

Downtown Traffic Study Phase 2 - Feasibility Study

Jaffrey, New Hampshire



Prepared for:
Town of Jaffrey, New Hampshire

Prepared by:
Vanasse Hangen Brustlin, Inc.
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VHB

Main Street Traffic Study Phase 2 – Feasibility Study

Jaffrey
New Hampshire

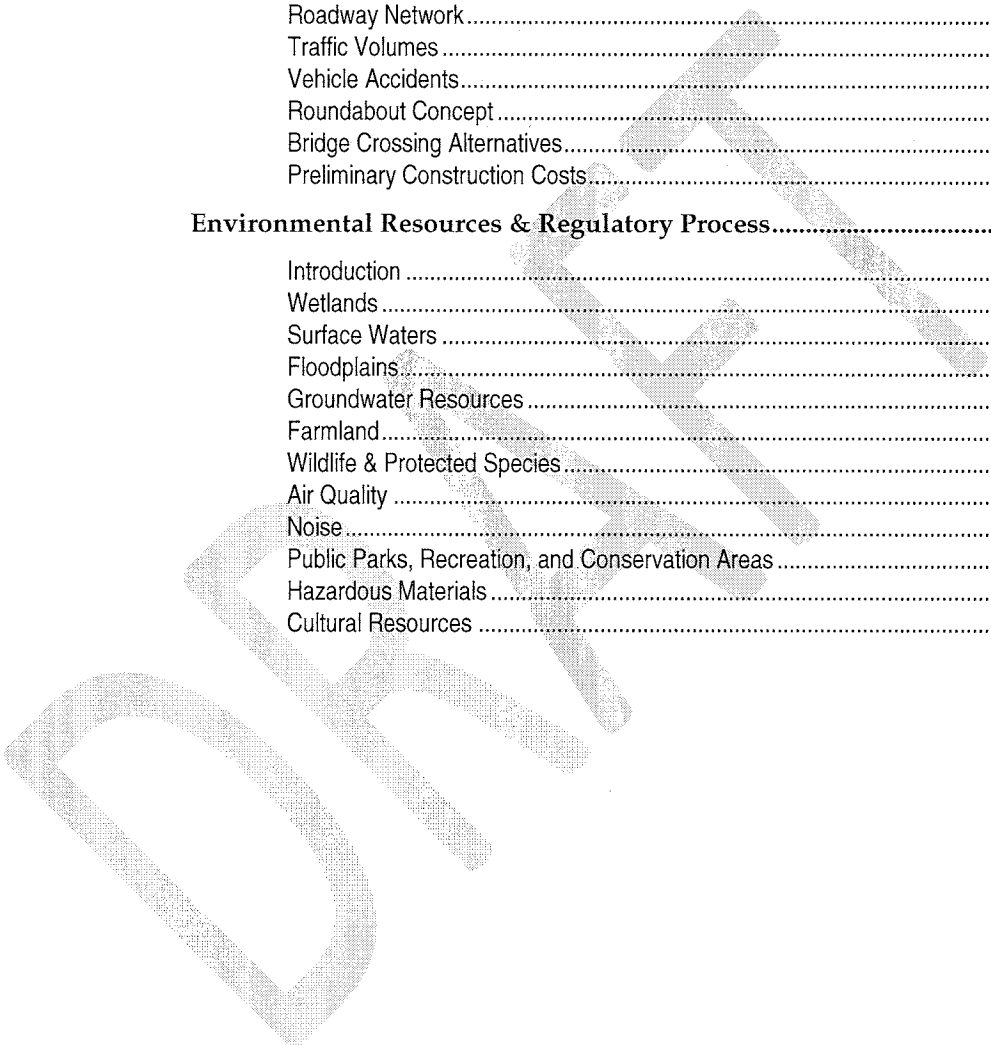
Prepared for **Town of Jaffrey**
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Introduction

Back in 2004, Vanasse Hangen Brustlin, Inc. (VHB) conducted a Main Street Traffic Study for the Town of Jaffrey, which evaluated the traffic operating conditions in the downtown with the goal of developing an action plan aimed at safely and efficiently accommodating motor vehicles while still providing the look and the feel of a place where pedestrian movement is easy, safe, and welcomed.

