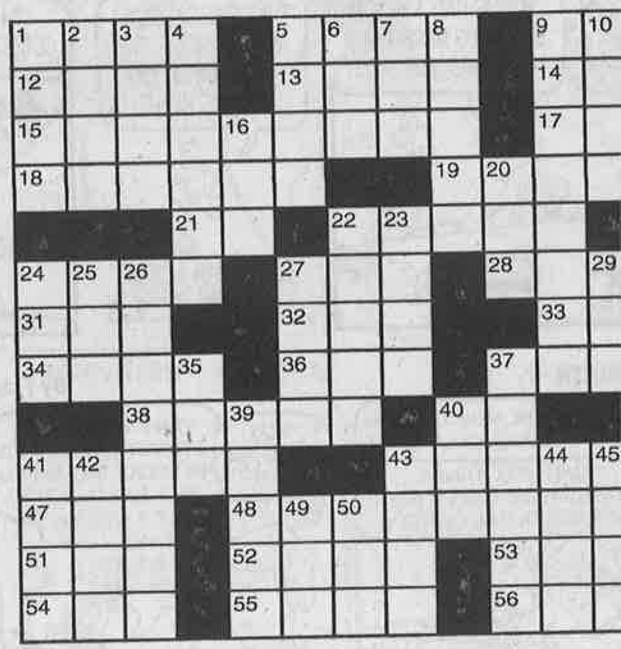
28 Linger
31 Chicken-king link
32 Recede
33 Mongrel
34 Two-wheeler
36 Ph. bk. listings
37 Relinquish
38 Occurrence

wear
42 Prefi plane
43 Fligh flock
44 — E Coyo
45 Wark weap brief
46 The Bee
49 Unfr
50 Exis

Solution time: 25 mins.

E	R	G	S		C	A	B		G	A	D	S
G	O	O	N		O	R	R		O	M	I	T
A	M	B	I	E	N	C	E		A	B	L	Y
D	E	I	F	I	C		A	W	H	I	L	E
			F	R	O		D	I	E	T		
B	A	A		E	R	R		N	A	I	L	S
A	L	M	A		D	I	S		D	O	I	T
D	E	B	T	S		G	T	O		N	E	D
		U	F	O	S		U	M	A			
A	S	S	I	S	T		B	A	R	E	S	T
B	O	H	R		A	M	B	R	O	S	I	A
B	Y	E	S		M	I	L		M	A	L	T
E	A	S	T		P	R	Y		A	U	K	S

Yesterday's answer 5-23



Cryptoquip

The cryptoquip is a simple substitution cipher in which each letter used stands for another. If you think the X equals O, it will equal O throughout the puzzle. Single letters, short words and words using an apostrophe can give you clues to locating vowels. Solution is accomplished by trial and error.

CGNIB CKN XTXEBI GTUB OBVRTHBHCZP IQCQVBW FZNCG ITROZBI. CGBP RQIC'UB XBBH IKTCFGBW TC XEVCG.

Yesterday's Cryptoquip: I DON'T KNOW WHY I JUST PLAYED A JOKE ON THAT SMALL BIRD, BUT PRESUMABLY I DID IT ON A LARK.

Today's Cryptoquip Clue: X equals B

Legal Notice

Boston-Lowell-Nashua-Manchester-Concord (BLNMC) Rail & Transit Alternatives Analysis
Legal Notice

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(UL - May 23)

Going Online?
See more public notices at
www.unionleader.com

Legal Notice

Public Notice:

ALC Leasing Ltd. dba AFSI Leasing with a principal place of business at 801 Cherry St Ste 3600, Fort Worth, TX 76102, hereby gives notice that as of April 29, 2013 it has ceased conducting business as a Sales Finance Company in New Hampshire and has surrendered its license(s) to the New Hampshire Bank Commissioner. Forinformation about pending transactions, contact: ALC Leasing Ltd. dba AFSI Leasing at 801 Cherry St Ste 3600, Fort Worth, TX 76102 and (800) 644-2297.

(UL-May 16, 23)

Legal Notice

Sealed proposals will be received by the Town of Merrimack until 3:00PM to replace and install hardware components to the existing cablecast system at the Town of Merrimack's Media Division Offices. Walk throughs will be held on Wednesday, May 29, 2013. Please contact Xenia Carroll, Purchasing Agent, at xcarroll@merrimacknh.gov or (603) 424-7075 to obtain a related bid package.

(UL - May 23)

Legal Notice

The Raymond Board of Selectmen will hold a Public Hearing on June 3rd, 2013, to receive public testimony on the condition, status and future of the Class VI portion of Scribner Road, starting from the end of the Town maintained pavement and running in a northerly direction approximately (700') seven hundred feet more or less and terminating at the intersection of the State of New Hampshire's Rails to Trails Systems.

If you need audio or visual assistance, please contact the Selectmen's Office at 603-895-4635 ext 113, 24 hours prior to the meeting

(UL - May 23)

Bridge

Steve Becker

Most books on the play of the hand contain one or more chapters on the mathematics of bridge. Among other things, they list how suits can be expected to divide and the proper way to handle a large variety of card combinations.

One subject sure to be covered is the question of whether or not to finesse when you have 10 cards of a suit missing the K-x-x, which was declarer's problem in the spade suit in today's hand.

Mathematically, the percentage play is to finesse rather than try to drop the singleton king behind the ace. What this means is that if you experimented hundreds of times with this combination, the finesse would succeed far more often than the play for the drop.

South was fully familiar with the proper percentage play, but when the moment of truth arrived, he played dummy's ace and felled East's king! However, he had ample reason for rejecting the finesse.

West began by cashing the K-A of hearts and shifted to the deuce of diamonds, hoping his partner had the queen and that declarer would misguess which card to play from dummy. But South played dummy's king, which won the trick.

Then, without bothering to enter his hand for a finesse, declarer simply played the ace of trumps, caught East's singleton king and so made the contract with an overtrick. Had he taken

West dealer.
East-West vulnerable.

Horoscope

Eugenia Last

IF BORN ON THIS DATE: Take what you do seriously, whether it is a job, your own business, your health, wealth or personal life. It's important to see the possibilities and strive to complete whatever you start. Your numbers are 2, 16, 24, 32, 38, 41, 46.

Birthdate of: Kelly Monaco, 37; Jewel, 39; Drew Carey, 55; Joan Collins, 80

ARIES
(March 21-April 19)
A change in the way you view life

unique or will bring you i with people from differe grounds.

LEO
(July 23-Aug. 22
Give and take will help yo your life. Don't let the someone tries to put on y in your way.

VIRGO
(Aug. 23-Sept. 2
Commence doing what to do instead of just talk

New Hampshire Capitol Corridor Rail & Transit Alternatives Analysis Press Release
May 21, 2013

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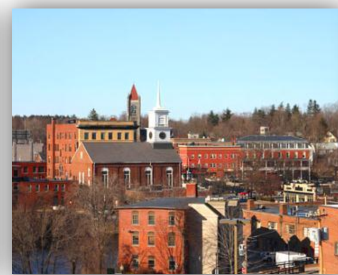


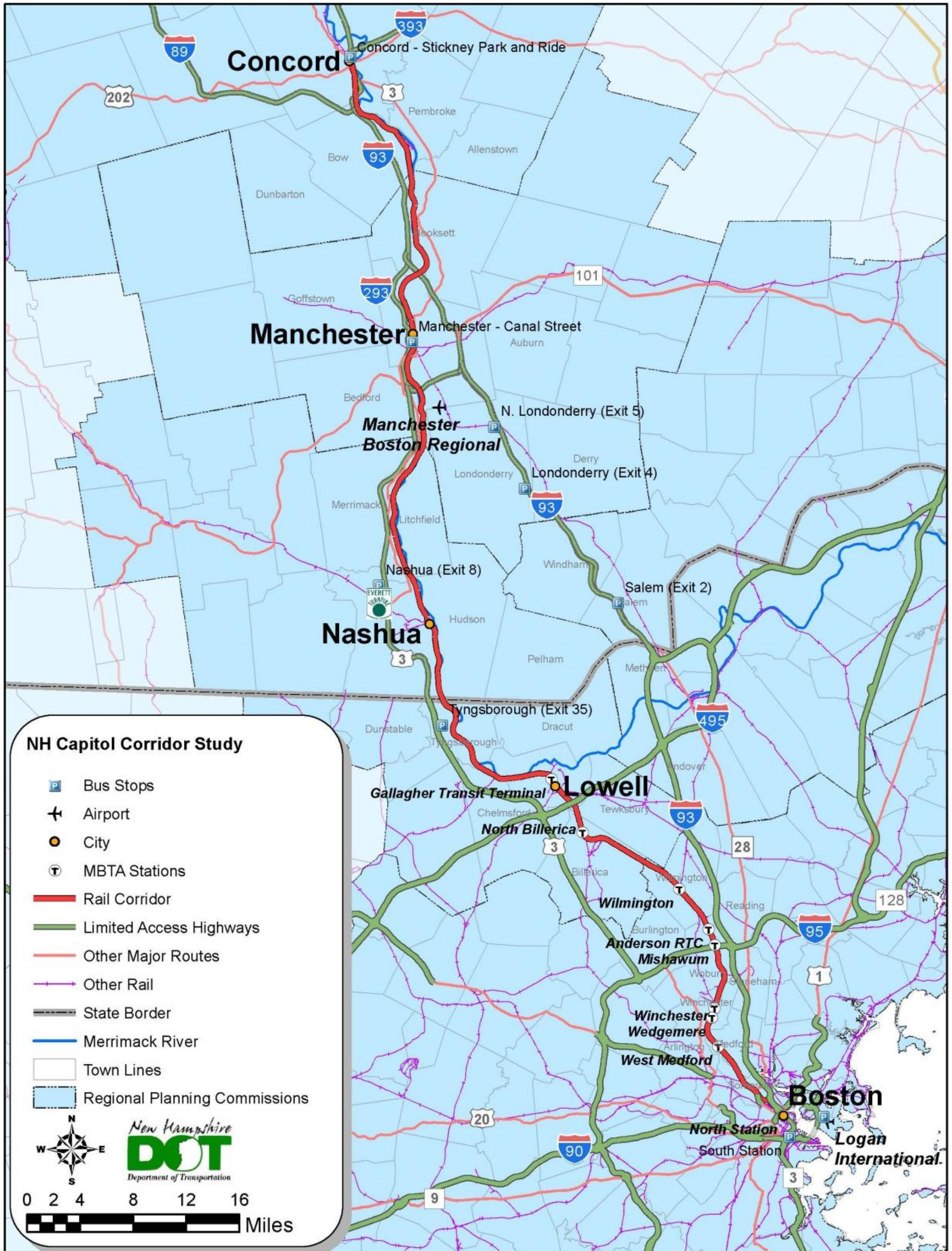
NH Capitol Corridor Study

Public Meeting

Manchester, NH

June 5, 2013

New Hampshire DOT
Department of Transportation



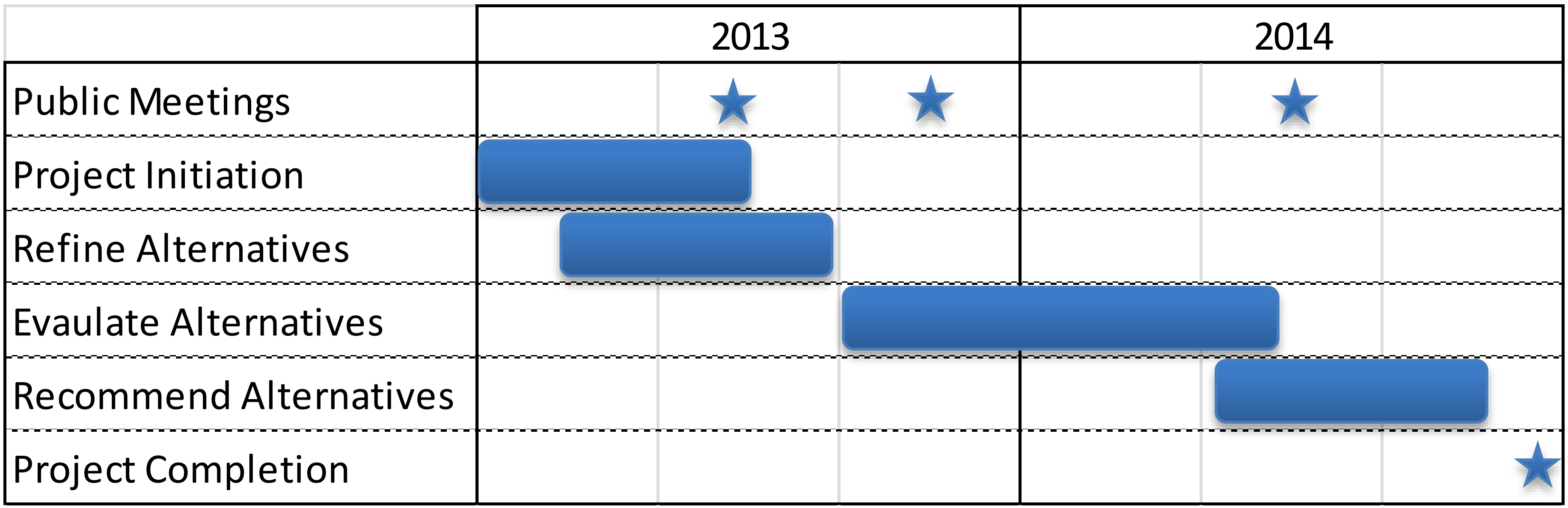
New Hampshire DOT Department of Transportation

Scope Outline

- Public and stakeholder involvement
- Purpose & need
- Possible Financing Options
- Definition of alternatives
- Preliminary screening
- Evaluation of alternatives
- Recommendation of Alternatives Based On:
  - Ridership
  - Costs: capital, operating
  - Environmental impacts (EA)
  - Transit-supportive land use, economic development
  - Demographics

New Hampshire DOT Department of Transportation

Study Schedule



Problem Statement

- Expanding Boston commuter market
- Congestion in Southern corridor: 128, I-93, Rte 3
- Residential suburbanization: congestion
- NH experiencing slower business development, job creation, especially high-tech

Problem Statement
(continued)

- Attracting and keeping young professionals
- Aging New Hampshire population:
  mobility options
- Strong existing intercity bus service: Boston markets
- Successful Park-and-ride strategy:
  little development impact

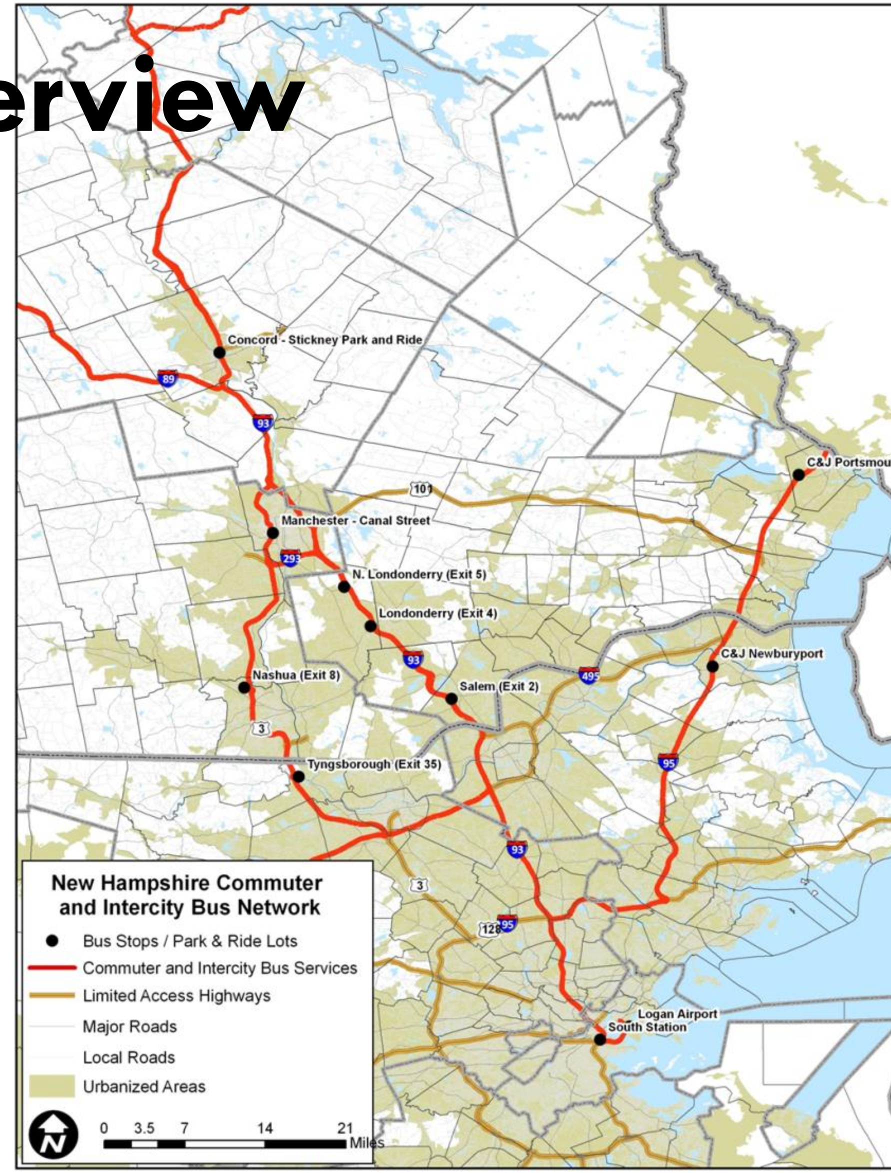
Problem Statement
(continued)

- THEREFORE: need for transit investment strategy:
  - Increases transit ridership
  - Provides alternative to congestion near Boston
  - Promotes compact, sustainable development
  - Contributes to economic development strategy stressing high-tech jobs and those attracted to them

New Hampshire DOT Department of Transportation

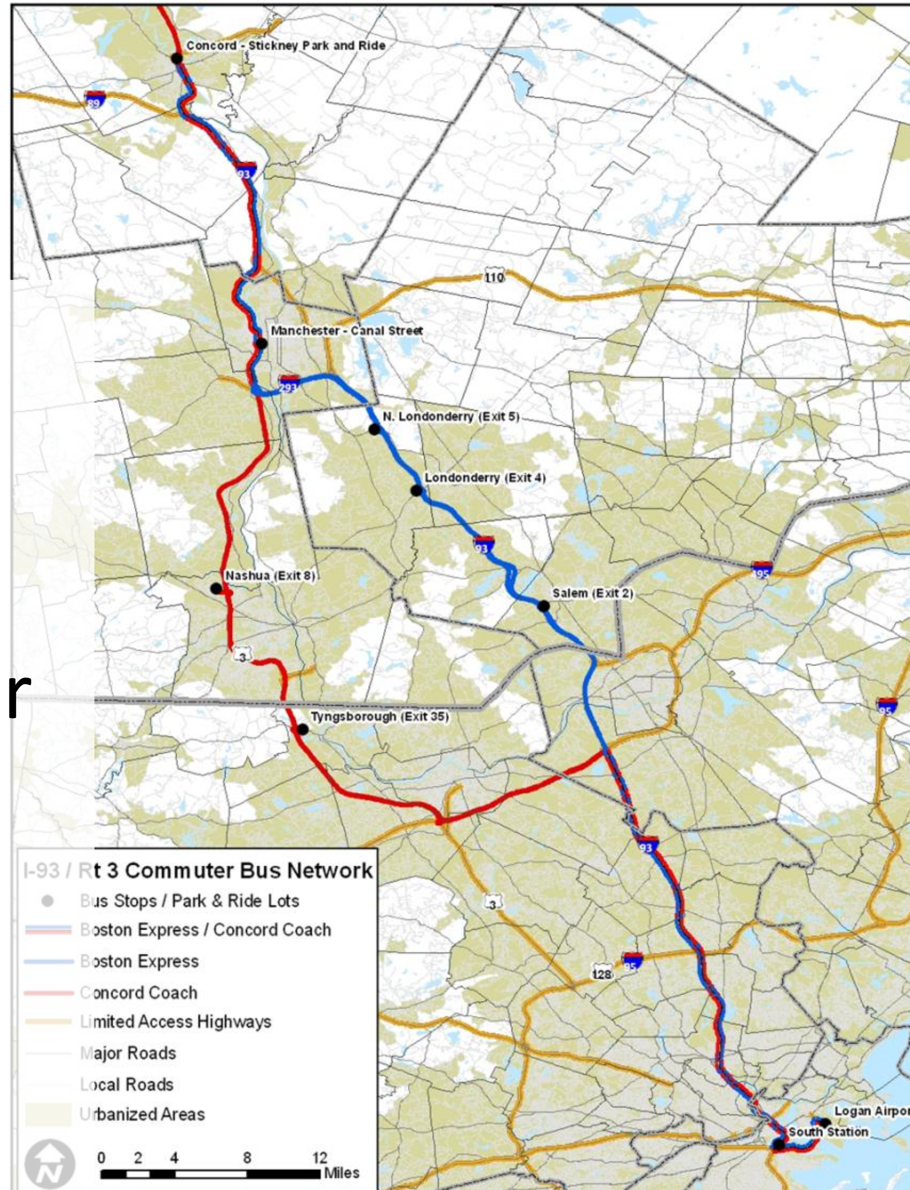
Transit Service Overview

- Existing services
- Conceptual improvement options



New Hampshire DOT Department of Transportation

- 22 weekday trips
- 80 to 110 minutes Concord to Boston
- Limited service to other intermediate stops



New Hampshire DOT Department of Transportation

80 Weekday Bus Trips

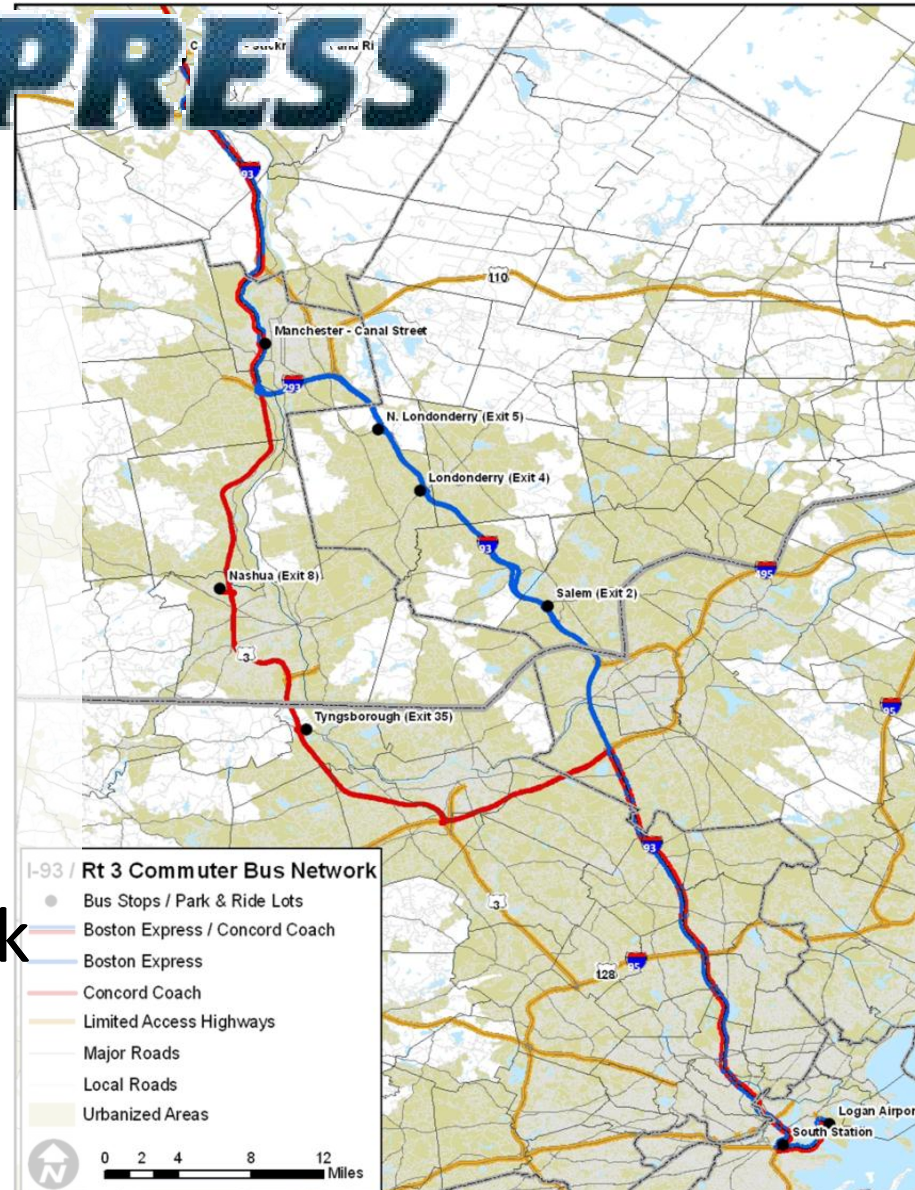
1,800 Weekday Boardings

- Manchester
- Nashua
- Londonderry
- Salem
- Tyngsborough (MA)

BOSTON EXPRESS

Everett Turnpike

- 24 weekday trips for South Station
- 65 to 105 minutes to Boston
- Serves Manchester, Nashua, Tyngsborough, Government Center, Park Street and South Station
- 600 weekday boardings

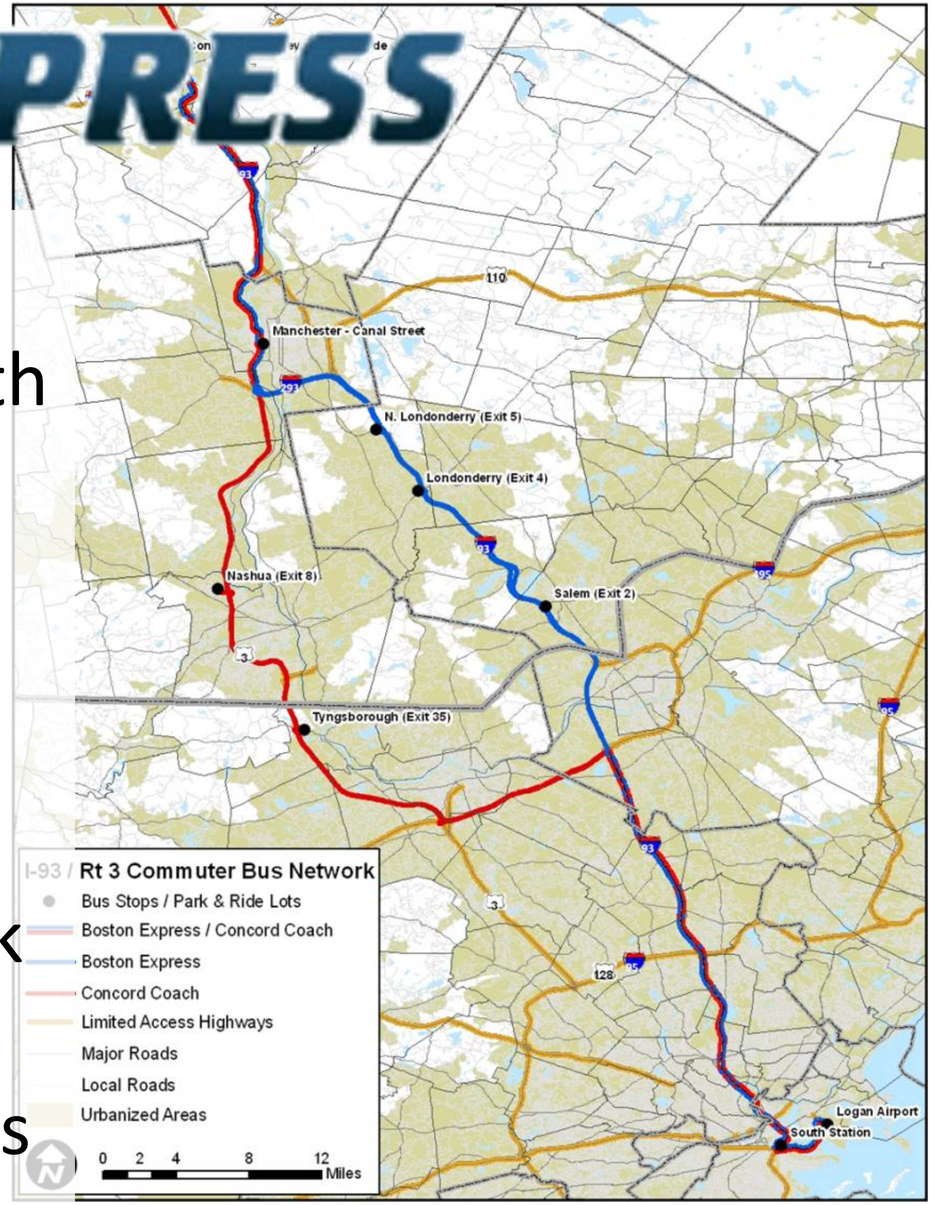


New Hampshire DOT Department of Transportation

BOSTON EXPRESS

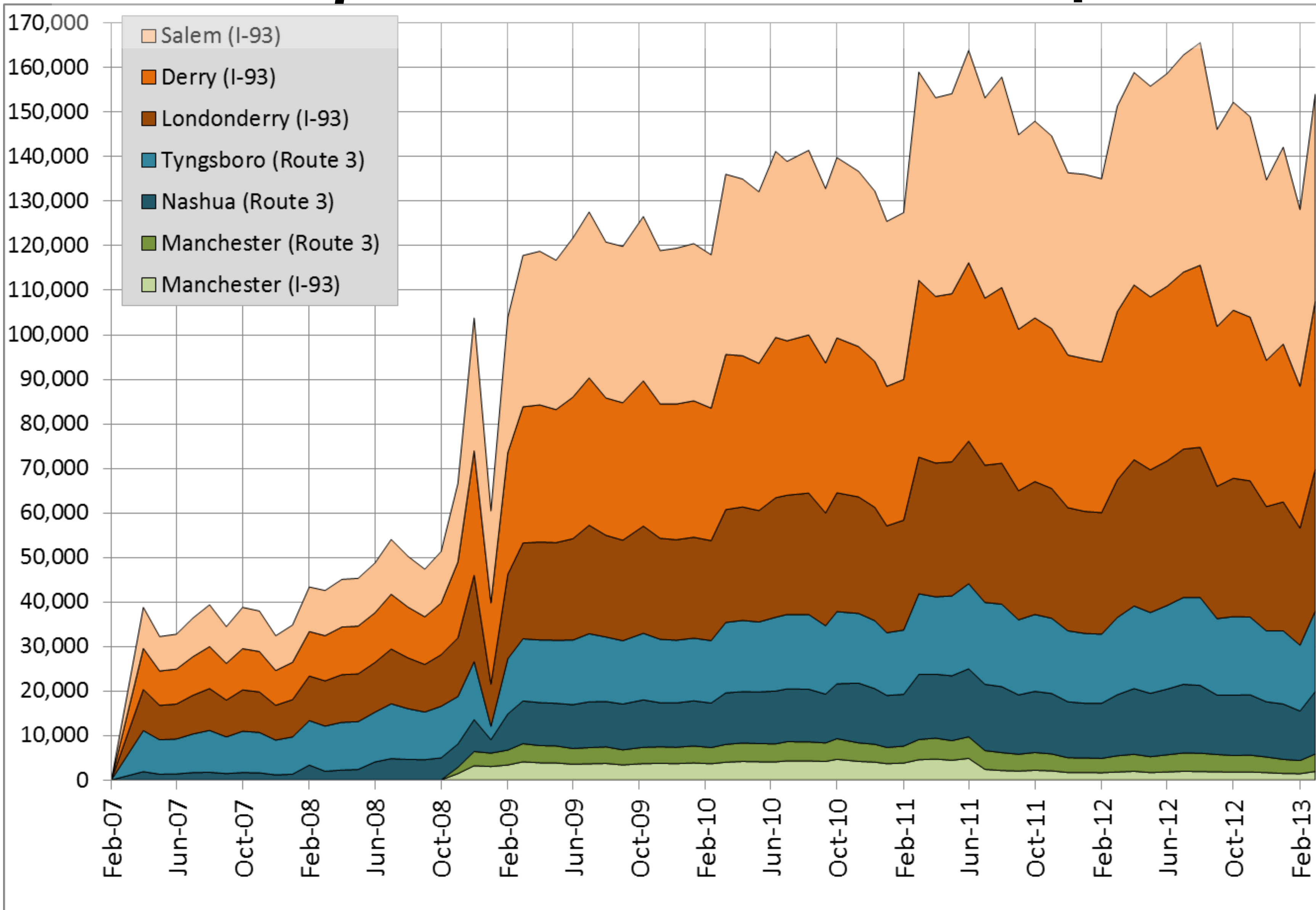
I-93 Service

- 56 weekday trips to South Station
- 65 to 100 minutes to Boston
- Serves Manchester, Londonderry, Salem, Government Center, Park Street and South Station
- 1,200 weekday boardings



New Hampshire DOT Department of Transportation

Boston Express: Six Years of Ridership Growth



New Hampshire DOT Department of Transportation

Concerning Bus Service: Key Issue

5,000 daily bus passengers from NH and MA are slowed by highway traffic on I-93 every day

What can be done?

1. Isolate buses from traffic congestion
2. Passenger rail

Bus on Shoulder

CA, DE, FL, GA, IL, KS, MD, MN, NC, NJ, OH, VA, and WS; Minneapolis has >300 miles of BOS.

MassDOT, MVRPC & NHDOT evaluating BOS for I-93 in MA.

Passenger Rail: Traffic-Free Route:

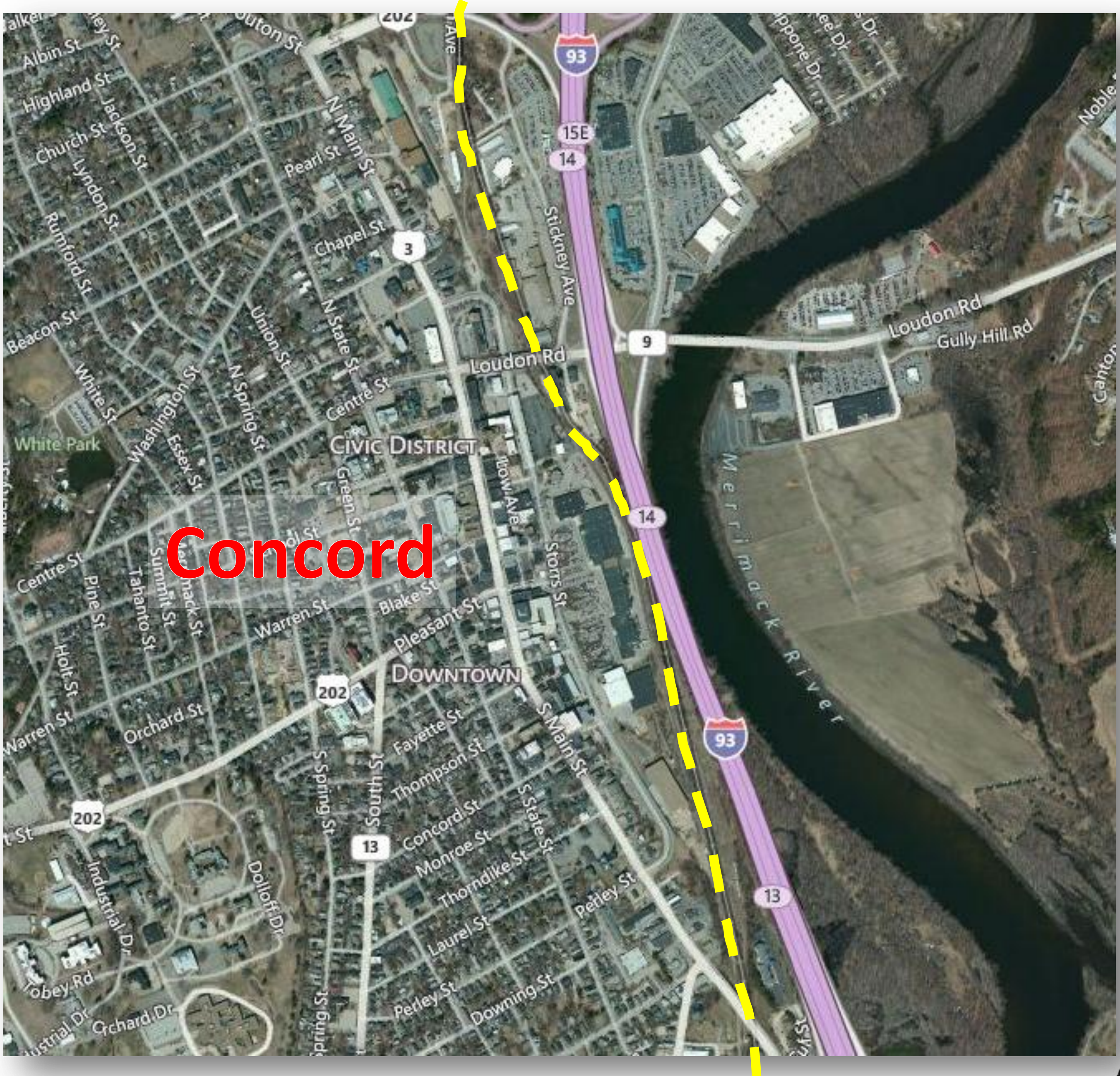
- *Conventional passenger trains*
- *Conventional railway tracks*
- *Local service in urban areas*

MBTA Commuter Rail: Thirty Five Years of Expansion

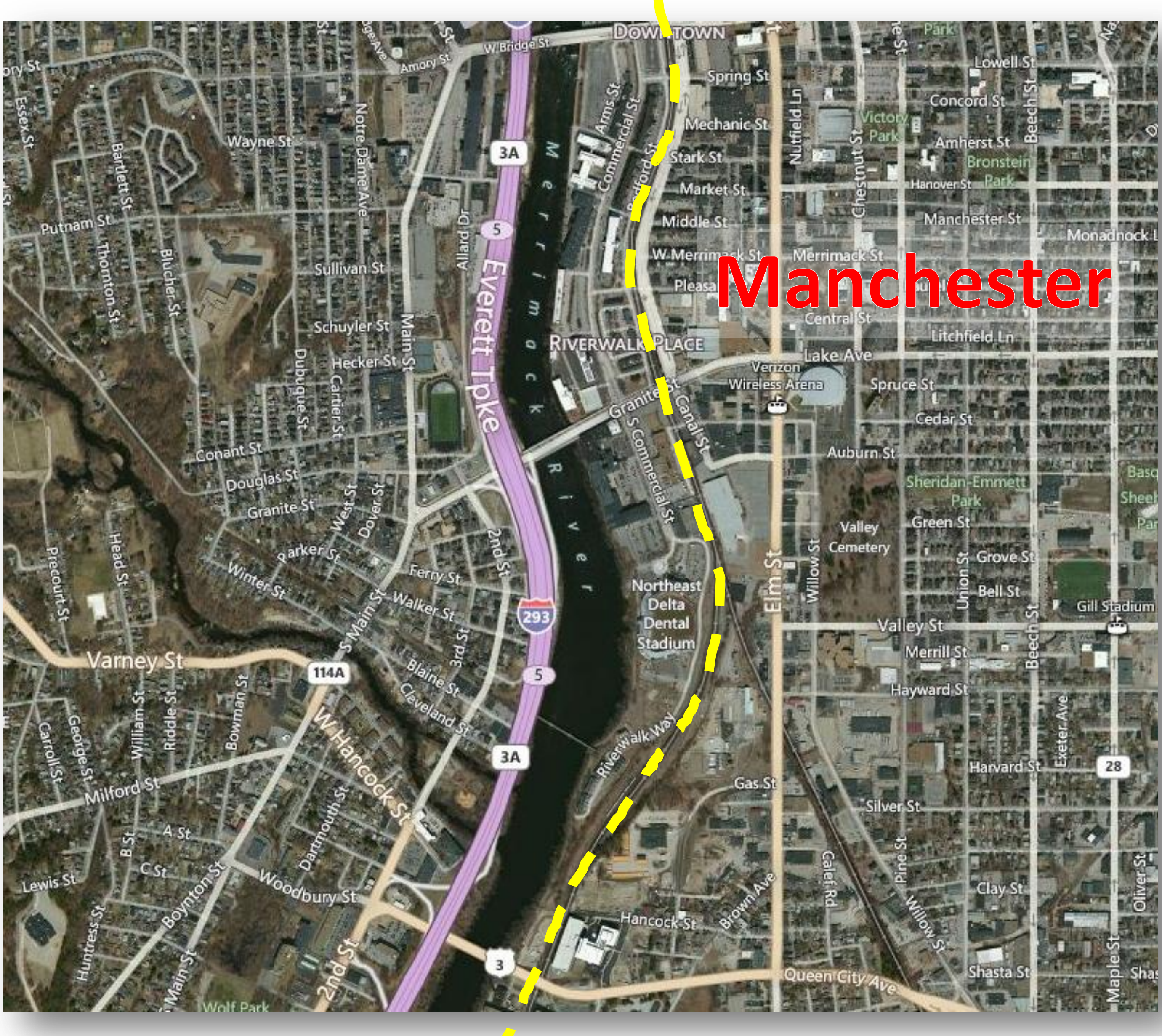
New Hampshire DOT
Department of Transportation

Passengers and Stations

- Most frequently identified benefit: attracting/retaining talented young professionals; improving connection to Boston
- Markets that will drive success
  - Boston
  - All the rest
- Best transit market: Nashua and South
- Best TOD locations: Downtown Manchester & Concord

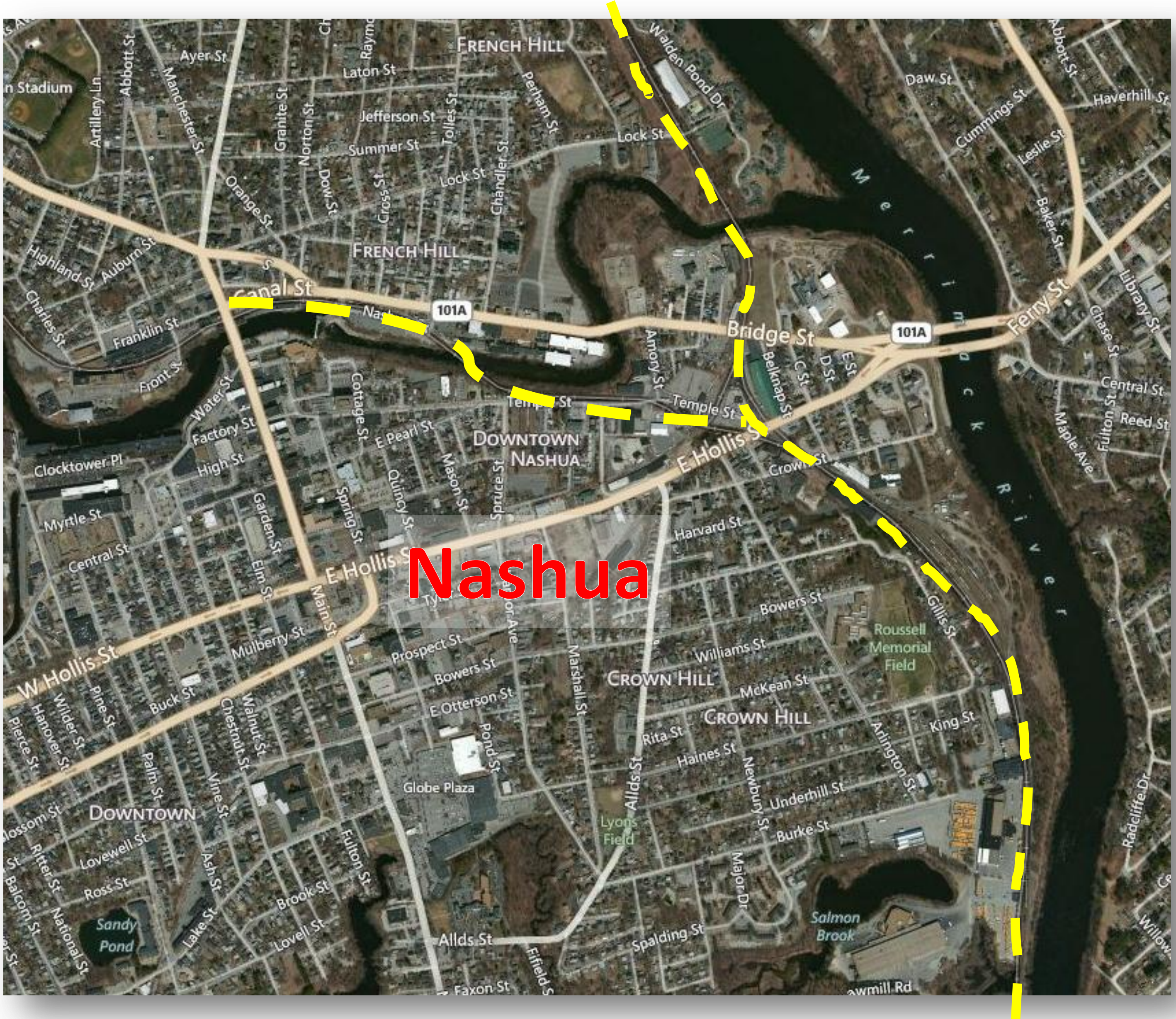


New Hampshire DOT Department of Transportation

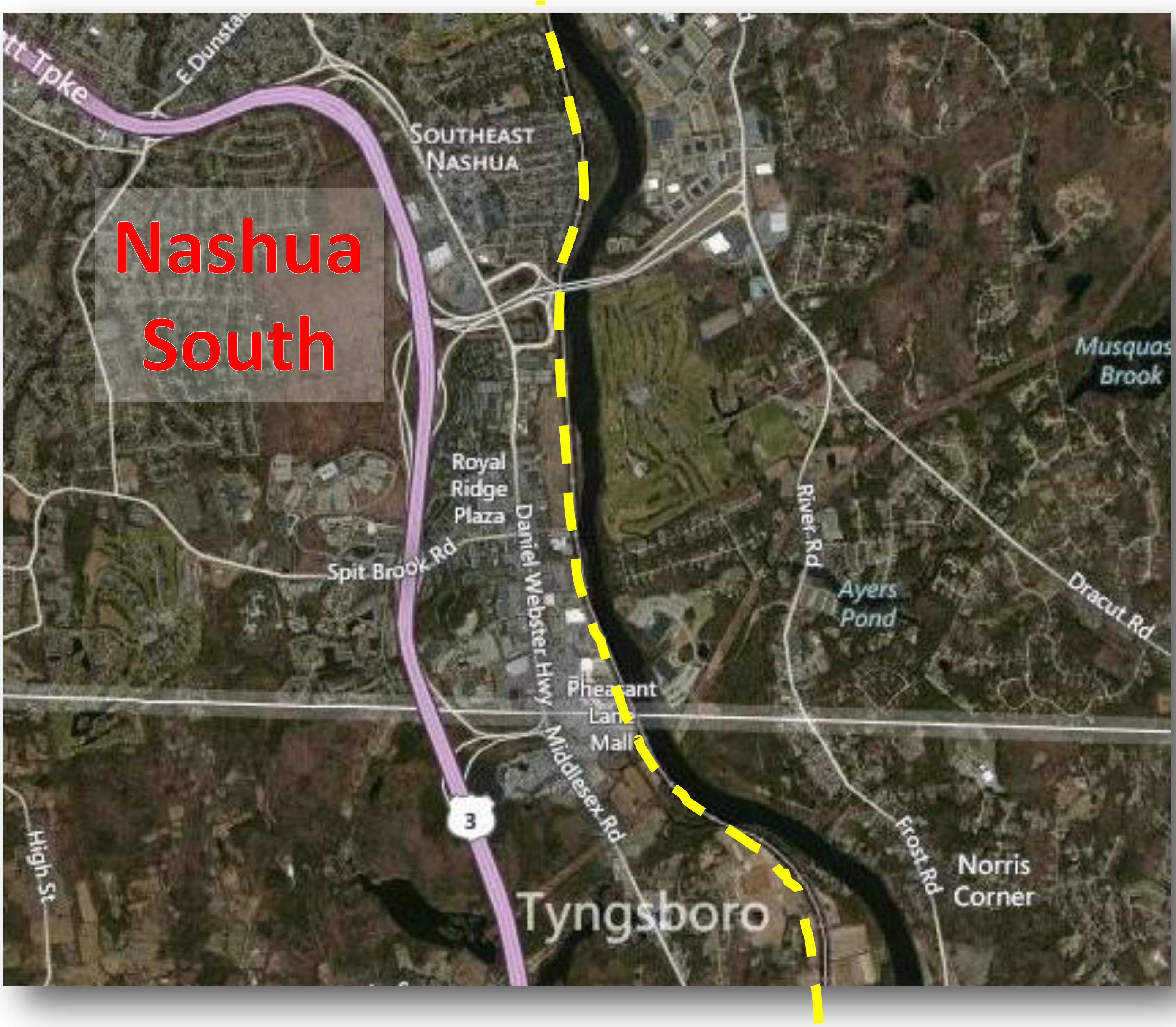


New Hampshire DOT Department of Transportation

New Hampshire DOT Department of Transportation



New Hampshire DOT Department of Transportation



Nashua
South
Southeast
Nashua
E Dunstable
Royal
Ridge
Plaza
Spit Brook Rd
Daniel Webster Hwy
Middlesex Rd
Pheasant
Lane
Mall
River Rd
Ayers
Pond
Dracut Rd
Musquash
Brook
3
High St
Tyngsboro
Frost Rd
Norris
Corner

Critical Issues

- Making the *transportation* case
- Biggest transportation problem: congestion in Massachusetts
- Making the financial and management case
- Solid financial plan needs Federal, State & Local participation
- Rail freight benefits
- Airport benefits

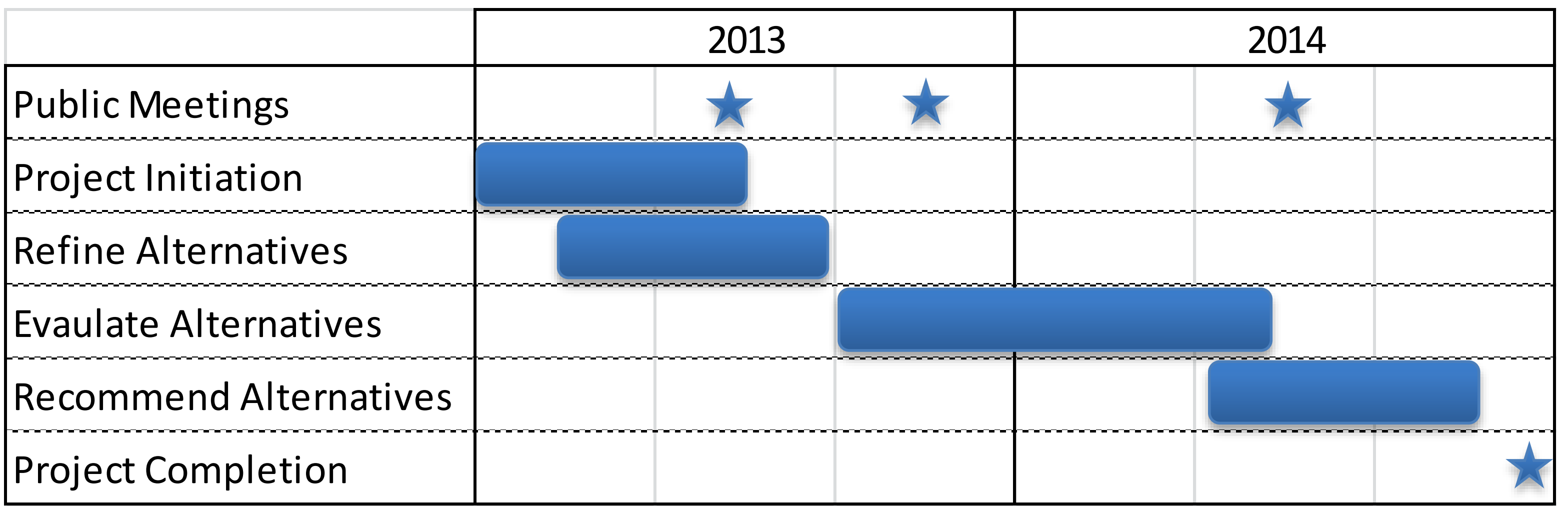
New Hampshire DOT Department of Transportation

Financials

- Key requirement - Credible financial plan for capital *and* operating costs
- Key assumption - 50% capital from USDOT
- No financial plan - No project

Next Steps

Development of detailed alternatives with public input



http://www.nhcapitolcorridor.com/

New Hampshire DOT Department of Transportation

NH Capitol Corridor Rail & Transit Study

The NH Capitol Corridor Study is defining and evaluating opportunities to improve inter-city transit service in the 73-mile corridor between Boston, MA and Concord, NH. While MBTA commuter rail service currently operates between Boston and Lowell, there has not been commuter rail passenger service north of Lowell since it was discontinued in 1967. A public-private partnership, supported by the State of New Hampshire, operates roughly 50 daily bus roundtrips within the corridor between New Hampshire and Boston; this service typically carries 1,800 passengers per day.