This initial study identified the need to eliminate the Route 202 “dog-leg” configuration consisting of traffic signals within 300 feet of each other at River Street and Peterborough Street. Various configurations were evaluated including the consideration of bridge crossings of the river north and south of Main Street. Based on the results of the evaluation and input from the public, the preferred alternative included the construction of a roundabout at the Main Street/Peterborough Street intersection and the construction of a bridge crossing of the river, south of Main Street. The benefits of the preferred plan included:

- Eliminates traffic signals and reduces traffic congestion
- 50% reduction in traffic on Main Street between River Street and Peterborough Street
- Opportunity for additional parking or wider sidewalks
- Enhanced access to the riverfront
- Roundabout calms traffic and serves as a gateway
- Redevelopment opportunities at Blake Street

Having obtained general concurrence on the action plan, the Town of Jaffrey again retained VHB to conduct this next step, which is an initial Feasibility Study. The purpose of the Feasibility Study is to collect and compile base information aimed at providing the Town a clear understanding of the existing conditions and environmental constraints within the study area and to take a closer look at potential locations of a river crossing south of Main Street.

A key element of this work effort was the development of constraint mapping, which includes property boundaries, zoning information, water resources (wetlands, floodplain, and poorly drained soils), wildlife resources, farmlands, conservation land, historic resources and archeological resources.

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Existing Conditions

The original Main Street Traffic Study included a description of the existing roadway network, a summary of traffic volume conditions, and most importantly a discussion of the traffic operational deficiencies in the area. For the purpose of this Feasibility Study, the previous data has been supplemented with some additional traffic volume counts including observations of truck traffic. In addition, vehicle accident records have been reviewed and evaluated. And finally, the roundabout concept, which was identified in the original study, has been further developed. This chapter summarizes these existing conditions and presents the more developed roundabout concept.

2.1 Roadway Network

As described in the original study, US 202 is an important regional north-south travel route that passes through Jaffrey's downtown. The corridor intersects Main Street at two signalized "dog-leg" intersections at Peterborough Street and at River Street.

The Main Street/Peterborough Street intersection is actually configured with three other streets (Blake Street, Stratton Street, and Turnpike Road) intersecting at a single location. US 202 approaches the intersection from both the north on Peterborough Street and the west on Main Street. The Peterborough Street approach consists of a shared left/through and an exclusive right-turn lane, which accommodates vehicles continuing on US 202. The Main Street approach consists of an exclusive left-turn lane, which accommodates vehicles continuing on US 202 and a shared through/right turn lane. Turnpike Road (NH 124) approaches the intersection from the northeast and consists of a shared left/through and an exclusive right-turn lane. The southeast approach of Stratton Road consists of a multipurpose lane and a right-turn slip lane, which accesses Turnpike Road. Blake Street from the south consists of a single multi-purpose lane.

Approximately 280 feet to the west on Main Street is the four-way signalized intersection of North Street (NH 137) and River Street (US 202). US 202 approaches the intersection from both the south on River Street and the east on Main Street. The



Main Street (US 202) approach from the east consists of an exclusive left-turn lane, which accommodates vehicles continuing on US 202 and a shared through/right turn lane. The River Street approach consists of a shared left/through and an exclusive right-turn lane, which accommodates vehicles continuing on US 202. Both the Main Street (NH124) approach from the west and the North Street approach from the north consist of a single multi-purpose lane.

Commercial buildings with signs noting their historic significance are located between the two signalized intersections. On the north side of Main Street is the Dillon Block built in 1940 and The Jaffrey Mills built in 1868 and listed in the National Register of Historic Places. Many businesses are housed in both of these buildings with the Dillon Block housing The Thrifty Bear, Jade Ocean Restaurant, and Seaver & McLellan Antiques. Two buildings are located on the opposite side of the street. One is the Bean Block (built in 1928) which contains Elaine's Antiques & Collectibles, HKS Realtors, Candy's Country Creations – Hair Salon and Gifts, Bellows-Nichols Insurance, and Harvest Christian Fellowship – a Foursquare Gospel Church. The other building is home to the Jaffrey Chamber of Commerce.

The historic buildings continue westward on Main Street with the Duncan Block circa 1914, Durant House circa 1820, Swig Block circa 1928, Power-Cournoyer Block 1826, and the Burpee Block 1857. Other non-historical buildings include the Jaffrey Police Department, Jaffrey Chiropractic Health Center, and TD Banknorth. Both sections of Main Street provide on-street parking with a two-hour time limit. Additionally, curbed sidewalks are present on both sides of the street with crosswalks on all legs of both signalized intersections and crossing Main Street at the School Street intersection west of North Street. An exclusive pedestrian phase is present at the intersection of Main Street and River Street while concurrent pedestrian phases are present at the Main Street/Peterborough Street intersection. Pedestrian accommodations are important as there are several schools nearby, including the Jaffrey Grade School on School Street to the west and the Jaffrey Rindge Middle School and Conant High School on Conant Way to the east.

2.2 Traffic Volumes

To determine the existing traffic volume demands and flow patterns along Route 202 in the vicinity of Main Street, 24-hour automatic traffic recorder counts were conducted. These were located north of Main Street, south of Main Street and on the Main Street portion of Route 202. The counts north of Main Street were conducted on August 5th and 6th (Tuesday and Wednesday) 2008 while the counts south of Main Street were conducted on August 12th and 13th (Tuesday and Wednesday). The Main Street counts were conducted from Saturday August 2nd through Friday August 8th, 2008.

As shown in Table 1, the Average Weekday Traffic (AWDT) along Route 202 is similar north and south of Main Street ranging from 9,566 vehicles per day (vpd) on

Peterborough Street and 9,584 vpd north on River Street. The segment of Main Street between Peterborough Street and River Street recorded an AWDT of over 13,000 vpd. The morning peak hour ranged from 5.5 to 6.0 percent of the average weekday traffic while the evening peak hour ranged from 7.6 to 8.1 percent. The morning peak hour varied between 7AM and 8AM while the evening peak hour varied between 3 PM and 4PM.

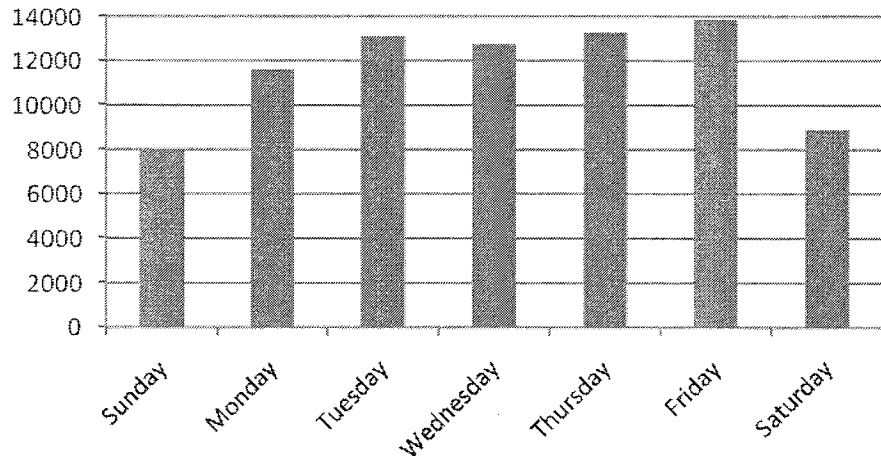
**Table 1
Existing Traffic Volume Summary**