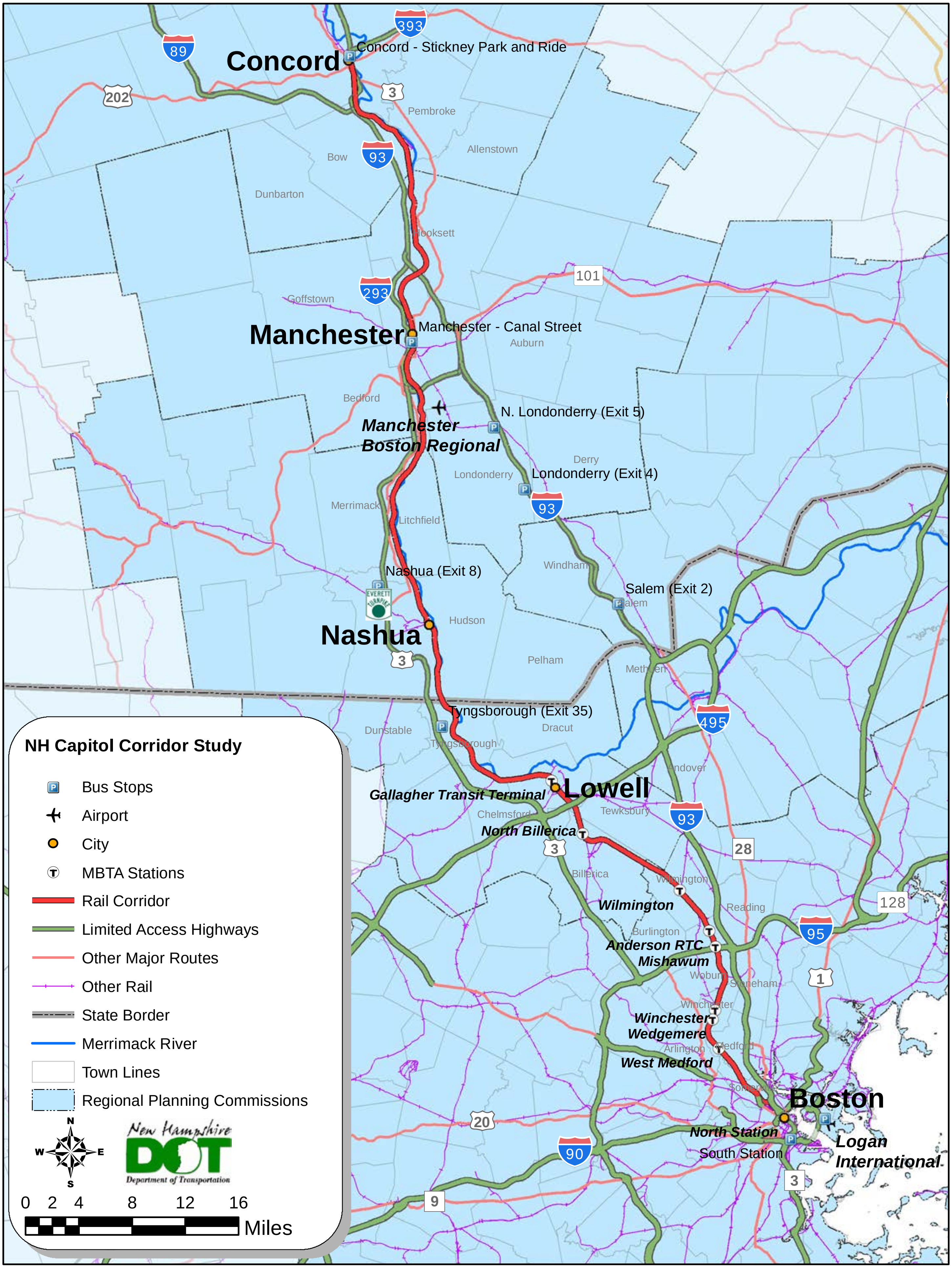
Increasing transportation demand and growing concerns about mobility, economic development and quality of life have led citizens and officials in New Hampshire and Massachusetts to explore options to improve transit service along the corridor. The NH Capitol Corridor project will evaluate a diverse set of rail and bus options for improving connectivity in the NH Capitol Corridor by leveraging existing transportation infrastructure, including the Pan Am Railway, US Route 3 and I-93.

In March of 2013, the NH Department of Transportation, working in concert with its counterparts in Massachusetts, started the NH Capitol Corridor Project, a 21 month project supported by both the Federal Railroad Administration (FRA) and Federal Transit Administration (FTA). Project activities include:

- **Evaluating existing conditions**: The project team is engaging with public and private stakeholders in New Hampshire and Massachusetts to understand the problems they hope to address with public transport improvements and the constraints they face in solving these problems. This fact-finding mission is also documenting current and future conditions within the corridor to guide the development of alternatives that respond to current and future market conditions and infrastructure constraints.
- **Developing alternatives**: The project will develop a mix of rail and bus alternatives that respond to opportunities and constraints along the corridor to address stakeholder concerns.
- **Defining and evaluating alternatives**: For each proposed development option, the team will estimate the cost to develop and operate the service, as well as the likely ridership. Parallel efforts will evaluate how the alternatives can be financed and managed and how they will affect the environment, economic development, the existing transportation network, and the region's high quality of life.
- **Engaging stakeholders**: Stakeholder input will be a critical component of the entire project, and will be consistently sought and comprehensively incorporated into all aspects of alternative development and evaluation.

The study, which will be completed in late 2014, will result in the development of a corridor transport investment strategy that is responsive to local transportation needs and the region's economic, social, financial, and environmental context and that will be competitive for federal construction funding.

Visit the project website: www.nhcapitolcorridor.com



NH Capitol Corridor Study
Bus Stops
Airport
City
MBTA Stations
Rail Corridor
Limited Access Highways
Other Major Routes
Other Rail
State Border
Merrimack River
Town Lines
Regional Planning Commissions
New Hampshire DOT
Department of Transportation
0 2 4 8 12 16
Miles
Concord
Concord - Stickney Park and Ride
Pembroke
Allenstown
Bow
Dunbarton
Hooksett
Goffstown
Manchester
Manchester - Canal Street
Auburn
Bedford
Manchester Boston Regional
N. Londonderry (Exit 5)
Londonderry
Londonderry (Exit 4)
Derry
Merrimack
Litchfield
Windham
Nashua (Exit 8)
Salem (Exit 2)
Nashua
Hudson
Pelham
Tyngsborough (Exit 35)
Dracut
Dunstable
Gallagher Transit Terminal
Lowell
Chelmsford
Tewksbury
North Billerica
Billerica
Wilmington
Reading
Burlington
Anderson RTC
Mishawum
Woburn
Stoneham
Winchester
Wedgemere
Arlington
Medford
West Medford
Boston
North Station
South Station
Logan International

APPENDIX H

Capitol Corridor Public Meetings – March 5, 2014

New Hampshire DOT

Department of Transportation

NH Capitol Corridor Alternatives Analysis and Service Development Plan
Legal Notice
February 12, 2013

The New Hampshire Department of Transportation will hold a public meeting on Wednesday, March 5, 2014 in the Granite State Conference Room at the New Hampshire Department of Transportation, John O. Morton Building, 7 Hazen Drive, Concord NH, 03302, from 6 pm to 8 pm. The public is encouraged to attend and provide the Department with input on transportation alternatives that have been developed as part of the study of transit and rail options in the 73-mile study corridor between Boston, MA and Concord, NH. *The meeting will discuss the preliminary alternatives, evaluation criteria, assessment of alternatives, and the selected alternatives that will be carried forward as part of the detailed evaluation. The meeting will also fulfill the project scoping meeting requirement of the National Environmental Policy Act.*

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Wednesday June 5, 2014

6:00PM – 8:00PM

NH DOT, John O. Morton Building

Granite State Conference Room

7 Hazen Drive, Concord, NH 03301

Ukraine's protest leaders and the president they aim to oust called a truce Wednesday, just hours after the military raised fears of a widespread crackdown with a vow to defeat "terrorists" responsible for seizing weapons and burning down buildings.

The two sides agreed to toll is substantially higher.

The intense clashes between police and protesters led President Viktor Yanukovych to declare that the military would take part in a "national anti-terrorist operation." The parameters weren't specified, but the military's involvement and Yanukovych's appointment they had agreed on a truce and negotiations.

Vitali Klitschko, a leader of the protests that have sought to keep Ukraine open to Europe and out of a close alliance with Russia, said Yanukovych assured them that police would not storm the protesters' encampment on Kiev's Independence dication of how they would be different from previous meetings of the president and the opposition leaders.

Perhaps crucially, there was no immediate indication of whether radical elements among the protesters would observe the truce or be mollified by the prospect of negotiations.

TERMINATION SHALL DIVEST YOU OF ALL LEGAL RIGHTS, PRIVILEGES, DUTIES AND OBLIGATIONS, INCLUDING BUT NOT LIMITED TO THE LOSS OF ALL RIGHTS TO CUSTODY, VISITATION AND COMMUNICATION WITH YOUR CHILD(REN). IF TERMINATION IS GRANTED, YOU WILL RECEIVE NO NOTICE OF FUTURE LEGAL PROCEEDINGS CONCERNING YOUR CHILD(REN).

You are hereby notified that you have a right to be represented by an attorney. You also have the right to oppose the proceedings, to attend the hearing and to present evidence. If you desire an attorney, you may notify this Court within ten (10) days of receiving this notice and upon a finding of indigency, the Court will appoint an attorney without cost to you. If you enter an appearance, notice of any future hearings regarding this child(ren) will be by first class mail to you, your attorney and all other interested parties not less than ten (10) days prior to any scheduled hearing. Additional information may be obtained from the Family Division Court identified in the heading of this Order of Notice.

If you need an interpreter or other accommodations for this hearing, please contact the court immediately.

Please be advised (and/or advise clients, witnesses, and others) that it is a Class B felony to carry a firearm or other deadly weapon as defined in RSA 625.11, V in a courtroom or area used by a court.

January 27, 2014 BY ORDER OF THE COURT Robin E. Pinelle, Clerk of Court

NEWS DIGEST

Airlines warned about new threat

WASHINGTON (AP) – The Homeland Security Department has warned airlines that terrorists could try to hide explosives in shoes. It's the second time in less than three weeks that the government has issued a warning about possible attempts to smuggle explosives on a commercial jetliner.

Homeland Security said Wednesday it regularly shares relevant information with domestic and international partners, but it declined to discuss specifics of the warning.

"Our security apparatus includes a number of measures, both seen and unseen, informed by the latest intelligence and as always DHS continues to adjust security measures to fit an ever evolving threat environment," it said.

Officers' bodies found on ship

NAIROBI, Kenya (AP) – Two American security officers have been found dead on a ship made famous when it was hijacked by Somali pirates, according to a police statement.

The two Americans – Jeffrey Reynolds and Mark Kennedy – were found dead Tuesday in a cabin on the Maersk Alabama, according to the police. The ship was hijacked by pirates in 2009, dramatized in the movie "Captain Phillips" starring Tom Hanks.

The two men's bodies were found Tuesday in their cabin on the ship where it was berthed in Port Victoria in the Indian Ocean island nation of Seychelles.

Coach charged in Mo. girl's death

ST. LOUIS (AP) – A middle-school football coach was charged Wednesday with first-degree murder in the death of a 10-year-old girl who was snatched off a street blocks from her southwest Missouri home as several residents watched in horror.

Craig Michael Wood also faces kidnapping and armed criminal action charges.

NH Capitol Corridor Alternatives Analysis and Service Development Plan

Legal Notice

February 12, 2013

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Wednesday March 5, 2014 6:00PM – 8:00PM
NH DOT, John O. Morton Building
Granite State Conference Room,
7 Hazen Drive, Concord, NH 03301

OLYMPICS UPDATE, PAGE 18

01841

has applied for a license to sell alcoholic beverages of the following type: **All Alcoholic Beverages**

As: **Restaurant**

Manager: **Eliodor N. Audate**

Located at: **188 Broadway, Lawrence 01841**

On the following described premises: **single story structure with 5 rooms; totaling 1,900 sq ft; front entrance on Broadway exit in rear**

Type of Application: **New LATE FILING**

Category of License: **all alcohol restaurant**

A Public Hearing will be held on this matter on **Feb 26, 2014** at 7:00 p.m., in the City Council Chambers of Lawrence City Hall located at 200 Common Street.

Signed:

The Local Licensing Authorities

By: Mayra Lantigua
Ronald Martin
Leocadio Paulino

ET – 2/22/14

COMMONWEALTH OF MASSACHUSETTS
THE TRIAL COURT
PROBATE AND FAMILY COURT

Essex Probate and Family Court
36 Federal Street
Salem, MA 01970
(978) 744-1020
Docket No. ES14P0253EA

Estate of:
Frederick M Wholley, Sr
Also known as:
Frederick Michael Wholley, Sr
Date of Death:
05/20/2013

CITATION ON PETITION FOR FORMAL ADJUDICATION

To all interested persons:

A Petition has been filed by: **Frederick M Wholley, Jr** of **New Bedford MA** requesting that the Court enter a formal Decree and Order of testacy and for such other relief as requested in the Petition.

And also requesting that:

Woodrow Grant	Hsld gds, Furn, Boxes, Tools, Applnces TV/Stereo Equip, Off Furn, Off Mach/Equip, Constrctn Equip
Melanie Francois	Hsld gds, Boxes, Tools
Ivette Colon	Hsld gds, Furn, Boxes
Joseph Markey	Household goods, Tools/Appliances, Office Furn/ Machines/Equip
Michael Mell	Hsld gds, Furn, Boxes
Madeline Andino	Household goods/furniture

ET – 2/22, 2/28/14

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Wednesday March 5, 2014
6:00PM - 8:00PM
NH DOT, John O. Morton Building
Granite State Conference Room
7 Hazen Drive, Concord NH 03301

ET – 2/22/14

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Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Public Meeting #2

Date: 03/05/2014 **Time:** 6:00pm **Location:** NHDOT - Concord, NH

Project Team: Patrick Herlihy (NHDOT), Ken Kinney (URS), Russell Wilder (URS), Carl Chamberlin (URS), David Nelson (Jacobs), Ryan Harris (Jacobs)

Attendees/Distribution: (Sign in sheet attached)

Minutes:

Patrick Herlihy welcomed the attendees to the meeting and Ken Kinney provided a brief overview of the progress of the study. Russ Wilder provided an over view of the NEPA process and that the study would be producing an EA under the auspices of FRA with FTA as the cooperating agency. Carl Chamberlin walked the attendees through the selection criteria and preliminary site layouts for the proposed stations and layover yards. Russ Wilder also mentioned that while the W.R. Grace site at Spit Brook Road has been identified as a layover and potential station site would likely require some environmental mitigation.

Peter Dearness of NESRR asked if high speed rail (HSR) was being considered in the corridor and if the travel time were compared to buses that may operate at 70mph on the highway. David Nelson answered that while the corridor was included in a Boston-Montreal HSR study in 1999, the Boston & Maine RR had a maximum speed of 70 mph while it was operating along the line. Effort has been made to raise existing speeds along the line without leaving the existing alignment, but the amount of curvature to the line along the Merrimack River makes it difficult. Certain segments may be able to increase speeds to 75mph and the line should be able to operate passenger travel times to Boston similar to those that existed in the 1920s and still support freight operations. Ken Kinney added that the cost-benefit analysis does not illustrate a good return on investment for the costs that would be required to introduce HSR along the line. David Preece of SNHRRPC asked if the plan was to evaluate HSR even though it would most likely be screened out, to which Ken replied that the study would describe a full range of reasonable options.

A question was asked regarding existing ridership levels on the Downeaster service. Tom Mahon replied that the Downeaster sees approximately 500,000 boardings per year, while the proposed Manchester commuter rail option would likely see approximately 800,000 boardings per year.

The third question related to whether the aging of New Hampshire would be incorporated in the study. David Nelson replied that it would, but the FTA is now looking for justification of whether projects make sense today and not just in the future. Tom Mahon added that while it has been widely publicized that Millenials are driving at lower levels, older people have also been reducing their driving. A third person (Paula Wallach) added that she would not continue driving forever.

Tom Mahon of the NHRTA asked how much lower the annual costs would be to initiate and maintain the Nashua Minimum CR6 option than for the Manchester Regional CR3 option. Ken Kinney replied that the project team is still evaluating this, but they would be lower.

Ken Kinney closed the presentation by discussing next steps, strategy and schedule. He described the options that were being advanced for further development and that a multimodal systems approach could include peak-rail/off-peak bus and phased implementation. He said that the high paying jobs in

Boston could help increase local household incomes and the bottom line questions of capital and operating costs were being discussed with stakeholders.

Peter Dearness of NESRR opened the Q&A portion of the meeting by making a direct request to the study team specifically related to the proposed Concord station and layover site. He said that he understands that any detailed engineering for the line is more than a year away, but that it will be important as the study progresses to maintain a connection between NESRR and the B&M at the site. He described an issue that the railroad is currently working to resolve with the city of Concord relates to a bankruptcy proceeding with the Holiday Inn and that the city is buying the land from the hotel. He said that the city's plan to relocate Storrs Street will also require some relocations. He also said that a double-ended siding would be necessary to ensure freight access to the northerly tracks.

Paula Wallach made a public comment in support of rail and in opposition to BRT which she felt has not been successful in other cities and Bus on Shoulder which she feels would not be safe. She also pondered why the state would consider running buses as she feels that they are much more expensive to operate than commuter rail. She stated that roads are subsidized by the state and that the cost of paving roads should be included in the cost of bus transit. She asked "who shot the passenger rail?" and said that the Capitol Corridor should be electrified since that would enable higher speeds, improved equipment reliability and reduced environmental impact. She suggested that additional north-south rail service should be reactivated on the M&L line and the Worcester-Nashua-Portland routes that have become recreational trails for yuppies. She added that local transit is lacking in the region and that an east-west light rail line should be studied across the city of Manchester.

Kenyon Karl of the Sierra club asked about the absence of connections to exiting city buses. Ken Kinney replied that we have been in contact with MTA, NTS and CTA and David Nelson added that each of the proposed downtown stations are located along existing local bus routes.

Peter Dearness of NESRR asked the final question of the evening about the state's current ownership responsibility of the Boston Express buses. Patrick Herlihy replied that 80% of the capital cost is provided by the federal government and that the remainder was covered by NHDOT.

New Hampshire DOT Department of Transportation

NH Capitol Corridor Study Public Meeting
NHDOT, Concord, NH
March 5, 2014, 6:00PM

Name	Agency	Email	Phone
Russ Wilder	URS	Russ.Wilder@urs.com	617-515-7258
Malcolm Taylor	NH Rail Transit Auth.	malcolmT295@Gmail.com	603-968-3846
PAUL HATCH	NEGS	negs2310@gmail.com	603-520-7692
Kenyon F Karl	Sierra Club NH	kenyon karl@gmail.com	603-[illegible]-7303
Larry Ayer	NEGS	LAYER0305Z@AOL.COM	603-881-5674
Pete Dearness	NES RR Co	mbldrpete@comcast.net	603-491-3660
[illegible] A Peres	NEGS	rrmedicdearness@yahoo.com	603-986-9859
FRANK JUDGE	NEGS	FBJ672@COMCAST.NET	603-472-2720
Thomas Manning	NES RR	Manning0627@comcast.net	603-360-5807
Rebecca Harris	Transport NH	RLHarris@TransportNH.org	
THOMAS J. MAHON	NH RAIL TRANSPORT AUTH		
Joshua Prescott			
RON CRICKARD	NH DOT	rcrickard@dot.state.nh.us	
JOHN FILIPPONE		jfilipp1@gmail.com	603-707-7799
Rebecca Fishow	Hippo Press	RFishow@hippopress.c	603-625-1855x36
Todd Fontanella	MVPC	tfontanella@mvpc.org	9788740519
Collin Lever	US Rep. Kuster	collin.lever@mail.house.gov	603595 [illegible]
Bob Rimol		bobrimol@gmail.com	494-5775

New Hampshire DOT Department of Transportation

NH Capitol Corridor Study Public Meeting
NHDOT, Concord, NH
March 5, 2014, 6:00PM

Name	Agency	Email	Phone
JOSH DENTON	US RBP SHEA-PURGBR	JOSH.DENTON@MAIL HOUSE.GOV	641-9536
Matt Leahy	Sen. Shaheen	Matt_Leahy@shaheen.senate.gov	647-7500
Mike Izbicki	NHRTA	msizbic@comcast.net	603-493-0534
MARK SAMSEL	SOUTH NH PLANNING COMM.	mark.samsel@LFO.com	6035457217
Simon Thomson	Sen. Ayotte's Office		603-622-7979
Meegan Doyle	Concord Monitor	mdoyle@cmonitor.com	369-3321
Jasen Cole	Devine Millimet	jcole@devinemillimet.com	695-8566
Ben Blunt	Concord Coach Lines	bblunt@concordcoachlines.com	228-3535
David Preece	SNHPC	dpreece@SNHPC.org	669-4664
Mike Tardiff	CNHRPC	mtardiff@cnhrpc.org	226-6020
Tom Irwin	CLF	tirwin@clf.org	225-3060
[illegible]	Montagne		
Paul Keriazes		pkeriazes@comcast.net	
Jim Haddadin	Nashua Telegraph		
D Nelson	Jacobs		
Bill Cass	NHDOT		
Mark Sanborn	Concord Coach		
Shelley Winters	NH DOT		

New Hampshire DOT Department of Transportation

NH Capitol Corridor Study Public Meeting
NHDOT, Concord, NH
March 5, 2014, 6:00PM

Name	Agency	Email	Phone
Patrick Herlihy	NH DOT		271-2468
Robert Baker		rb64@earthlink.net	
RONALD GRANDMAISON	NHDOT		271-6198

NH Capitol Corridor
Rail & Transit Alternatives Analysis

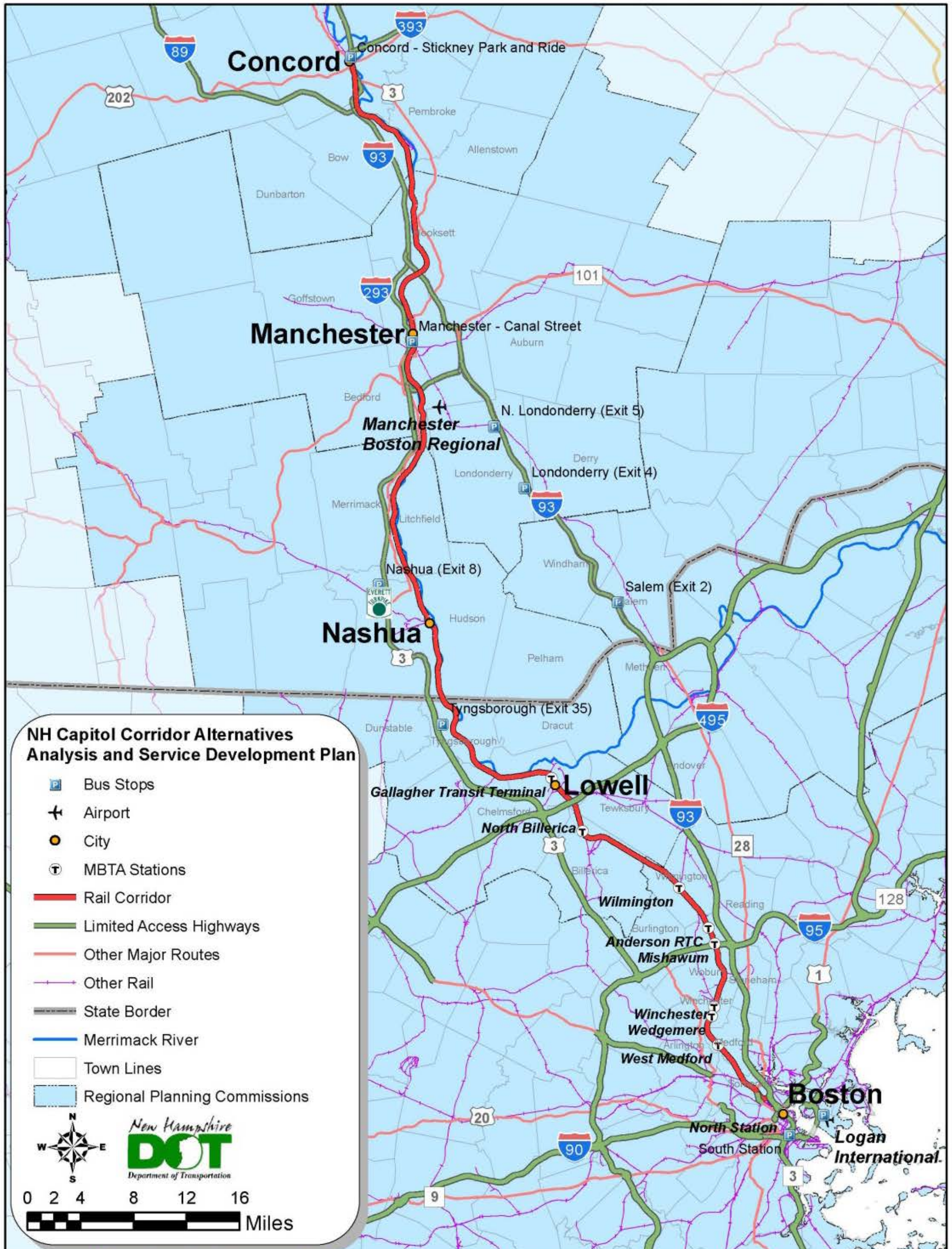
Public Scoping Meeting

March 5, 2014

New Hampshire DOT
Department of Transportation

Agenda

- Study overview
- National Environmental Policy Act
- Preliminary alternatives: rail, bus, stations, layover facilities
- Objectives/benefits
- Evaluation criteria, assessment of alternatives
- Final alternatives
- Next steps/implementation

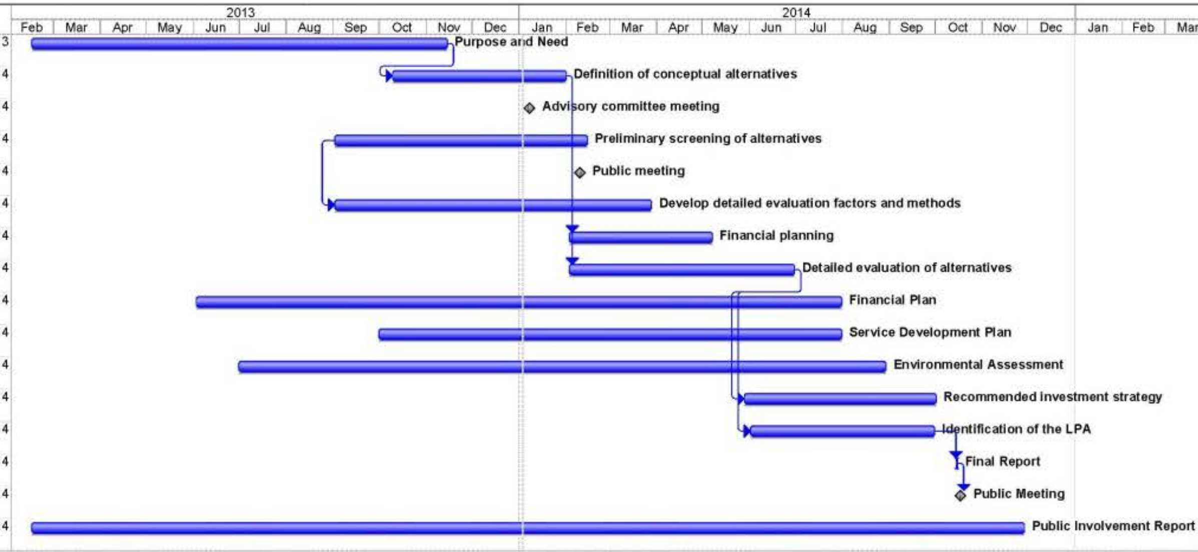


New Hampshire DOT Department of Transportation

Schedule

Alternatives Analysis Timeline

ID	Task Name	Duration	Start	Finish
1	Purpose and Need	9.75 mons	Fri 2/15/13	Thu 11/14/13
2	Definition of conceptual alternatives	4.1 mons	Thu 10/10/13	Fri 1/31/14
3	Advisory committee meeting	0 days	Wed 1/8/14	Wed 1/8/14
4	Preliminary screening of alternatives	6 mons	Mon 9/2/13	Fri 2/14/14
5	Public meeting	0 days	Mon 2/10/14	Mon 2/10/14
6	Develop detailed evaluation factors and methods	7.5 mons	Mon 9/2/13	Fri 3/28/14
7	Financial planning	3.4 mons	Mon 2/3/14	Wed 5/7/14
8	Detailed evaluation of alternatives	5.3 mons	Mon 2/3/14	Mon 6/30/14
9	Financial Plan	15.2 mons	Mon 6/3/13	Thu 7/31/14
10	Service Development Plan	10.9 mons	Tue 10/1/13	Thu 7/31/14
11	Environmental Assessment	15.25 mons	Mon 7/1/13	Fri 8/29/14
12	Recommended investment strategy	4.5 mons	Thu 5/29/14	Wed 10/1/14
13	Identification of the LPA	4.35 mons	Mon 6/2/14	Tue 9/30/14
14	Final Report	1 day?	Wed 10/15/14	Wed 10/15/14
15	Public Meeting	0 days	Fri 10/17/14	Fri 10/17/14
16	Public Involvement Report	23.3 mons	Fri 2/15/13	Fri 11/28/14



NEPA Process

- What is the National Environmental Policy Act (NEPA)?
  - Establishes procedural requirements for all federal government agencies to prepare environmental assessments (EAs) and environmental impact statements (EISs)
  - EAs and EISs contain statements of the environmental impacts of proposed federal agency actions
  - The NEPA process includes public input in the planning and permitting of projects

NEPA Process (cont.)

- How does NEPA apply to the NHCC project?
  - FRA has provided funding to the NHDOT to study intercity passenger rail service to Concord, NH from Boston, MA
  - If the project were to be funded by the FRA, it would be a federal action subject to NEPA
  - FRA – Tier 1 Environmental Assessment (EA) for intercity service
    - For this study the FRA is the lead agency and FTA is a cooperating agency

NEPA Process (cont.)

FTA

– Supplement Environmental Information from previous study to include Nashua to Manchester transit options

– Appropriate environmental documentation to follow if a transit project moves forward

NEPA Process (cont.)

- Public input sought tonight:
  - Intercity Passenger Rail with Bus
  - Transit System (Commuter Rail and Bus Options)
  - Social, economic, or environmental impact
  - Alternatives and measures which might avoid, minimize and/or mitigate adverse environmental impacts

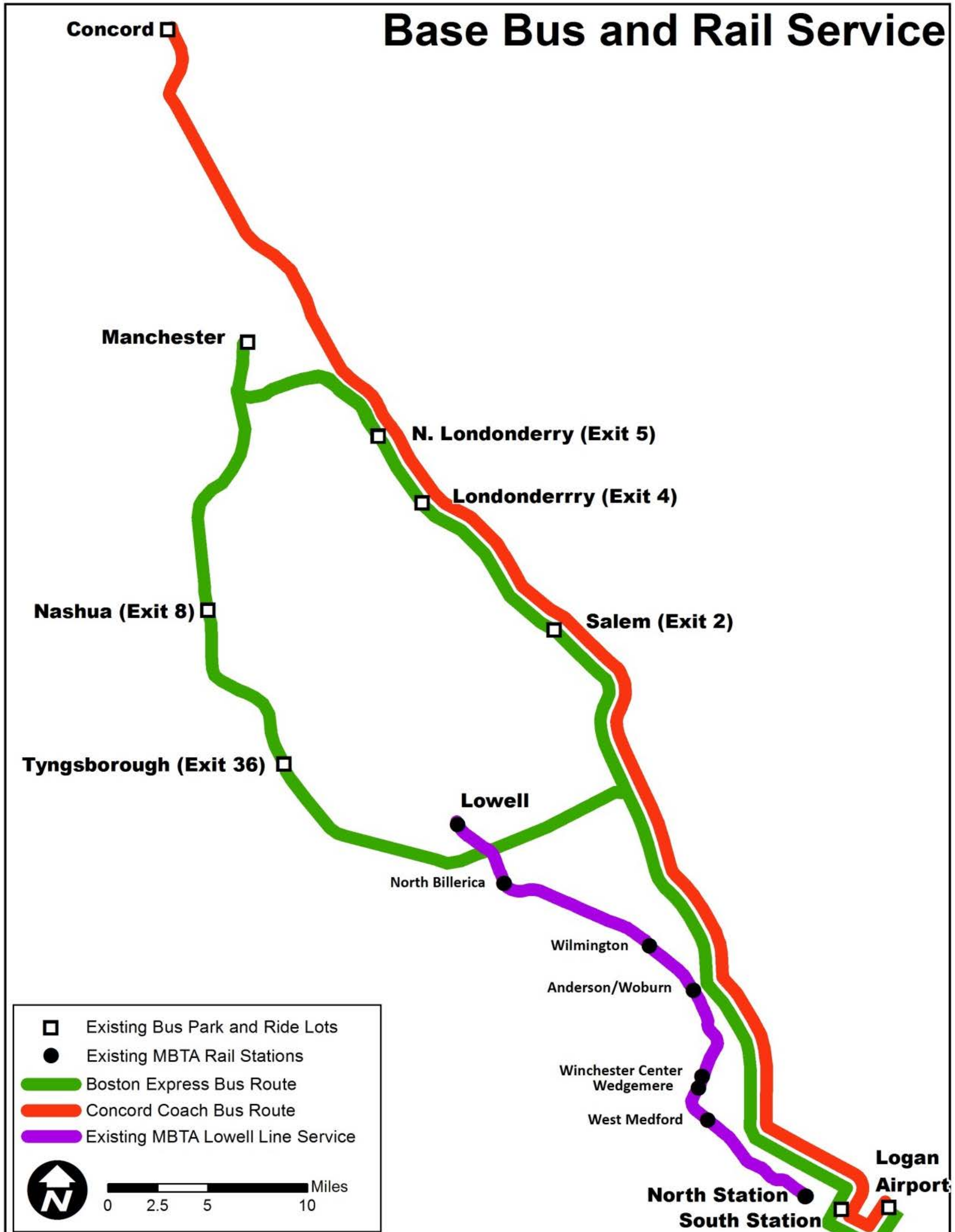
MBTA Commuter Rail: Thirty Five Years of Expansion

New Hampshire DOT
Department of Transportation

Commuter Rail Service Options

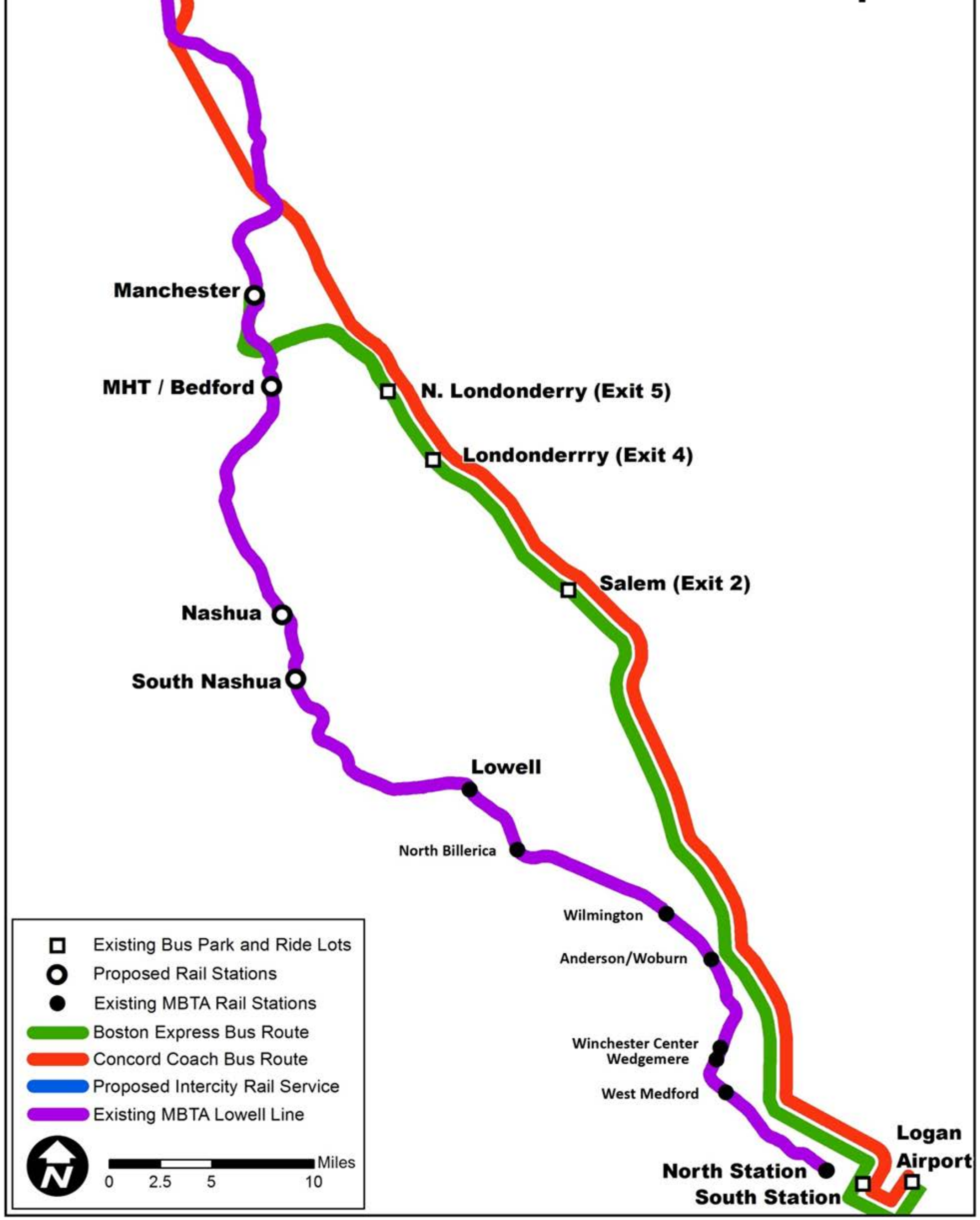
Options	Weekday Revenue Trains				Route Miles	Station	Wkday Train Miles
	Lowell	Nashua	Manch	Concord			
1. Concord Regional	44	30	8	8	73	14	1,957
2. Concord Commuter	44	26	22	18	73	14	2,374
3. Manchester Regional	44	34	16	0	56	13	2,068
4. Manchester Commuter	44	30	20	0	56	13	2,091
5. Nashua Commuter	44	34	0	0	39	11	1,888
6. Nashua Minimum	44	16	0	0	35	11	1,496