	Average Weekday Traffic Volume (vpd)	AM Peak Hour (vph)	Percent of Daily Traffic	PM Peak Hour (vph)	Percent of Daily Traffic
Peterborough St.- North of Main Street	9,584	576	6.0%	747	7.8%
River St. – South of Main Street	9,566	524	5.5%	724	7.6%
Main St. between River St and Peterborough St.	13,047	732	5.6%	1,063	8.1%

vph = vehicles per hour
vpd = vehicles per day

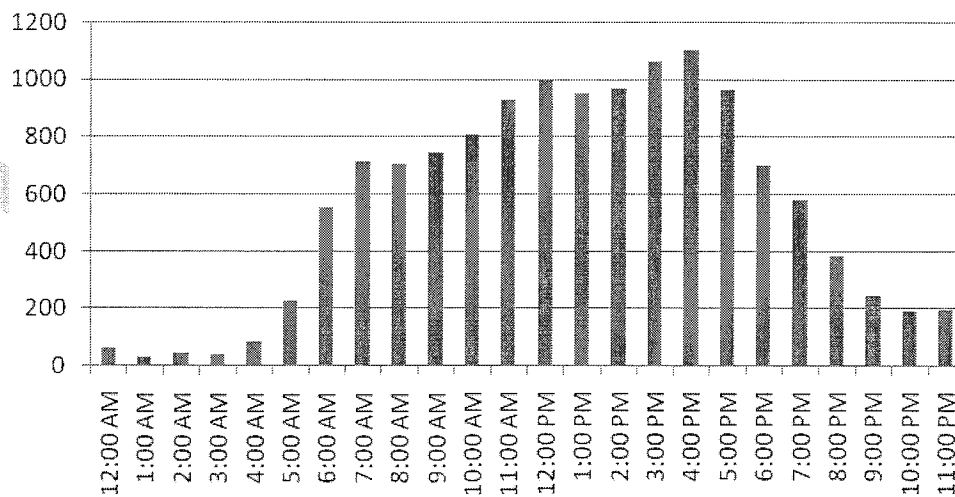
Examinations of the daily traffic volume variation during the month of August depicted in Figure 1 show Friday to be the highest volume day of the week with approximately 13,850 vehicles per day (vpd). Traffic volume levels for the weekdays are relatively consistent while the volume of traffic on the weekend is substantially lower with approximately 8,900 vpd on Saturday and 8,050 vpd on Sunday.

Figure 1
Daily Variations (August)



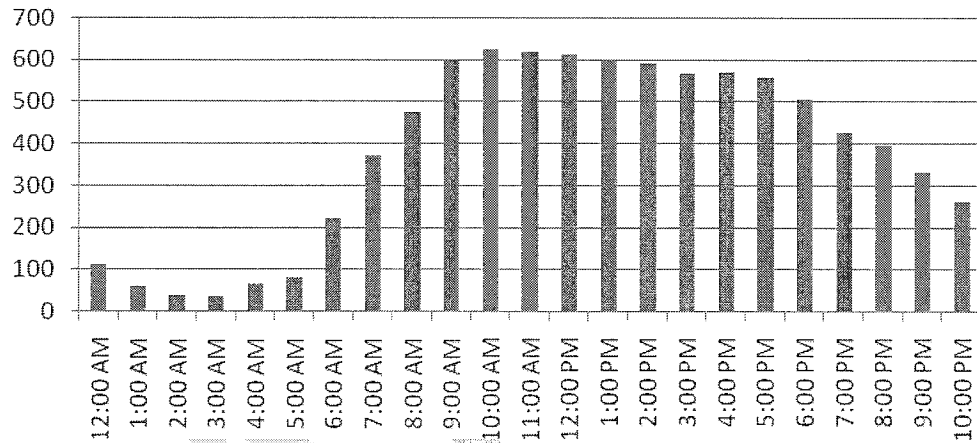
A review of the hourly variations for a typical weekday in August (Thursday), as depicted in **Figure 2**, does not exhibit typical commuter route characteristics with the graph showing distinct AM and PM peak commuter hour activity. The morning peak hour occurs by 7:00 AM with the volume of traffic growing steadily throughout the day with the high volume recorded between 4:00 and 5:00 PM in the evening.