New Hampshire DOT Department of Transportation



New Hampshire DOT
Department of Transportation

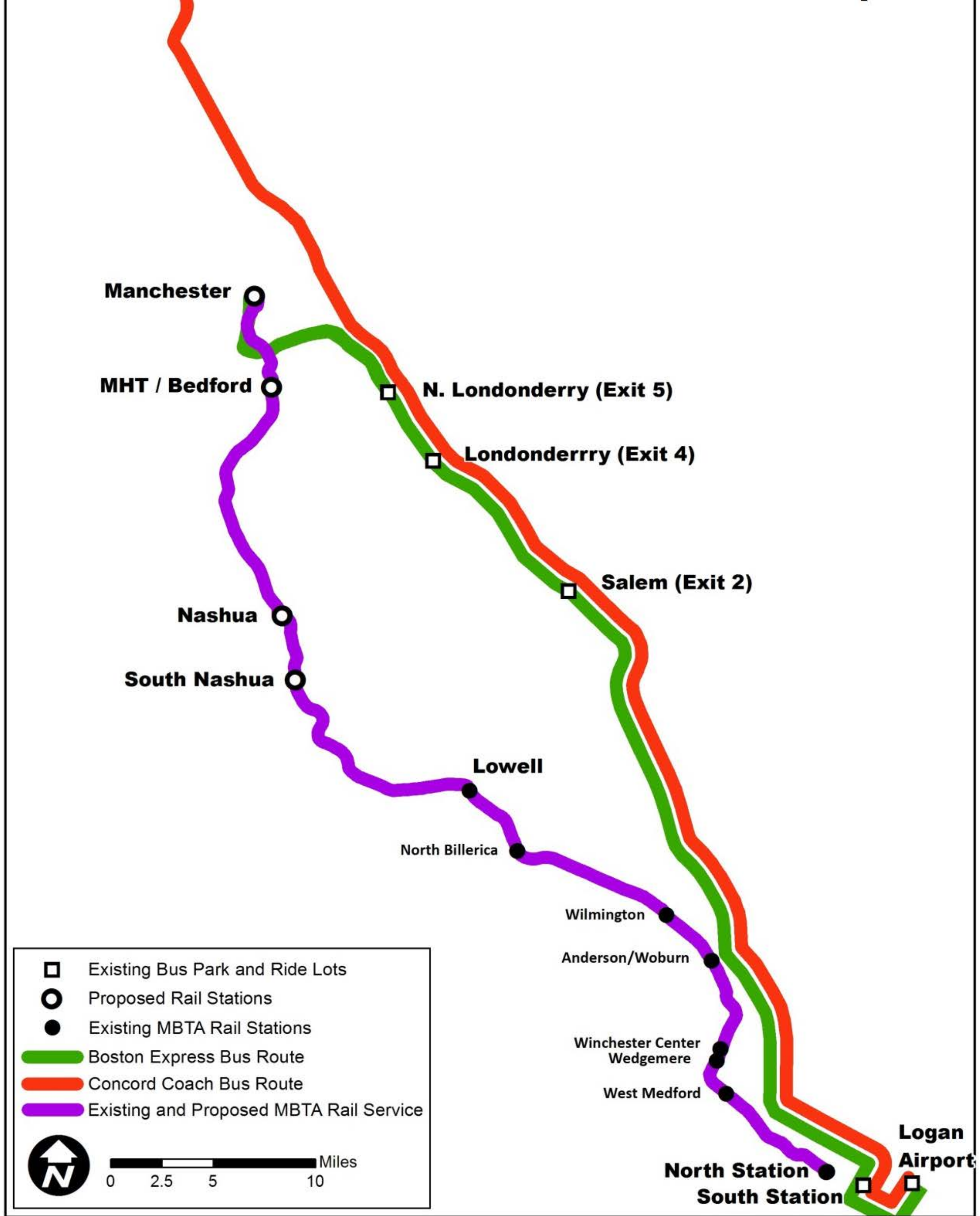
Concord Rail Service Option



NH Capitol Corridor

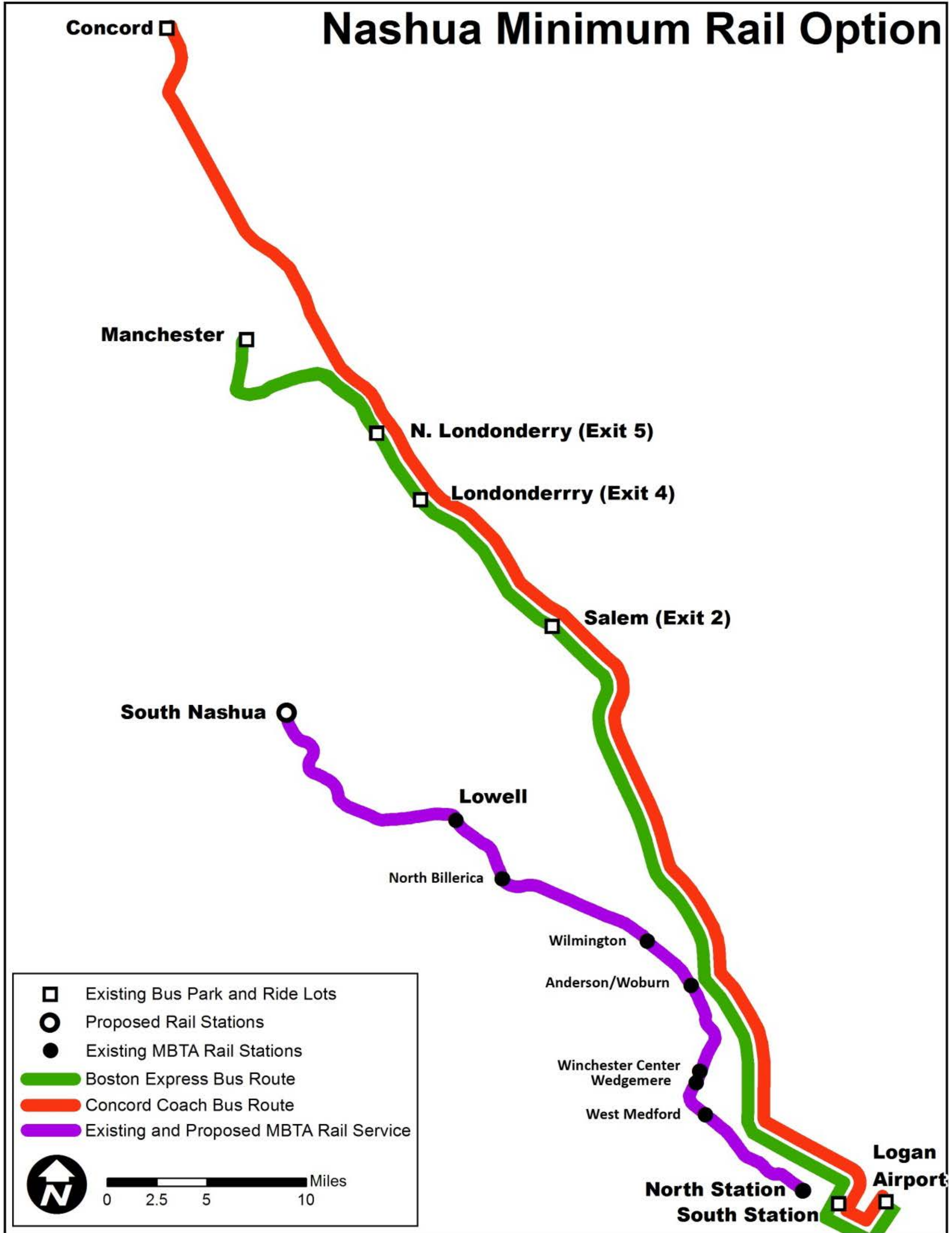
New Hampshire DOT Department of Transportation

Manchester Rail Service Option



New Hampshire DOT Department of Transportation

Nashua Minimum Rail Option



New Hampshire DOT
Department of Transportation

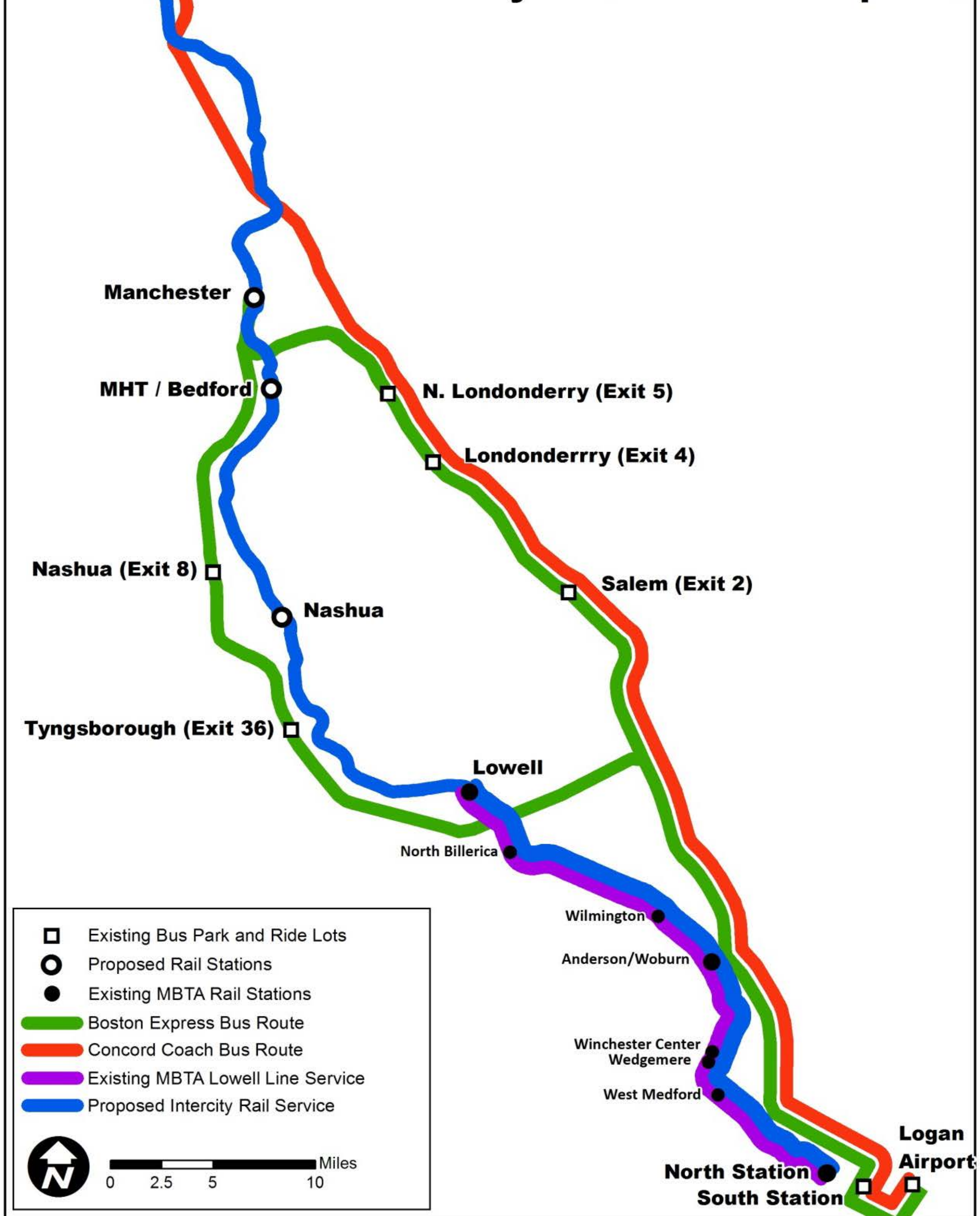
Conceptual Stations

Station	Miles to Boston	Max Time to Boston	Min Time to Boston
Concord	73.4	1:54	1:46
Manchester	55.5	1:32	1:25
MHT / Bedford	50.1	1:24	1:17
Nashua	38.8	1:14	1:02
South Nashua	35.2	1:08	0:54

Intercity Rail Service Options

Options	Weekday Revenue Trains			Route Miles	Stations	Wkday Train Miles
	Nashua	Manchester	Concord			
1. Intercity 8	8	8	8	73	12	2,038
2. Intercity 12	12	12	12	73	12	2,332
3. Intercity 18	18	18	18	73	12	2,771

Intercity Rail Service Option



New Hampshire DOT
Department of Transportation

Conceptual Intercity Stations

Stations	Miles to Boston	Intercity Time to Boston	Min CR Time to Boston	Max CR Time to Boston
Concord	73.4	1:36	1:46	1:54
Manchester	55.5	1:22	1:25	1:32
MHT / Bedford	50.1	1:09	1:17	1:24
Nashua	38.8	0:56	1:02	1:14
Lowell	25.5	0:38	0:44	0:49

Potential Station Locations

Primary Criteria

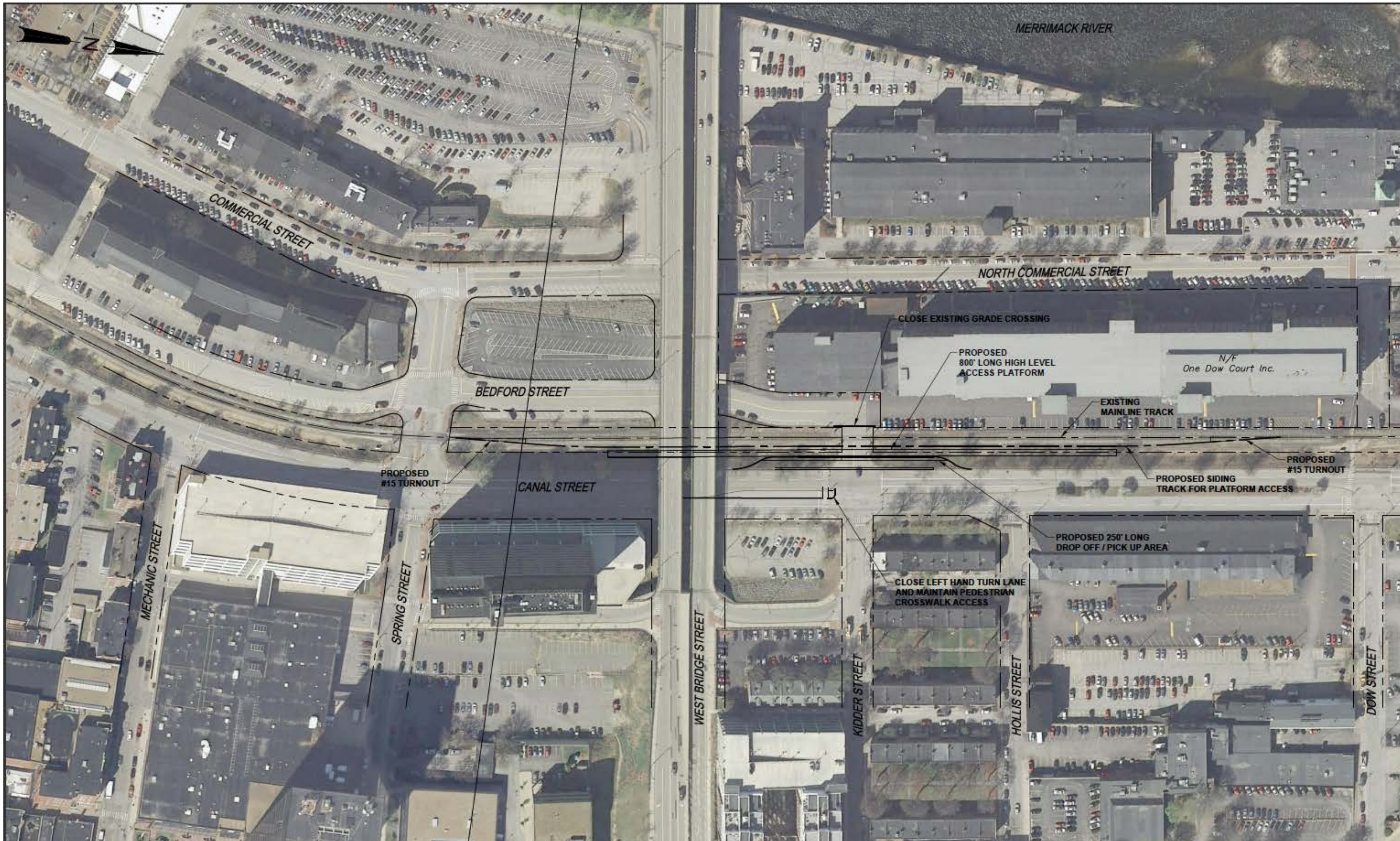
- Market (Nashua, Manchester, Concord)
- Access (Major highways, exits, local roads)
- Track Characteristics (straight track, sidings)
- Land Use (residential, commercial, industrial)
- Lot Size/Configuration

Secondary Criteria

- Environmental (wetlands, river, habitat)
- Ownership (State or private)
- Sensitive Receptors (residential, schools, hospital)
- Miscellaneous Factors

Concord – Stickney Avenue

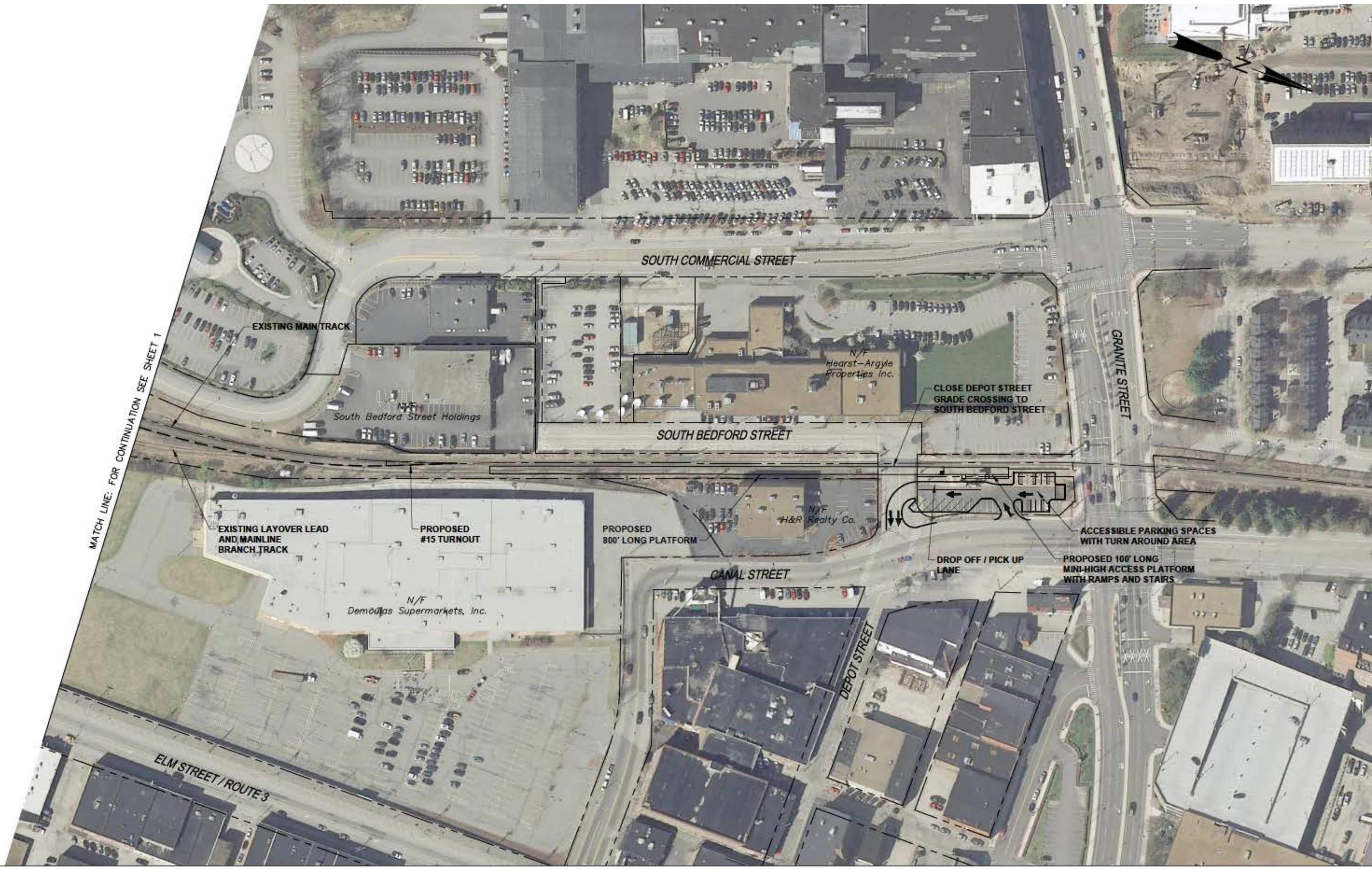
Manchester – Spring Street



NH Capitol Corridor Rail & Transit Alternatives Analysis

New Hampshire DOT Department of Transportation

Manchester – Granite Street



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MHT – Ray Wieczorek Drive

New Hampshire DOT Department of Transportation

Nashua – Crown Street

New Hampshire DOT Department of Transportation

Nashua – Spit Brook Road

New Hampshire DOT Department of Transportation

Nashua – Pheasant Lane Mall

New Hampshire DOT Department of Transportation

Potential Layover Sites

Primary Criteria

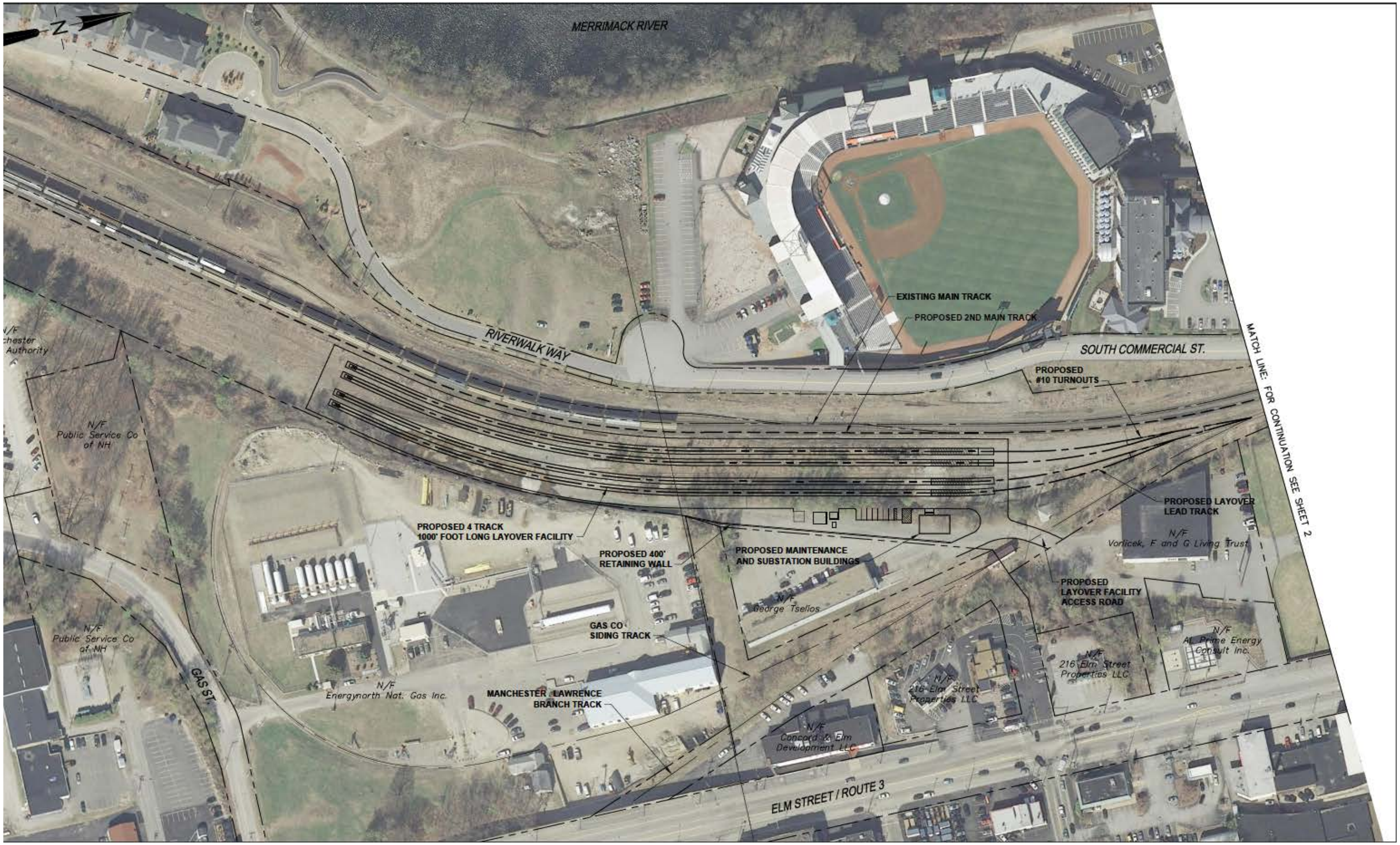
- Terminus (Nashua, Manchester, Concord)
- Track Characteristics (straight track, sidings, existing rail yard)
- Land Use (Residential, commercial, industrial)
- Sensitive Receptors (residential, schools, hospital)

Secondary Criteria

- Environmental (wetlands, river, habitat)
- Ownership (State or private)
- Miscellaneous Factors

Concord – Stickney Avenue

Manchester – Granite Street



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Manchester – Cemetery

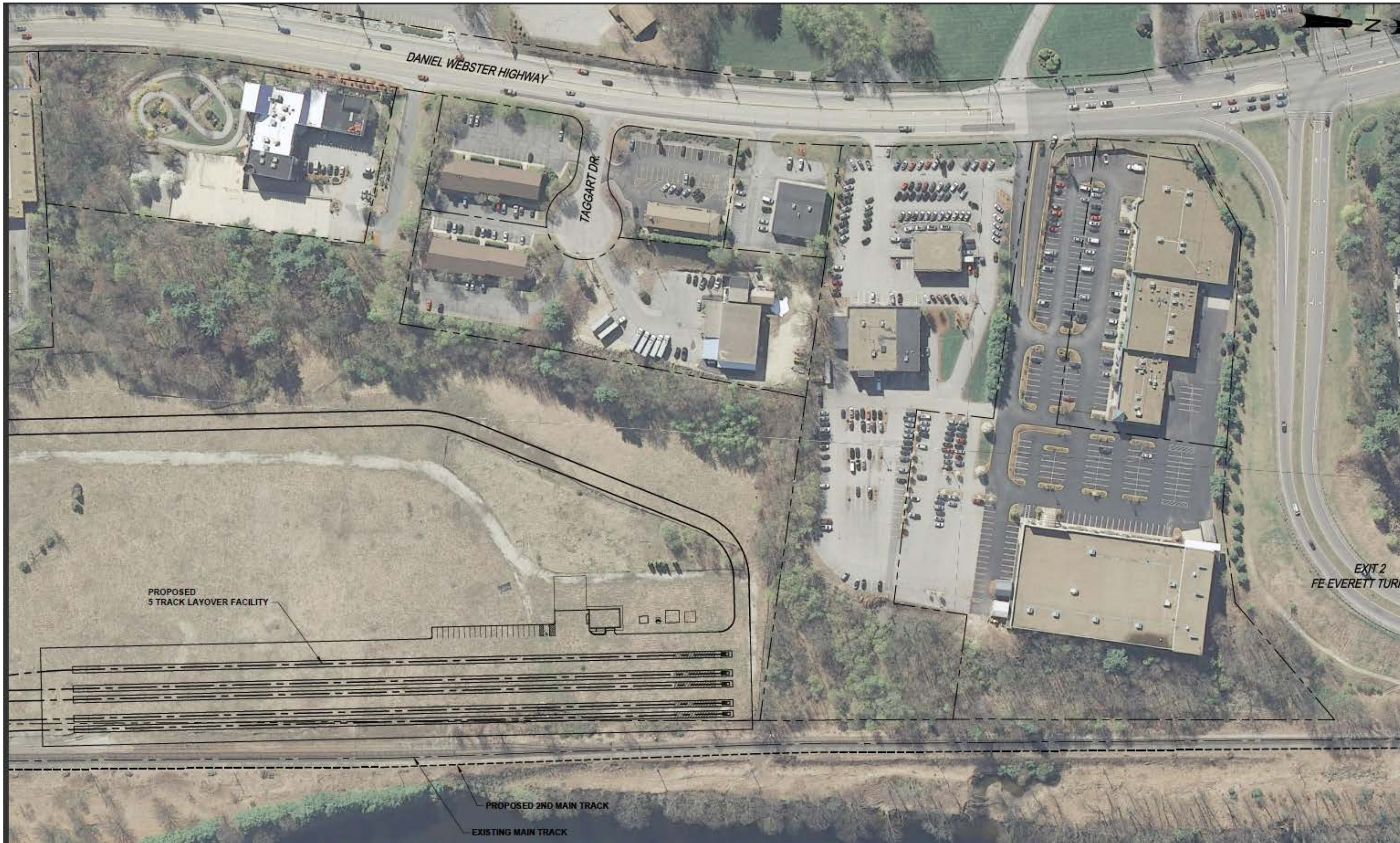
Manchester – Cemetery (cont.)

Manchester – Wastewater Treatment Plant

Manchester – Wastewater Treatment Plant (cont.)

New Hampshire DOT Department of Transportation

Nashua – Spit Brook Road



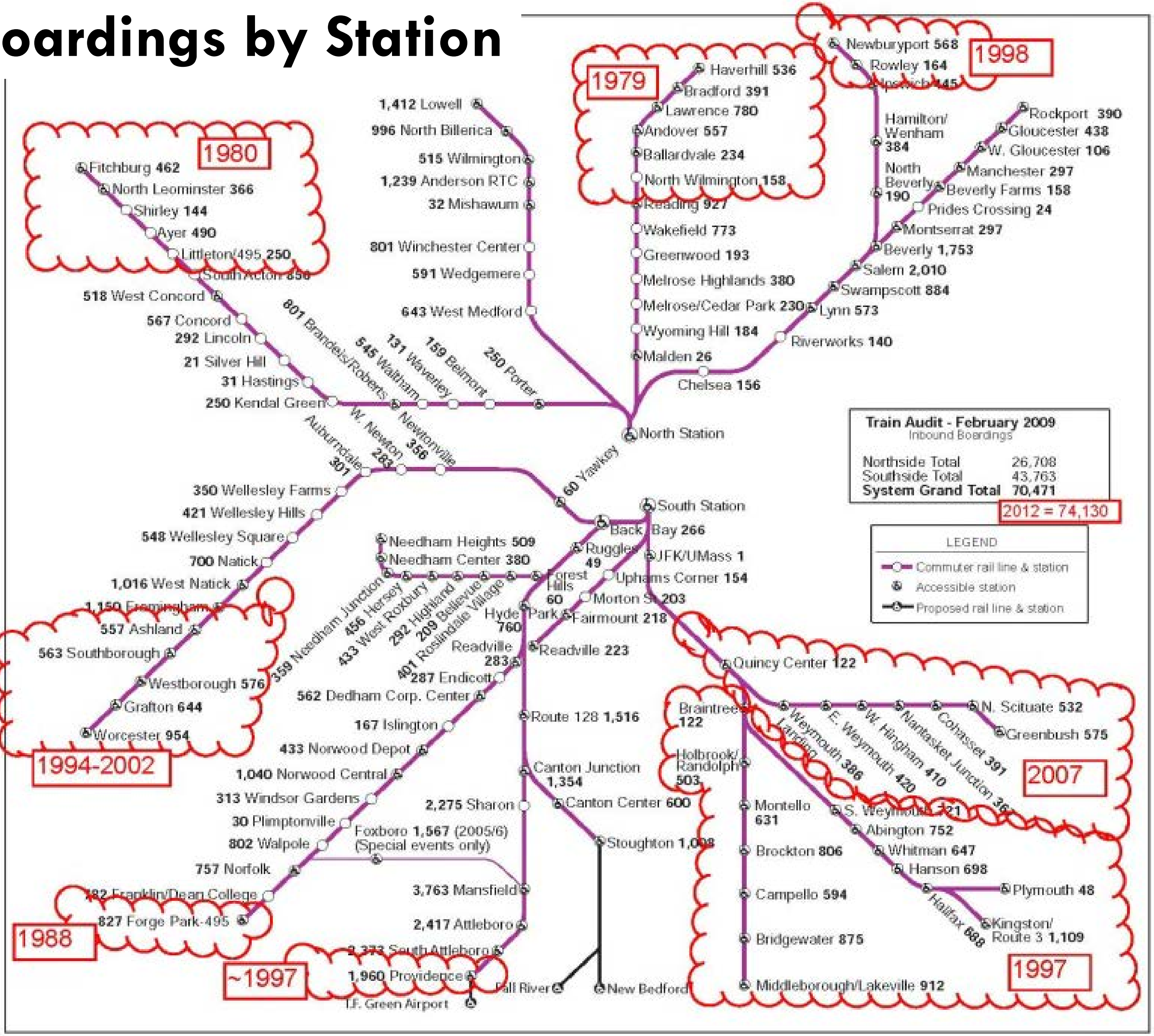
Express Bus Options

- Bus on Shoulder for Existing Service
  - 80 weekday buses
  - 8-12 minute savings for 16 am peak southbound buses
  - Afternoon savings are less
- Bus on Shoulder for Enhanced Service
  - Approximately 120 weekday buses
  - 8-12 minute peak savings over current travel times
  - 30-minute peak headway; 60-minute off-peak
  - All peak buses offer non-stop service to Boston

Rail Ridership

- Up to 3,100 total boardings per weekday
- Boston-Manchester
  - 16 trains to Manchester
  - 34 trains to Nashua
- Existing bus service on I-93

MBTA Boardings by Station



Bus on Shoulder Ridership

- Up to 1200 boarding per weekday
- Expanded BoS Service

Benefits/Objectives

- Address the congestion issue at southern end of the corridor, thereby reducing trip times and providing a wider set of alternatives to the automobile.
- Improve access to higher-paying jobs in greater Boston. Commute from New Hampshire; return money to New Hampshire.
- Improve access to other tourism, recreation and cultural attractions in both greater Boston and in New Hampshire.
- Attract and retain population in New Hampshire, especially younger, highly-educated professionals.

Benefits/Objectives

- Build that employee base to attract new businesses and grow existing ones in New Hampshire.
- Promote concentrated development (TOD) to mitigate sprawl development patterns, help accommodate residents seeking additional lifestyle choices and to reduce vehicle miles travelled.
- Attract federal transportation investment dollars by leveraging existing transportation infrastructure.
- Improve the potential for additional rail freight business.
- Provide additional transit service to the Manchester-Boston Regional Airport.

New Hampshire DOT Department of Transportation

NH Capitol Corridor Rail and Transit Study

Preliminary Screening of Conceptual Alternatives

Alternative	Cost	NH Ridership	Land Use/ Economic Development	Environmental **Fatal Flaw ONLY**
No Build / No Transit Improvement	○	○	○	●
Concord Regional	◔	◑	◕	●
Concord Commuter	◔	◑	◕	●
Manchester Regional	◑	◑	◑	●
Manchester Commuter	◑	◑	◑	●
Nashua Commuter	◕	◔	◔	●
Nashua Minimum	◕	◔	◔	●
Intercity 8	◑	◔	◔	●
Intercity 12	◔	◔	◑	●
Intercity 18	◔	◔	◕	●
BOS	●	◔	○	●
BOS +	◕	◔	○	●

Alternative Definition and Selection: What Makes a Big Difference

- Rail capital costs are much greater than bus
- Land use/development/TOD
  - Bus, rail both can have development impacts – just very different
- Ridership
  - Stronger markets closer to Boston
  - Park-and-ride vs. center city stations; importance of drive access
  - Rail ridership forecasts higher than bus

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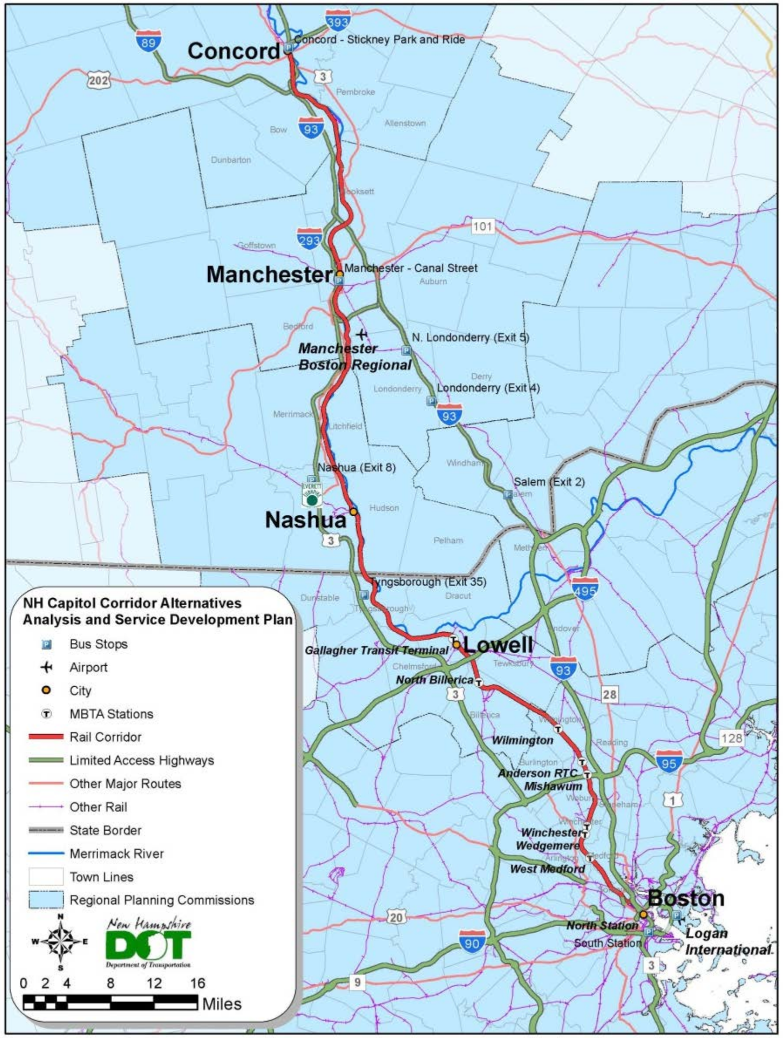
Bottom Line Questions

#1: What does rail do best?

#2: What does express bus do best?

Bottom Line Questions

#3: Can we do it all? The transit *system* strategy.



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Bottom Line Questions

#4: Can we get 50 percent of capital from the federal government?

Bottom Line Questions

#5: What is the state/local annual financial requirement – after federal support, fares?

- Illustrative alternative : Boston - Manchester
  - $8 - $10 million per year
- Source(s): TBD

Alternatives Advanced for More Detailed Evaluation

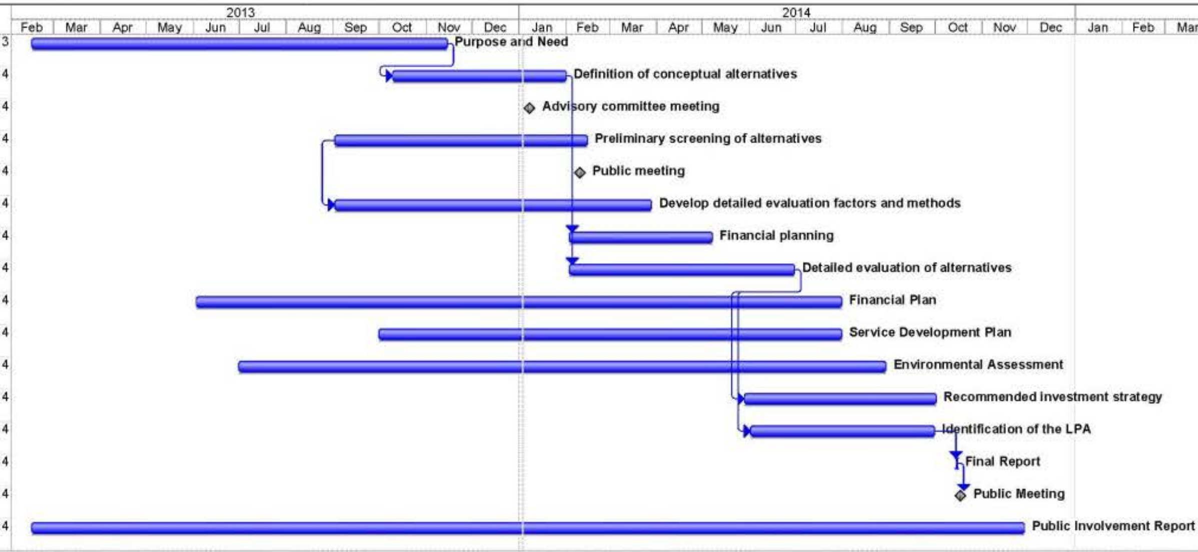
- No Build: Base Bus
- Base Bus on Shoulder (BoS)
- Base Enhanced (Base+)
- Bus on Shoulder Enhanced (BoS+)
- Nashua Commuter Rail Minimum – plus bus
- Manchester Regional Rail – plus bus
- Concord 8 Intercity Rail – plus bus

- Next phase: fare sensitivity analysis
- Next phase: ridership system sensitivity
- Next phase: phased-in implementation

Next Steps

Alternatives Analysis Timeline

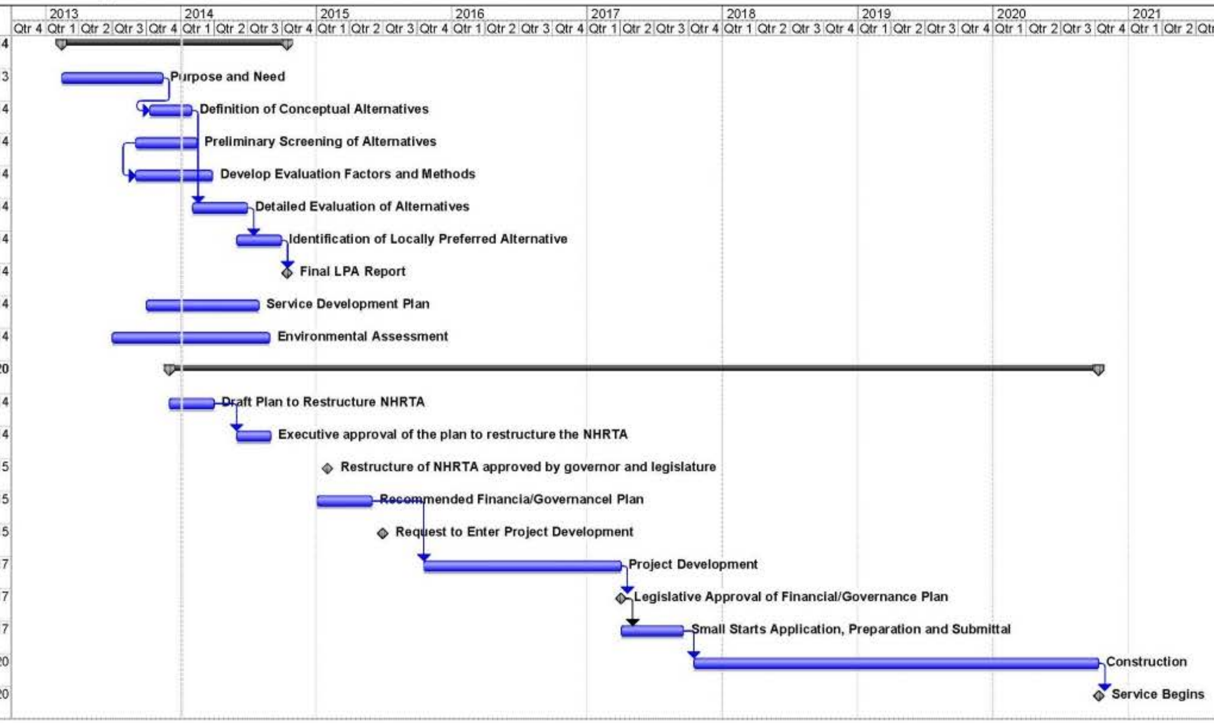
ID	Task Name	Duration	Start	Finish
1	Purpose and Need	9.75 mons	Fri 2/15/13	Thu 11/14/13
2	Definition of conceptual alternatives	4.1 mons	Thu 10/10/13	Fri 1/31/14
3	Advisory committee meeting	0 days	Wed 1/8/14	Wed 1/8/14
4	Preliminary screening of alternatives	6 mons	Mon 9/2/13	Fri 2/14/14
5	Public meeting	0 days	Mon 2/10/14	Mon 2/10/14
6	Develop detailed evaluation factors and methods	7.5 mons	Mon 9/2/13	Fri 3/28/14
7	Financial planning	3.4 mons	Mon 2/3/14	Wed 5/7/14
8	Detailed evaluation of alternatives	5.3 mons	Mon 2/3/14	Mon 6/30/14
9	Financial Plan	15.2 mons	Mon 6/3/13	Thu 7/31/14
10	Service Development Plan	10.9 mons	Tue 10/1/13	Thu 7/31/14
11	Environmental Assessment	15.25 mons	Mon 7/1/13	Fri 8/29/14
12	Recommended investment strategy	4.5 mons	Thu 5/29/14	Wed 10/1/14
13	Identification of the LPA	4.35 mons	Mon 6/2/14	Tue 9/30/14
14	Final Report	1 day?	Wed 10/15/14	Wed 10/15/14
15	Public Meeting	0 days	Fri 10/17/14	Fri 10/17/14
16	Public Involvement Report	23.3 mons	Fri 2/15/13	Fri 11/28/14

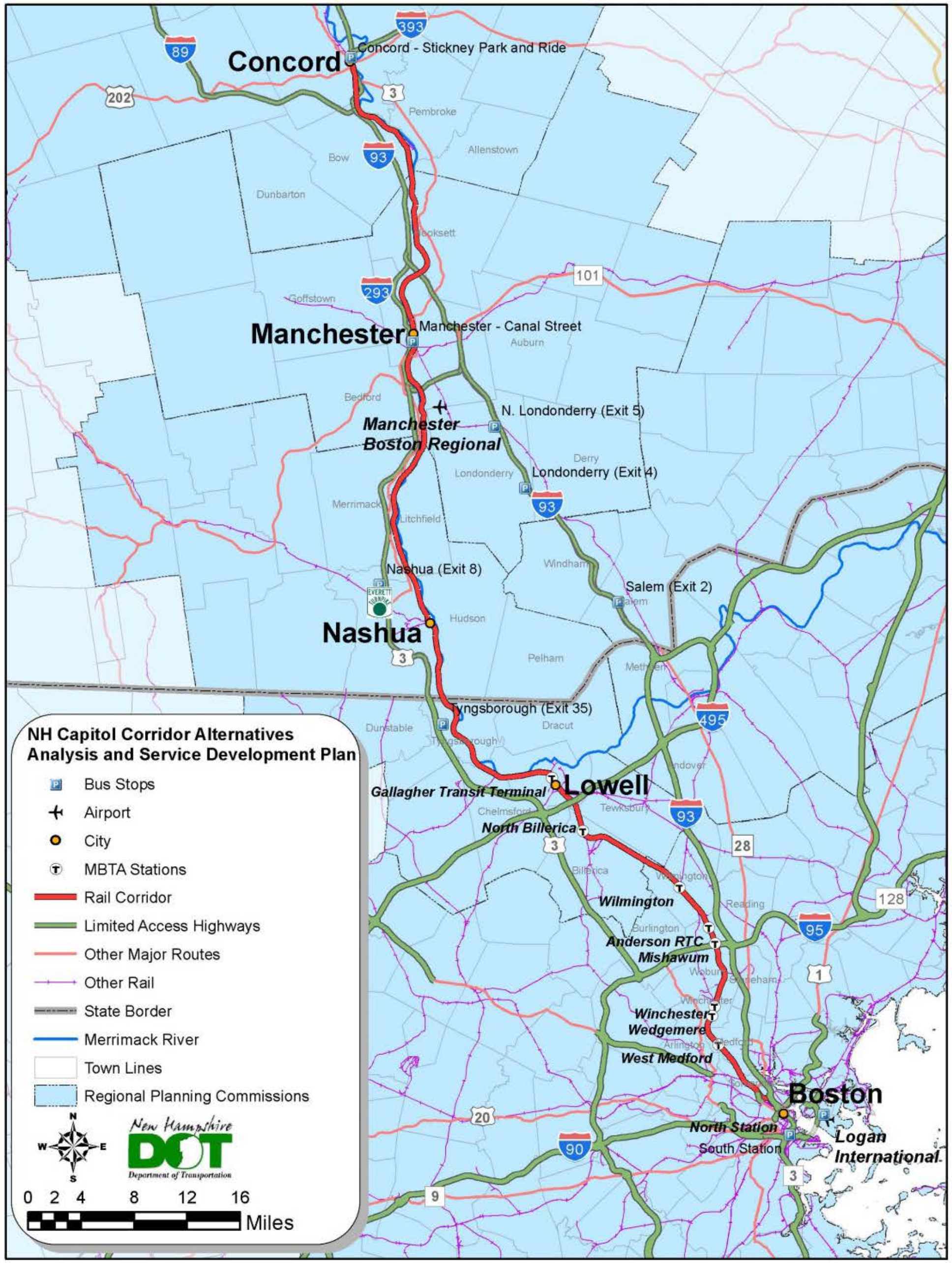


Project Implementation

Project Implementation Timeline

ID	Task Name	Duration	Start	Finish
1	**NH Capitol Corridor Study**	**434 days**	**Fri 2/15/13**	**Wed 10/15/14**
2	Purpose and Need	9.75 mons	Fri 2/15/13	Thu 11/14/13
3	Definition of Conceptual Alternatives	4.1 mons	Thu 10/10/13	Fri 1/31/14
4	Preliminary Screening of Alternatives	6 mons	Mon 9/2/13	Fri 2/14/14
5	Develop Evaluation Factors and Methods	7.5 mons	Mon 9/2/13	Fri 3/28/14
6	Detailed Evaluation of Alternatives	5.3 mons	Mon 2/3/14	Mon 6/30/14
7	Identification of Locally Preferred Alternative	4.35 mons	Mon 6/2/14	Tue 9/30/14
8	Final LPA Report	0 days	Wed 10/15/14	Wed 10/15/14
9	Service Development Plan	10.9 mons	Tue 10/1/13	Thu 7/31/14
10	Environmental Assessment	15.25 mons	Mon 7/1/13	Fri 8/29/14
11	**Project Implementation**	**1791 days**	**Mon 12/2/13**	**Mon 10/12/20**
12	Draft Plan to Restructure NHRTA	4.35 mons	Mon 12/2/13	Tue 4/1/14
13	Executive approval of the plan to restructure the NHRTA	3.3 mons	Mon 6/2/14	Mon 9/1/14
14	Restructure of NHRTA approved by governor and legisla	0 days	Mon 2/2/15	Mon 2/2/15
15	Recommended Financia/Governancel Plan	5.3 mons	Mon 1/5/15	Mon 6/1/15
16	Request to Enter Project Development	0 days	Wed 7/1/15	Wed 7/1/15
17	Project Development	19 mons	Tue 10/20/15	Mon 4/3/17
18	Legislative Approval of Financial/Governance Plan	0 days	Mon 4/3/17	Mon 4/3/17
19	Small Starts Application, Preparation and Submittal	6 mons	Tue 4/4/17	Mon 9/18/17
20	Construction	39 mons	Tue 10/17/17	Mon 10/12/20
21	Service Begins	0 days	Mon 10/12/20	Mon 10/12/20




Concord
Concord - Stickney Park and Ride
Pembroke
Allenstown
Bow
Dunbarton
Goffstown
Manchester
Manchester - Canal Street
Auburn
Bedford
Manchester Boston Regional
N. Londonderry (Exit 5)
Derry
Londonderry
Londonderry (Exit 4)
Merrimack
Litchfield
Windham
Nashua (Exit 8)
Salem (Exit 2)
Hudson
Nashua
Pelham
Tyngsborough (Exit 35)
Dracut
Dunstable
Gallagher Transit Terminal
Lowell
Chelmsford
Tewksbury
North Billerica
Billerica
Wilmington
Reading
Burlington
Anderson RTC
Mishawum
Woburn
Winchester
Wedgemere
Arlington
West Medford
Boston
North Station
South Station
Logan International
NH Capitol Corridor Alternatives Analysis and Service Development Plan
Bus Stops
Airport
City
MBTA Stations
Rail Corridor
Limited Access Highways
Other Major Routes
Other Rail
State Border
Merrimack River
Town Lines
Regional Planning Commissions
New Hampshire DOT Department of Transportation
0 2 4 8 12 16
Miles

http://www.nhcapitolcorridor.com/

New Hampshire DOT Department of Transportation

New Hampshire DOT
Department of Transportation

NH Capitol Corridor Study Public Meeting
NHDOT, Concord, NH
March 5, 2014, 6:00PM

Name	Agency	Email	Phone
Russ Wilder	URS	Russ.Wilder@urs.com	617-515-7258
Malcolm Taylor	NH Rail Transit Auth.	malcolmT295@Gmail.com	603-968-3846
Paul Hatch	NEGS	negs2310@gmail.com	603-520-7692
Kenyon F Karl	Sierra Club NH	Kenyon Karl@gmail.com	603-724-7303
Larry Ayer	NEGS	LAYER03052@AOL.COM	603-881-5674
Pete Dearness	NES RR Co	rrbldrpete@comcast.net	603-491-3660
Val A Reyes	NEGS	rrmedicdearness@yahoo.com	603-986-9859
Frank Judge	NECS	FBJ672@comcast.net	603-472-2720
Thomas Manning	NES RR	Manning0627@comcast.net	603-360-5807
Rebecca Harris	Transport NH	RLHarris@TransportNH.org	
Thomas J. Mahon	NH Rail Transport Auth		
Joshua Prescott			
Ron Crickard	NH DOT	rcrickard@dot.state.nh.us	
John Filippone		jfilipp1@gmail.com	603-707-7799
Rebecca Fishow	Hippo Press	RFishow@hippopress.	603-625-1855x36
Todd Fontanella	MVPC	tfontanella@mvpc.org	9783740519
Collin Lever	US Rep. Kuster	collin.Lever@mail.house.gov	6035956006
Bob Rimol		bobrimol@gmail.com	494-5775

New Hampshire DOT Department of Transportation

NH Capitol Corridor Study Public Meeting
NHDOT, Concord, NH
March 5, 2014, 6:00PM

Name	Agency	Email	Phone
JOSH DENTON	US REP SHEA-PORTER	JOSH.DENTON@MAIL.HOUSE.GOV	641-9536
Matt Leahy	Sen. Shaheen	matt_leahy@shaheen.senate.gov	647-7500
Mike Izbicki	NHRTA	msizbic@comcast.net	603-493-0534
MARK SAMSEL	SOUTH NH PLANNING COMM.	mark.samsel@LFO.com	6035457217
Simon Thomson	Sen. Ayotte's Office		603-622-7979
Megan Doyle	Concord Monitor	mdoyle@cmonitor.com	369-3321
Jason Cole	Devine Millimet	jcole@devinemillimet.com	695-8566
Ben Blunt	Concord Coach Lines	bblunt@concordcoachlines.com	228-3535
David Preece	SNHPC	dpreece@SNHPC.ORG	669-4664
Mike Tardiff	CNHRPC	mtardiff@cnhrpc.org	226-6020
Tom Irwin	CLF	tirwin@clf.org	225-3060
[illegible]	Montagne		
Paul Keriazes		pkeriazes@comcast.net	
Jim Haddadin	Nashua Telegraph		
D Nelson	Jacobs		
Bill Cass	NHDOT		
Marie Sanborn	Concord Coach		
Shelley Winters	NH DOT		

New Hampshire DOT Department of Transportation

NH Capitol Corridor Study Public Meeting
NHDOT, Concord, NH
March 5, 2014, 6:00PM

Name	Agency	Email	Phone
Patrick Herlihy	NH DOT		271-2468
Robert Baker		rb64@earthlink.net	
RONALD GRANDMAISON	NHDOT		271-6198

Capitol Corridor Rail & Transit Alternatives Analysis

New Hampshire DOT Department of Transportation

Project Open House/Public Scoping Meeting (March 5, 2014)

Thank you for attending tonight's public meeting! Please provide us with any comments below and return it to a project staff member this evening. You know the corridor best – your input is valuable!

If you would like further information about the project or to make comments online, please:

- Visit the project website (www.nhcapitolcorridor.com)
- Contact the NHDOT (NHCapitolCorridorStudyComments@dot.state.nh.us)

Comments:

As we plan for the future we would be best served by comprehensive transportation choices which include bicycle, shared automotive, bus transit but indeed train. I support rail to Concord and would prefer to not use a motor vehicle whenever possible.

APPENDIX H

Capitol Corridor Stakeholder Outreach

New Hampshire DOT
Department of Transportation

APPENDIX H

Capitol Corridor Stakeholder Meetings: Airport

New Hampshire DOT
Department of Transportation

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Kick-off Week Stakeholder Meetings – ***Manchester Airport Management Team***

Date: 03/13/2013 **Time:** 10:00am **Location:** Manchester Airport, Londonderry, NH

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
Mark Brewer – Airport Director	mbrewer@flymanchester.com	Mark Sanborn (NHDOT)
Brian O'Neill – Deputy Airport Director	boneill@flymanchester.com	Patrick Herlihy (NHDOT)
Richard Fixler – Assistant Airport Director for Engineering and Planning	rfixler@flymanchester.com	Ken Kinney (URS)
		Russell Wilder (URS)
		David Nelson (Jacobs)
		Ryan Harris (Jacobs)

Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process.

Mark Brewer described the airport as an economic engine for the state with about $1.24B economic impact. He said that the travel purpose split of approximately 48% business and 52% leisure, that 26% of the passenger activity comes from NH, 22% from Massachusetts and that $785m of the economic impact comes from sources outside of NH. He also expressed that there has not been a large change in population in NH and that the general goal of the region is to brand the airport as more of an intermodal hub for the state. Another potential market could be servicing any proposed casinos in Southern NH. He added that rail transportation would make the airport more viable and more attractive to international carriers, particularly when Providence airport has both rail and customs.

Mark Brewer added continued that airport passengers want ground transportation options and that they are quite limited now. The upcoming Flightline E-W bus to Portsmouth will address that to some degree and there is also the potential for a N-S connection. The question is who will pay for these services and what are the revenue generation options as the mayor is not supportive of a flat subsidy. He added that his understanding is that the market for Nashua to Boston ground transportation makes sense and that Manchester does to a lesser degree and that Concord would be really expensive.

Manchester Airport has plenty of capacity for freight which is good for when Logan gets to the point of wanting to push freight traffic out to its regional "partners". Over 176m lbs of freight came through MHT in 2012, with UPS and FedEx splitting that about 50-50. UPS recently won the LL Bean contract from FedEx which used to fly out of Portland, but that freight is now trucked to MHT.

Brian O'Neill suggested that the ideal ground transportation system for the airport would provide feeder service to and from the many scattered population centers of the state and wondered if the typical early AM departure and Late PM arrival pattern fit with whatever schedule the trains might have. He suggested that there would be little value if it were to only stop at the airport between 8am and 6pm. With respect to the employee travel market he noted that currently among the 1,900 airport employees, only 3 janitorial staff regularly use transit for their commute. While there is a separate and enclosed employee parking lot, would this change if there was an increase in gas prices? Mark Brewer added that Flightline currently provides on-call and 8 daily scheduled trips a day between Manchester Airport, the Park and Ride lots and Logan Airport. Starting in June 2013, Flightline will also provide 20 state supported trips between Portsmouth and the airport.

Mark Brewer asked whether the service is likely to be operated by Amtrak and what control would the state have on the price point. David Nelson replied that it is unlikely that this would be Amtrak operated, but would more probably operate similar to the Pilgrim Partnership where RI pays for capital and MBTA pays for the service and takes revenues to support operations. Mark Sanborn added that NH would need MBTA to operate any rail extension, but they are hurting financially and that both the ridership and revenues for the RI rail service are currently below estimates. Mark Brewer asked where the capital will come from and Ken Kinney replied that it would likely be a 50-50 FTA-Local split

Mark Brewer then asked what stops the train is expected to make in MA, and whether the Merrimack River or the M&L line would be used. David Nelson replied that the M&L line would be a heavy lift operationally and that the stations would likely be located in Lowell, Billerica, Wilmington, Anderson/Woburn, two in Winchester, W Medford and North Station. Ken Kinney mentioned that the previous plan was for a station behind the Holiday Inn and the sewage treatment plant and Patrick Herlihy added that any previously identified station locations cannot be assumed as predetermined. Mark Brewer added that the airport would run a shuttle to meet train and that they like the idea of the Anderson/Woburn model of a free commuter lot and a paid overnight lot. Mark Sanborn added that the state could also consider implementing variable price parking at park and ride lots or stations with no parking.

Ducker, Renee

Subject: Stakeholder Meeting with MHT
Location: Manchester Airport

Start: Wed 3/13/2013 1:00 PM
End: Wed 3/13/2013 2:00 PM

Recurrence: (none)

Organizer: Wilder, Russ

Categories: Capitol Corridor

J. Brian O'Neill, Deputy Director
Mark Brewer, Director
Richard Fixler - Planning

Airport Master Plan Update done by URS
Issue and Market Condition

Existing and Potential

Economic Engine to the Region $1.2B

22% from MA
26% from NH
44% from elsewhere – ¾ of economic benefit comes from this

Domestic and International – Intermodal Connectivity -Ground Transportation Options

Limited at this point – enticing for intermodal hub

Partnership with state for East-West Bus Service plus Concord and Nashua

Who is going to pay for it? How will the operating deficit be paid for?

Must avoid downshifting cost.

CMAQ funds cannot be used

What about the operating subsidy? How does it work in other parts of the country?

Brian: Hours of operation at peak travel times (each end of day). How does train schedule match?

40% of users are from away. Service should be more like BWI?

Multiple markets – Connection with Downtown Boston – how to serve?

No idea what the future holds. What should it be? Growth in NH is flat (1.5M).

Gambling as a destination?

I the next 12 years, Logan might get full and regionalization happens?
Gasoline prices?
MTA bus service to downtown Manchester – very little use

1900 employees at the airport

TOD translocation, nothing new for growth.

BWI trains are used, though only 3% of a large number.

Rail Station Location?

New airport connector – Parking Lot shuttle would run to station

Any parking would be like Woburn and at TF Green. No overnight parking

Train ticket to board shuttle bus?

Station with no parking?

NHDOT owns 10 acres in Merrimack? For parking

50% of capital costs would be federal (FTA)

Non-Federal Capital in the overall financial plan

How would connection to downtown Manchester work with airport. Air travelers that come for business are not going to downtown. 48% business travelers.

International carriers would favor rail. Providence leading MHT. Ryan Air + others

Station has to be identified with the airport.

Official FAA Master Plan, 2% growth gets airport back to 2005 levels in 20 years.

MHT has growth in Cargo – Freight connection?

Track will be improved

176m lbs of air freight FEDex and UPS last year UPS (LL Bean)

Ideal transit solution for the airport

Multimodal facility at the airport with connections to the rest of New England

Flight Line 8 trips to Logan and door-to-door

Portsmouth-Epping-Airport-Downtown Manchester (24 hours/day) Starts in June.

September 2014 - LPA will be known.

APPENDIX H

Capitol Corridor Stakeholder Meetings: Bus Companies

New Hampshire DOT Department of Transportation





NH Capitol Corridor
Rail & Transit Alternatives Analysis

Boston Express Workshop

March 04, 2014

New Hampshire DOT
Department of Transportation

Agenda

1. Review of Final Service Alternatives
2. Independent Utility of Bus on Shoulder
3. Comparative Travel Times by Time of Day
4. Peak Rail-Off Peak Bus
5. Plans for the March 5 Public Meeting
6. Comparing the North Station and South Station travel markets.

Review of Final Service Alternatives

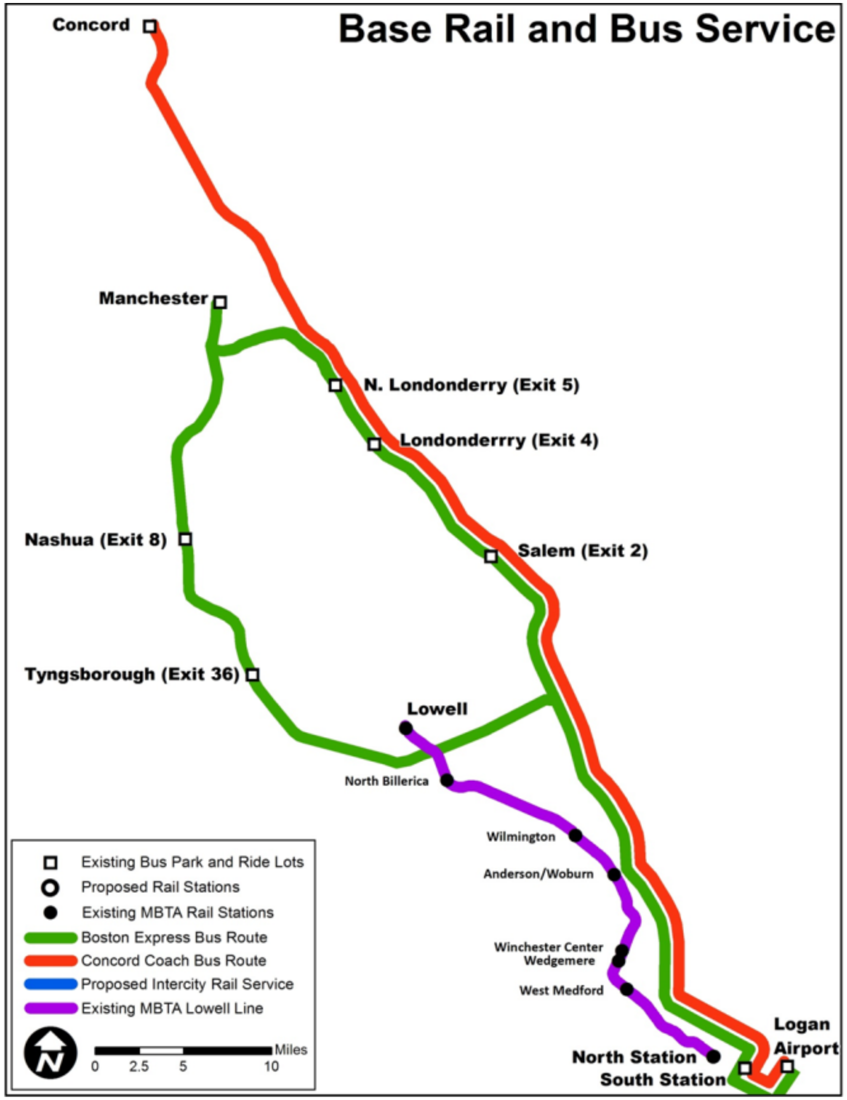
- Four Bus Only Service Development Options
  1. Base
  2. Bus on Shoulder (BoS)
  3. Base Enhanced (Base+)
  4. Bus on Shoulder Enhanced (BoS+)

- Three Multimodal Service Development Options
  4. Nashua Minimal Rail Service (CR6)
  5. Manchester Regional Rail Service (CR3)
  6. Intercity Rail Service (IR8)

New Hampshire DOT Department of Transportation

1. Base (No-Build)

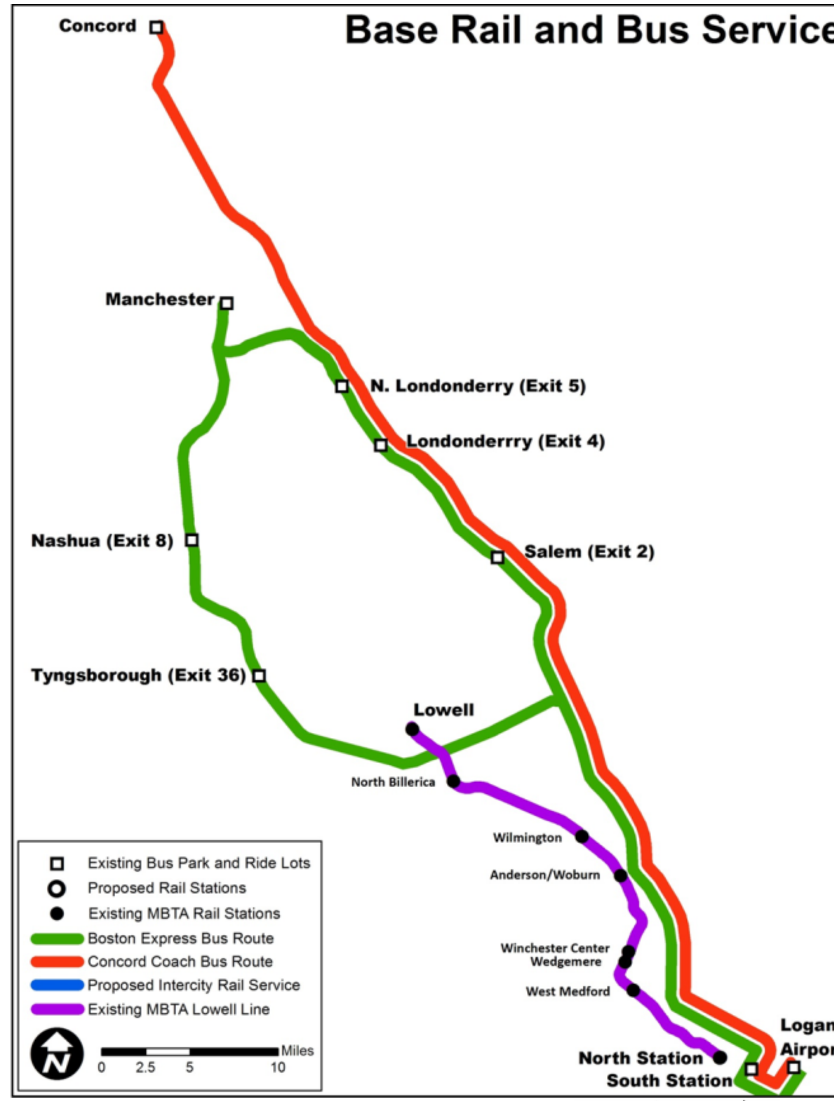
- No investment.
- Existing bus and rail services are continued but not expanded.



New Hampshire DOT Department of Transportation

2. Bus on Shoulder (BoS)

- Existing 80 bus network allowed to run on shoulders of I-93 to bypass congestion in general purpose lanes.
- Expected savings of 8 to 12 minutes in the AM peak.
- Smaller savings in the PM peak.
- No changes to existing passenger rail services.



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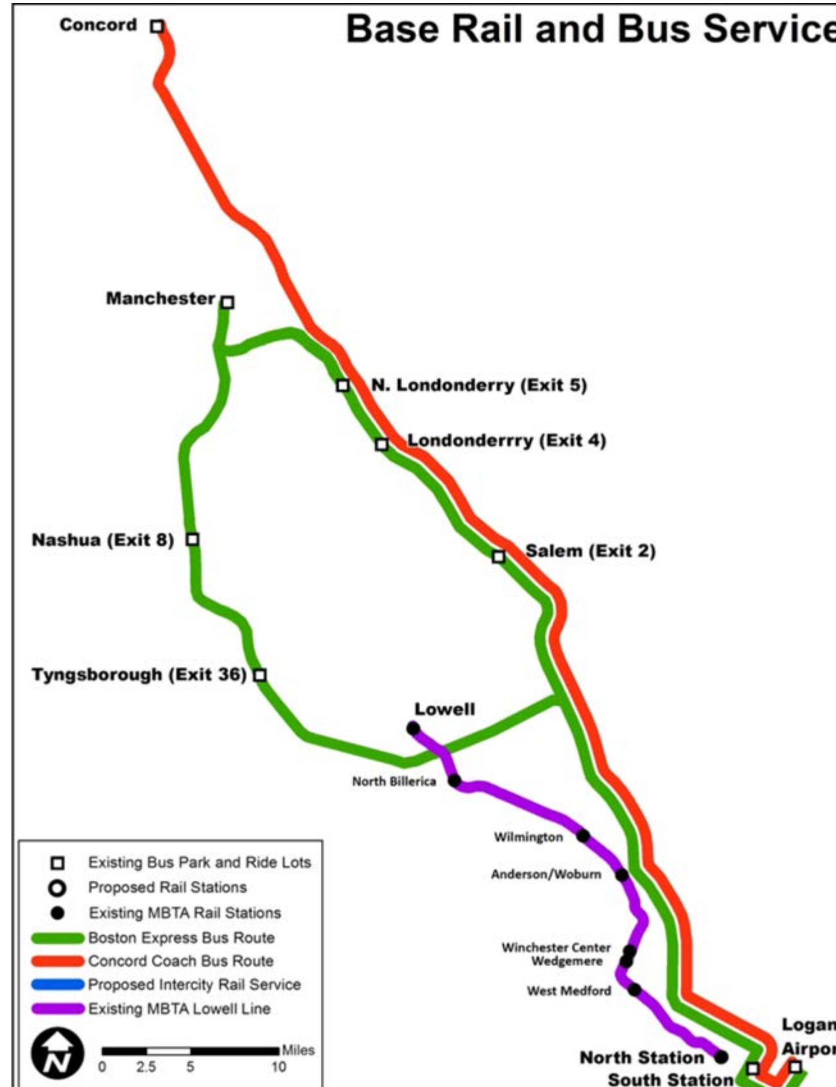
3. Base Enhanced (Base+)

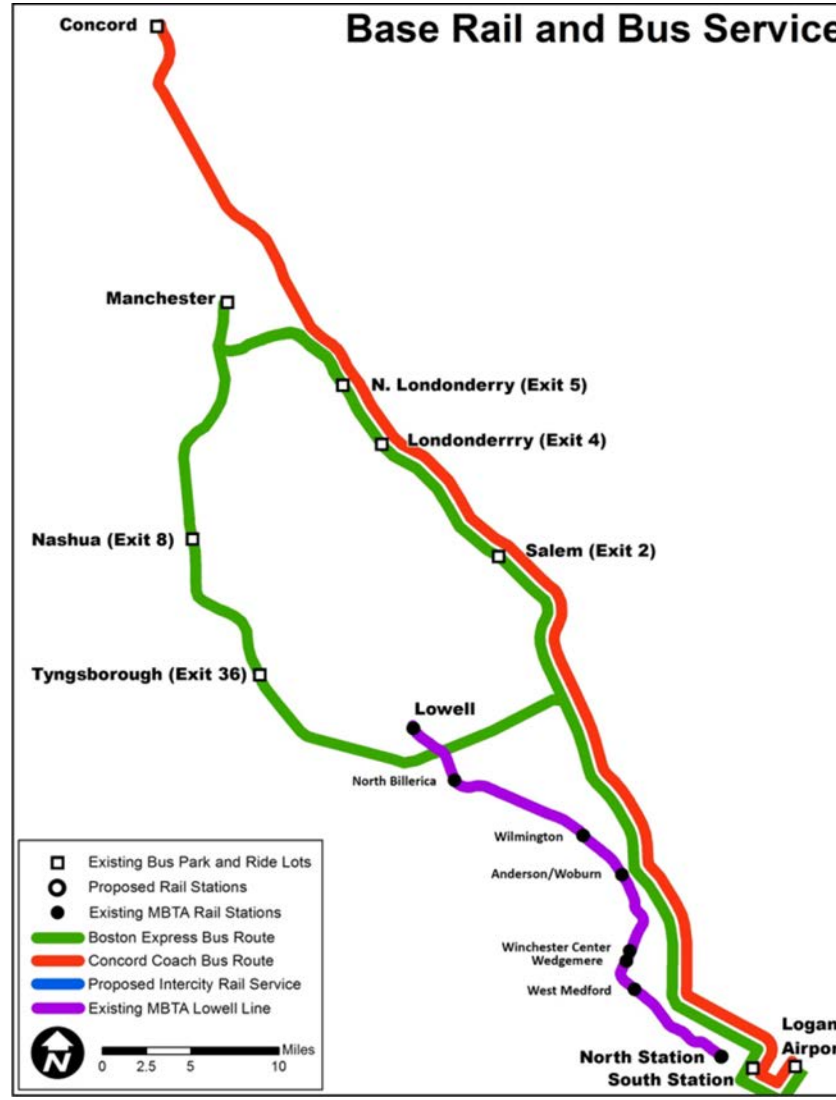
- 120 buses per day up from current 80 buses/day
- 30 minute peak period headway, direct non-stop service between NH park-and-ride lots and Boston
- Hourly off-peak (but not direct) service for each NH park-and-ride lot.
- No changes to existing passenger rail services.



New Hampshire DOT Department of Transportation

4. Enhanced Bus on Shoulder (BoS+)

- 120 trip per day Base+ service allowed to run on shoulders of I-93 to bypass congestion in general purpose lanes.
- Expected savings of 8 to 12 minutes in the AM peak.
- Smaller savings in the PM peak
- No changes to existing passenger rail services.



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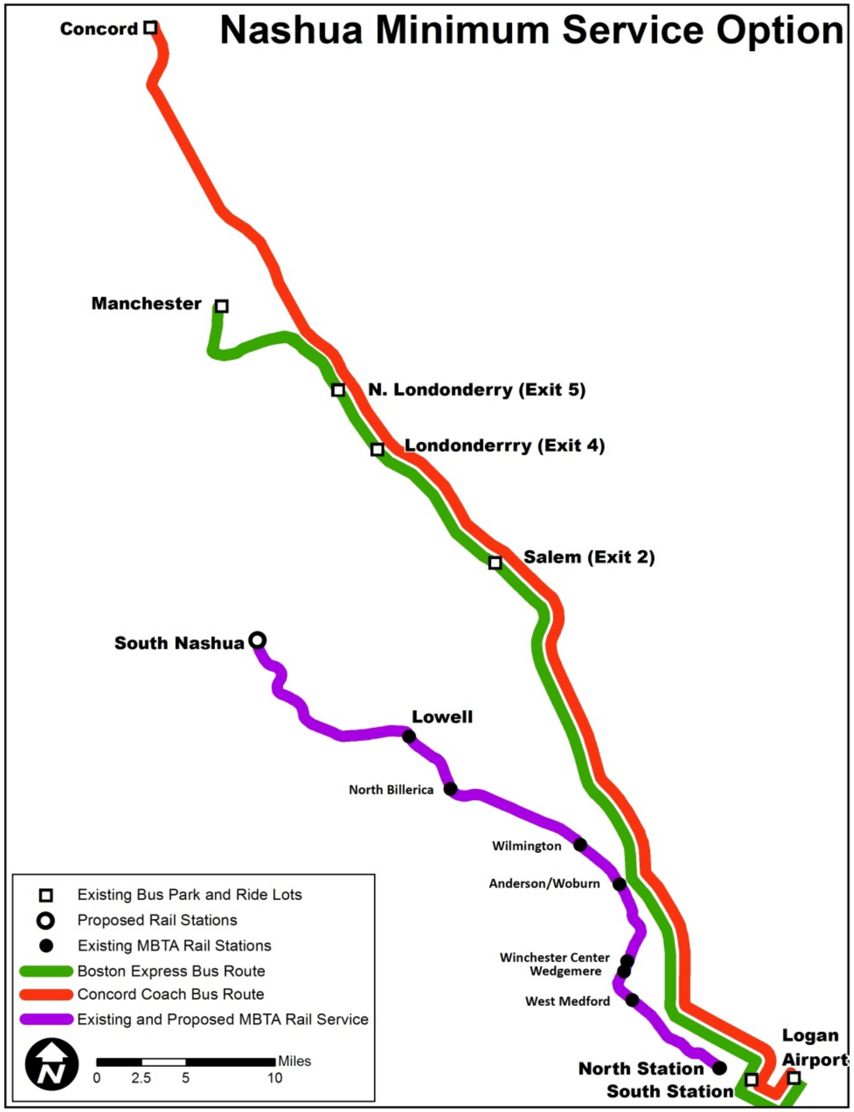
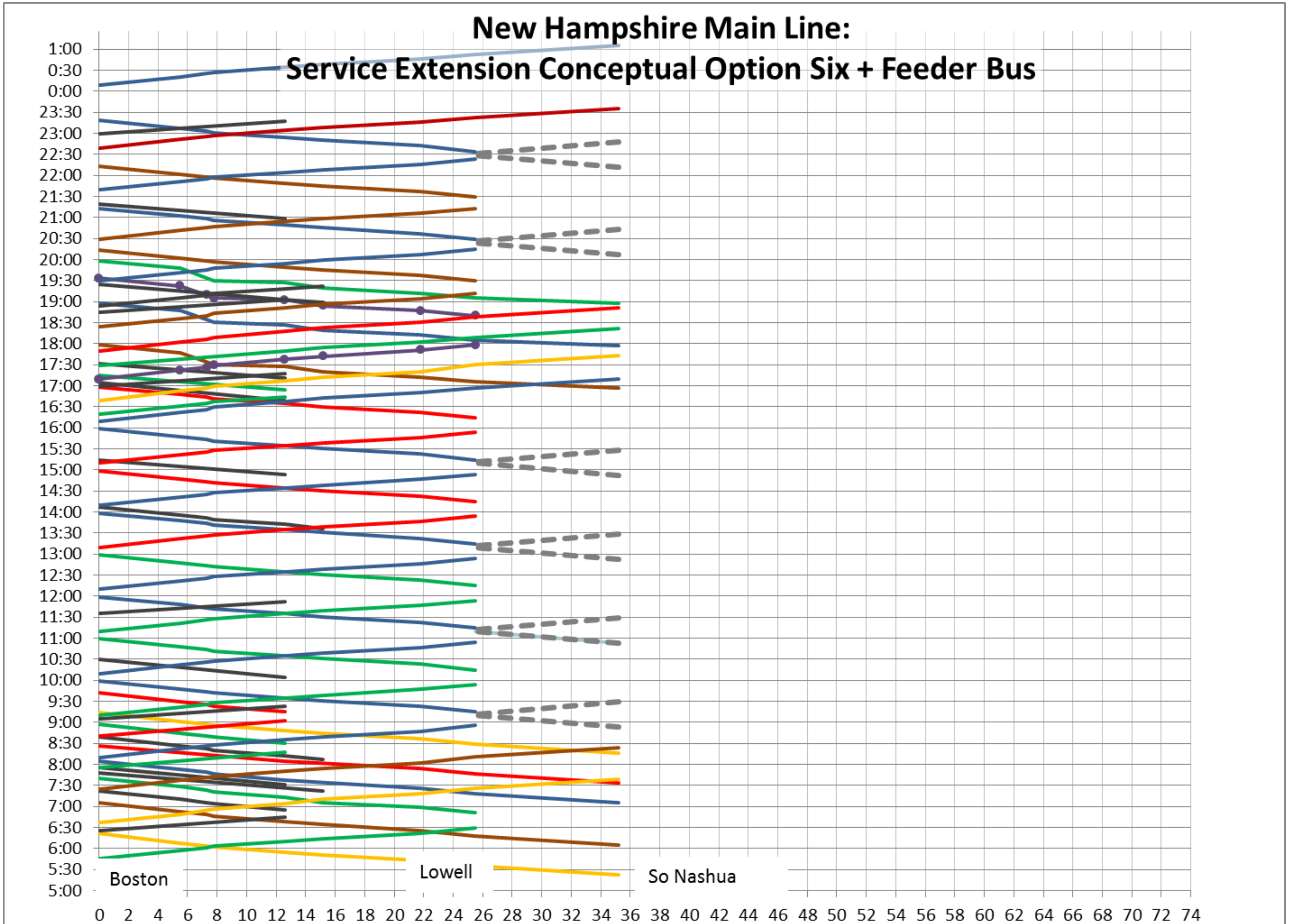
5. Nashua Minimum Rail Service (CR6)

- Extends MBTA commuter rail service north to South Nashua
- 16 weekday rail trips
- 14 Lowell-Nashua feeder bus trips
- BX I-93 service to Manchester, North Londonderry, Londonderry and Salem is retained.
- BX Route 3 service to Nashua and Tyngsboro is eliminated.



New Hampshire DOT Department of Transportation



New Hampshire Main Line:
Service Extension Conceptual Option Six + Feeder Bus
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0:30
0:00
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23:00
22:30
22:00
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5:30
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Boston
Lowell
So Nashua
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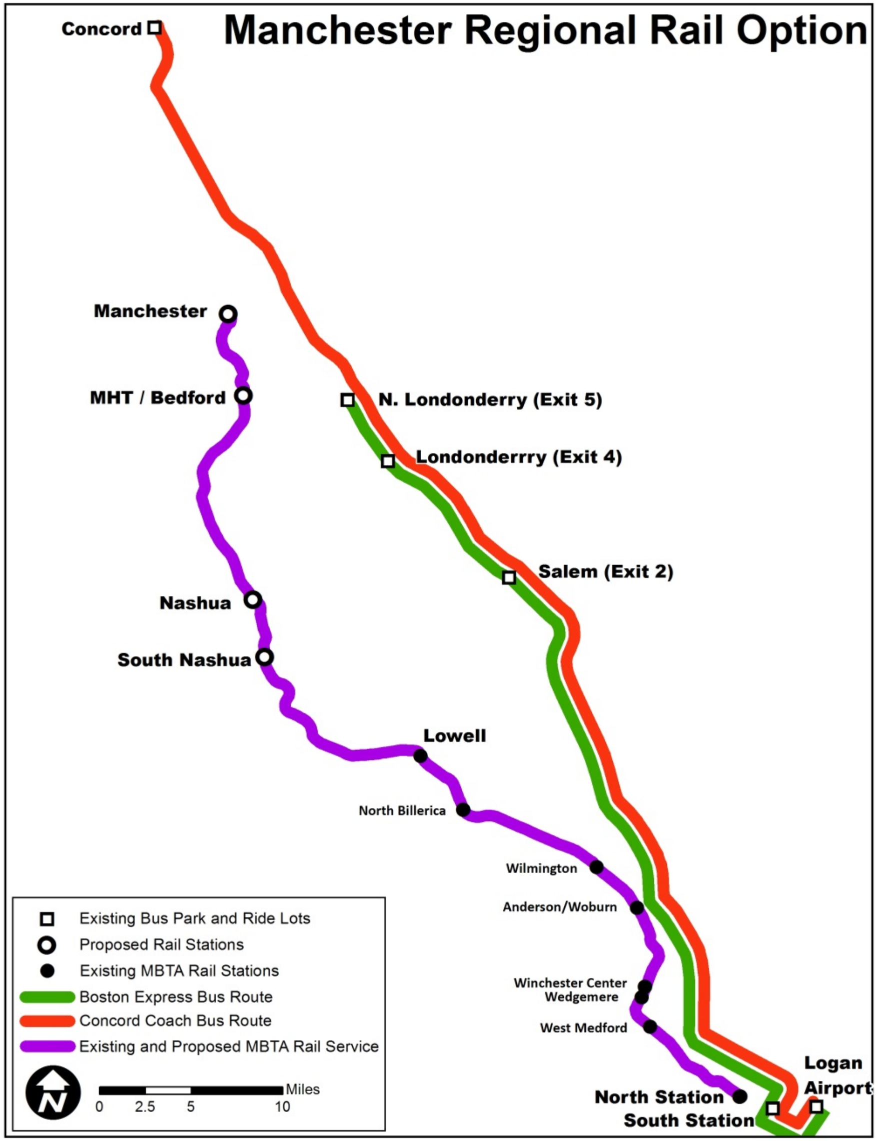
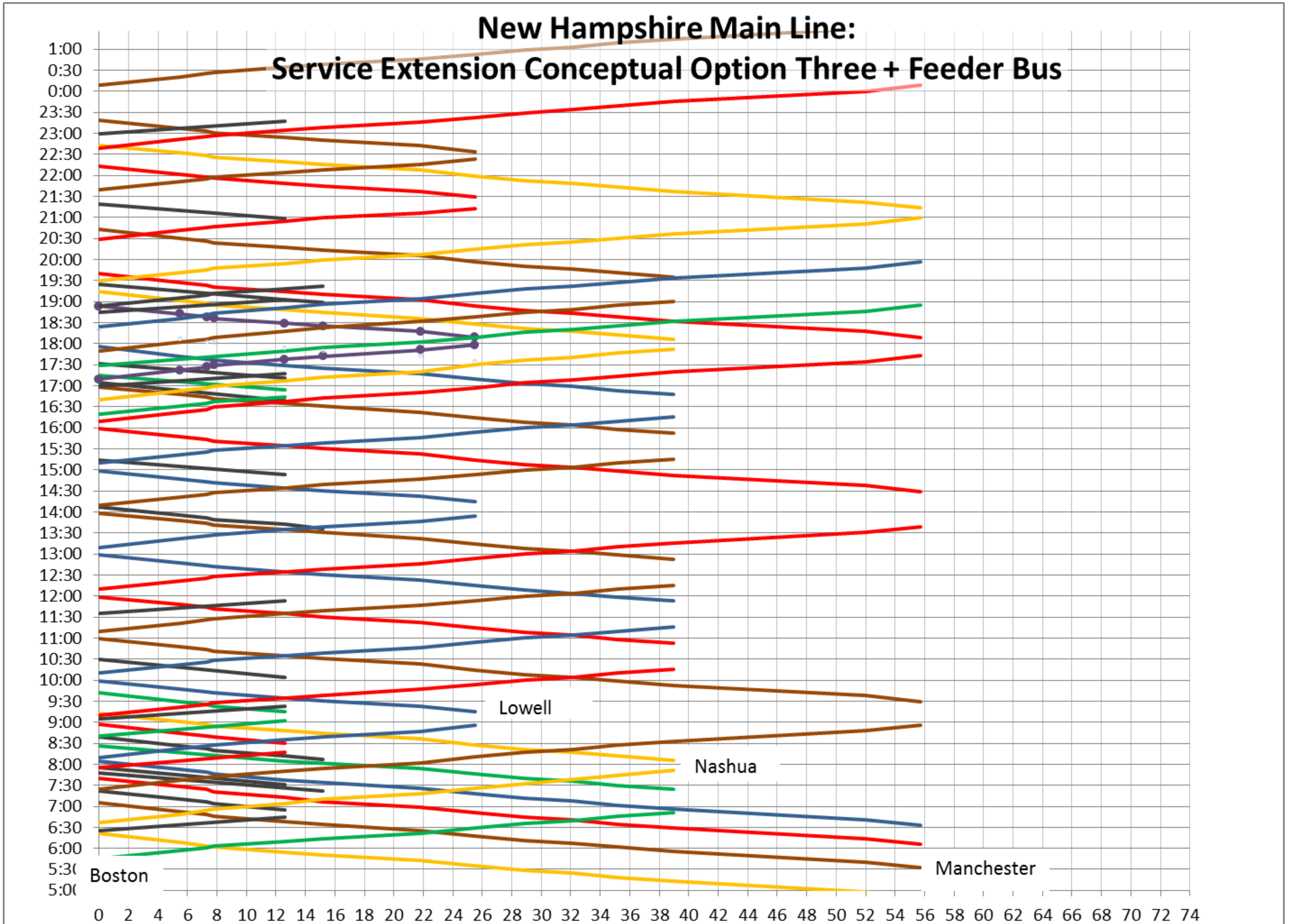
6. Manchester Rail Service (CR3)

- MBTA commuter rail service to Manchester
- Intermediate stops at MHT, Nashua and South Nashua.
- 34 weekday rail trips for Nashua
- 16 weekday rail trips for Manchester
- BX I-93 is retained.
- BX I-93 service to Manchester is shifted to MHT park and ride.
- BX Route 3 service to Manchester, Nashua and Tyngsboro is eliminated.



New Hampshire DOT Department of Transportation



New Hampshire Main Line:
Service Extension Conceptual Option Three + Feeder Bus
1:00
0:30
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Nashua
Manchester
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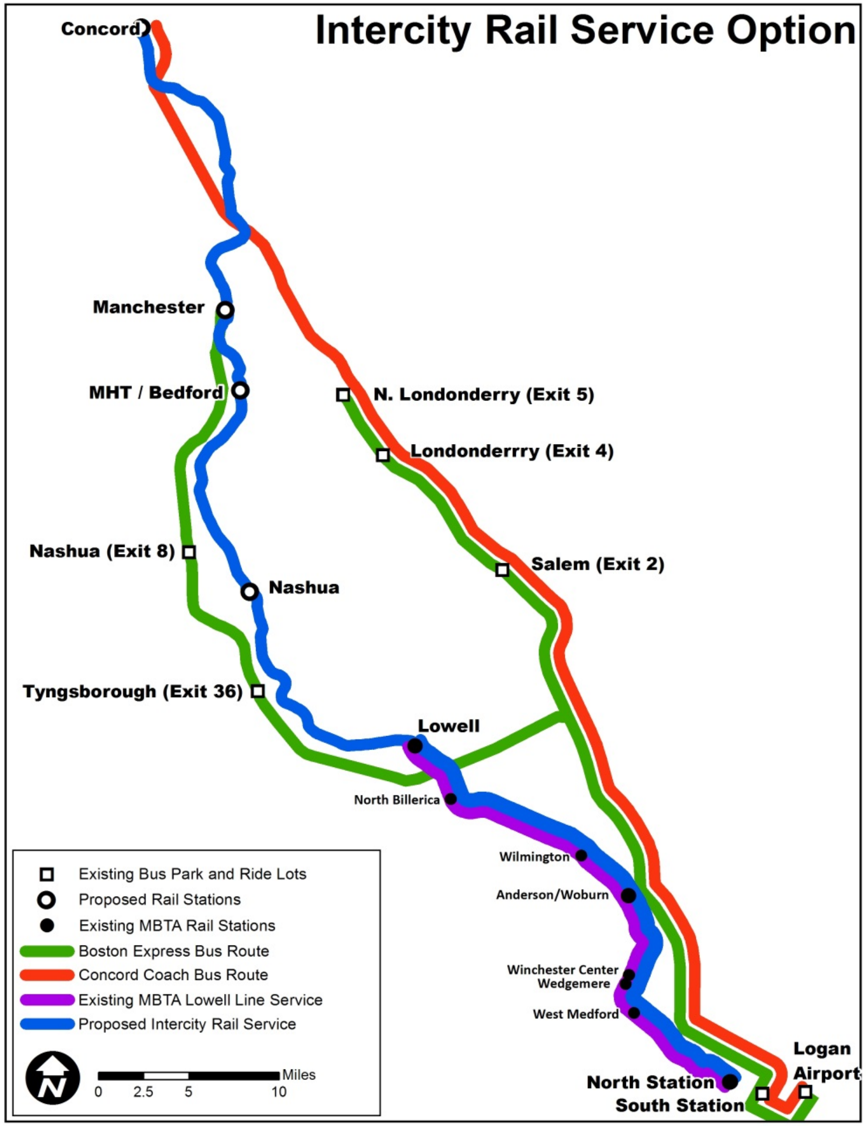
7. Intercity Rail Service (IR8)

- Eight daily intercity passenger rail round trips between Concord and Boston
- Intermediate stops at Manchester, MHT, Nashua, Lowell and Woburn.
- No changes to BX services.
- *Would BX Manchester service shift to MHT park and ride?*



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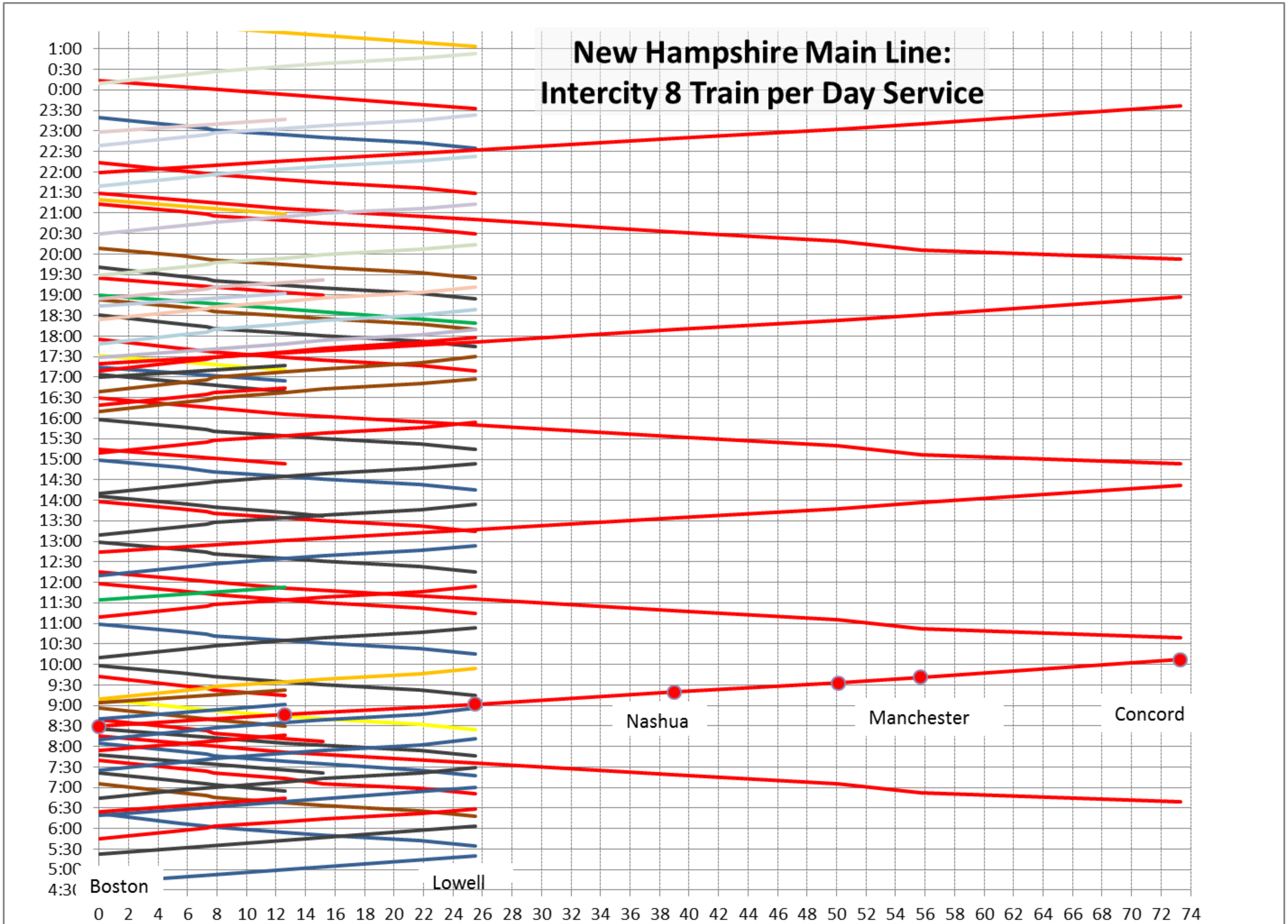
New Hampshire Main Line:
Intercity 8 Train per Day Service
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Boston
Lowell
Nashua
Manchester
Concord
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74

Agenda

1. Review of Final Service Alternatives
2. **Independent Utility of Bus on Shoulder**
3. Comparative Travel Times by Time of Day
4. Peak Rail-Off Peak Bus
5. Plans for the March 5 Public Meeting
6. Comparing the North Station and South Station travel markets.

Independent Utility of Bus on Shoulder

- Regardless of any rail service along the Route 3 Corridor, bus will remain the I-93 transit backbone for NH.
- Bus on Shoulder for I-93 would:
  - reduce the peak travel times
  - substantially improve reliability
- Jacobs finds there are no significant physical barriers to implementation
- With the right support from many stakeholders BoS could be a short-term reality along I-93

New Hampshire DOT Department of Transportation

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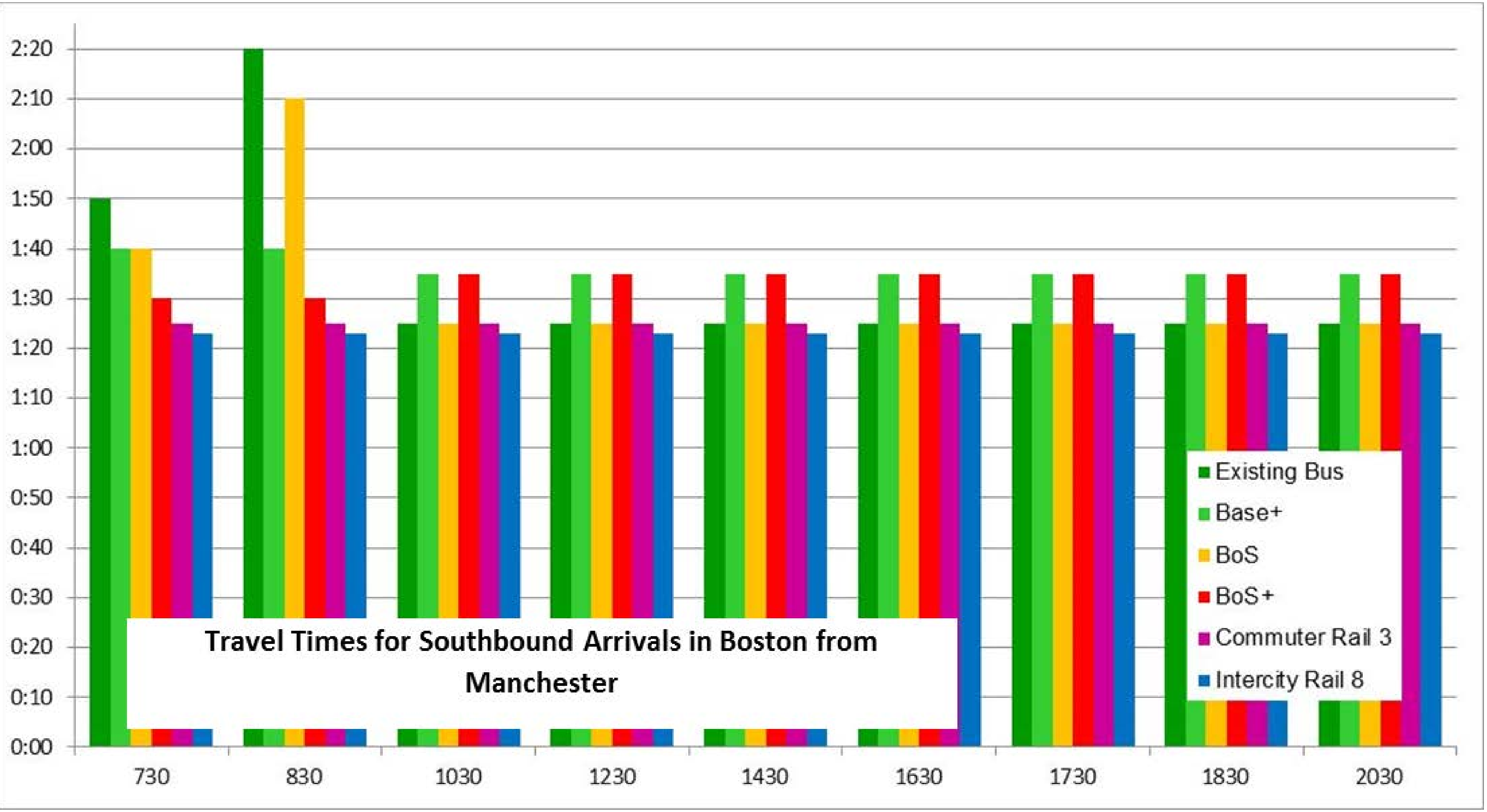
Manchester Regional Rail Service

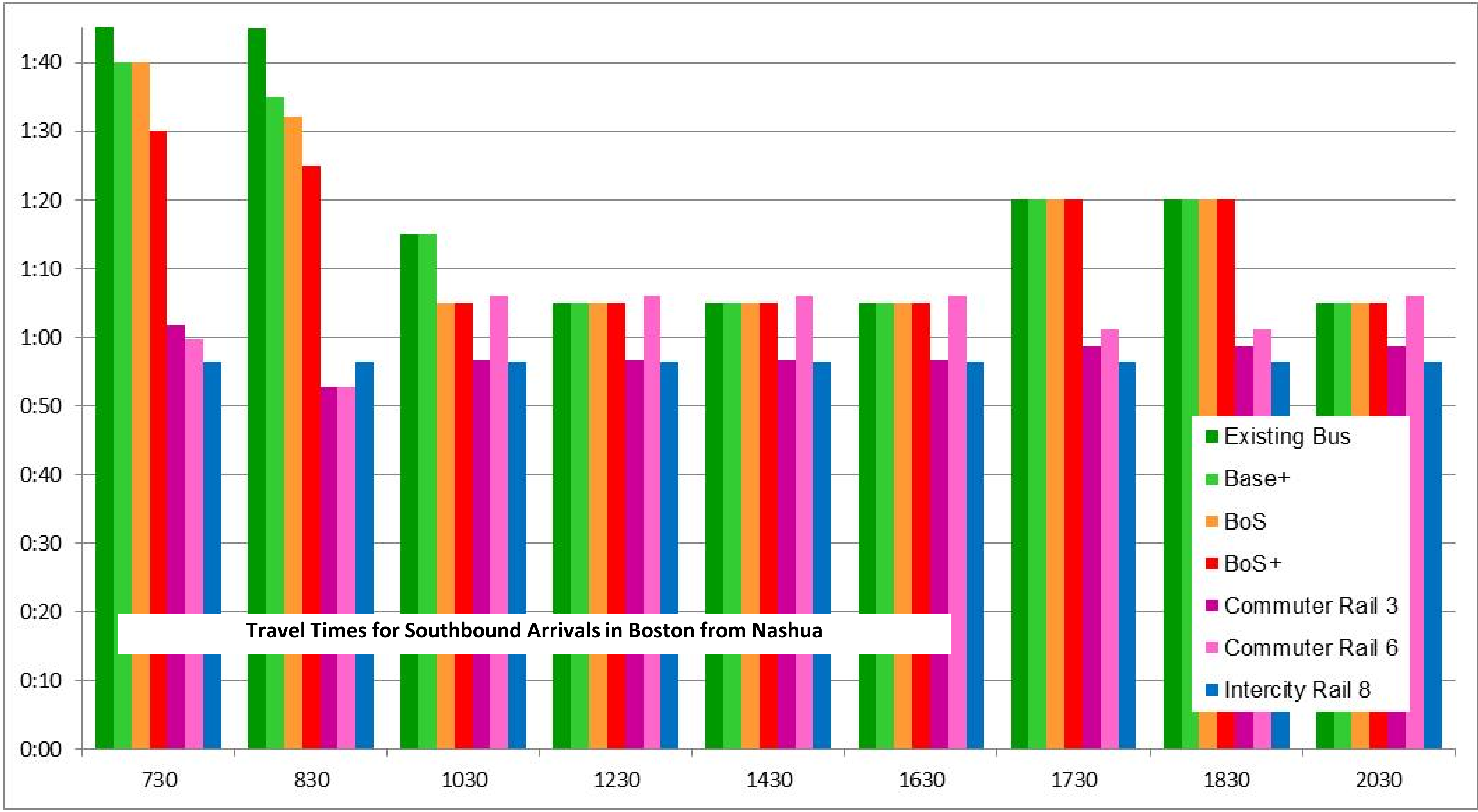


Manchester Regional Rail Service

Manchester Regional Rail Service

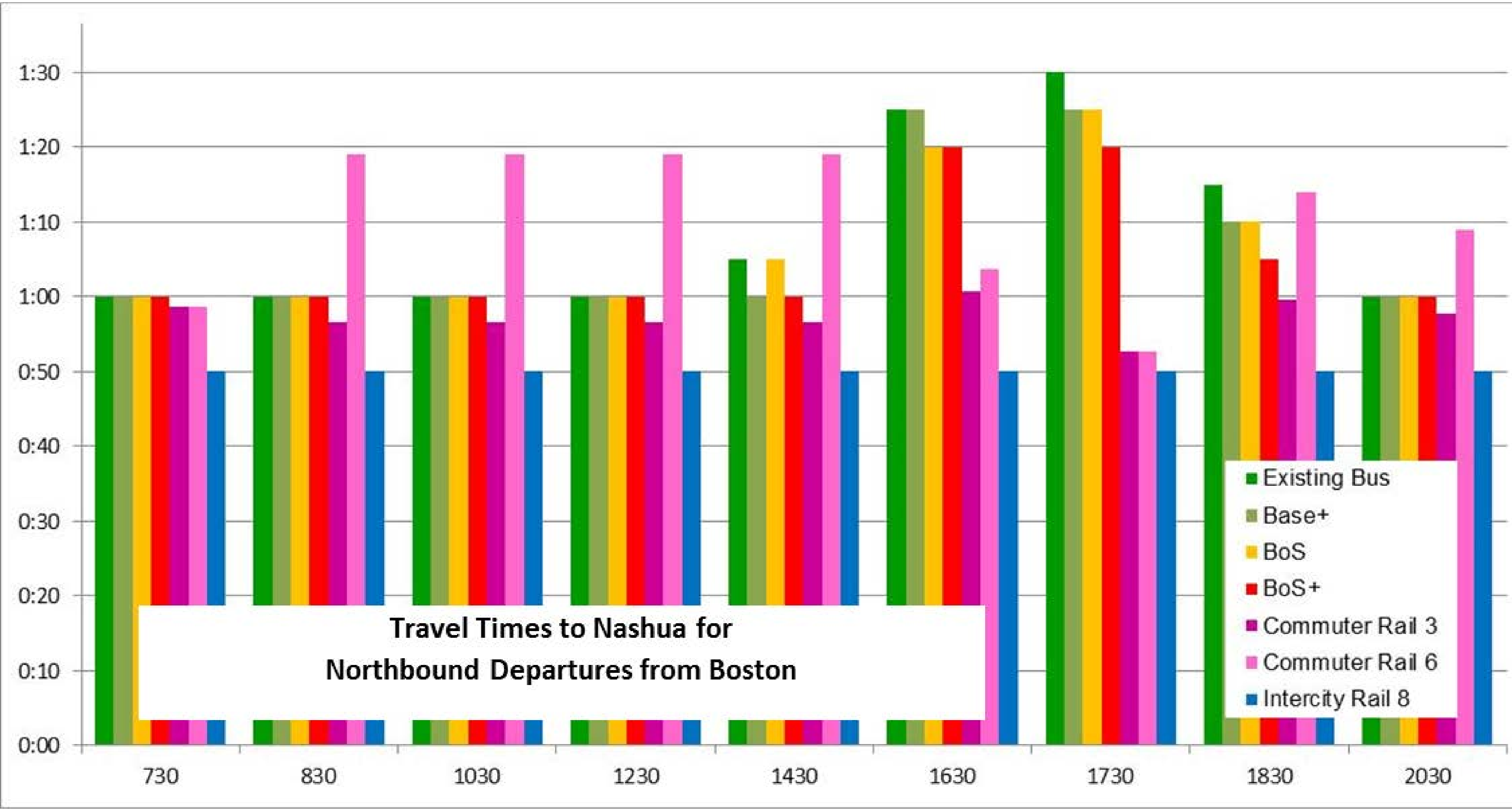
- Commuter rail service offers AM peak travel time savings compared with bus services.
- During the PM peak and off-peak the travel time differences between bus and rail negligible.

Nashua Minimum Rail Service



New Hampshire DOT Department of Transportation

Nashua Minimum Rail Service



Nashua Minimum Rail Service

- Commuter rail service offers all day inbound travel time savings compared with bus services
- Off-peak travel time savings are smaller for northbound service
- Feeder bus service does not offer off-peak travel time savings

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Peak Rail-Off Peak Bus

- Jacobs explored cost and travel time implications of substituting buses for-off peak rail trips
- **Nashua Minimum Rail Option** was designed with off-peak feeder bus service linking Lowell with South Nashua to reduce operating costs to a bare minimum.
- **Manchester Rail Option** was designed to a more robust rail service but it could have a variant that uses off-peak buses.

Several Off-Peak Bus Options for Manchester Rail Service

1. **One Feeder Bus** connecting Manchester, MHT, Nashua and South Nashua with trains at Lowell
2. **Two Feeder Buses** connecting to trains at Lowell:
   - one for Manchester and MHT
   - one for Nashua and South Nashua
3. **One Direct Bus** from North Station to Manchester, MHT, Nashua and South Nashua
4. **Two Direct Buses** from North Station:
   - one for Manchester and MHT
   - one for Nashua and South Nashua

Manchester Off-Peak Bus Travel Times

Illustrative Travel Times for Midday Trips to and From North Station

Southbound READ DOWN						Northbound READ UP				
Two Direct Buses	One Direct Bus	Two Feeder Buses	One Feeder Bus	Rail	Passenger Station	Rail	One Feeder Bus	Two Feeder Buses	One Direct Bus	Two Direct Buses
10:44	10:18	10:25	9:56	10:34	Manchester	13:34	14:13	13:44	13:51	13:25
10:59	10:33	10:40	10:12	10:42	MHT	13:26	13:58	13:29	13:36	13:10
10:58	10:58	10:36	10:36	10:56	Nashua	13:12	13:33	13:33	13:11	13:11
11:14	11:14	10:52	10:53	11:02	South Nashua	13:06	13:17	13:17	12:55	12:55
-	-	11:15	11:15	11:15	Lowell	12:54	12:54	12:54	-	-
11:59	11:59	11:59	11:59	11:59	North Station	12:10	12:10	12:10	12:10	12:10

Manchester Off-Peak Bus Travel Times

- Off-Peak Direct bus would be faster than direct rail from Manchester
- Off-Peak Direct bus would not offer significant times savings for Nashua
- Feeder Bus Options would be much slower than commuter rail

Manchester Off-Peak Bus Costs

- Rough costs estimates based on published reports:
  - Commuter rail would be operated by MBTA.
  - Feeder bus would be operated by a mix of local bus agencies serving Lowell, Nashua and Manchester.
  - Direct bus would be operated by BX.

Manchester Off-Peak Bus Costs

Estimated Transport Costs for One-Way Off-Peak Trips

Service	Value	Units	Unit Cost	One Way Trip Cost
Commuter Rail (MBTA)	30.2	Miles	$23.23	$701.55
One Feeder Bus	17.6	Miles	$3.41	$60.02
Two Feeder Buses	54.3	Miles	$3.41	$185.16
One Direct Bus	68.4	Miles	$4.17	$285.23
Two Direct Buses	112.6	Miles	$4.17	$469.55

Manchester Off-Peak Bus Evaluation

Off-Peak Bus offers operating cost savings:

- Feeder bus offers great savings but slow service.
- Direct bus offers smaller savings but faster service.
  - One direct bus operates at 40% of direct rail costs but doesn't save time.
  - Two direct buses operates at 67% of direct rail cost with a travel time saving for Manchester but not Nashua.

New Hampshire DOT Department of Transportation

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1. Review of Final Service Alternatives
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6. Comparing the North Station and South Station travel markets.

Agenda

1. Review of Final Service Alternatives
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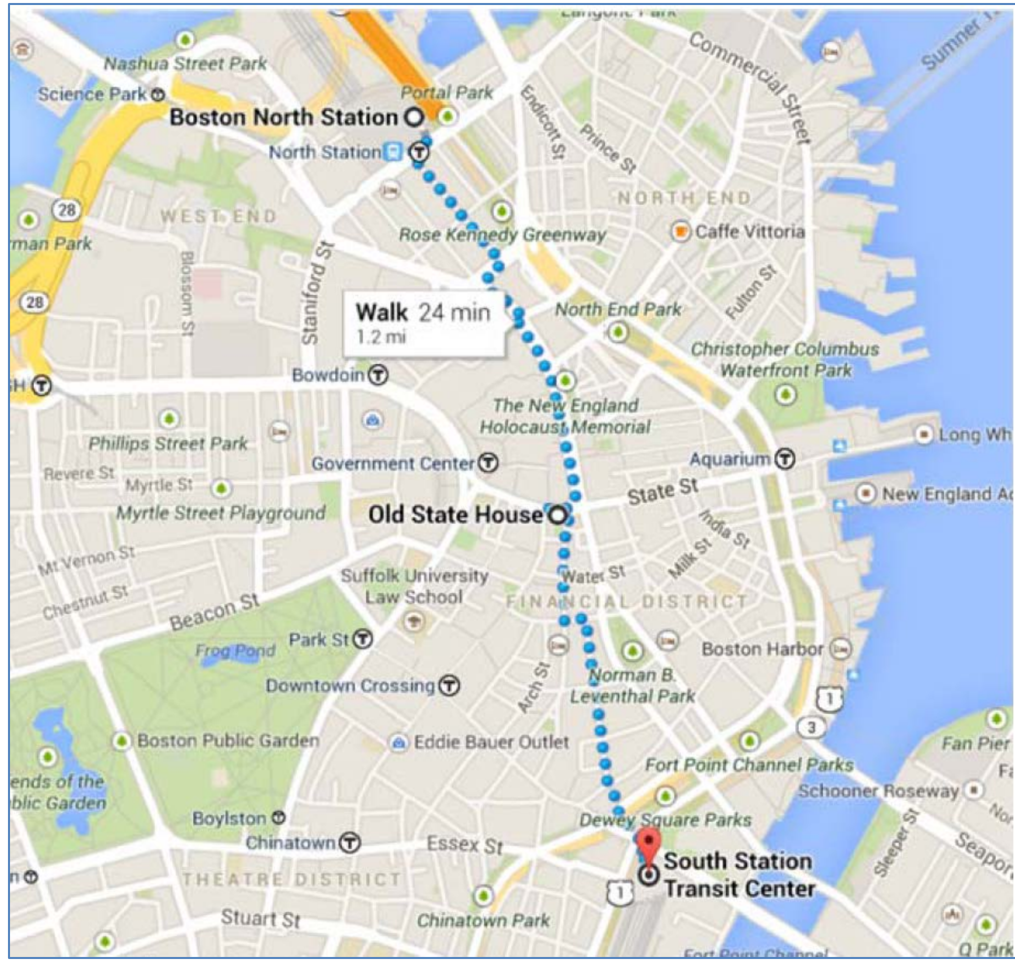
3. Comparative Travel Times by Time of Day
4. Peak Rail-Off Peak Bus
5. Plans for the March 5 Public Meeting
6. **Comparing the North Station and South Station travel markets.**

North Station & South Station Travel Markets

- North and South Stations are on opposite edges of the Boston peninsula equidistant from the historic center of the city and within walking distance of most downtown employment.

- Each terminal serves the Downtown Financial District, Government Center and the Waterfront equally well.



North Station

- Strong rapid transit connections to Back Bay and other points west of downtown.
- Over half (54%) of the arriving riders continue their trips on foot.
- Over one-third (35%) transfer to either the Green or Orange Lines.
- The remaining 11% transfer to MBTA buses, private shuttles or other commuter rail services.

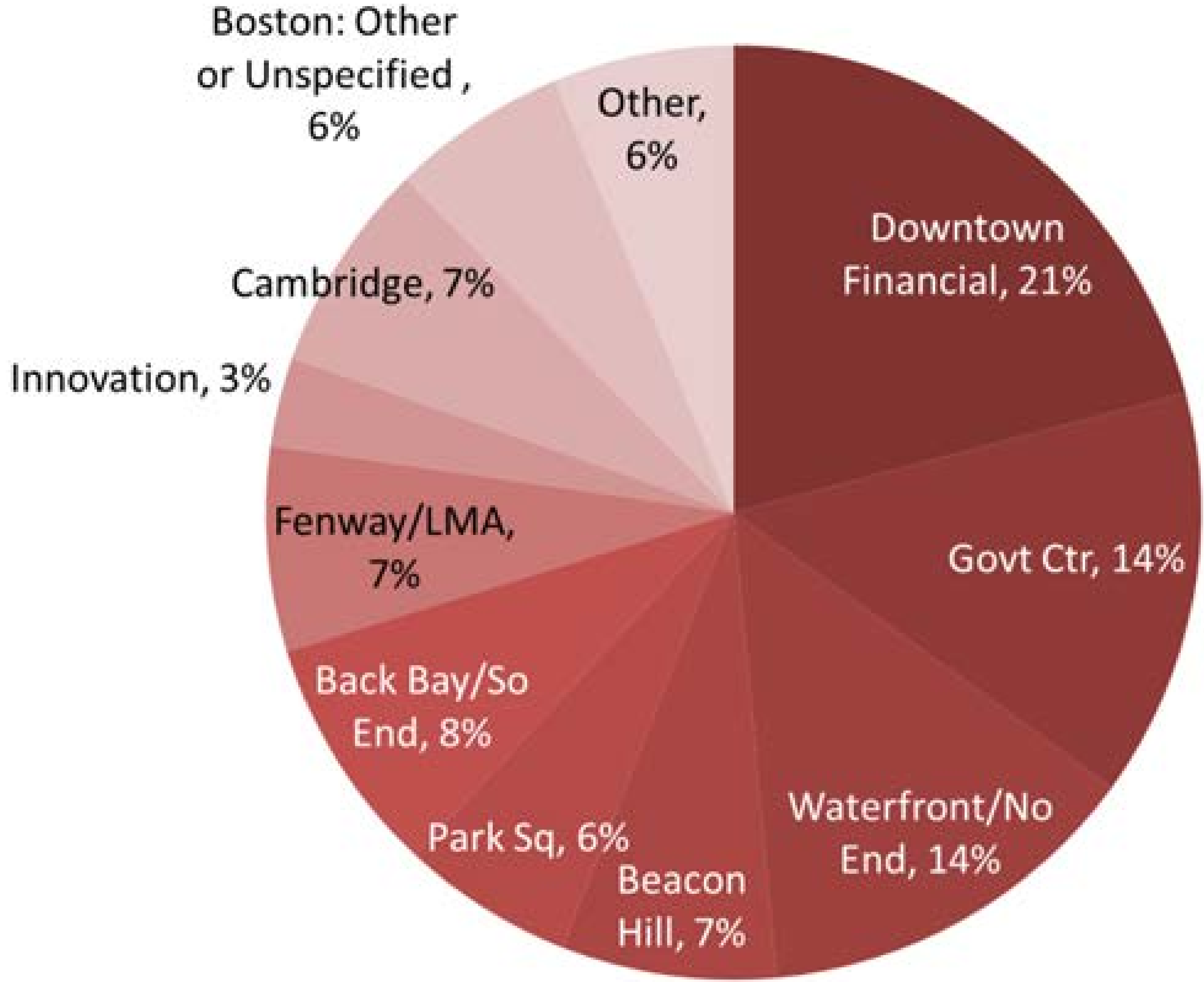


Figure 2: North Station Destinations

South Station

- Only one direct rapid transit connection, but closer to the locus of downtown employment.
- 76% of customers complete their trip on foot.
- Only 17% transfer to the rapid transit network.
- 5% transfer to buses.
- Weak connection to west, 5% of travelers that don't pass through Back Bay take commuter rail west to Back Bay.
- Very few transfers to Silver Line. Most travelers walk to the Seaport.

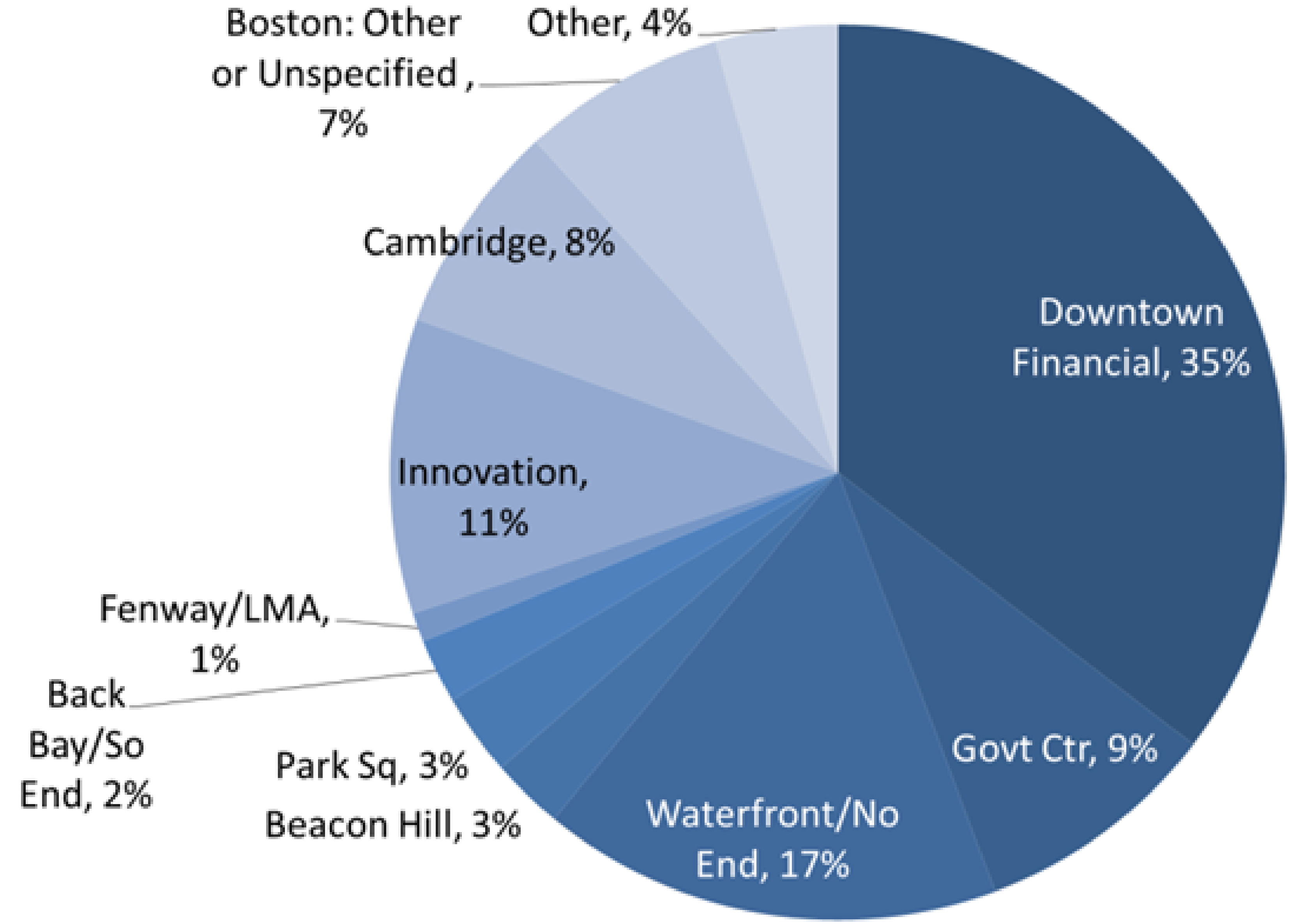
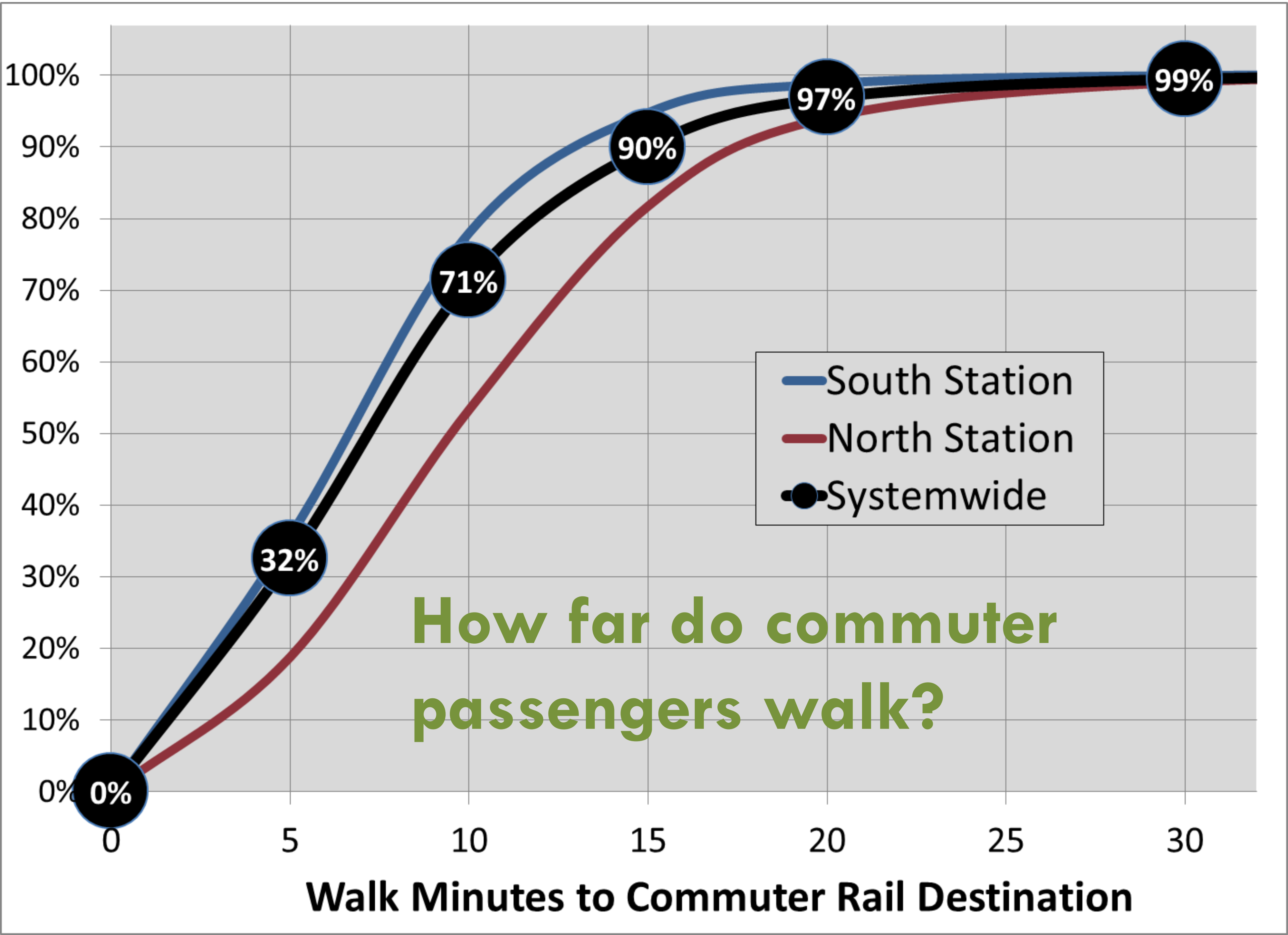


Figure 3: South Station Destinations


100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
5
10
15
20
25
30
0%
32%
71%
90%
97%
99%
South Station
North Station
Systemwide
How far do commuter passengers walk?
Walk Minutes to Commuter Rail Destination

Access to Employment

Boston Office Submarkets

Boston Market	Office/R&D SF
North Station, West End, North End	**1,863,372**
Charlestown	2,843,898
Back Bay	12,682,940
Fenway / Kenmore	1,826,057
Downtown Financial District	**33,599,226**
South End / Roxbury	1,025,000
Seaport / Innovation District	6,563,191
South Station / Chinatown	**1,184,017**
BOSTON TOTAL	**61,587,701**

Colliers International, Greater Boston Market Viewpoint, Q4 2013

Access to Employment

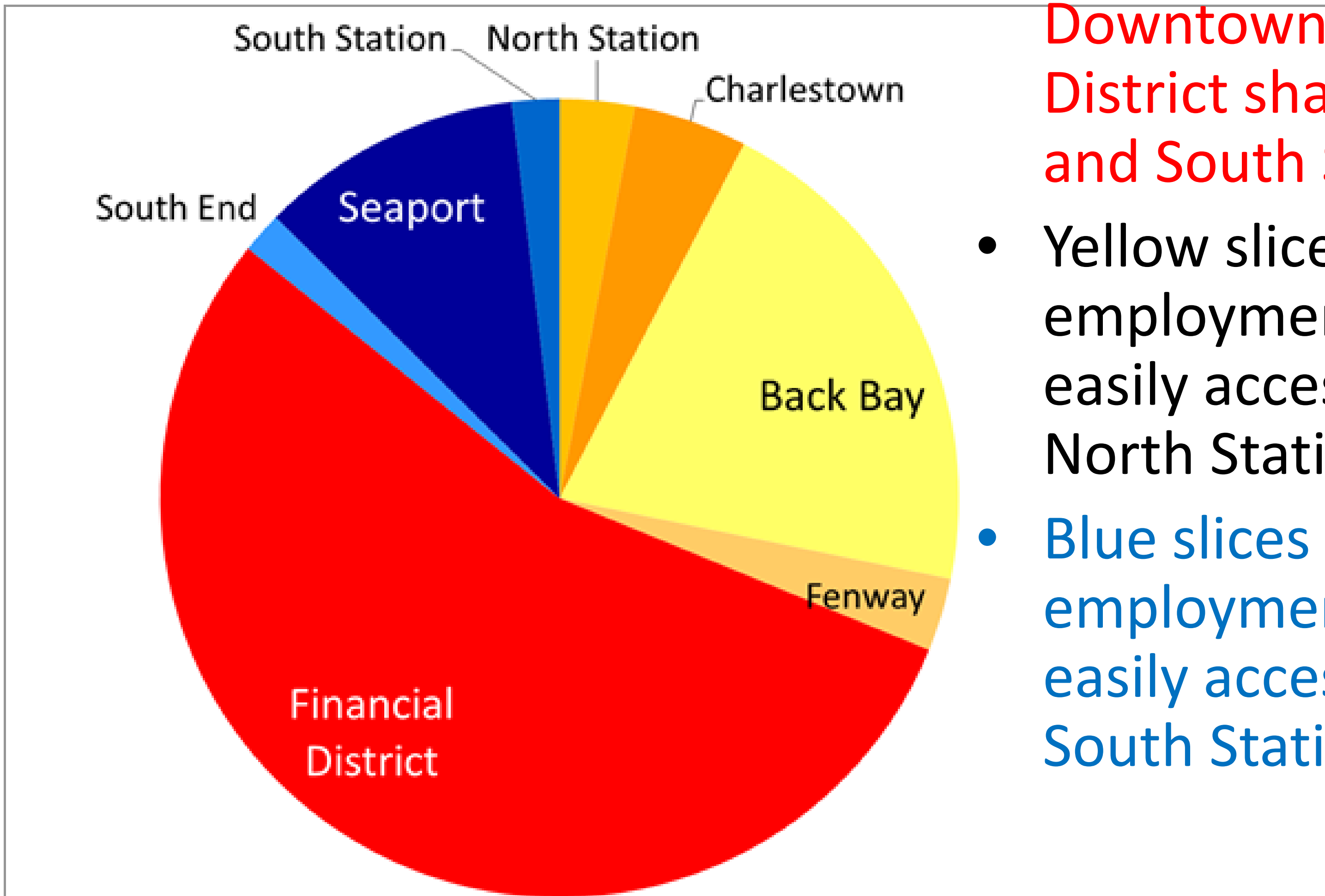


Figure 4: Distribution of Boston Office and R&D Space

- Red slices show the Downtown Financial District shared by North and South Stations.
- Yellow slices show employment that's more easily accessible from North Station.
- Blue slices show employment that's more easily accessed from South Station.

New Hampshire DOT Department of Transportation

Access to Employment

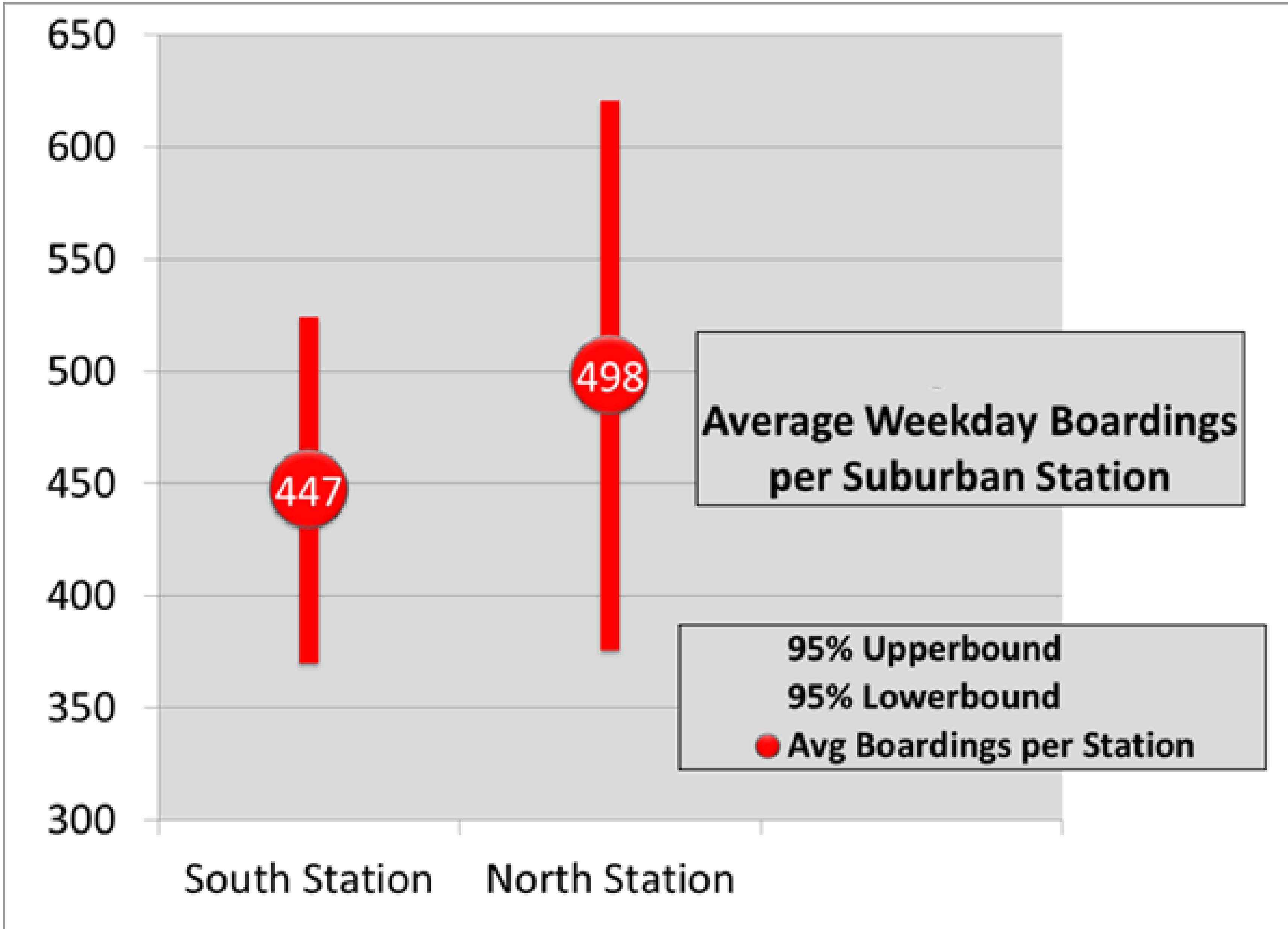
Boston's Five Largest Employers

Employer	Market	Employees
Massachusetts General Hospital	North Station	14,752
Brigham and Women's Hospital	Fenway/Kenmore	11,229
Boston University	Fenway/Kenmore	9,783
Boston Children's Hospital	Fenway/Kenmore	7,903
State Street Bank & Trust Co	Financial District	7,800

Boston Redevelopment Authority, "Largest Employers in the City of Boston" 2013

North Station offers superior access to most of Boston's largest employers

Each suburban station serving North Station averages a few more passengers than South Station



North / South Summary

- **North Station** offers direct rapid transit connections to wide array of Boston destinations especially Back Bay and other points west of downtown.
- **North Station** also offers direct access to more of the Boston's largest employers.

- **South Station** offers fewer direct rapid transit connections, but it is closer to the locus of downtown employment
- **South Station** as a terminal is not particularly well-connected to Back Bay, Park Square, or the Longwood Medical Area.

Each suburban station serving North Station averages a few more passengers than South Station

Dominant Access Path from Terminal to Major Destination Districts

Destination	North Station	South Station
Downtown Financial	**Walk**	**Walk**
Government Center	**Walk**	**Walk**
Waterfront/North End	**Walk**	**Walk**
Seaport / Innovation	**Orange** to **Red**	**Walk**
Beacon Hill	**Walk**	**Red Line**
Park Square	**Green Line**	**Red** to **Green**
Back Bay/South End	**Orange Line**	**Red** to **Orange**
Fenway/Longwood Medical Area	**Green Line**	**Red** to **Green**
East Cambridge	**Green Line**	**Red** to **Green**
Central and West Cambridge	**Green** to **Red**	**Red Line**

North / South Summary

With an integrated rail-plus-bus system New Hampshire travelers will be slightly better off enjoying the option of direct transit service to both Boston terminals; North and South Stations



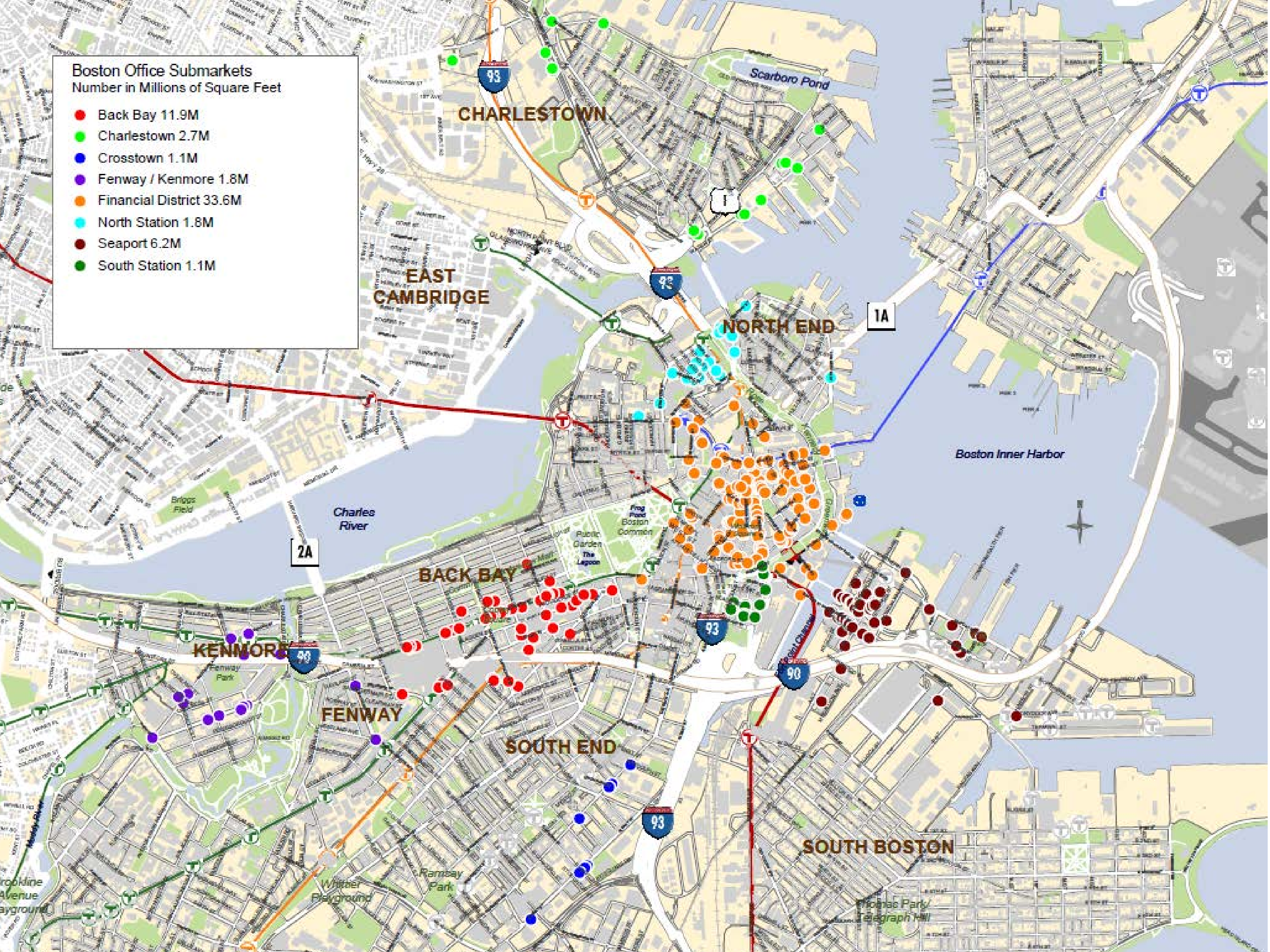


NH Capitol Corridor
Rail & Transit Alternatives Analysis

Boston Express Workshop

March 04, 2014

New Hampshire DOT
Department of Transportation



Boston Office Submarkets
Number in Millions of Square Feet
Back Bay 11.9M
Charlestown 2.7M
Crosstown 1.1M
Fenway / Kenmore 1.8M
Financial District 33.6M
North Station 1.8M
Seaport 6.2M
South Station 1.1M
CHARLESTOWN
EAST CAMBRIDGE
NORTH END
BACK BAY
KENMORE
FENWAY
SOUTH END
SOUTH BOSTON
Scarboro Pond
Boston Inner Harbor
Charles River
Briggs Field
Public Garden
Boston Common
Frog Pond
The Lagoon
Fenway Park
Ramsay Park
Whittier Playground
Thomas Park/ Telegraph Hill
93
90
1A
2A
1

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Kick-off Week Stakeholder Meetings – ***Concord Area Transit***

Date: 03/12/2013 **Time:** 9:00am **Location:** NHDOT Office – Concord, NH

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
James Sudak – Director, Concord Area Transit	jsudak@bm-cap.org	Mark Sanborn (NHDOT)
Terri Paige, Transportation Mobility Manager	tpaige@bm-cap.org	Patrick Herlihy (NHDOT)
		Ken Kinney (URS)
		Russell Wilder (URS)
		David Nelson (Jacobs)
		Ryan Harris (Jacobs)
		Mark Shamon (URS)

Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process.

James Sudak described the existing CAT service as largely a human service transportation provider. They carry approximately 117,000 passengers per year and about 250 passengers per day. While most of their passengers are disadvantaged, complimentary ADA paratransit service accounts for only perhaps 5% of total riders. Overall, an increasing percentage of the ridership uses demand responsive paratransit. Medical or work are the primary trip purposes. The number of choice riders has slowly been increasing, with anecdotal evidence of concerns with respect to I-93 construction, environmental quality, and those using bus-mounted bike racks. It was estimated that approximately 25% of the passengers are choice riders. Passenger concerns include accessing Concord Coach service at the Stickney Park and Ride and the cost of travel to Manchester and Manchester airport. Passengers of course are concerned with convenience, but are largely “mode-agnostic”. (e. g. more interested in mobility than mode of transport)

CAT is currently operating 35 cutaways and 4 historic trolleys. The City Council was initially skeptical of the trolleys, but now reportedly love them. Volunteer drivers provide paratransit service to the outlying districts on mileage reimbursement basis. CAT currently has timed transfers on Main Street for the three fixed routes. There is a question for how to best get to the airport and Manchester. Manchester MTA comes up to Concord twice a day (9am and 1pm) for $4. CAT also provides feeder service to Nashua.

Some of the challenges that CAT faces are funding, stop safety, bus cleanliness, and customer costs. As a small rural system, CAT just changed back to 60 minute headway and can’t afford more frequency. CAT funding is a mixture of FTA, local and employer contributions. The system is owned by the Belknap-Merrimack Counties Community Action Program, which receives HHS funding. The federal sequester may start to hurt by June 2013.

When the participants discussed regional problems that a major investment might address they included:

- Providing more mobility options for all segments of the regional population

- Providing service that would attract more choice riders and respond to a wider array of trip purposes and destinations.
-

When discussing expanded rail service the participants mentioned concerns including

- Parking – Many choice riders want to park and ride
- Fares – CATS passengers are very cost sensitive
- Frequency – CATS hourly service schedule limits its attractiveness to choice riders

The City of Concord recently won a TIGER grant for a Main Street complete streets project. Currently, there is no downtown terminal, just two Main Street bus stops. People would like to extend the Main Street improvements down to the river (Storrs St). There are parking issues downtown and at the Park and Ride lots (I-89 & Stickney). There is also a potential need for secure bike parking.

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Kick-off Week Stakeholder Meetings – ***Concord Coach / Boston Express***

Date: 03/12/2013 **Time:** 9:00am **Location:** NHDOT Office – Concord, NH

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
Harry Blunt – General Manager	hblunt@bostonexpressbus.com	Mark Sanborn (NHDOT)
Ben Blunt – Assistant General Manager	bblunt@bostonexpressbus.com	Patrick Herlihy (NHDOT)
		Ken Kinney (URS)
		Russell Wilder (URS)
		David Nelson (Jacobs)
		Ryan Harris (Jacobs)
		Mark Shamon (URS)

Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process.

Harry Blunt expressed that his main concern was whether the study began with any preconceived conclusions that may make private sector bus operations difficult. Mr. Blount understands that Boston Express is a state supported service but it is also is a non-union shop, where there will be need to protect current employees in the event that the Boston Express service is abandoned or curtailed. Ken assured him that the cost/benefit analysis to be undertaken in the study must address all employment related impacts.

Harry mentioned the need for phasing, communications and coordination. He praised the GO Train in Toronto as having done a good job of phasing the system from bus to rail with coordinated schedules and ticketing. He felt that a problem with the Downeaster is that there is unfortunate limits on the coordination of revenues vs. tickets vis-à-vis the lack of cross-honored passes. He is concerned whether bus service in the Capitol Corridor will survive after the implementation of rail. Furthermore, he feels that parking at Manchester bus station is a problem and intercity passengers are mostly suburban, but stations are primarily in downtown areas. David Nelson assured him that the goal of the study should be to develop a full system and not just focus on one mode.

Harry shared that there are different travel markets between the passengers bound for North Station, South Station and Logan Airport. He feels that there is a thin market for a Downeaster type of service within the corridor and that it would be of limited convenience since it would take so long.

- The Concord to Boston/Logan Coach carries about 140k pass/yr, from a catchment area of 100,000 residents.
- The Nashua to Boston Coach carries about 121k pass/yr (170K with Tyngsboro) and takes about 1 hr to Boston. He felt it would a stronger service if the 90 minute headway were shortened to hourly.
- The Manchester to Boston Express takes about 1 hr to Boston, while rail would be 1.5 hr.
- The Portland to Boston Coach carries about 400k pass/yr and about 150k pass/yr to Logan, while the Downeaster is about 200k pass/yr. The Portland Coach is higher frequency and shorter travel time (1:50 vs 2:30).

Mark Sanborn asked if the Downeaster cut in to Boston Express ridership. Harry felt there was a tide that raised all boats, but the Downeaster did cut in to bus ridership growth by about 5%-10%. His main problems revolve around dealing with Amtrak's difficult bureaucratic organization. He suggested that the management of any rail service be kept within NHDOT and not through the Rail Authority or especially Amtrak.

Harry shared an interesting rule of thumb in the coach express business that the service headway should equal the travel time. So that a 90 minute service should operate every 90 minutes and a 60 minute trip should be run every hour

When the Mr Blunt discussed problems that a major transit investment might address he included:

- Relieve competition between buses and automobiles for highway space
- Financal support for transit services
- Improve the intercity express transit terminal in Manchester that lacks dedicated parking and staging space for bus operations.
- Improve rail freight service to the region
- Improve transit options to the airport.

When discussing expanded transit service the participants offered that

- Concord –Boston is a long trip and a small market that will be hard to make fast and frequent enough to be attractive
- Manchester's downtown facility needs parking and staging space
- MHT would not be expected to a strong market by itself.

David asked how Concord Coach feels about bus on shoulder, and added that Massachusetts is the only state that allows all vehicles in the shoulder. Harry has concerns about safety and the psychological issue of traffic zipping by on the right-side of auto drivers.

The discussion also included a discussion of ridership information and planned ridership survey. The study's contact for those elements of the study will be Mr. Ben Blunt.

Meeting Notes

Project:	Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A
Subject:	Kick-off Week Stakeholder Meetings – ***Manchester Transit Authority***
Date:	03/14/2013 **Time:** 1:00pm **Location:** MTA Office – Manchester, NH

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
Mike Whitten – Executive Director	mwhitten@mtabus.org	Mark Sanborn (NHDOT)
Karen Holden – Operations Planning Manager	kholden@mtabus.org	Patrick Herlihy (NHDOT)
		Ken Kinney (URS)
		David Nelson (Jacobs)
		Ryan Harris (Jacobs)

Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process.

Mike Whitten asked if the study was focusing just on rail as he feels that the feasibility is low and that it would be hard to go from minimal transit service directly to supporting rail service. David Nelson responded that the alternatives would be a mixture of modes and could include initial improvements to Boston Express that would later be phased to rail. He added that there is a better case for transit in the corridor as there used to be no buses, and now there is a flock of them.

Mike said that he would like to see what level of demand exists between cities and between states and If there is a modal impact within all markets, transit riders, people who drive in and park, etc. Ken said that quantification of access and mode to stations will be included in ridership model and Mark Sanborn added that the impartiality of the model provided by independent consultants is key.

Mike suggested that the state could use rail to help redevelop areas within the city such as the Gaslight District between Granite St and Queen City Ave. He said that he would have liked to put an intermodal station on the ballpark site which is south of the proposed site but still a short walk to the Gaslight District. Currently Manchester has no downtown transit center aside from the intercity terminal on Canal Street that is not the proper size for MTA's use . The MTA's main downtown transfer location is located curbside in front of the nearby Radisson, so an intermodal rail / bus intermodal station would be useful. MTA would like a larger facility for the storage and maintenance of their combined fleet of transit andschool buses.

MTA currently provides intercity service to Concord and Nashua. These consist of five daily trips to Nashua (1,000 pass/mo) and two daily trips to Concord (400 pass/mo, began Nov/11). The Nashua service is the second most productive route after the South Willow route to the mall. MTA also operates the Green Dash circulator (Elm to Mill Yard and from Granite to West Brook).

Patrick Herlihy asked about increased costs to carry increased passenger loads or the need to extend routes to provide coverage. Mike replied that MTA offers service 6 days per week from 5:30am to 5:30pm with some buses returning to the garage as late as 7:00pm from the 6:30pm airport run. Currently about 5% of passengers are choice riders, 65% transit dependant and 30% are elderly. The MTA struggles with a very limited budget and has nowhere near the frequency that they would like to provide. Currently MTA can only operate hourly service. But the MTA service area stretches to Kohls, which is the most northern Nashua Transit stop and to the Stickney Park and Ride in Concord. Mark Sanborn added that the politics are such that MTA cannot serve the Exit 5 / N Londonderry Park and Ride lot and that NHDOT needs to look in to park and ride policy and impacts or changes.

Mike described a number of additional institutional and competitive issues that the MTA must deal with. State concessions give high revenue routes to the private operators, while the local transit providers get stuck with the routes that require a subsidy. Boston Express didn't allow MTA in to the Stickney Park and Ride lot. There is also very little communication between operators, and since MTA gets no state support there is no reason for them to participate in discussions. The Seacoast region has a betterinternal communication and Nashua Transit Service is getting better. Concord Area Transit offers 5311 rural service so they work closely with NHDOT. Nashua Transit Service is eligible for 5307 funds, but they want to provide less service. The MTA stays within grant availability, but the main problem is the lack of a local match. If the state makes it a priority to connect cities with transit, then perhaps NHDOT could provide support when MTA travels outside of the City of Manchester.

Mark Sanborn asked if the priority should be to move commuters or to foster economic development and Mike replied that economic development would be key to foster ridership growth. He mentioned that with additional funding the MTA could provide airport demand responsive service. Currently there are three taxi companies licensed by the city that charge approximately $35 for a local trip to the airport. Other improvements that they would like to make include improving schedule information and getting MTA on to Google Maps. The MTA has been aggressively pursuing public-private partnerships and has increased the share of this revenue source from $2,500 to $50,000 per year. Patrick Herlihy closed the meeting by sharing that "a bus system for the poor, is a poor bus system".

APPENDIX H

Capitol Corridor Stakeholder Meetings: Cities

New Hampshire DOT
Department of Transportation

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Kick-off Week Stakeholder Meetings – ***City of Nashua***

Date: 03/12/2013 **Time:** 1:00pm **Location:** Nashua City Hall – Nashua, NH

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
Mark Sousa – Director of Transportation	sousam@nashuanh.gov	Mark Sanborn (NHDOT)
Kathy Hersh – Community Development Director	hershk@nashuanh.gov	Patrick Herlihy (NHDOT)
Chris Williams – President, Nashua Chamber of Commerce	cwilliams@nashuachamber.com	Ken Kinney (URS)
Tom Galligani – Economic Development Director	galligani@nashuanh.gov	David Nelson (Jacobs)
		Ryan Harris (Jacobs)

Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process.

Kathy Hersh suggested that the main goal of the study should be to find the answer to all cost questions and should include all stakeholders, reference case studies and include the political perspective. She asked ultimately who would get to vote on the final alternative. Mark and Ken described the AA process, cost vs. benefits analysis and LPA selection.

Mark Sousa suggested that congestion is minimal, but the Nashua Transit System (NTS) would like to add service. He felt that a southside station would not be a problem to serve but that a downtown location could be a central intermodal terminal, but that it would likely have traffic impacts.

Kathy felt that trains would help to attract a younger population from Boston by providing better transportation to jobs and referenced the East Nashua Masterplan and a ULI Report "10 things in 10yrs in Housing". She mentioned that in addition to the Crown Street site, the city has been buying abandoned properties along the rail line in anticipation of redevelopment. She also felt that the connection to Manchester is vital and that a connection to Manchester Airport should be included in the first phase of any plan.

Tom Galligani expressed a need to attract talent from Boston and that Nashua currently functions as a big suburb. He felt that areas along the rail corridor have suffered as companies have moved closer to highways. He suggested that both a downtown TOD and suburban park and ride station would be ideal and that a layover facility could be located at the former Beazer tie plant brownfield site in the northeast of the city. Ken referenced Kenosha, WI which changed when it became the northern most rail suburb of Chicago.

Chris Williams mentioned that the study needs to focus on benefits and not just the costs. There is the potential for TOD development in coordination with the Exit 36 SB project and that it could improve access to the Technology Park. He also suggested that a downtown intermodal station would improve the attractiveness of the Mill District which will be improved along with the Broad Street Parkway development.

When the participants discussed regional problems that a major transit investment might address they included:

- Provide an environment that will make the state better able to attract and retain young workers and their families.

- Improve transportation connections to the regional economic hub (Boston)
- "Put Nashua back on the map"
- Provide transportation choices to the private automobile
- Provide capacity for future growth

When discussing expanded rail service the participants mentioned concerns including

- Need for both a downtown station and a park n ride station
- Importance of connections between Nashua, MHT and Manchester

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Stakeholder Meeting – City of Dover

Date: 05/30/2013 **Time:** 10:30am **Location:** McConnell Center, Dover, NH

Attendees/Distribution:

Name (Affiliation)	Email	Study Team
Christopher Parker	c.parker@dover.nh.gov	Mark Sanborn (NHDOT)
Timothy Corwin	t.corwin@dover.nh.gov	Ken Kinney (URS)
		Carl Chamberlin (URS)

Mark Sanborn and Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process. The purpose of the meeting is to talk about rail impact in the city as it relates to development, opportunities, challenges, etc.

Summary of comments from Christopher Parker:

- Placement of the train station near the downtown area is important to the success of the train in the city, with ridership increasing every year.
- The only negative aspect of the service is that because the state of NH doesn't provide any funding for the service, the state (and by extension the city) has less leverage when it comes to service changes and other aspects of operations
- Dover has a lot of transit options, and it has been their experience that the train produces more economic development than bus
- Developers that contact the city are generally interested in the train (as well as other transit connections)
- The train station in Dover serves both commuters (majority) and tourists (minority). The downtown area is a tourism draw generally, and more specifically the children's museum is a tourism draw for train passengers
- From a development perspective, the downtown mills have converted space from commercial to residential, including affordable units, and pushing for re-use of underutilized properties near downtown
- The city has sped up and streamlined the review process for development projects to promote new development
- In addition, the city has adjusted impact fees for re-use projects and built flexibility into the code enforcement for re-use projects.
- In an ideal world, the city would like to have located that station one block to the east in order to be closer to downtown, however there was concern over blocking multiple at-grade crossing during stops
- The city had considered at one time locating the station off of Route 16 in order for it to be a park and ride style station, although most everyone believes the downtown stop has been very successful
- The width of the current building located at the train station has made it difficult to attract vendors
- The city has successfully integrated multiple connections at the train station, with buses, parking, and the midpoint of the community trail is located at the station
- The city is working on developing signage to better connect the station with downtown

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Stakeholder Meeting – Town of Durham and UNH

Date: 04/03/2013 **Time:** 11:00am **Location:** Durham Town Hall, Durham, NH

Attendees/Distribution:

Name (Affiliation)	Email	Study Team
Mike Lynch (Public Works)	publicworks@ci.durham.nh.us	Mark Sanborn (NHDOT)
John Carroll (UNH-Natural Resources)	john.carroll@unh.edu	Patrick Herlihy (NHDOT)
Diana Carroll (Town Council)	dianacarrollnh@hotmail.com	Ken Kinney (URS)
Todd Selig (Town Administrator)	tselig@ci.durham.nh.us	Carl Chamberlin (URS)
Dan Innis (UNH-Business School)	dan.innis@unh.edu	
Steve Pesci (UNH-Community Planning)	stephen.pesci@unh.edu	
Leila Paje-Manalo (Office International Students)	leila.paje-manalo@unh.edu	
Carden Welsh (Resident)		
Ann Welsh (Resident)		

Mark Sanborn and Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process.

The meeting was an open session provided to solicit comments from the group. Below is a summary of their comments:

<u>Leila Paie-Manalo</u>

- The international student population is continually growing at UNH.
- Transportation issues have a disproportionate impact on international students that attend the three campuses of UNH (Durham, Concord, and Manchester).
- The transit system is the only way to connect different students and different campuses.
- A local connection within cities is also an important link.
- Specific issues include accessibility to Concord DMV for international students, difficulty getting between campuses.
- Transportation system is car based, which is difficult for international students.

<u>John Carroll</u>

- Transportation between Durham and Concord is very difficult.
- MBTA has been successful with planning stations within walking distance of certain destinations, as walking distance is important aspect of planning (transit oriented development).
- An example where this has been successful is Durham, and an example of where this has been less successful is Portland.

<u>Steve Pesci</u>

- Student parking permits have decreased over time at UNH.
- Surveys have shown that proximity to transit is an important aspect for students living off campus.
- UNH operates buses on campus, and Wildcat transit to off campus communities.
- Location of train station in Durham has (anecdotally) made UNH a more competitive school.

- In a perfect world, the station and platform would be larger, and the train cars would support bicycles.

Dan Innis

- When making the case to students about campus, the train provides a positive talking point, especially for potential students coming from Massachusetts.

Todd Selig

- The train has had a positive impact on the town of Durham, specifically on congestion downtown
- The walkability aspect of the train has been good for the university and the community.
- For the future, the town would like to make the station more accessible to the commuter population.
- Anecdotally, that train station has helped bolster retention of residents, increase property values, encourage new developments, and expand business opportunities in town.

Carden Welsh

- A station closer to town would provide additional benefits to the town, which is an important lesson for future train expansion.
- The frequency and service are the two most important factors for ridership.

Diana Carroll

- As the train is on university campus, it is more convenient for UNH than for the town residents
- She recommends emphasizing transit oriented development in any future rail expansions.
- How do you plan ahead and trouble shoot conflicts that can decrease service, power outages, signals, accidents, etc.

From: Patrick Herlihy [mailto:PHerlihy@dot.state.nh.us]
Sent: Wednesday, March 26, 2014 9:13 AM
To: Kinney, Ken; Chamberlin, Carl
Subject: Manchester BOA Presentation

Good Morning,

Last night I gave an update to the Mayor and Board of Alderman in Manchester. Two takeaways from Mayor Gatsas were:

1. Look at the "Rivers Edge" area of Manchester for a layover facility (also supported by Alderman O'Neil)
2. Look south of the ball park as well for a station location.

Thanks.

Patrick C. Herlihy
Director of Aeronautics, Rail and Transit
New Hampshire Department of Transportation
PO Box 483, 7 Hazen Drive
Concord, New Hampshire, 03302-0483
(603) 271-2449 (Tel)
(603) 271-3914 (Fax)

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Stakeholder Meeting – Town of Manchester

Date: 04/02/2013 **Time:** 2:00pm **Location:** Manchester City Hall, Manchester, NH

Attendees/Distribution:

Name (Affiliation)	Email	Study Team
Ted Gatsis		Mark Sanborn (NHDOT)
Sean Owen		Patrick Herlihy (NHDOT)
		Ken Kinney (URS)
		Carl Chamberlin (URS)

Mark Sanborn and Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process. Mark offered a position on the project advisor board to the Mayor or a designee from his office. Mark closed the introduction by asking the question: within the context of this project, what is important to the Mayor's office?

The Mayor stated that the Boston-Manchester Regional Airport (MHT) is the economic engine for the state of New Hampshire, and any study of the corridor needs to include connections with the airport or other integration of the airport. The Mayor stated, in specific terms, that if the project is centered on Massachusetts, and benefits to Massachusetts, he would not support the project in the long term. He would like to see the planning for the corridor focus on the benefits to the state of New Hampshire.

Ken Kinney assured the Mayor that the interface with MHT is going to be addressed as part of the Alternatives Analysis portion of the project. It was discussed that a stakeholder meeting with MHT has already been completed.

The Mayor asked the question to the Study Team: how is the project going to be subsidized?

Ken Kinney responded by explaining that a financial plan will be developed as part of the planning study process, and that the project cannot progress any further without addressing the financial implications of the corridor study.

Mark Sanborn followed up by explaining that the airport has historically been in favor of investigating a rail link with the airport and that this type of connection could improve the ability to provide international service out of MHT.

The Mayor stated that another concern he has with the project is that communities would have to provide matching or subsidies for stops in their towns/cities. If this type of financial model is necessary for the project, he would not be in favor.

Mark Sanborn reiterated that this will be addressed as part of the financial modeling for the study, and that all funding models will be investigated.

The Mayor stated that although he is concerned about potential subsidies for the project, he will be "open eyes and open ears," and looks forward to critiquing the funding numbers when they are ready.

The Mayor closed by offered up a number of other comment associated with the project. I-93 is the most important transit link in southern NH, and the I-93 project needs to be completed prior to this project beginning. The city is moving forward and seeing substantial growth regardless of the presence of rail. The city is constrained by the number of lots available for the development of a rail station.

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Stakeholder Meeting – Merrimack Chamber of Commerce

Date: 04/18/2013 **Time:** 4:00am **Location:** Merrimack Town Hall, Merrimack, NH

Attendees/Distribution:

Name (Affiliation)	Email	Study Team
Richard Barry (State of NH)	dickbarry@juno.com	Mark Sanborn (NHDOT)
Eric Brand (P&L Landscaping)	ericbrand1@comcast.net	Patrick Herlihy (NHDOT)
Allen Holmes (UPS)	nne1adh@ups.com	Ken Kinney (URS)
Victor Kwitkiwski (Ameriprise)	victor.m.kwitkiwski@ampf.com	Carl Chamberlin (URS)
Thomas Lachance (BAE Systems)	thomas.lachance@baesystems.com	Julia Suprock (URS
Connie Nichols (Bumbersol IT)	davennnnn@yahoo.com	
David Nichols (Bumbersol IT)	davennnnn@yahoo.com	
Tim Roache (NRPC)	timr@nashuarpc.org	
David Rogers (Wheeler Chapel)	drogers102@comcast.net	
Steven Schwed (Thunder Well & Pump)	thunderwellandpump@yahoo.com	
Dawn Sheperd (Go Wireless)	dawn@gowireless.org	
Jeff Gilbert (UPS)	jbgilbert@ups.com	
Nathaniel Durgin (Yankee Industrial Supply)	Bdurgin@Yankeeind.com	

Mark Sanborn and Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process.

The meeting was an open session provided to solicit comments from the group. Below is a summary of their comments:

David Rogers

- A train from Lowell to Nashua is a “win-win” for the communities in this area, and is a “no-brainer.”
- It is important that freight rail also be included as an aspect of the study.

Dick Berry

- Connections between the rail and the Boston-Manchester Regional Airport are an important aspect for economic development in the region.
- Transit alternatives can be used as an opportunity to attract colleges and universities to the region.

Eric Brand

- Increased transit options are more desirable for recruiting workers and for hiring a more diverse work force.

Tim Roache

- Integration of the whole system is an important aspect of the project.

Nathaniel Durgin

- Would track work impact adjacent properties along the rail ROW? (Answer: unknown)

- As a property owner in the region, there is a natural “break” created by the transportation system in Southern NH. Those residents in South Nashua generally have higher real estate values, and are willing to commute to Massachusetts, while this is generally the opposite for North Nashua.
- More transit options would expand real estate options for commuters looking to live outside of Massachusetts.
- Real estate values are impacted by increased transit options.

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Kick-off Week Stakeholder Meetings – ***Nashua Chamber of Commerce***

Date: 03/12/2013 **Time:** 4:00pm **Location:** Nashua City Hall – Nashua, NH

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
Chris Williams – Greater Nashua Chamber of Commerce	cwilliams@nashuachamber.com	Mark Sanborn (NHDOT)
Lori Piper – Merrimack County Savings Bank	lpiper@mcsbnh.com	Patrick Herlihy (NHDOT)
Sy Mahfuz – Persian Rug Gallery	sy@persianrugsnh.com	Ken Kinney (URS)
Paul Hebert – United Way of Greater Nashua	paul@unitedwaynashua.org	David Nelson (Jacobs)
Nicole Horan – Squires Staffing Services	nicole@squirestaffing.com	Ryan Harris (Jacobs)
Bette Lasky – New Hampshire State Senate	bette.lasky@leg.shate.nh.us	
Karen Cooper – Rivier University	kcooper@rivier.edu	
Eric Carlson – Oracle	eric.carlson@oracle.com	
Claire Castanino – Bellwether Community Credit Union	claire.castanino@bccu.org	
Peggy Gilmour – New Hampshire State Senate	peggy.gilmour@leg.state.nh.us	
Ellen Scarponi – Fairpoint Communication	escarponi@fairpoint.com	

Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process.

Mark Sanborn provided some additional background on the study, the steering committee selection process and the state legislation that will require legislative approval to fund any rail projects. He also reminded the group that the state has determined that the Crown Street site offers utility as a park and ride location independent of the outcome of the transit investment study. He also noted that the $300m capital cost figure that has been publically circulated is outdated.

Chris Williams mentioned that the study needs to focus on benefits and not just the costs and that he hopes that there will be rail advocates on the steering committee. He mentioned the potential for TOD development in coordination with the Exit 36 SB project and that it could improve access to the Technology Park. He also suggested that rail access to Manchester Airport or downtown Manchester would greatly improve regional mobility.

Ellen Scarponi agreed that mobility within the state is often overlooked, but that it is just as important, if not more important, that easing commute trips to Boston. Senator Lasky agreed and that it would be very important to quantify and publicize the economic benefits. Eric Carlson felt that rail would be a boon to businesses such as his that highly value reliable connections to offices in Boston and to Manchester airport.

Senator Lasky suggested that Nashua is an inter and intra state transit wasteland and stressed that rail would be an important piece to help make NH more prosperous and that there is a need to pay attention to the state as a whole – which would require buy-in from the North Country. Mark Sanborn added that Ray Burton is a big rail advocate from the North Country.

Nicole Horan said that rail service could help to keep and attract young people to the region and Chris Williams suggested that the study team should reach out to young professional groups in the region. Karen Cooper added that Rivier University wants to make Nashua more attractive to students and connections to educational resources in Boston and Cambridge would be a benefit. Lori Piper stressed that there is also a need to educate people about the use and viability of transit and Ellen Scarponi added that there already is an historical legacy of transit and trains in NH.

Sy Mahfuz implored that the state needs to invest in options that Europeans take for granted for our children's future. He suggested that we need to start arming advocates with rail success stories from around the country. Mark Sanborn closed the meeting by reminding the group that all we need do is look at the success of the Downeaster and the 200k NH pass/yr that utilize the service.

When the participants discussed regional problems that a major transit investment might address they included:

- Catalyze economic development
- Provide an environment that will make the state better able to attract and retain young workers and their families.
- Improve access to New England's economic hub
- Better integrate Nashua and the rest of Southern New Hampshire into the regional transport and economic network.
- Enhance the educational experience offered by instititions of higher learning based in South Central New Hampshire
- Provide mobility alternatives to the private automobile
- Improve transportation safety and reduce drunk driving
- Put Nashua "on the map"
- Provide new green transport options to guide future development
- Provide intermodal service to the regional airport

APPENDIX H

Capitol Corridor Stakeholder Meetings: Land Use

New Hampshire DOT
Department of Transportation

Meeting Notes

Project: NH Capitol Corridor Alternatives Analysis and Service Development Plan (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Land Use Workshop – Concord NH

Date: 07/23/2013 **Time:** 9:00am **Location:** NHDOT 7 Hazen Drive, Concord, NH

Attendees/Distribution:

Name (Affiliation)	Email	Study Team
		Mark Sanborn (NHDOT)
		Patrick Herlihy (NHDOT)
		Ken Kinney (URS)
		Carl Chamberlin (URS)
		Julia Suprock (URS)
		Jen McNeil Dhadwal (URS)
		Chris Porter (CS)

Opening

Jen McNeill Dhadwal opened the workshop with a powerpoint presentation that provided an overview of TOD concepts and how they relate to transit, station locations, layover sites, and this project specifically.

Open Discussion

Historically, the shopping plaza property, located on Storrs Street off of North Main Street, in Concord was the location of the former rail station (at Depot Street), and this is one viable location for a future rail station. This property is privately owned.

The second most viable location for a future rail station in Concord is at Stickney Avenue, which is the location of an existing park and ride, and bus terminal. NHDOT owns most of the properties in this location.

The shopping plaza was built in the early 1960's, and the city has had past ideas and plans for reconfiguration of this area. The property is out of context with the surrounding businesses and main street development, however, it is a regional shopping brand which draws customers into the downtown area.

Any train facility needs to have sufficient parking and ease of access for the station to be successful.

The city has not been able to establish regular communication with the current (overseas) owners of the shopping plaza, which may make future negotiations for the property difficult.

One advantage of the Stickney Avenue location is that the land is currently owned by NHDOT, and therefore will be easier to control. Also, the surrounding land and buildings have more potential for future development, including a larger amount of land that is currently vacant.

Another advantage of the Stickney Avenue location is that is provides connections to other areas of the state due to its proximity to interstate off ramp and existence of bus facility that serves the North Country. The Stickney Avenue location could serve as a multi-modal transit facility with bus, rail, park and ride, and local transit connections. It will be easier to provide parking at this site than the Depot Street site.

The city has been working on plans to connect the newly developed Horseshoe Pond area with the downtown area of the city. The Stickney Avenue location sits between Horseshoe Pond and downtown, and redevelopment of this area could help make this connection.

There have been multiple redevelopment projects in the past few years downtown. One-half million square feet of new office and retail have been completed on South Main Street since 2007. The Council is pushing market-rate housing on Main Street, with a 25-unit project completed. The Central Business Performance District has very liberal zoning, with zero setbacks and no parking requirements.

One thing that is missing for development in the downtown area of Concord is a large employer that can anchor any new development in the downtown area. A rail station may attract or be a potential selling point to attract large employers to this area.

There has been recent development outside of the downtown district that was spurred by a brownfield redevelopment site and was spearheaded by a local development corporation. The city may have missed out on an opportunity to strengthen employment downtown by not trying to locate this development in the downtown district. Development outside of the downtown district has pulled employment away from the best location in the city with potential for TOD.

Looking at the regional economy, the area "weathered the recession well." Commercial vacancy in the Heights (east Route 9) is about 5% and there is new development along this corridor. Loudon Road will be given a "road diet" next year to improve traffic safety and pedestrian and bicycle conditions. There has been $8 million in new investment in the Penacook village center. New Hampshire Technical Institute (northeast of the Stickney Ave site, across I-93) has been expanding and is a major source of transit ridership. Franklin Pierce Law School joined UNH and may benefit from state school connections. Langley Parkway will improve access between southwest and northeast Concord (connecting to I-393). These factors support the likelihood of a market for new development in the station areas under consideration.

In order to make Stickney Avenue a viable location for rail station, the city would need to re-zone the property and surrounding location to support redevelopment, and approve development agreements. The city is considered very likely to support such changes. The city would also need to improve pedestrian connections to increase walkability between downtown and the Horseshoe Pond area and ensure that the design of new development supports walking along this corridor.

The poor walkability that exists today makes the distance between downtown and Stickney Avenue seem a lot further than it is in reality.

There is an idea amongst stakeholders in the city that developers are waiting for the first piece of the puzzle to spur change in the Stickney Avenue/North Main Street area. A rail station could be a potential piece that helps induce development.

The consensus in the group is that the shopping plaza would be a great location for a station, however it would be following existing development rather than aiding development (the downtown district is highly saturated for a development perspective). The Stickney Avenue location on the other hand, is more open for future development.

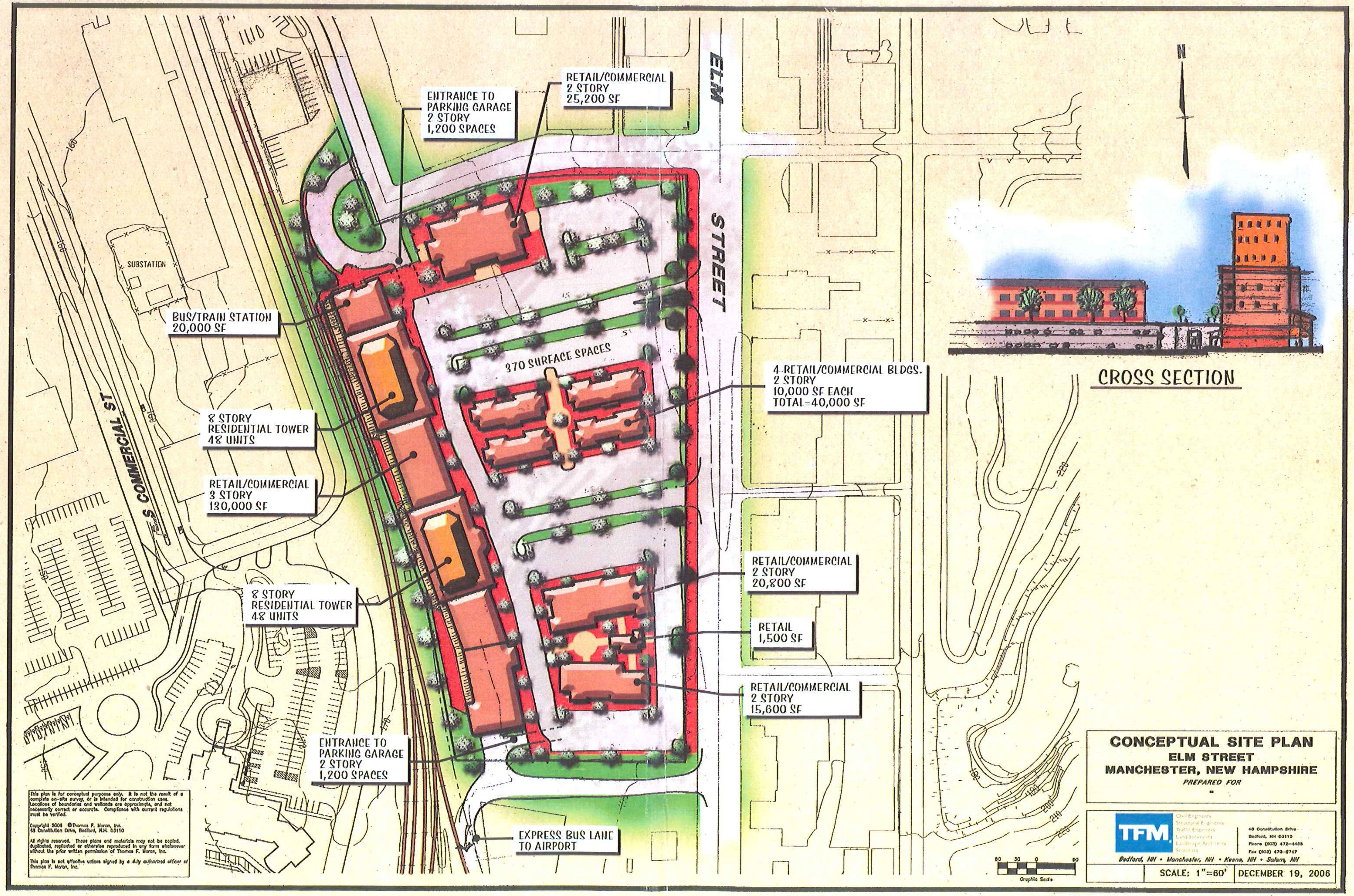
The design of any transit center/rail station is important to the stakeholders, and the design can either help or hinder the prospect for future development and success of any station.

The major constraints to implementing the Stickney Avenue location are zoning and improving access to downtown for pedestrians.

Fort Eddy Plaza (shopping plaza across I-93 from the Stickney Ave location) is a prime commercial retail site in Concord and would be difficult to redevelop.

It will be important to coordinate plans for the widening of I-93 to facilitate multi-modal access within the vicinity of whichever station area is selected.

Several participants expressed interest for a two station concept in the city, with one station near downtown and a second location south of the city to serve as a park and ride location.



This plan is for conceptual purposes only. It is not the result of a complete on-site survey, or is intended for construction uses. Locations of boundaries and wetlands are approximate, and not necessarily correct or accurate. Compliance with current regulations must be verified.

This plan is not effective unless signed by a duly authorized officer of Thomas F. Moran, Inc.

CONCEPTUAL SITE PLAN
ELM STREET
MANCHESTER, NEW HAMPSHIRE

PREPARED FOR

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747

Bedford, NH • Manchester, NH • Keene, NH • Salem, NH

SCALE: 1"=60' | DECEMBER 19, 2006





NH Capitol Corridor
Rail & Transit Alternatives Analysis

Potential Station Area Land Use and Economic Development Analysis

December XX, 2013

New Hampshire DOT
Department of Transportation

Agenda

- Capitol Corridor potential station locations
- Station area analysis: [name of town]
- Station area land use and economic development recommendations
- Capitol Corridor potential layover facility sites

Potential Station Locations

- Concord (mix)
  - Depot Street
  - Stickney Avenue
- Manchester (TOD)
  - Granite Street
  - Bridge Street
- MHT (P&R)
  - Raymond Wieczorek Drive
- Nashua (TOD)
  - Crown Street
  - Main Street
- South Nashua (P&R)
  - Spit Brook Road
  - Pheasant Lane Mall
  - Beazer East

Evaluation Criteria

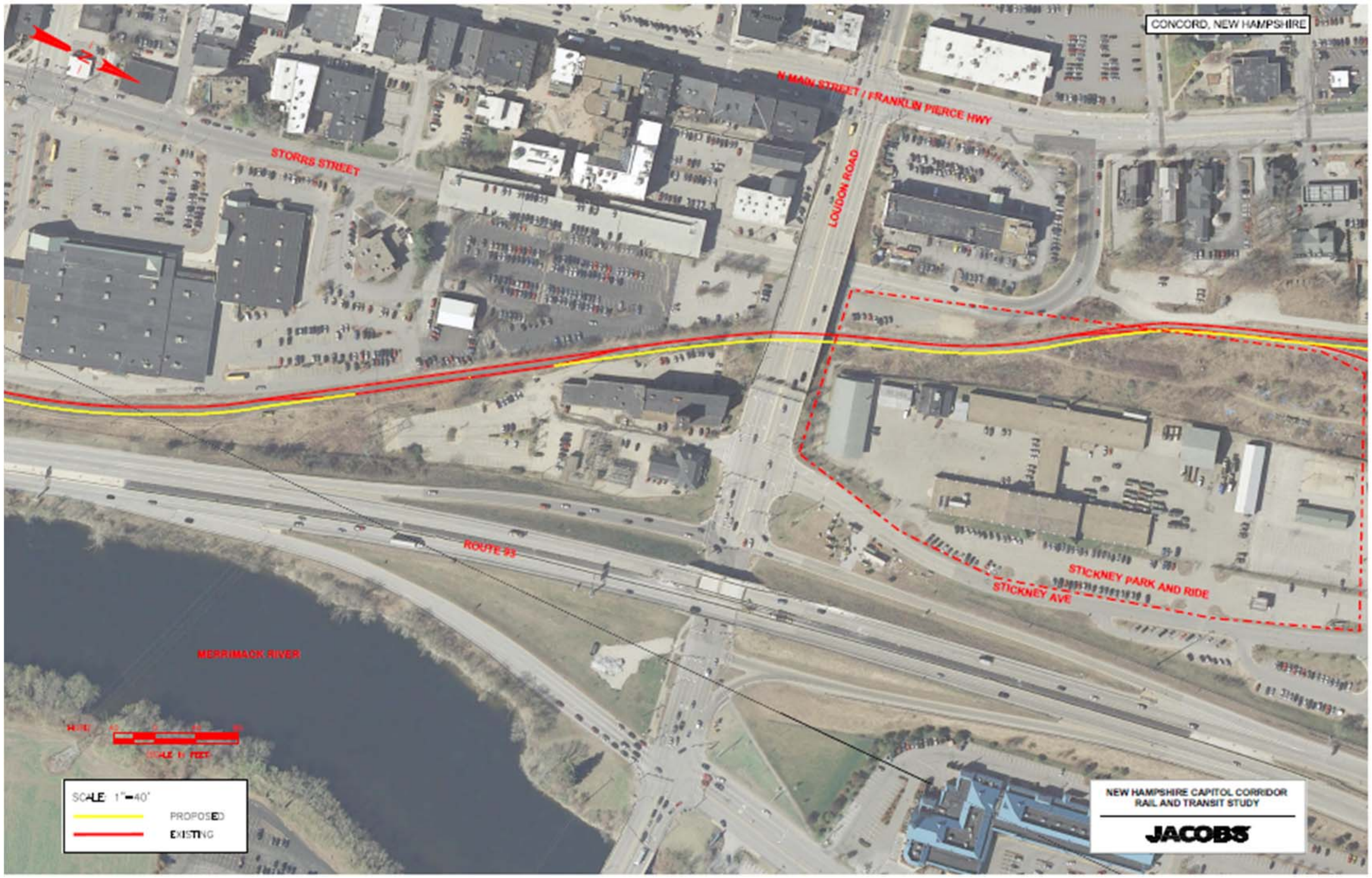
Primary Criteria (1 to 5)

- Market (Nashua, Manchester, Concord)
- Access (Major highways, exits, local roads)
- Track characteristics (straight track, sidings)
- Land use (Residential, commercial, industrial)
- Lot size/configuration

Secondary Criteria

- Environmental (wetlands, river, habitat)
- Ownership (State or private)
- Sensitive receptors (residential, schools, hospital)
- Miscellaneous factors

Concord: Stickney Avenue



Concord: Stickney Avenue

Category	Rating	Notes
Market	5	Close to existing park and ride lot
Access	4	Close to 393, but needs a more direct access point from 393 and 93; This would be solved with I-93 rebuild plan for the area and extension of Storrs Street
Track	4	Track may need to be realigned
Land use	5	Former DOT buildings
Parcel	5	Large with flexibility and potential
Environmental	Y	Potential remediation
Owner	G	Government ownership
Noise	N	Vacant land and commercial developments
Miscellaneous	Y	Many different options available at the site; could fit in with city's plans to redevelop the area and rebuild of I-93 in this area

Concord: Depot Street

Concord: Depot Street

Category	Rating	Notes
Market	5	Close to downtown
Access	4	Access from Main Street; Could have access from I-93
Track	4	Slight curve in the track at this location, but enough straight tracks for platform
Land use	4	Existing commercial development
Parcel	5	Large enough to be suitable for redevelopment
Environmental	N	Nothing obvious
Owner	P	Privately owned
Noise	N	Commercial development
Miscellaneous	Y	Would require redevelopment of the site; City has not had success working with current owner

Manchester: Bridge Street

New Hampshire DOT Department of Transportation

Manchester: Bridge Street

Category	Rating	Notes
Market	5	One block from downtown
Access	4	Indirect exit from 293, public parking garage nearby
Track	3	Curve in track, may require blocking one or more grade crossings
Land use	5	Existing commercial uses
Parcel	4	Tight space, may need surrounding properties for station
Environmental	N	Nothing obvious
Owner	P	Privately owned parcels
Noise	Y	Surrounding commercial buildings
Miscellaneous	Y	The city may have a preferred location separate from this site

Manchester: Granite Street

New Hampshire DOT Department of Transportation

Manchester: Granite Street

Category	Rating	Notes
Market	5	One block from downtown
Access	5	Direct exit from 293, public parking garage nearby
Track	5	Straight track, with no issues
Land use	5	Existing commercial uses
Parcel	4	Tight space, may need surrounding properties for station; Parking would need to be in public garage across Granite St.
Environmental	N	Nothing obvious
Owner	P	Privately owned parcels
Noise	Y	Surrounding commercial buildings
Miscellaneous	Y	The city may have a preferred location separate from this site; Existing Bus Terminal

New Hampshire DOT Department of Transportation

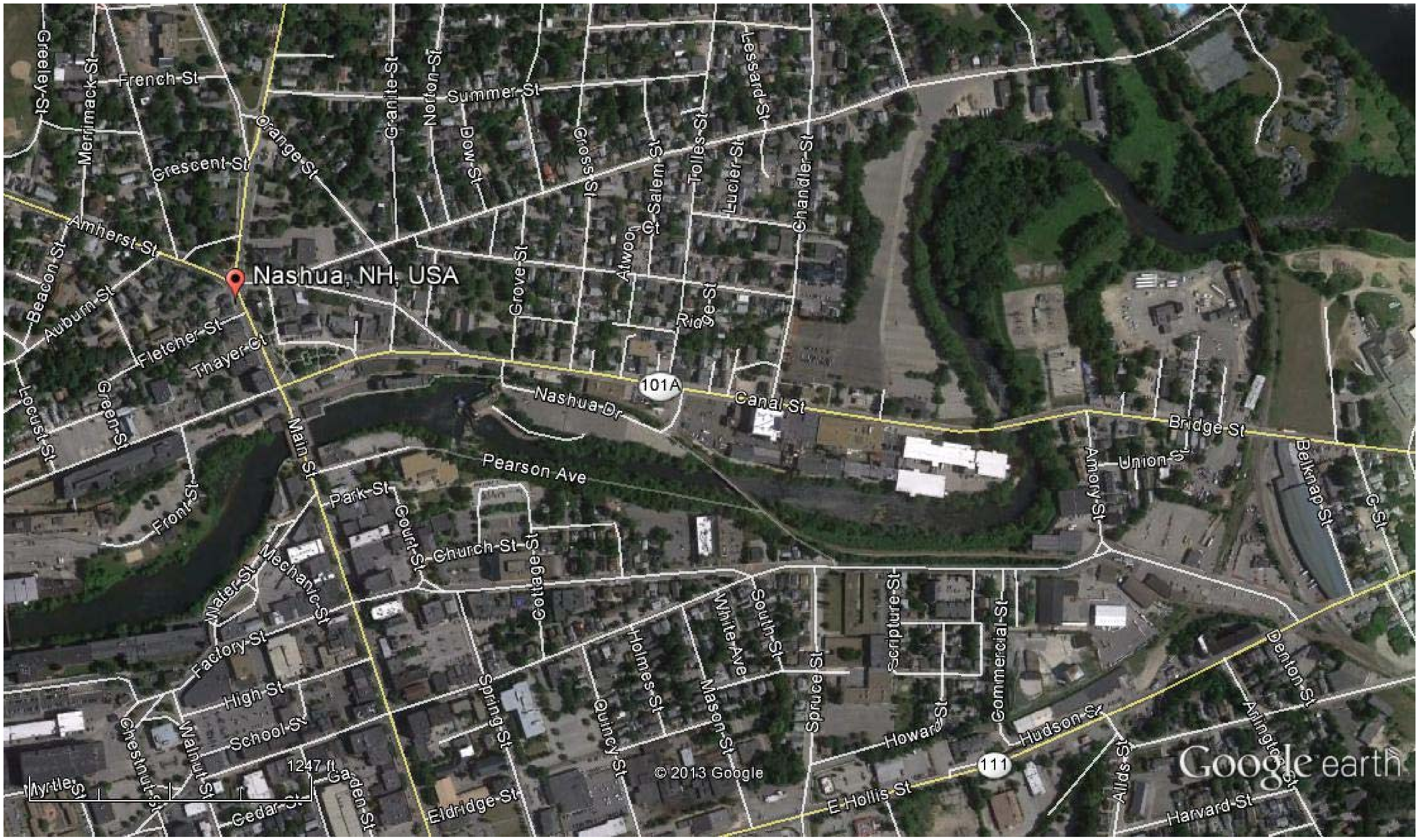
MHT

BEDFORD, NEW HAMPSHIRE
MHT #1
MHT #2
NEW PLATFORM
MHT/BEDFORD
RAYMOND WIECZOREK DRIVE
SCALE: 1"=40'
PROPOSED
EXISTING
NEW HAMPSHIRE CAPITOL CORRIDOR
RAIL AND TRANSIT STUDY
JACOBS

MHT

Category	Rating	Notes
Market	5	Nearest access point to the airport
Access	5	Direct access to the site from Ray Wieczorek Drive
Track	5	Straight unencumbered track
Land use	5	Mostly vacant, surrounding transportation uses
Parcel	5	Potentially need to utilize multiple parcels
Environmental	Y	Wetlands – Values N &S need to be assessed
Owner	S/P	State owns some of the parcels, some of the parcels are privately held
Noise	N	No sensitive receptors
Miscellaneous	Y	Airport willing to run shuttle service; Bedford has had plans to develop this area and NHDOT built conspan bridge under off ramp

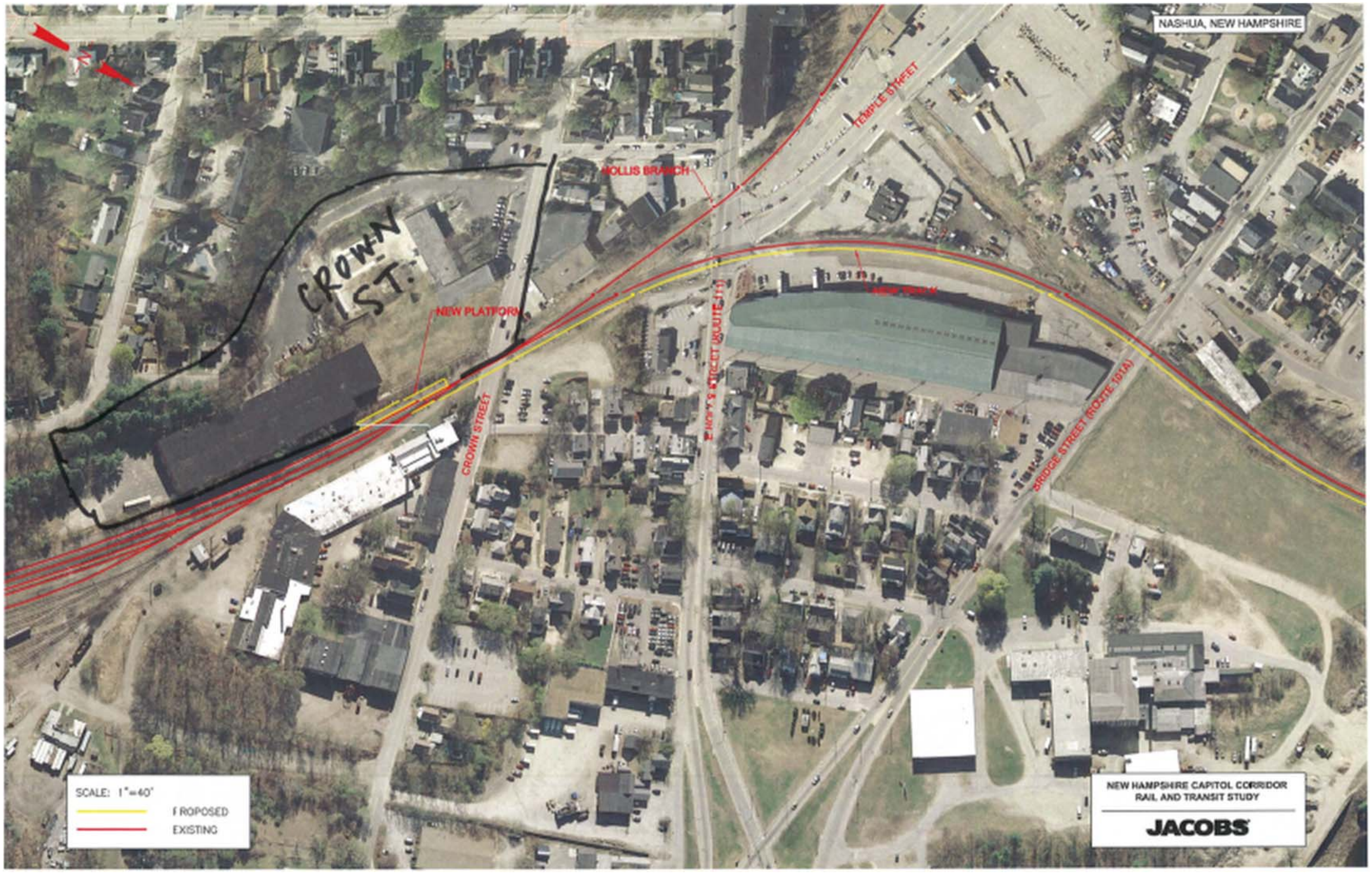
Nashua Downtown: Main Street



Nashua Downtown: Main Street

Category	Rating	Notes
Market	5	Close to downtown
Access	5	Close to existing development
Track	1	Operationally it is located off of the mainline, track would need complete upgrade
Land use	5	Existing developed area with TOD potential
Parcel	5	Plenty of parcels available for redevelopment
Environmental	Y	Close to the river, potential soil remediation at redevelopment sites
Owner	P	Privately owned (assumed)
Noise	Y	Retail, commercial, and condo developments downtown
Miscellaneous	Y	City prefers Crown Street, rail engineers discourage leaving mainline

Nashua: Crown Street



New Hampshire DOT Department of Transportation

Nashua: Crown Street

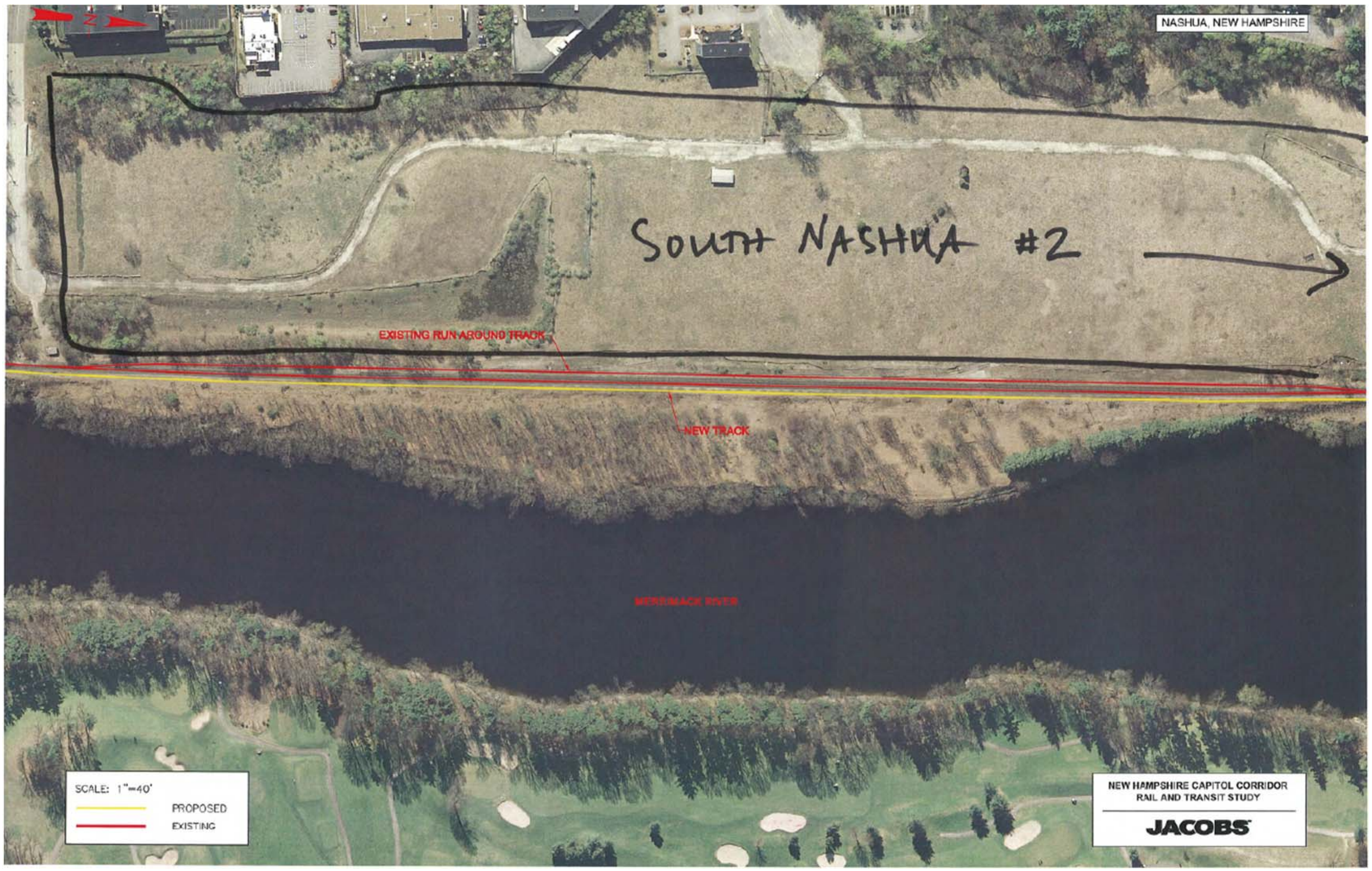
Category	Rating	Notes
Market	4	Close to downtown
Access	4	0.8 miles from downtown
Track	5	Only viable stretch of track in the downtown area
Land use	4	Future park and ride site for the town, mixed industrial/residential
Parcel	5	Seven acre site owned by the city, designated for transit
Environmental	Y	Potential soil remediation, unknown; most likely urban fill. Easy to handle. Possible complications for demolition
Owner	G	Government owned (City of Nashua)
Noise	Y	Mixed residential neighborhoods near site
Miscellaneous	Y	City would like to utilize this site.

North Nashua: Beazer East

North Nashua: Beazer East

Category	Rating	Notes
Market	2	North Nashua, closer to Merrimack, Nashua would need to drive North to go South
Access	2	Indirect from Route 3, winds through neighborhood
Track	5	Straight track, no issue
Land use	3	Vacant parcel, but adjacent to existing neighborhood
Parcel	5	Large vacant parcel, plenty of land
Environmental	Y	Site has existing soil contamination; would not interfere with proposed use
Owner	P	Privately owned, available for development; Could help spur development
Noise	Y	Vacant lot with adjacent neighborhood
Miscellaneous	Y	Need to create new access

South Nashua: Spit Brook Road

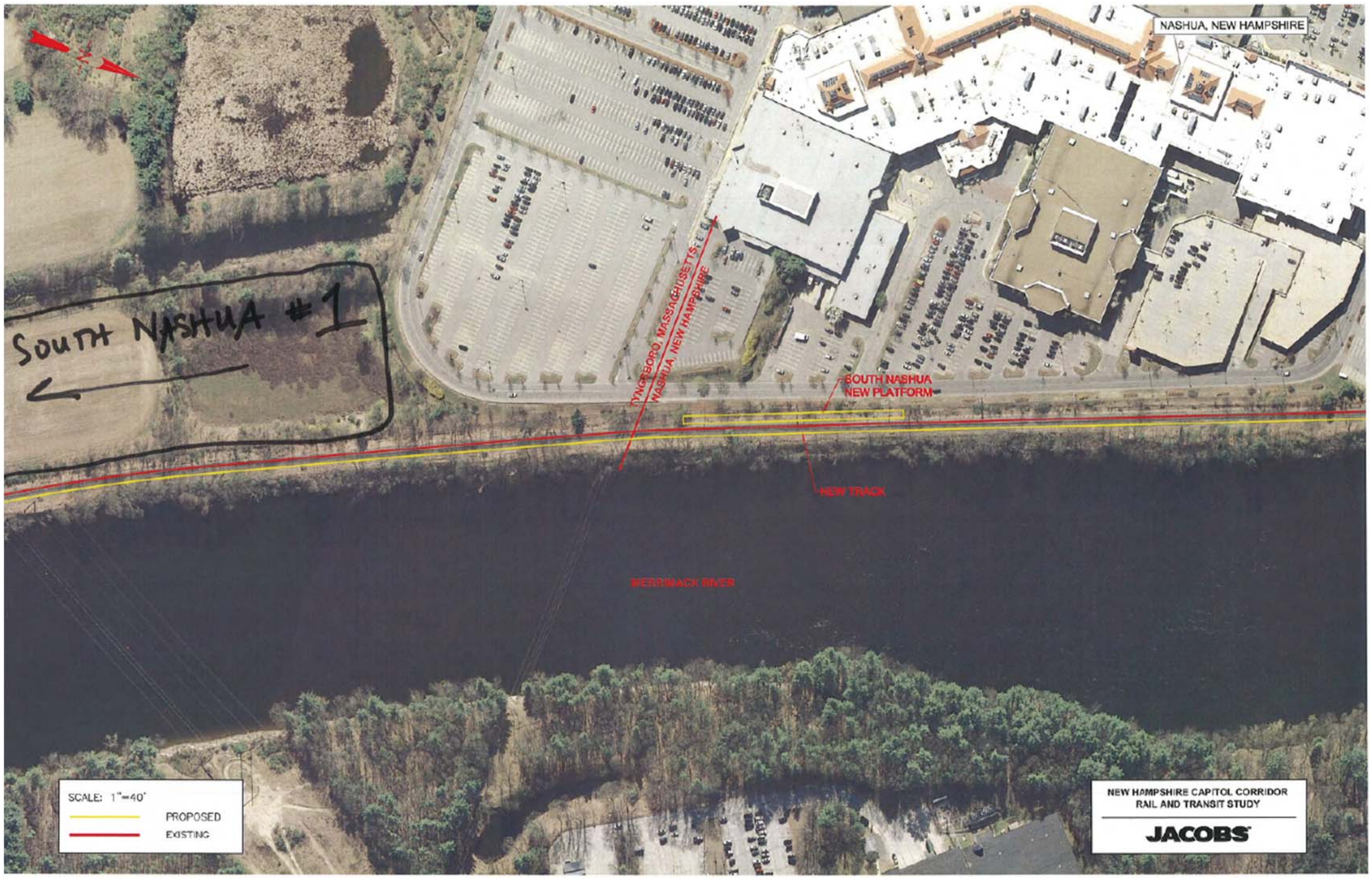


South Nashua: Spit Brook Road

Category	Rating	Notes
Market	5	South Nashua close to commuter populations
Access	4	Direct from Route 3, slow traffic along local roads
Track	5	Straight track, no issue
Land use	5	Vacant parcel
Parcel	5	Large vacant parcel, plenty of land
Environmental	Y	Site has contaminated soil and existing wetland in southern portion; not considered to be difficult to solve
Owner	P	Privately owned, available for development; Could help spur development in this area.
Noise	Y	Vacant lot surrounded by commercial use
Miscellaneous	Y	May need to create new access point, good layover site as well

New Hampshire DOT Department of Transportation

South Nashua: Pheasant Lane Mall



South Nashua: Peasant Lane Mall

Category	Rating	Notes
Market	5	South Nashua closest to commuter populations
Access	4	Direct from Route 3, needs interchange re-design
Track	5	Straight track, no issue
Land use	4	Need agreement to share parking with existing use
Parcel	4	Parcel has existing constraints (mall)
Environmental	N	Site already developed, no obvious environmental constraints
Owner	P	Privately owned, would require agreement to share parking
Noise	N	Existing commercial use on site
Miscellaneous	Y	Requires agreement with mall owner, and redesigned interchange

Summary Table

	Primary Criteria					Secondary Criteria			
	Market	Access	Track	Land Use	Parcel	Enviro	Owner	Noise	Misc.
Nashua									
Pheasant Lane Mall	5	4	5	4	4	N	P	N	Y
Spit Brook Road	5	4	5	5	5	Y	P	N	Y
Beazer East	2	2	5	3	5	Y	P	Y	Y
Nashua Downtown									
Crown Street	4	4	5	4	5	Y	G	Y	Y
Main Street	5	5	1	5	5	Y	P	Y	Y
Manchester Airport									
Ray Wieczorek Drive	5	5	5	5	5	Y	G/P	N	Y
Manchester									
Granite Street	5	5	5	5	4	N	P	Y	Y
Bridge Street	5	4	3	5	4	N	P	Y	Y
Concord									
Depot Street	5	4	4	4	5	N	P	N	Y
Stickney Avenue	5	4	4	5	5	Y	G	N	Y

Placeholder

LAND USE AND ECONOMIC DEVELOPMENT SLIDES HERE

Layover Facilities

- One in Nashua
  - Spit Brook Road
  - Pan Am Yard
  - Beazer East
  - Mast Road – Merrimack
- One in Manchester
  - Riverwalk Way
  - Lehoux Drive – Hooksett
- One in Concord
  - Langdon Avenue
  - Adjacent I-93

Evaluation Criteria

Primary Criteria (1 to 5)

- Terminus (Nashua, Manchester, Concord)
- Track Characteristics (straight track, sidings, existing rail yard)
- Land Use (Residential, commercial, industrial)
- Sensitive Receptors (residential, schools, hospital)

Secondary Criteria

- Environmental (wetlands, river, habitat)
- Ownership (State or private)
- Misc. Factors

New Hampshire DOT Department of Transportation

Concord: I-93

New Hampshire DOT Department of Transportation

Concord: I-93

Category	Rating	Notes
Terminus	4	south of terminus
Track	5	old rail yard
Land Use	5	old rail yard
Sensitive Receptors	5	adjacent to I-93
Environmental	N	nothing obvious
Ownership		ROW
Miscellaneous	Y	may be too close to downtown

Concord: Langdon Avenue

New Hampshire DOT Department of Transportation

Concord: Langdon Avenue

Category	Rating	Notes
Terminus	4	south of terminus
Track	5	straight, no issues
Land Use	5	existing industrial/vacant
Sensitive Receptors	5	nothing obvious
Environmental	N	nothing obvious
Ownership	P	privately owned
Miscellaneous	Y	only real alternative to I-93

Hooksett: Lehoux Avenue

New Hampshire DOT Department of Transportation

Hooksett: Lehoux Avenue

Category	Rating	Notes
Terminus	3	between both Concord and Manchester
Track	4	unknown
Land Use	4	existing gravel pit, need access
Sensitive Receptors	5	nothing obvious
Environmental	Y	close to the river
Ownership	P	privately owned
Miscellaneous	Y	first viable site north of Manchester

Manchester: Riverwalk Way

Manchester: Riverwalk Way

Category	Rating	Notes
Terminus	5	close to Granite Street
Track	5	old rail yard
Land Use	5	old rail yard
Sensitive Receptors	3	adjacent to hospital
Environmental	N	nothing obvious
Ownership	ROW	
Miscellaneous	Y	potential as development or station site

Manchester: Water Treatment Plant

Manchester: Water Treatment Plant

Category	Rating	Notes
Terminus	4	south of Granite Street
Track	5	long and straight
Land Use	4	limited ROW to work in
Sensitive Receptors	5	commercial area
Environmental	N	nothing obvious
Ownership	ROW	
Miscellaneous	Y	narrow area

Merrimack: Mast Road

New Hampshire DOT Department of Transportation

Merrimack: Mast Road

Category	Rating	Notes
Terminus	4	north of Crown Street
Track	5	long and straight
Land Use	5	existing water treatment plant
Sensitive Receptors	5	no obvious receptors
Environmental	Y	potential wetlands
Ownership	G	City
Miscellaneous	Y	better option than Beazer-East, however, a little farther north from terminus

Nashua: Beazer East

Nashua: Beazer East

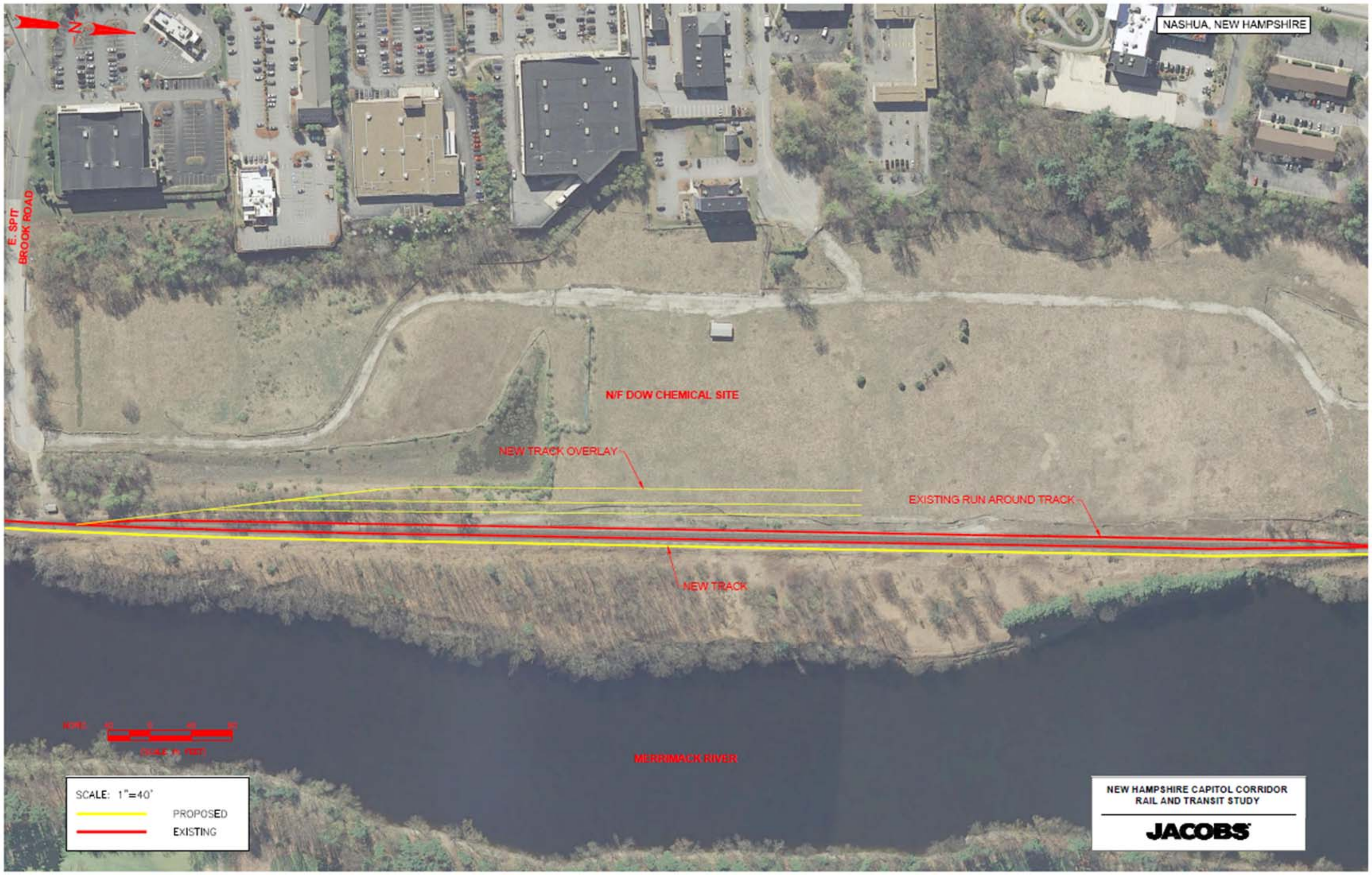
Category	Rating	Notes
Terminus	4	north of Crown Street
Track	5	long and straight
Land Use	3	surrounding neighborhoods, development planned at site
Sensitive Receptors	3	adjacent neighborhoods
Environmental	Y	contamination
Ownership	P	privately owned
Miscellaneous	Y	may be good back up if Spit Brook isn’t an option, however, adjacent neighborhoods will be a difficult sell

Nashua: Pan Am Yard

Nashua: Pan Am Yard

Category	Rating	Notes
Terminus	5	close to Crown Street station
Track	3	existing yard in use by Pan Am
Land Use	5	existing yard with additional land to the south
Sensitive Receptors	4	neighborhoods close-by, existing yard already noisy
Environmental	N	nothing obvious
Ownership	P	privately owned
Miscellaneous	Y	good because it is an existing yard, but the yard is already being utilized

Nashua: Spit Brook Road



New Hampshire DOT Department of Transportation

Nashua: Spit Brook Road

Category	Rating	Notes
Terminus	5	co-located with station
Track	5	already one siding at this location
Land Use	5	vacant parcel
Sensitive Receptors	5	no obvious receptors
Environmental	Y	wetlands on site
Ownership	P	privately owned
Miscellaneous	Y	potential development parcel, town may be reticent to locate layover here

Summary Table

	Primary Criteria				Secondary Criteria		
	Terminus	Track	Land Use	Noise	Enviro	Owner	Misc.
Nashua							
Spit Brook Road	5	5	5	5	Y	P	Y
Pan Am Yard	5	3	5	4	N	P	Y
Beazer East	4	5	3	3	Y	P	Y
Merrimack							
Mast Road	4	5	5	5	Y	G	Y
Manchester Airport							
Ray Wieczorek Drive	3	5	5	5	Y	G/P	Y
Manchester							
Water Treatment	4	5	4	5	N	ROW	Y
Riverwalk Way	5	5	5	3	N	ROW	Y
Lehoux Drive	3	4	4	5	Y	P	Y
Concord							
Langdon Avenue	4	5	5	5	N	P	Y
I-93	4	5	5	5	N	ROW	Y

Capitol Corridor Alternatives Analysis
Land Use and Economic Development Workshops, July 2013

- Introduction – about the project (10 minutes)
  - Overview
    - P&N, scope, geography, modes
    - Schedule
  - The FTA evaluation process
    - General
    - Land use and economic development – what & when it comes into play
- Purpose of this meeting (5 minutes)
  - *The purpose of this workshop is to engage local knowledgeable resources in the documentation of current and land use and economic development conditions and the potential for increased development (particularly transit-oriented / transit-supportive development) in the areas around proposed transit stations. This information will inform the project team on the type and scale of potential impacts a transit project might have on the community. It will also help to advise the communities on steps to take to maximize the land use or development benefits of the transit service.*
- TOD Primer (20 minutes)
  - What is it, what does it look like, how does it happen
  - Setting Expectations – mode & neighborhood context
  - Local case studies (Haverill, Lowell, Dover, Exeter)
  - Other examples from similar markets
- State of Development in ____ (60 minutes)
  - Charrette / Breakout tables (pending group size & composition)
    - Assessment of existing market – their thoughts and plans
    - Thoughts about commuter rail, bus -> impact on development in their areas
    - Concerns about implementation
  - Report-back
- Open discussion on project (20-30 minutes)
  - Issues, ideas, concerns, etc.

Pre-work

Logistics (Mark and Patrick)

- Invitation list – who's who
  - Public officials, municipal staff (planning, economic development, community development, etc.)
  - Chamber of Commerce:
    - Developers (residential, commercial/retail, mixed use)
    - Brokers / realtors

        - Current nearby business owners
- Location
    - Capability for presentation/overhead; space for posters/boards; round-tables for discussion
- Dates/Times
    - Concord, July 23, 9am-11am
    - Nashua, July 24, 1pm-3pm
    - Manchester, July 25, time tbd

Content / presentations (Julia and Jen)

- Background demographics, plans, maps, etc.
- Working maps
- Case study materials (photos, summaries, etc.)

Manchester Land Use Meeting – July 25, 2013

Manchester Chamber of Commerce

54 Hanover St.

Introductions

Amoskeag Industries

Will Stewart – Manchester Chamber

Manchester Planning Department

Ward 3 Alderman – Bill

David/Pat?

Southern NH Planning

Finance – Business

Norwood Group

Opening

Jen McNeill Dhadwal opened the workshop with a powerpoint presentation that provided an overview of TOD concepts and how they relate to transit, station locations, layover sites, and this project specifically.

Responding to questions from participants, Mark Sanborn (NHDOT) gave an overview of the project and its objectives and funding/sponsorship, along with the outline and schedule of the study. One motivation for looking at rail is changing demographics and the orientation of youth to alternative forms of transportation and implications for economic development and stopping the brain drain from NH. Participants commented that it will be a challenge to find funding for the project and it will be important to determine and communicate the benefits.

A likely station location in downtown Manchester would be at Granite Street, although a location somewhat south (e.g. in the vicinity of Delta Dental Stadium) is also a possibility. In addition to a downtown station, a park-and-ride station would most likely be planned at the Manchester Airport connector road.

Open Discussion

There was discussion of current bus service and its implications for rail service. People are thrilled with the bus, but it does not create TOD, and service has decreased recently. Need to have direct access to transit in downtown to support development. Potential housing market within a 10 minute walk – people are looking for commute options that don't involve driving. Bus and rail should be co-located.

There is precedent at Downeaster stations for rail to Boston supporting residential growth. Dover and Durham are retaining young professionals in part because of the Amtrak service, which is used by over half commuters.

Travel time needs to be competitive (no more than 70-80 minutes to Boston) for the train to attract a residential commuter market.

For workshop participants, downtown is clearly the best/preferred place in the region to locate a station to encourage development. Note that 1/10th of the state's population lives within five miles of downtown.

Redevelopment of the mill buildings has been a major economic success in Manchester over the past two decades. It was 60-65% filled in 1995, with 20% Class A office space, and is now built out with largely Class A space. This has been led by the private sector. Companies in the millyard are hiring young people and there is increasing interest in urban living among young people. Dyn, Inc. is currently tripling in size.

The residential market is also strong. Additional new housing is being constructed or planned downtown, including 200-300 units at 300 Bedford Street, 300-400 units on Gregor Street, proposed student housing on Pearl Street, and 160 units between the stadium and the new Market Basket, which provides an important amenity for downtown residents. Note that upper-story residential in older buildings is underutilized because of lack of parking.

Other trip generators – Manchester Institute of Art, UNH, and College of Pharmacy are all within walking distance.

Next redevelopment area is south of Granite Street, between the civic arena and the stadium. The millyard is getting maxed out. The health center will anchor this area at the south end. High-pressure gas lines may limit non-industrial development in the vicinity of the gas facility.

CBD zoning is very permissive. No parking is required and there is no height limit. Reuse of buildings is encouraged.

The city does not have an economic development/business recruitment entity although the mayor's office responds to inquiries. Development has largely been organic/market-driven. Other groups have supported recruitment/ retention (MDC, Chamber of Commerce, Amuskeag Incubator High-Tech Council). Chamber has also led an initiative on walkability, "Intown Manchester."

A question was raised about the possibility of air-rights development over a station.

Concerns were raised about improved accessibility to Boston possibly hurting Manchester by encouraging businesses to locate in Boston, not Manchester. A member of the consultant team noted a study in New Jersey finding that train stations benefited from increased property values and spending from new residents.

Revisiting the question of downtown station location, it was felt that the location at Granite Street would provide an ideal balance between serving existing development primarily to the north of Granite Street, and encouraging new development to the south.

The Manchester south (airport) station proposal is not viewed as supporting development in Manchester. This station site is physically located in Bedford and is also close to Londonderry.

Meeting Notes

Project: NH Capitol Corridor Alternatives Analysis and Service Development Plan (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Land Use Workshop – Nashua NH

Date: 07/24/2013 **Time:** 1:00pm **Location:** Nashua City Hall, 3rd floor

Attendees/Distribution:

Name (Affiliation)	Email	Study Team
		Mark Sanborn (NHDOT)
		Patrick Herlihy (NHDOT)
		Ken Kinney (URS)
		Carl Chamberlin (URS)
		Julia Suprock (URS)
		Jen McNeil Dhadwal (URS)
		Chris Porter (CS)

Opening

Jen McNeill Dhadwal opened the workshop with a powerpoint presentation that provided an overview of TOD concepts and how they relate to transit, station locations, layover sites, and this project specifically.

Gateway Hills Development

In South Nashua, Between Exit 2 and Exit 1, off of Spit Brook Road, the Gateway Hills Development (formerly Nashua Technology Park) has started constructing upscale apartments, manufacturing, retail, medical and technology space. The development has tenants in most of its commercial space, and built a portion of the apartment space, with a large area of the parcel still left to be developed. The development is straining the capacity of existing highway infrastructure, and transit alternatives could have a positive impact on the development pattern of this area as well as opening up more developable land. The development could shuttle people between a potential rail station and employers in the development.

Open Discussion

The GM of the Pheasant Lane Mall commented that the potential for a station in or near the Pheasant Lane Mall could be positive for attracting customers, but is concerned about traffic impacts that could occur.

There is a consensus in the city that residents prefer the idea of having two stations, one in the greater downtown area and one south of the city.

The ideal downtown station location would be the former mill yard, which is on the west side of Main Street in downtown Nashua. This location is in the midst of seeing increased investment, and is a good location for redevelopment. The Jackson Falls Building (30 condo units, on the east side of Main Street at Railroad Square) is an example of recent development in this area. This project opened in 2007 and has sold out. However there has been little activity since then.

Vacancy rates in downtown reached a 5-year low in December 2012. Businesses with a longer history in the city fared better than newer businesses during the recession.

The new Broad Street parkway, under construction with completion scheduled in 2015, will provide a better connection between Route 3 and the industrial properties along the Nashua River on the west side of downtown and could help stimulate 10 to 15 years of redevelopment opportunities in this area.

Ground was broken on the Cotton Mill project this spring, the first new project in this area, with completion expected in 2014.

Employment centers/clusters in downtown include incubator businesses in the millyard, #1 Chestnut St., and Southern NH Medical Center.

Downtown was upzoned 8-10 years ago and therefore has lots of potential. However developing downtown is generally difficult, due to limited parking, and the cost of teardown or rehabilitation. Most projects will need financial help. Note that the Cotton Mill project received 13 Federal and state grants. The exception is the millyard which has both available land and parking.

Outside of downtown, the city has seen recent development along 101A toward Milton and in south Nashua, including the Gateway Hills Development. The southern side of the city, near Route 3, is where the primary market for new development is, since it is within the easiest commuting distance of Massachusetts.

The Crowne Street location is the other area near downtown that is a likely candidate for a train station. Crowne street has been de-industrializing for 5 decades and one development is planned for mixed use residential development in this area (Renaissance, 200 to 300 units north of Bridge St.). There has been some interest in vacant buildings along East Hollis St. between downtown and Crowne St.

A plan was developed about eight years ago for TOD in the Crowne Street area. The Renaissance project could have 700 to 800 units at buildout (in five years?) with 70,000 sq. ft. of commercial space.

Crowne Street has traffic capacity issues as the location is near a river crossing (one of only two river crossings in the area) which sees traffic disruption during peak times. Reconstruction of the intersection of Bridge/Ferry/Hollis Streets into a roundabout is planned (funded in the TIP), which will help to improve pedestrian connections from the potential station area to the Renaissance and other potential development sites north of these streets.

The three areas in the city with the greatest potential for development/redevelopment are: (1) mill yard area (2) Crowne Street area and (3) south Nashua. The mill yard area is planned for redevelopment with high potential, Crowne Street has one new development planned with longer term development potential, and south Nashua has the Gateway Hills Development in process and other potential sites.

In the downtown area, the mill yard would be the number one priority, and the ideal location for a station, with Crowne Street being a solid secondary option.

The idea was raised that if Crowne Street was selected for a station, the city could make the connection between Crowne Street and downtown with a street car, bus, or shuttle.

In south Nashua, the W.R. Grace site, adjacent to the railroad tracks, could potentially be a site for new TOD. However, there are use restrictions on this site due to contamination. Evolution of the Pheasant Lane Mall into a more transit-oriented form would be a “hard sell” due to subdivision into five or six ownerships; it might be easier to do something across the border in Tyngsboro.

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Stakeholder Meeting – Town of Manchester

Date: 04/02/2013 **Time:** 4:00pm **Location:** 7 Hazen Drive, Concord, NH

Attendees/Distribution:

Name (Affiliation)	Email	Study Team
Tom Irwin	tirwin@clf.org	Mark Sanborn (NHDOT)
		Patrick Herlihy (NHDOT)
		Ken Kinney (URS)
		Carl Chamberlin (URS)
		Russ Wilder (URS)

Mark Sanborn and Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process. Mark offered a position on the project advisor board to Tom Irwin or a designee from his office. Mark closed the introduction by asking the question: within the context of this project, what is important to CLF?

Tom Irwin asked a couple preliminary questions about the scope of the project, and offered up the following comments:

- The purpose and need needs to include mobility options beyond single occupancy vehicles, accommodating changing demographics in the state, and options attractive to a younger demographic.
- The existing transit system in NH is one dimensional, it does not accommodate multiple user demographics.
- The environmental impacts associated with the project would potentially be on transit capacity and greenhouse gas emissions in the state.
- The study has the potential to explore ways to move from a highway-centric system to one that is multimodal.
- The planning study should build on already develop planning processes, including the NH Climate Action Plan, and the NH Long Range Transportation Plan. The case for more transit options has been made during these planning processes.
- Interconnection with the airport would be positive.
- It is important to include marketing into the financial plan to build a model for a sustainable transit option. TOD – Sustainable Development – Station location matters a lot.
- Mentioned redevelopment of the Concord downtown and linkage to a transit station
- Financial plan should include value capture
- Avoid the pessimism surrounding the political realities in NH, and make the planning documents as objective and data driven as possible.
- It is important to not ignore the potential benefits to freight operations that could be seen as an outcome to the project.
- Please add Steve Duprey as a stakeholder to the process.

Questions for Interviews with Civic\Business Leaders

in Towns Served by the Downeaster

May 14 – 16, 2013

1. Project Identification

a. Please describe the three most significant economic development projects completed or launched with a ground breaking in your town during the last five years. Tell us what was built at approximately what scale:

_____ # housing units

square feet of space developed:

_____ Retail

_____ Office

_____ Industrial

_____ Other

_____ # jobs created

_____ $ invested

b. Please locate these projects on a map (which CNT will bring to the interview).

2. Station Area Development Project Process

For each of these development projects within a one-mile radius of the town's Downeaster station:

a. What do you think were the market trends, existing assets, or other conditions that made this project possible?

Was the availability of Downeaster service or an increase in the frequency of this service an important factor?

b. What was the impetus of this project?

_____ A local government or community-based plan that attracted private investment?

_____ A private developer's proposal that secured local support?

_____ Initiated in a different way?

c. What were the major public agencies, community groups, and developers involved in this project? What were their distinctive contributions? Who were the leading individuals in these organizations, and what is their contact information?

d. What were the main impediments to the completion of this project? How were these obstacles overcome?

e. What public incentives or other public resources -- federal, state, and local -- were invested in the project?

3. Project Outcomes

a. In addition to the direct development achieved by the project (per question 1.a. above) what economic impacts has the project had on your town, such as:

- Stimulus for additional housing or business development
- Increased local buying power
- Household savings in transportation costs
- State and local tax revenues
- Other?

b. Has the project impacted the quality of life in your town or resident/visitor impressions of the town? If so in what ways?

4. Planned Projects

Are there projects planned and likely to be executed, within the one-mile radius station area, on the same scale as the implemented projects considered above? If so apply the questions under items 2 and 3 above to the anticipated process and outcomes of these planned projects also.

APPENDIX H

Capitol Corridor Stakeholder Meetings: Railroads

New Hampshire DOT
Department of Transportation

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Stakeholder Meetings – ***Massachusetts Department of Transportation***

Date: 04/03/2013 **Time:** 3:00pm **Location:** MassDOT Office – Boston, MA

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
Jody Ray, MassDOT		Mark Sanborn (NHDOT)
Joe Cosgrove, MBTA		Patrick Herlihy (NHDOT)
		Ken Kinney (URS)
		Ryan Harris (Jacobs)
		Dan Breen (Jacobs)
		Rob DiAdamo (TPRG)

Jody Ray opened the meeting with a discussion of the Pilgrim Partnership and the low/no cost operations that Rhode Island has enjoyed over the last 15 years. The line has been extended twice and the service frequency and number of days of operation have been expanded several times. Rhode Island has never paid one dollar of operating subsidy and it is safe to assume that NH would want to follow that same model. It will likely be a capital intensive startup, but operations costs can potentially be covered through an agreement like the Pilgrim Partnership. After an agreement is made, then only the most vital improvements should be made so that the capital can be applied going forward. The capital investments in MA were probably going to happen anyway, so NHDOT will want to build as much as possible in NH and then the capital funds expended in MA can be used in lieu of MBTA picking up future operating costs.

There are capital costs that the service requires, and then any there are additional capital resources that can be applied to cover in-lieu operating costs. Any capital investment that needs to be made in order to operate the service will be a necessary expenditure for NH. But if the capital is applied to something that isn't necessary on day one and it directly or indirectly benefits the NH service, then that would meet the test with the FTA. RI helped to pay for the layover yard in Pawtucket. They also paid for a large portion of the Boston Engine Terminal in Charlestown which services all MBTA trainsets. But because it also services equipment that goes to RI, then it was deemed to be an acceptable cost. RI also bought additional coaches before their service needed them with the knowledge that they would be needed in the near future. MBTA was buying new coaches at the time and RI had money available even though the stations weren't built, Amtrak hadn't approved of the operation yet, and agreements to run the service were not fully in place. So MA received the benefit of using those coaches for five years before MBTA provided service to RI. So MA now owed RI a level of operating subsidy equal to the benefits that had been received before RI needed the coaches for their service.

A good place to start as the NH service moves forward would be if PanAm requests improvements in North Chelmsford, then NHDOT can agree to that but not complete them immediately. MBTA will complete them at a later date when there is some benefit to MA that can help to offset some level of operating costs. If the improvements are necessary to start the service then they would have to be made upfront and then MA wouldn't gain anything unique that could be applied towards what could be a substantial level of operating costs.

There isn't an expectation that this is how MBTA wants to structure any agreement, but NH would most likely rather not pay for operating costs, and this is a proven method to structure the service that way. There are many different ways that the operating costs could be covered, but this would avoid the need to find those funds at all. It has been very successful for RI, and whenever they find some uncommitted CMAQ money or receive earmarks or other funding that they don't have an immediate need for or a spending deadline is approaching, then they can invest that in capital that may benefit them in the future in return for operating subsidy. What RI does is to give the federal funds directly to MA and MBTA comes up with the local match, but the match is valued at a much higher level than the federal funds that come in.

And while MBTA never tracks the total capital transfer, the operating costs are very closely tracked to ensure that there is never a deficit. RI need only stay ahead of that, and if they fall behind then MBTA will send them a bill, of which RI can propose to cover with additional transfers of capital money. That is the way that MA wants to cover the operating costs and MBTA does not expect to receive any RI taxpayer money to cover operations. But MA also needs to say that it is not subsidizing service to RI by accounting for the costs are acceptably covered.

This conversation would be the same for Plaistow, except that it would be even better for NH as MBTA would be a tenant. So as long as MBTA is laying over at the proposed facility, and would have to pass by the station in Plaistow, then that station would need to be served. Therefore there would not be an expectation for NH to provide operating funding.

Ken Kinney said that one factor to keep in mind is that the study is being funded by both the FRA and the FTA. The study will also consider alternative modes of service and different rail operations strategies north of Concord. The FRA is covering the larger portion of the budget as the corridor is a federally designated High Speed Rail corridor, and the FRA has directed that the study evaluate Amtrak as a service provider. This however would bring up potential capacity issues at North Station.

Jody replied that Amtrak would be interested to operate the service, as long as NH signs a 209 agreement. There will already be one for the Downeaster and for the Vermonter, so it may be in the best interest of NH to avoid signing an additional one for this corridor. But if the service were to be structured as an Amtrak operation, where it would not be designed as a peak-period commute service with more than two trains during the peak, then it would probably fit in to the existing schedule.

There are two more tracks at North Station that are currently unused and unconnected. MassDOT has begun a takings process with the Spaulding Rehabilitation Hospital to connect those tracks, so it is not close at hand but the process has already begun as MBTA wants to avoid a similar situation as exists at South Station where there is a demand for additional service but there is no available capacity. If a more robust Amtrak service was proposed, such as if they were hired to operate a commuter service with five inbound trips per day, then it would be hard to do that without the two new tracks.

Another service example is the Amtrak Downeaster which doesn't pay anything to use MBTA tracks anymore. They transfer significant capital funds to MA, which amounts to a about prorated 30% their formula funds. Pat Quinn wanted to transfer 37% of the formula money to MA, but now they are going to collect it all and then transfer that percentage to MA. This ends up being more than MBTA was made on trackage fees and it helps Pat when she reports to the FRA as it reduces her operating costs a significant amount.

MA didn't spend a lot of time on signing the trackage rights agreement with PanAm. The secretary at the time had negotiated a very large deal and it was nearing completion and PanAm made some last minute changes. So the Secretary asked for the trackage rights to Concord as he saw it as an opportunity to get something of value out of PanAm since they were getting something out of MA. It turns out that largest piece of benefit by track mile for signing off on the North Point project was the $30-$35 million value of the trackage rights to Concord.

PanAm accounted for all of the funds and there no way to break it up, and some parts of track had more value than others. But the Concord trackage rights probably didn't get reviewed with a level of scrutiny that they may have done otherwise since they came in at the last minute. The agreement says that the MBTA would have to complete a study of commuter rail to Concord within 10 years or the trackage rights would be lost and the process would have to start from scratch. David Fink knows that MBTA is participating in this study and he's on board that this study fulfills that requirement, even if all that MBTA ends up doing is stamping a logo on one version of the final report.

The agreement does not address exactly what improvements would be required to allow passenger operations along the line, but says that any infrastructure requirements must match the service proposed. The MBTA does not want to be responsible for directly negotiating the infrastructure improvements or be involved in another construction project outside of MA. Ideally the MBTA should have a front row seat at the table, but mostly to keep PanAm reigned in so that they do not ask for pie in the sky improvements that aren't really required for passenger and freight service to coexist on the line.

Ken Kinney mentioned that David Nelson is developing operating plans and that he suspects that we should be able to provide reasonable levels of service just by extending existing MBTA service. The assumption in developing the service plan is that the schedules in Lowell would not have to change in any significant way. And if that is possible and there are no capacity problems at North Station, then does that bring up to potential need for additional coaches?

Jody replied that running with existing equipment, that two things would have to be in place. MBTA can't change the current Lowell schedule very much all at once and it would have to slowly evolve over time as we bring in NH service, because MA taxpayers would complain about their schedules being disrupted for the benefit of out-of-staters. The way this would happen is that MBTA currently does not store any trains in Lowell and every peak train deadheads out of Boston. Later in the rush there is a train or two that comes outbound with passengers, and MBTA is proud of the reverse commute service. What has changed is that now trains shuttle back and forth between Anderson and Boston and they actually carry more in the reverse commute than the Lowell reverse commute. So if MBTA can run a train 25mi out from Boston then a train could come down from NH in the same manner without incurring extra fuel or crew costs. It would be different in the midday as there isn't an extra hour built into the schedule for a Lowell turn. Any train that currently does that and turns in Lowell is probably there for only 20 minutes, so it would not be possible to do the same with Nashua, which suggest a much larger schedule change than would be required for the peak period service. There may be a need to add an extra trainset. That would add a cost that would need to be found somewhere and it also means that there would be an additional train in Boston.

MS: Yes, there has been a little shift as there is interest in a downtown Nashua station, such as the Crown street location. It has been identified by the city as a Park-and-Ride location right now and there is an ongoing purpose and need debate as to whether it's goal would be to get commuters out of their cars or whether the primary purpose would be to encourage economic development downtown. The places where both of those needs could be fulfilled are in Manchester and Concord. The best place for a Park-and-Ride for Nashua commuters is likely at exit 1 or exit 2 off of Route 3 and less so in downtown. So the locations that have been discussed are some sort of Nashua south, some sort of Nashua downtown, Manchester Airport, Manchester downtown and Concord downtown.
MS: Yes, we're going in with no predetermined locations and it depends on what URS comes up with for locations and that will give us idea of ridership.

MS: Since it came up, it would be interesting to hear your thoughts on potential MA locations along the line.

JR: Previously proposed legislation stipulated that any extension to NH would have to include a station in Chelmsford by Southwell Field or Wellman's farm, just north of the wye in North Chelmsford, but it didn't propose where the money would come from or who would be responsible. The other thing is that UMass Lowell have always asked for a stop. They are actually acquiring more property and have, an underpass to an industrial property on the other side of the tracks that they would like to develop. But that was a decade ago and we haven't heard anything since then.

Mark Sanborn mentioned that MassDOT and MBTA are members of the 22 person Advisory Committee and PanAm will also be a part of, which gives additional credence that this is the study that will meet the requirements of the agreement. The Advisory Committee is not a decision making group, but rather just a committee to help drive the process over 18 months. If there is any documentation of the value of the trackage rights, it could be an important item that NH could bring to the stakeholders as a tangible display of MA participation in the project.

Jody replied that we'll need to be careful with how that message is portrayed as politically it would not be good for MA to appear to be giving away $35m of trackage rights to NH. Where it works is that MA is very supportive of HSR. There are two ways to get to Montreal; one follows the Knowledge Corridor through Springfield and continues south, but MA is generally more interested in serving Boston directly. Therefore, MA is supportive of the vision of improved passenger rail to and through Concord. At one point PanAm had control of study, but the FRA would never allow that going forward, so now the MBTA will coordinate their participation. It may be beneficial to have a smaller design review committee with fewer people, as having PanAm in a room with 22 people may not turn out to be the best situation as they will not want to have to explain their business to lay people. They stand by their agreement and that their expectation is that they will work directly with the MBTA.

Rob DiAdamo suggested that a new commuter rail stop is likely to be proposed in northern MA, perhaps in Tyngsboro or North Chelmsford, so it could be possible to allocate some of that benefit to those people. Jody replied that the MBTA owns up to the border, so if that $35m is just for trackage rights in NH, then there wouldn't be anything to apply to build anything in MA. But providing to ensure that the line remains available all the way up to and through Concord is a viable option for making investments in the long term. This wasn't real money that MA gave up, and it gave up a lot of what it was promised, but they were only promises, not contracted agreements. Of course MA got a fairly big development deal in East Cambridge by working the trackage rights agreement to Concord.

Mark Sanborn mentioned that there is a meeting scheduled with PanAm and Rob Cullerford on Wednesday, April 17th from 1:00pm to 2:30pm in Billerica. Jody added that it would be important that he is in the room for the first meeting with David Fink and then would probably step back and let David Nelson handle the negotiations moving forward. Rob Cullerford negotiated the agreement and knows what was in the deal and they are going to stand by what was agreed to. David Fink will want to make sure that he is dealing with the MBTA, but it is moving in the direction that MassDOT is now handling the planning for all system expansions, so we will have to see how that develops. But to keep PanAm comfortable, we need to make sure that MBTA is at the table at the highest levels to ensure that it proceeds smoothly.

KK: Nuts and bolts question; David put together list of technical information, should we go through you two guys?

JR: Yes. We will probably get someone from the Highway Department to dig in to some of that. But route your request through Joe Cosgrove and he should be able to direct you to the correct people.

KK: There have been discussions in connection with the streetcar in Lowell about possibly adding an addition station.

JR: I suspect that they happen at the same time, because the trolley comes up very close to the mainline at Western Ave. In fact it was a branch off of the mainline that became the trolley track. But that's not a good location for that connection to take place, and it would be much better to be located about ¾ mile north of there which would give access to a portion of the UMass even though it is so spread out around the city.

MS: As we move forward and when there starts to be public meetings, I know the article in the Times that mentioned it, we're going to turn to you again with respect to trackage rights value. How would we make your life the easiest. We'll look to you for guidance on how to message that, we'll work with you on the right way to say that.

JR: I think you'll want to say that what happens in MA is their concern, but it'll be important for your service because if there are too many stops it would degrade the level of your service. There is a concern of adding too much.

MS: Because so many people have been involved for a long time, they'll remember a Tyngsboro, even amongst supporters with the Nashua south station being located near Exit 36 and Pheasant Lane Mall has always been a location as the powers of the mall even proposed it as a location

MS: The reason this is coming up, don't know if you know this but, Nashua Regional Planning Council has an Exit 36 South study and part of that involves calculating the value that the exit would bring to a potential multimodal facility in the area, so that is driving some of the discussion there. When we had our meeting on this project, they spoke of Exit 36 a lot, so we'll monitor that. Mary Beth wonders why

Nashua is talking about a rail station before we even do this study.

JC: What's going on with Plaistow

MS: We're hoping for a decision at the next Governors Council Meeting on April 20th, or the following on May 1st. We're looking for the local match with toll credits, and we received permission from the Committee that approves that, the Executive Committee has gone from anti-rail to supportive of rail. It's not a done deal, but it looks like it will move forward, and we're close to having a contract with consultants, so all we need is for the Attorney General and the Governor to stamp it.

JR: I got very specific direction from the Secretary to support this and bring everything to the table to participate so I think we can help you to get this where you need to be.

MS: So Chris Ericson is still involved, substitute Chris for Rob on this one, so in next 6 weeks or so, will be looking to do similar conversation to this one on Plaistow. We had to negotiate a deal and I was told I had no integrity by the Board of Selectmen in Plaistow. Basically what we had to do was hold their nose, Atkinson had built a lot of support to kill this even in this much more friendly make up of political leadership in the state, so what we did was to get the Comissioner, Cliff, the head of the Rockingham Council, Chris Sununu and myself negotiated the deal. Plaistow got to say no to one site, Atkinson got to say no to one site, and what we did in the study was to say that these locations were reviewed and deemed not feasible due to lack of political support, we have a signed agreement with 4 of 5 selectmen in Plaistow and 3 of 3 in Atkinson saying that with these two sites taken off the table we'll support the study moving forward. So that changed the dynamic and got Chris Sununu on board. That got the Republics to sign off on toll credits and we'll be able to go to a much friendlier committee.

JR: Are there actually other sites identified for Plaistow?

MS: We have local support after taking those two off the table , we've got these so we'll have to get local support, there are a number of viable locations, you have trackage rights about a mile beyond the historic Plaistow station so we have some potential locations. The site that Atkinson didn't like that straddled the Plaistow and Atkinson line had problems and the owner of that had sued NH six times over the I-93 widening project, so he's not a person NHDOT or the Attorney General prefers to deal with and it had many wetlands, so it wasn't a great location really.

Comments and Updates by david.nelson@jacobs.com
February 4, 2014

Jody Ray

Rob DiAdamo

David Nelson

Friday January 31, 2014 11:00 to 12:30 @ MassDOT 10 Park Plaza

1. Need call from Governor Hassan to Governor Patrick: strong interest in NH; appreciate MA support; need to continue to commitment and reduce financial uncertainty moving forward toward a 2015 application for federal funding to extend MBTA commuter rail service to Manchester NH. NH and MA need a strong partnership to advance this project for their mutual benefit.
    a. NH planners expect to be able to deliver a basic Manchester commuter rail service (with more service to Nashua) for a capital cost of $150 to $180 million.
    b. Forecast incremental operating costs are ~$10 million.
    c. Forecast passenger revenues are ~$7 million.
    d. Between federal funding and state bonds, NH thinks it can deliver this service for annual state outlay of $8-10 million per year.
    e. The Governor is prepared to publicly commit to the project in 2014 if the cost and revenue estimates hold true as details are negotiated over the coming months.
2. Need call from Commissioner Clement to Secretary Davey before Feb. 6 meeting: glad Jody's coming; appreciate support; NH study team will contact Bev Scott to ensure continued MBTA technical support
3. Operating Costs: Team will also need support of new contractor (Keolis) to establish firm operating costs for the service extension.
4. Infrastructure: MBTA, PanAm and NH should meet in February (week of Feb 24) to establish design standard for infrastructure upgrades
5. Design Phase Concepts
    a. MBTA will set infrastructure standards
    b. NH and MA will need to coordinate on design. Each state will handle design in their own states. Perhaps hire a shared design contractor?
6. Construction Phase Concepts
    a. Pan Am will likely build infrastructure upgrades
    b. NH and MA will manage construction in their own states.
    c. "Optics" of a MBTA employee or contractor managing construction in NH are probably not good.

7. Operations Phase Concept
    a. Operating agreement will extend MBTA service to Manchester (perhaps Nashua as interim).
    b. Parties will agree on annual costs to operate service.
    c. MBTA will control service schedules
    d. NHDOT will provide a layover facility in NH
    e. NHDOT will set fares
    f. NHDOT will set and collect parking fees (if any)
    g. Passenger revenue will be audited to satisfaction of both MBTA and NHDOT
    h. NHDOT will pay cash to MBTA annually for agreed upon operating expense that is not covered by NH passenger revenues
    i. NHDOT can substitute FTA Section 5307 formula funds for cash to cover operating expense recognizing that 5307 funds come as 80 cent dollars since they require a local match.
8. Middlesex County:
    a. North Chelmsford: Congress person Tsongas is interested in project and can support a North Chelmsford Station. The addition of No. Chelmsford may marginally change the basis for estimating the capital costs and operating costs to be covered by NH
    b. Graniteville: MBTA and PanAm are moving forward with plans and materials to restore Graniteville siding in Westford. This siding is critical to restoring passenger service between Lowell and North Chelmsford. The study team should improve its understanding of the status and perhaps encourage Tsongas to submit for a TIGER grant if the project is not fully funded.
9. Senator Shaheen
    a. The project plan presently calls for 2 industrial sidings (~5 miles in Merrimack) and (~2 miles in Manchester) to improve Pan Am's ability to share track with passenger services and improve reliability of freight services on the line.
    b. If the project team can firm up overall infrastructure requirements in the next month or so, these sidings would be possible candidates for 2014 TIGER grant applications.

Project:	New Hampshire Capitol Corridor Rail and Transit Study and Service Development Plan (Parts A&B) – State Project Numbers 16317 and 63037-A
Subject:	Stakeholder Meetings – ***Massachusetts Department of Transportation***
Date:	07/17/2013 **Time:** 11:00am **Location:** MassDOT Office – Boston, MA

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
Jody Ray, MassDOT		Mark Sanborn (NHDOT)
Steve Jones, MBTA		Patrick Herlihy (NHDOT)
Ron Morgan, MBTA		Ken Kinney (URS)
		David Nelson (Jacobs)
		Jonathan Bruneau (Jacobs)
		Ryan Harris (Jacobs)
		Rob DiAdamo (TPRG)

David Nelson opened the meeting by updating the group on the development of service options. While presenting the rail option stringlines that include feeder buses, Steve Jones stated that MBTA does no schedule connecting bus services and does not hold trains for buses and would not guarantee transfer connections. Steve Jones also asked how many new trains would be required and that the team should ensure that costs for PTC are included in estimates. David replied that one new trainset and one new coach for each of the existing trains would be required. Jody asked whether any dwell times on the moved trains would exceed 15 minutes, and David replied that dwell times were most were but that a few were closer to 8 minutes.

Jody shifted the conversation towards PanAm by adding that they used to store coal trains at Graniteville and that they have been asking MBTA to double track Stony Brook so that they can store trains off of the main line. He also said that the Lowell interlocking exists and is powered, but that it would need to be rehabbed before returning to use. He suggested that these numbers could be estimated at the higher end of the range as the MBCR contract is up for renewal and an overestimated O&M cost could be negotiated downwards. Jody also asked David to check his weekday train miles calculation for the options. David responded that his calculation included 44 trips to Lowell with 6 deadhead trips plus the Anderson and Haverhill trains.

David asked how the MBTA felt about constructing sidings for stations and Jody asked whether the study was considering providing a high and wide path for PanAm by the station platforms. He added that the stations should be left on the mainline without dedicated sidings unless PanAm makes it a requirement and that indication of the proposed sidings should be eliminated from the track charts. Jody asked where the proposed South Nashua station is as the naming is similar to Nashua South which was the previous name of interlocking CPN9. Mark Sanborn replied that the current locally preferred location is at Exit 36 near the Pheasant Lane Mall.

Steve Jones asked whether it will be imperative to have two side platforms and suggested that center platforms provide operational flexibility and that they would ideally be at existing grade crossings so as to avoid the need for a "jungle gym in the sky" overpass. He also suggested that the team should consider double tracking all the way to Concord and that the station platforms could be placed on the new track.

In reviewing the proposed track carts, Jonathan Bruneau mentioned that the Merrimack Running track does in fact connect to the mainline on both sides and could function as the MHT/Bedford station siding. Jody added that the Perni siding on the track chart is actually the Perini Construction siding. He then asked where the Concord station could be located and Mark Sanborn replied that the study preference is at the foot of Depot Street on the site of the historic train station, but that the local preference is near the Stickney Ave Park and Ride. Pat Herlihy added that Concord wants to beautify the I-93 frontage and try to reconnect downtown to the river.

Steve Jones asked where the layover facility would be located and added that the new MBTA engines are very quiet. David replied that it had not yet been determined, but that it likely would not be in Nashua due to adjacent sensitive receptors. Steve added that MBCR would handle all MOW in Massachusetts and that Pan Am would handle everything within New Hampshire. David mentioned that Pan Am has low construction costs and that they would be happy to take on the work and the dollars, with Jody adding that NHDOT would just have to make sure that Pan Am actually did the work. David added that Pan Am claims that all of their track is in Class I or II condition, when some of it is actually at Class III.

Jody mentioned that MassDOT has acquired the land and is building tracks 11 and 12 at North Station. He said that NNEPRA has never asked to store trains at North Station and that MBCR does not want to handle commissary service at the Mass Engine Terminal. He also said that while Rule 209 allows states to hand Amtrak state support rail services over to a private operator and that Connecticut and Vermont have looked in to doing that, but add that it might be different for New Hampshire since it is not a 209 state and doesn't pay money for Downeaster operations. Mark Sanborn stated that since there is no requirement or restriction on how the services could be operated that they should be referred to as "commuter" and "inter-city" services as opposed to MBTA and Amtrak services.

Steve Jones wondered whether it would be wise to consider storing a protect train in Lowell to supplement any southbound trains that are delayed further up the line so as to minimize potential impacts to any passengers south of Lowell. David suggested that Nashua is closer to Lowell than Lowell is to Boston and that bringing trains south from a New Hampshire layover facility would be more economical. Steve added that there are currently protect trains posted on the Worcester line at Framingham. Jonathan asked why there are currently no trains laying over in Lowell. Jody replied that there is not enough available space in the yard and could just barely store two trains there. The tracks used to be busy and Pan Am historically did have a layover facility there.

Mark Sanborn raised the potential political issue with respect to station platforms, parking and access between a South Nashua station that could straddle the state line. Jody replied that

MassDOT would divide the costs with New Hampshire at the border, even if certain parts of the station straddled the border. He also remembered that there had been a deal discussed in the past to provide station parking on existing mall parking lots. Mark added that New Hampshire voters had been hesitant to fund infrastructure in Massachusetts, but that there is almost universal agreement that Exit 36 South improvements benefits New Hampshire voters even though it is in Massachusetts.

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Stakeholder Meeting – Northern New England Passenger Rail Authority (Downeaster)

Date: 04/03/2013 **Time:** 9:00am **Location:** Dover City Hall, Dover, NH

Attendees/Distribution:

Name (Affiliation)	Email	Study Team
Patricia Quinn	patricia@nnepra.com	Mark Sanborn (NHDOT)
		Patrick Herlihy (NHDOT)
		Ken Kinney (URS)
		Carl Chamberlin (URS)

Mark Sanborn and Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process. Ken Kinney began the discussion by asking the following question: how did NNEPRA get through the planning process for the Downeaster service, in particular the financial planning involved with securing government funding?

Patricia Quinn opened by prefacing her following statements by stating she had been brought into the process after most of the original planning had been completed. The following bullets summarize her responses during the meeting:

- Many of the studies for the Downeaster service were conducted far ahead of the actual service being implemented; making most of the information irrelevant by the time service began.
- The operating funding for the service (approximately $15 million) is year-to-year and is derived from a combination of fares (~$8 million), CMAQ funds (80% of remaining budget), and a multimodal account that is derived from a combination of taxes (i.e. rental car tax).
- The initial planning for the service didn’t address the long term maintenance costs of the system, and many of the associated costs weren’t anticipated.
- Among the many comments regarding the Downeaster system, she stressed two important points about planning a new system:
    - She stressed that finding a dedicated source of funding is important, and that funding the project with “General Fund” dollars is an uncertain proposition.
    - She also stressed that operations planning is vitally important, for instance, schedule times, frequency, etc.
- In response to questions about the original service versus the service today:
    - The Brunswick service was always in the original plan for the project.
    - It is important to be transparent about the service level during planning (i.e. don’t promise Amtrak style service, and deliver MBTA style service)
    - Each line and each town are different, so it is important to understand the markets involved.
- In response to questions about the existing operations:
    - MBTA style service would not have worked for the Downeaster.
    - Space a North Station is limited, and may limit future expansion of Downeaster service.
    - Downeaster has its own manager, crew base, and superintendent from Amtrak.
    - It maintains a positive relationship with both Pan Am and MBTA.
    - The service is run and is managed on its own without much interference from MaineDOT.
    - The board is made up of seven members.

    - The staff has 6.5 people: Executive Director, Marketing Director, Manager of Passenger Service, Data Analyst, Manager of Budget & Admin, Special Projects Manager, and Marketing Assistant.
- One of her final points of reflection on any new service is whose identity will the service take on: NHDOT? MBTA? Amtrak?
- Lastly, Patricia agreed to provide planning documents to NHDOT as reference for the planning study, including a Task Force Report and Business Plan.

Meeting Notes

Project: New Hampshire Capitol Corridor Rail and Transit Study and Service Development Plan (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Stakeholder Meetings – ***Pan Am Railways***

Date: 07/19/2013 **Time:** 11:00am **Location:** NHDOT Offices – Concord, NH

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
Luke McCaul (Pan Am)	lmccaul@panam.com	Mark Sanborn (NHDOT)
Shawn Higgins (Pan Am)	shiggins@panam.com	Patrick Herlihy (NHDOT)
Tim Kunzler (Pan Am)	tkunzler@panam.com	Ken Kinney (URS)
Rob Culliford (Pan Am)	rculliford@panam.com	David Nelson (Jacobs)
Ted Krug (Pan Am)	tkrug@panam.com	Jonathan Bruneau (Jacobs)
		Ryan Harris (Jacobs)

David Nelson opened the meeting by updating the group on the development of service options. He then asked whether Pan Am had a preference between storing trains at Stony Brook or Graniteville. Tim Kunzler suggested that it would be valuable to replace the third track at Graniteville. Luke McCaul added that there are some issues with the track capacity around N. Chelmsford, South Manchester and with tying in to the Perini siding. He suggested that replacing the third track would be valuable at Middlesex and at Westford Middle and that it may be necessary to build more tracks at Nashua Yard and to replace the second track near the tie plant.

David said that the corridor must be double tracked in order to provide enough capacity to operate the necessary level of passenger trains. Rob Culliford said that there are some issues around Plaistow with the Downeaster's interface with MBTA trains in Haverhill and that it would be important to ensure that trains from the north do not interfere with both passenger and freight service around Winchester. David asked how much service is operated south of Lowell. Rob Culliford replied that freight service south to Woburn and Winchester is growing and that there are many changes coming to the line. He stated that Pan Am is concered with maintaining the MBTA schedule in light of double tracking and other changes coming to the western route post-New Starts / TiGER/ Fitchburg/ Watchusett improvements.

Luke said that there are already congestion issue around Woburn and Winchester interlockings from Montvale MP10 to North Wobun MP15 and that most customers are on the west side of the track. David replied that the project would then need about 5 miles of third track in order to support 18 trains per day. Luke added and that Andserson RTC is becoming the defacto Rt 128 station for the northern metro area and that he is concerned with longer dwells and turning time due to increased passenger loads. He said that uni-directional interlocking are probably fine in this location and that there isn't a need for full interlockings in order to make reverse train moves. He also added that NNEPRA has plans to double track through Reading and along the Wildcat branch.

Luke mentioned that he is concerned with the Nashua Yard lead with respect to changes proposed for passenger service and that Pan Am could potentially loose roughly 100 cars would of storage space and that it would be too expensive to build six 20-car storage tracks. He added that he is still concerned with issues around the Merrimack Industrial track.

Tim Kunzler produced the Pan Am existing and proposed track charts and offered to share the CAD files with Jacobs and said that it appears as though a crossing near Pleasant Street was missing from the Jacobs track charts. He asked if the plan was realistically looking to travel all the way to Concord and whether the study was assuming to double track through Manchester. Luke asked if the lack of passenger traffic to TF Green Airport would be an issue when trying to sell rail service to MHT and Rob asked whether providing service to only South Nashua would be viable. David responded that it would not be politically realistic with respect to gaining support of the rest of the state, but Mark countered that it would appease the fiscal concerns of many voters while still providing service to residents.

Rob asked how the study was examining the location of stations and layover facilities and David replied that it was too early to define exact locations. Rob then asked if the stations would be located off of the ROW and offered that if Pan Am would be open to selling any surplus land that they may own near any proposed station locations. David said that station facilities would be located outside of the ROW, but asked how wide the ROW is. Tim said that the ROW varies between approximately 60 ft to about 100 ft wide.

Rob asked how the study was accounting for PTC and that Pan Am is working with MBTA on implementing the Class I IETMS PTC system that works for shared territory with both passenger and freight service. Luke added that PTC experiences a lot of issues with switching operations and that interoperability issues between Amtrak and NS south of Baltimore have lead to the construction of separate wayside tracks. David asked what the situation was with the Downeaster and Rob replied that it is exempt due to the low levels of service operated. Tim responded that only the Intercity 18 option would get close to passing the threshold for implementing PTC.

APPENDIX H

Capitol Corridor Stakeholder Meetings: Regional Planning Commission

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Kick-off Week Stakeholder Meetings – ***Central New Hampshire Regional Planning Council***

Date: 03/11/2013 **Time:** 3:00pm **Location:** NHDOT Office – Concord, NH

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
Michael Tardiff – CNHRPC Executive Director	mtardiff@cnhrpc.org	Mark Sanborn (NHDOT)
Dick Lemieux – CNHRPC TAC Member		Patrick Herlihy (NHDOT)
Stephen Henninger - Assistant City Planner, City of Concord	shenninger@concordnh.gov	Ken Kinney (URS)
		Russell Wilder (URS)
		David Nelson (Jacobs)
		Ryan Harris (Jacobs)

Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process.

Dick Lemieux suggested that the study should focus on finding the money required to have the system up and running. He also felt that the there would be a challenge to gain support as there is currently a bias towards bus over rail since most NH residents are drivers and more comfortable with the idea of road vehicles.

Michael Tardiff asked how freight rail would be evaluated in the study as it requires such large capital outlays. David Nelson offered that passenger rail will have to work together with existing operations as freight is such a big part of the corridor. While passenger rail can drive freight traffic away, that is something that we cannot allow to happen in this corridor. While industry will not magically come back, investments for passenger service can help to make freight more viable.

Michael Tardiff then spoke about the changing demographics and travel patterns within the corridor. There is an aging population in the state and growth rates have slowed to approximately 1% per year. While retires are moving to the lakes region, central and southern NH communities are consolidating schools. There has been a net growth in senior housing, while young adults are drawn towards density and a shift from other traditional housing choices. He said that north-south commuting within the corridor currently has a good mix of vehicles without the need to widen I-93 .

Dick Lemieux suggested that HOV lanes would be a good way to speed buses, but then asked if it wouldn't just be easier to bring jobs to the region. He also asked if PanAm's resistance to passenger rail is an indication of the incompatibility of mixing with freight service. David replied that private railroads tend to be very concerned about the liabilities introduced by new passenger services and do not want to limit their flexibility in providing freight service, nonetheless for a lightly used line passenger service can be a valuable element of the portfolio of services that contributes substantial revenue.

Mark Sanborn countered that PanAm may have been difficult to work with, but that they don't have the leverage that they used to. Ken offered that while Boston is the largest, it is not the only job market and that a faster running and a more widely utilized bus network operating within the corridor to a variety of destinations may be a goal of the study.

Dick Lemieux expressed some concern with burdening downtown streets with station-related traffic and that grade crossing safety and potential air quality impacts should be studied. He also stressed, however, that cars and parking must be included and that structured parking could help to reduce the station site requirements or Concord Coach could bring riders to the rail system. Ken explained the difference between walk-up stations in town centers and park and ride stations located near highways. He offered that we could do photo simulations of what type of development would attract more riders. David asked where CNHRPC envisions a potential station location. Mike suggested a site near Loudon Road between Storrs St and Stickney Ave, but that it may not be the most walkable location.

Dick Lemieux asked how the study team defines feasibility and how could the state identify the capital funds required to build the system, particularly if MassDOT will not pay to upgrade the last 10 miles in northern Massachusetts. Ken replied that it is not just whether an alternative is physically possible, but what the costs vs. benefits analysis uncovers, and that the financial plan will grade all aspects of the study. Mark added that the Downeaster currently operates with subsidy of 50% on a longer route with an expensive operating arrangement. This study should provide reliable facts and figures for descision-maker, and eliminate questions about costs.

When the participants discussed regional problems that a major investment might address they included:

- Relieve congestion on I-93

- Provide transportation choices to the private automobile
- Provide capacity for future growth
- Enhance rail freight service
- Provide for a rapidly growing elderly population
- Provide an environment that will make the state better able to attract and retain young workers and their families.

When discussing expanded rail service the participants mentioned concerns including

- Grade crossing – safety, noise and traffic
- Stations – traffic
- Noise and vibration
- Cost of developing and supporting service

Michael Tardiff asked if phasing of improvements would be included in the study as that would resonate well with people in the region. Ken agreed, and suggested that demographics from CNHRPC would help to inform the phasing. Mark added that the study will develop plans for the entire corridor, but that doesn't mean that NHDOT is committed to building the entire corridor all at once.

David closed the meeting by adding that it will be an important decision to identify a layover facility and that the further north that facility is would be better for improved freight operations. Michael Tardiff suggested that a site near the river on Route 3a in the Town of Bow would be a good location. Patrick Herlihy added that the state recently passed a bill to limit the idling of trains.

Ducker, Renee

Subject:	Fw: Stakeholder Meeting with Southern New Hampshire Planning Commission and Manchester Chamber of Commerce
Location:	SNHPC Office - 438 Dubuque St Manchester, NH
Start:	Wed 3/13/2013 2:30 PM
End:	Wed 3/13/2013 3:30 PM
Recurrence:	(none)
Meeting Status:	Accepted
Organizer:	Mark Sanborn
Categories:	Capitol Corridor

The Manchester Chamber of Commerce will be joining this meeting as well, thanks so much to David Preece for hosting both groups!

Phased in Investment Strategy

David Preece, Executive Director SNHPC

SNHRPC Planners, Julie Chen; Adam Hlasny; Jack Munn

Robin Comstock – Manchester Cof C

Will Stewart
Vice President of Economic Development & Advocacy

Dan O'Neil

Rick Sawyer, Planner, Town of Bedford

Purpose and Need in the context of problems and opportunities – Very important problem statement with alternatives flowing from it.

Development of a financial plan is done in parallel – 50% would be paid for by feds 70% of the way there in order to move on with the feds

Capital and O & M

Freight is included in the study

David – Financial Feasibility – potential partners – MBTA extension of service; Amtrak will be contacted. MBTA more likely and has a better cost profile.

Discussion of the Pilgrim Partnership

Discussion of Partnership with Pan AM and MBTA

David Preece - Economic Opportunities – Regional Developers interested in developing around stations

Dick Anagnost

Robin Comstock – Airport supported by project

USNH and UMass connection; 9 other colleges and universities in Manchester (6,000 students?). Section in Regional Plan about this

City of Manchester Planning Department

SNHRPC Planners, Julie Chen; Adam Hlasny; Jack Munn

Rick Sawyer, Town of Bedford

Anecdotal – Talent exported to Boston because of the project. Economic Development Hub in Downtown Manchester. Mixed Use including residential within the central business district

Vision of a project – Gaslight District South of Granite Street (South Elm). Refurbish this historic district. Station would be the hub of this central business district. Gets people in not taking people out. Dick Anagnost and Dean Kamen

Dan O'Neil – Airport, International service

Property that Dick Anagnost owns. Owns most of property along the track south of Granite Street

Very important to reach out through Dan (Aldermen) – under quorum meeting

Brown Ave Industrial Park

Bob McKenzie – Gaslight District

Freight – Grappone – cars, other auto dealers

CLF take heat off of state if rail happened?

MTA bus limited to Nashua and Concord – What is the ridership?

Public meeting in June at the Aldermanic Chambers?

Connectivity Aspect? – Ability to move people both ways both south and north. Brady Sullivan 110 Units in the Millyard – Rental of Apartments. Living adjacent to Rail

Brady Sullivan would now about demand for TOD.

TIF districts are helpful and public/private partnerships

Minor League Baseball Stadium

Real live real estate plans are beyond anecdotal.

Granite to Queen – Dan will pull together

Armory at the Amoskeag end of town – Carl Norwood is developer

Rick Sawyer, Town of Bedford – very much in support (Izbicki). Station stop at the airport would serve Bedford – multimodal center

David Preece – Study of Station Locations

Celebration rendering 2010 MP and following zoning ordinance changes for multimodal facility at Manchester Airport

Aging of NH issue

David – Pettingill Road Development in Londonderry ($12.5M – street and sewer) Russ Tebow. Meet with the Town of Londonderry.

Demographers – Peter Francese – Graying of NH – Communities and Consequences

Robin Comstock – Downeaster packed with students

Jack Munn – Need to look state-wide Origins and Destination survey at Lowell RR Station

Economic Development Director in Dover

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Kick-off Week Stakeholder Meetings – ***Nashua Regional Planning Commission***

Date: 03/13/2013 **Time:** 10:00am **Location:** NRPC Office – Merrimack, NH

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
Kerrie Diers - Executive Director	karenb@nashuarpc.org	Mark Sanborn (NHDOT)
Tim Roache - Assistant Director/MPO Coordinator	timr@nashuarpc.org	Patrick Herlihy (NHDOT)
		Ken Kinney (URS)
		Russell Wilder (URS)
		David Nelson (Jacobs)
		Ryan Harris (Jacobs)

Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process. Mark Sanborn provided some additional background on the study, the steering committee selection process and reminded the group that the state will stand by the independent utility of the Crown Street site.

Kerrie provided some brief background on NRPC with respect to this study and mentioned that they are currently working on a regional plan. She mentioned a survey report that is posted on their website and that people are asking for alternative modes including bus service to Manchester Airport and are generally supportive of rail. The transit dependent or just car-less population is growing and that travel patterns are changing with the aging population and the departure of young people.

Tim said that it is currently difficult to get between NH cities without an automobile. He mentioned that the Manchester MTA goes to Nashua Mall, which is the northern extent of Nashua's NTS service, but that it should really go to the downtown bus terminal where more connections are available. The same situation exists with the transfer to Lowell RTA at the Pheasant Lane Mall. These are both examples of the lack of communication, connectivity and coordination between transportation providers. He added that he had worked on the Downeaster implementation while based on the Seacoast and heard from Jim Jalbert of C&J that the RI rail service was killing Bonanza Bus. He expressed a concern that integrated ticketing, marketing and communication would allow bus and rail to operate together more seamlessly and in a complimentary fashion.

Tim gave an overview of the local Nashua and corridor projects currently in their TIP. He mentioned that one of the higher priorities in the region is the Exit 36 SB improvement project and added that most people assume that a TOD/TIF rail station in that area would be included in the study. For corridor projects he mentioned the widening of the turnpike from Exit 8 south to create lane uniformity, improvements along Route 101A and issues of locating future open road tolling plazas.

With respect to the study, Tim added that Northern Middlesex COG says that Chelmsford wants a station if Tyngsboro gets one and that he hopes that MassDOT politics doesn't hold things up for NH. Mark Sanborn added that this is already being experienced in the political issues of a Plaistow, NH layover yard vs. continuing to store trains in Bradford, MA. He also suggested that there is a potential for some value capture along the corridor through the implementation of a TIF district.

Mark Sanborn asked about NRPC's view of the planned Broad Street Parkway. Tim suggested that the added redundancy across the river was important and that it makes redevelopment of the Mill District more attractive. He said that the East Hollis St and Crown St sites are better related to rail than to bus, although they would require a CMAQ analysis. He added that the Regional Coordinating Council is talking of potential rail connection to Wilton via the Hillsborough spur.

Tim said that NRPC and SNHRPC both use TransCAD for travel demand modeling. He noted that that VHB did the model for the Tyngsboro bridge for Northern Middlesex Council of Governments and expressed his thought that CTPS/MassDOT would likely do the modeling for this study.

Mark asked about NTS services within the city vs within the region. Kerrie said that city specific routes are fixed, but that the level of service provided to the region outside the city is limited by available funding. Tim added that the NTS' federal 5307 formula grant was recently reduced from $2.2m to $1.5m as city grew and transformed from a big fish in a small pond to a small fish in a big pond.

Mark then asked what NRPC's perception of a successful study was and what their priority is for a northern terminal station. Kerrie suggested that really knowing what the actual cost numbers would be and what benefits the various public investment choices would provide. Tim agreed that a direct quantification of the economic development benefits was key, and offered that former Governor Dukakis at Northeastern University has offered to assist this study. Tim added that a northern terminal station at Manchester Airport would be ideal, but even just downtown Nashua would be very nice. He opined that when Logan needs MHT for capacity overflow, then we'll get the attention/money for rail.

In summary when the respondents discussed regional problems that a major transit investment might address they included:

- Improved mobility options for corridor transportation
- Facilitate intrastate trips between Concord, Manchester and Nashua
- Respond to the needs of the growing elderly population and increasing fraction of the population that does not drive
- Relieve future congestion and the need to further widen I-93 and Route 3

Ducker, Renee

Subject: Nashua Regional Planning Commission
Location: 9 Executive Park Dr, Merrimack, NH

Start: Wed 3/13/2013 9:00 AM
End: Wed 3/13/2013 10:00 AM

Recurrence: (none)

Organizer: Wilder, Russ

Categories: Capitol Corridor

Kerrie Diers
Tim Roach
Ken Kinney
Pat Herlihy
Mark Sanborn
Ryan Harris
David Nelson

BLNMC AA

Multiple Alternatives – possibly rail plus bus

Begins with Purpose & Need – Don't lead with a solution in search of a problem

Credible Financial Plan – Where is the local money?

Transparency in the process is essential – Mark Sanborn (Woody and Ben Blount and Jim Jalbert + politicians)

Kerrie: Regional Plan from NRPC – Transportation needs survey – top thing was (1,000) alternative ways of getting around – rail and bus (MHT from Nashua via bus?)

Boston Express very successful for the entire corridor

- Get survey report

Tim: AA to incorporate Bus. Bonanza in RI was killed by train

Discuss Integrated ticketing marketing and branding

Lack of communication between providers (bus companies)

Very little connectivity and coordination between corridor cities (including Lowell)

Rail and bus could work together

TDP demographics - Aging in place issues is growing *forward any quantitative demographics/population projections for TDP.

Where are the young professionals going?

Information from the business community on hiring/recruiting

MHT market – what is the forecast for users?

What are the transportation initiatives now absent this?

Infrastructure Improvements? Nothing in the TIP after 2 years

101A Corridor

Exit 36 South – Turnpike, Route 3 – Higher priority Study finish by the time the BLNMC study is complete. Could there be a connection with a multi-modal facility/rail station? Should have big picture numbers. There is a steering committee (Mark and Patrick to be on it). NHRPC to invite them

Pettingill Road – TDM models
CTPS/MassDOT do modeling
VHB did model for the Tyngsboro bridge (Northern Middlesex Council of Governments (NEMCOG))
Central New Hampshire has a model, too? CNHP would run it and give the study the numbers?

Widening of the Turnpike and the new toll plaza is a concern. Open Road tolling and widening. Where the plaza will be? Ramp tolls in Merrimack and the airport. More safety vs congestion.

NMCOG – Chelmsford wanting a station – political roadblocks in MA. Also Tyngsboro

Exit 36 – best opportunity for TOD (TIF)

Sharing cost with MA? – True interest in this project by the MBTA, not like Plaistow.

Value Capture – Increased in the value of property (skim this off to help pay for the project). Nashua City Council had opportunity to set up a TIF and did not previously.

MPO – Broad Street parkway?

Synergy? – Never considered this project and rail before. Bigger project would be East Hollis Street and Crown Property. Need CMAQ Analysis. Need info about roundabout – city project. There is an old East Hollis Street Master Plan. Have conceptual planning and traffic counts. Brochure being created for the Mayor

Renaissance downtown?

Wilton Spur – Hillsborough Branch

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Stakeholder Meeting – Nashua Regional Planning Commission

Date: 04/18/2013 **Time:** 1:00am **Location:** NRPC Office, Merrimack, NH

Attendees/Distribution:

Name (Affiliation)	Email	Study Team
Karin Elmer (Merrimack)		Mark Sanborn (NHDOT)
Daniel Del Greco (Merrimack		Patrick Herlihy (NHDOT)
Mike Fimbel (Mont Vernon)		Ken Kinney (URS)
Kerrie Diers (Executive Director)	kerried@nashuarpc.org	Carl Chamberlin (URS)
Tim Roache (Assistant Director)	timr@nashuarpc.org	Julia Suprock (URS
Dan Kelley (Nashua)		
Richard Maddox (Hudson)		
Michael Dell Orfano (Amherst)		
Ed Gleason (Pelham)		

Mark Sanborn and Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process.

The meeting was an open session provided to solicit comments from the group. Below is a summary of their comments:

Dan Kelley

- Asked the question: what is included in the management plan and financial plan?
- Ken Kinney answered: a detailed cash flow analysis, with specific sources of funding not identified at this point, and on the management side, identify who is going to operate the system. The project will not be $300 million as has been reported in the past.
- Mark Sanborn elaborated: it is the role of NHDOT to do the analysis, answer questions, and study alternatives in an objective, fact-based manner.
- Asked the question: what about the trackage rights?
- Mark Sanborn answered: the study satisfies the requirements of the 10 year agreement between Pan Am and MBTA (MBTA has trackage rights all the way to Concord).
- Asked question: will the airport be part of the study? (Answered affirmatively)

Richard Maddox

- Nobody in the town of Hudson is clamoring for transportation alternatives in the corridor, the location of the town is such that residents will not see major benefits.
- Public outreach on the part of NHDOT has been problematic so far with regard to the project.
- Why would you consider teaming with the MBTA as an alternative for this project? This seems like a negative point.
- The study needs to further explore and expand bus service options in the corridor (both local and intercity). It is a mistake to focus on the rail line as the main transit option.

Kerrie Diers

- Will the study compare the benefits of both bus and rail (and compare the options against each other)? (Answered affirmatively)

- The NHRTA (note: Kerrie is a member) is going to be the entity tasked with outreach and marketing for the ridership and for development of the service (this is not the role of NHDOT).

Ed Gleason

- The project should look at linking small communities to transport hubs.
- The project needs to state the benefits for all communities in the corridor, not just the major communities.
- Currently, it seems that public sentiment is against the project.
- Aging populations need local transit options.

Michael Fimbel

- The region needs multi-modal solutions; transit system lacks options.
- The line should go all the way to Concord, and not just stop in southern Nashua.
- A certain sector of the population in NH is just single mindedly against rail, regardless of potential benefits.
- The key to the study will be developing financial partners, identifying attractive station locations, and connecting business and other features in the state.

Michael Dell Orfano

- Linkages between the towns west of Nashua are important to the economies of small towns.
- He would like to see the project include ancillary infrastructure projects included in the study that would benefit smaller communities in the corridor, including improving transportation between smaller communities and Nashua.
- Real estate values will be positively impacted by the project, especially in communities with access to the stations/park and rides.
- Can the system be run by the RPC or towns? (Answered negatively)

Karin Elmer

- Asked the following questions (all answered affirnmatively):
  - Are you coordinating with the universities in the corridor?
  - Are you studying the environmental impacts of the project?
  - Are you looking at connecting employees of businesses to rail?
  - Will quality of life benefits be included in the analysis?

Meeting Notes

Project: Boston-Lowell-Nashua-Manchester-Concord Rail and Transit Alternatives Analysis (Parts A&B) – State Project Numbers 16317 and 63037-A

Subject: Kick-off Week Stakeholder Meetings – ***Southern New Hampshire Regional Planning Commission***

Date: 03/13/2013 **Time:** 3:30pm **Location:** SNHRPC Office – Manchester, NH

Attendees/Distribution:

Name (Affiliation)	Email	Project Team
David Preece – Executive Director, SNHRPC	dpreece@snhrpc.org	Mark Sanborn (NHDOT)
Robin Comstock – Greater Manchester Chamber of Commerce	president@manchester-chamber.org	Patrick Herlihy (NHDOT)
Will Stewart – Greater Manchester Chamber of Commerce	wills@manchester-chamber.org	Ken Kinney (URS)
Daniel O'Neil – City of Manchester Alderman at Large	doneil@manchesternh.gov	Russell Wilder (URS)
Rick Sawyer – Planning Director, Town of Bedford	rsawyer@ci.bedford.nh.us	David Nelson (Jacobs)
Jack Munn – SNHRPC	jmunn@snhrpc.org	Ryan Harris (Jacobs)
Julie Chen – SNHRPC	jchen@snhrpc.org	
Adam Hlasny – SNHRPC	ahlasny@snhrpc.org	

Ken Kinney opened the meeting with an introduction to the study with the official title, a brief background on the corridor, an overview of the focus on multiple rail and bus alternatives and the planned cost-benefit and financial planning process.

David Preece asked who would operate a potential rail system and David Nelson replied that it would most likely be MBTA with a similar arrangement to the Pilgrim Partnership with RI. In that, RI pays for capital improvements, rent and liability to Amtrak (NEC track-owner) and MBTA pays for operations and collects passenger revenue. The host railroad on the Capitol Corridor would be PanAm. MBTA owns up to the state line and already has operating rights north to Concord.

Robin Comstock stressed the economic potential that rail service could provide for the region, particularly if done in coordination with the airport. And Daniel O'Neil stressed that the airport will never get international traffic without rail service. It could also provide transportation for academic institutions and students of the growing UNH campus in Manchester and the 6,000 students already attending the 10 colleges in Manchester. Rail service could also help to attract business and convention traffic priced out of Boston.

Robin also said that the Chamber is worried about the "brain drain" with all the talent exiting New Hampshire in general and downtown Manchester in particular. She sees the station as a redevelopment catalyst for the areas in and around the Gaslight District, South Elm St, WMUR and the Stadium. Just to the north, the Mill District has high end employees that draw talent and business. She added that Bob MacKenzie, Director of Planning & Community Development is working on plans for the Warehouse District between Granite St and Queen City Ave and that the National Guardis looking to vacate the armory near Amoskeag and suggested Carl Norwood thinks it could be redeveloped into intermodal terminal.

Daniel O'Neil also spoke of the redevelopment potential that rail could bring. Dick Anagnost owns property along the tracks south of Granite Street that is walkable to the Gaslight District. Shane Brady and Arthur Sullivan are the largest landowners in the Mill Yard and will soon be holding a ribbon cutting for 100 units of rental housing there. Also, DYN is one of the fastest growing businesses in NH and is located in the Mill Yard. He suggested that we could reach out through him for contacts and information.

Rick Sawyer said that the Bedford Town Manager wanted to be at this meeting as the leadership in Bedford see the airport station as the Bedford Station and Manchester's suburban multimodal center. Younger people don't want to stay in NH right now, so we need to make it attractive to them. The town completed the Bedford Station location study in 2010 and a TOD Masterplan in 2012 for the area surrounding the proposed airport station with a smart growth overlay. It would be the first residential zone in a commercial/highway district in the town, but would only allow residential with a mix of land uses. David Preece added that Bedford needs $12.5m to complete road and utility upgrades for the proposed TOD area around Pettingill Road.

Jack Munn said that the study should look at the entire state. There are a lot of commuters interested in taking a train to get in to Boston, but they have to leave NH by car first to access rail stations in MA. Stations in NH would be a benefit to the entire state. He suggested that an origins and destination survey at the Lowell RR Station could show the magnitude of that travel pattern.

Robin Comstock echoed the concerns about demand and shared that the ridership on the Downeaster is amazing and the trains are always packed. The Dover economic development director raves about the economic impact of the rail service along the Seacoast. Daniel O'Neil shared that NHDOT Commissioner George Campbell had said that passenger rail service would only happen if freight rail also returned. He also added that the Grappone car dealership has suggested that shipping new cars to Manchester on trains would save money for local dealerships.

David Nelson asked about the recurring theme that planners had been sharing regarding the greying of the New Hampshire population and the exodus of young people. David Preece shared that an influential monograph had been prepared by Peter Francese and Lorraine Stuart Merrill called "Communtities and Consequences: The Unbalancing of New Hampshire's Human Ecology and What We Can Do About It. He provided a copy of the report to David Nelson. For more information see a trailer for the associated NHPTV documentary @ http://www.youtube.com/watch?v=PSTfr2rJXNs

Mark Sanborn closed the meeting by saying that 13% of Concord Coach traffic goes direct to Logan, and that those passengers pay the full fare. This helps Concord Coach to regularly draw 92% of operations revenue from the farebox.

In summary, when the participants discussed regional problems that a major transit investment might address they included:

- Provide an environment that will make the state better able to attract and retain young workers and their families.
- Allow the airport to compete for international passenger traffic
- Provide transportation options for college and university students
- Anchor sustainable walkable development in downtown Manchester
- Provide new transport option for all residents of Central and Northern New Hampshire similar to the options that so popular in Dover, Durham and Exeter.
- Enhance rail freight service for New Hampshire businesses.

APPENDIX H

Capitol Corridor Stakeholder Meetings: UNH

New Hampshire DOT
Department of Transportation

Ducker, Renee

From: Mark Sanborn <MSanborn@dot.state.nh.us>
Sent: Thursday, April 04, 2013 3:30 PM
To: Kinney, Ken; Wilder, Russ; Chamberlin, Carl; David Nelson (david.nelson@jacobs.com); Ryan Harris (ryan.harris@jacobs.com)
Cc: Patrick Herlihy
Subject: FW: Capital Corridor: UNH Campus Master Plan

Follow Up Flag: Flag for follow up
Flag Status: Flagged

Additional information from UNH.

Mark Sanborn
Federal Liaison - NH Department of Transportation
(603) 271-1620
msanborn@dot.state.nh.us

From: Pesci, Steve [mailto:stephen.pesci@unh.edu]
Sent: Thursday, April 04, 2013 2:19 PM
To: Mark Sanborn
Cc: spesci@unh.edu
Subject: Capital Corridor: UNH Campus Master Plan

Mark,
I neglected to provide one more resource to you and the URS Consultants regarding UNH.
A request was made to provide UNH Campus Master Plan.

The newly updated plan has been approved by President Huddleston and is awaiting presentation (and formal approval) to the USNH Trustees.

The Plan can be downloaded at www.unh.edu/cmp

In terms of the rail service/impacts at UNH a few points to note.

1) This is UNH's second Master Plan since the start of Downeaster service. It is the first to make land use recommendations which clearly represent the importance of the rail station /UNH Transit Center:
    a. Executive Summary: Zones for Public Private ventures - pp 14- 15, -Lot A vicinity
    b. Full Document: PPV page 13; pp 15 - Addressing Climate Change; Future Placeholders p25 #53, north drive and Depot Road Reddevelopment
    c. Pp49-51 - Transportation and Parking p 52 - Main Street adjacent to Campus Stadium
    d. (note Depot lot is owned by the Town so UNH defers to it - but we have a shared vision for development there)
2) I would also suggest a look at Appendix 1 (which show TDM benefits of rail and transit at UNH over past years)- related to standardized UNH ratios (parking/housing etc) and Appendix 2 - Prioritized projects - PPV

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