Figure 2
Hourly Variations (Weekday in August)



In contrast, on Saturday, (Figure 3) the peak volume condition occurs at approximately 10 AM and then falls at a relatively constant rate throughout the remainder of the day.

Figure 3
Hourly Variations (Saturday in August)



A traffic count was conducted on Tuesday April 15 and Wednesday April 16, 2008. This count was an origin/destination of the turning movements for heavy vehicles during the weekday peak hours at the bend in Route 202. Heavy trucks and buses were counted separately.

During the weekday evening of the 25 trucks observed during the peak hour (5 PM) 13 or 52% were traveling on Route 202 through the bend in downtown Jaffrey. These were split approximately in half between trucks traveling northbound or southbound on Route 202. Similarly during the weekday morning peak hour (7 AM) 79 trucks and buses were observed with 24 or 30% traveling on Route 202. While this is a lower percentage than during the weekday evening, approximately half (32) of the heavy vehicles observed in the morning were school buses. With schools located on School Street, west of the Route 202 bend and on Conant Way east of the bend, almost all of the area school buses travel through this intersection. If the school buses were discounted the amount of trucks remaining on Route 202 would be 51% almost the same as in the evening.

2.3 Vehicle Accidents

Accident records provided by the New Hampshire Department of Transportation (NHDOT) were reviewed and evaluated for the most recent three year period available covering the period of January 2003 through December 2005. This research

was centered on the intersections of Routes 202 and 124 extending past each intersection between 500 and 1,000 feet.

A total of 43 vehicle crashes were reported within the examined area. The highest crash locations, averaging to 3 or less accidents per year, occurred at the intersections of Route 202 (Peterborough Street) at Route 124 (Main Street), Route 124 (Main Street) at School Street/Goodnow Street, and Route 124 (Main Street) at Charlonne Street. The majority of the reported accidents were of an unknown type and severity. However, two crashes were fixed object crashes and one involved a bicycle. Ten crashes (23 percent) reported some type of personal injury. The number of accidents were distributed relatively evenly throughout the year though with slightly more accidents reported in the fall and winter (September through February). The majority of crashes were not weather related.

2.4 Roundabout Concept

One of the evaluated actions identified in the original study was the placement of a modern roundabout at the Main Street/Peterborough Street intersection. The idea was that the roundabout in concert with the new bridge crossing would serve to safely and efficiently accommodate both regional and local traffic while “calming” traffic, enhancing pedestrian movement, and serving as a “gateway” to the downtown. The installation of a roundabout also allows the existing four-lane section of Main Street to be reduced to two lanes thereby allowing either additional on-street parking or wider more pedestrian friendly sidewalks.

Based on public input received during the initial traffic study, most recognize the benefits that would be derived from the placement of a roundabout at the Main Street/Peterborough Street intersection. However, there were concerns raised with regard to the size of the roundabout, its ability to accommodate truck traffic, and whether it could be constructed without impacting any of the existing buildings at the intersection. To address these concerns, a refined conceptual layout of a roundabout at the intersection was prepared. The conceptual plan is depicted in **Figure 4**.

The roundabout was designed to accommodate a WB-67 (53' trailer) truck vehicle, which is larger than the typical 18-wheel tractor trailer. The roundabout, as designed, would have an outside curb to curb diameter distance of 120 feet and could be constructed without the need to take any of the existing buildings at the intersection. Note that there would be a need for some property acquisition at the northeast corner at the Rite-Aid. However, neither the building nor the parking lot would be impacted.

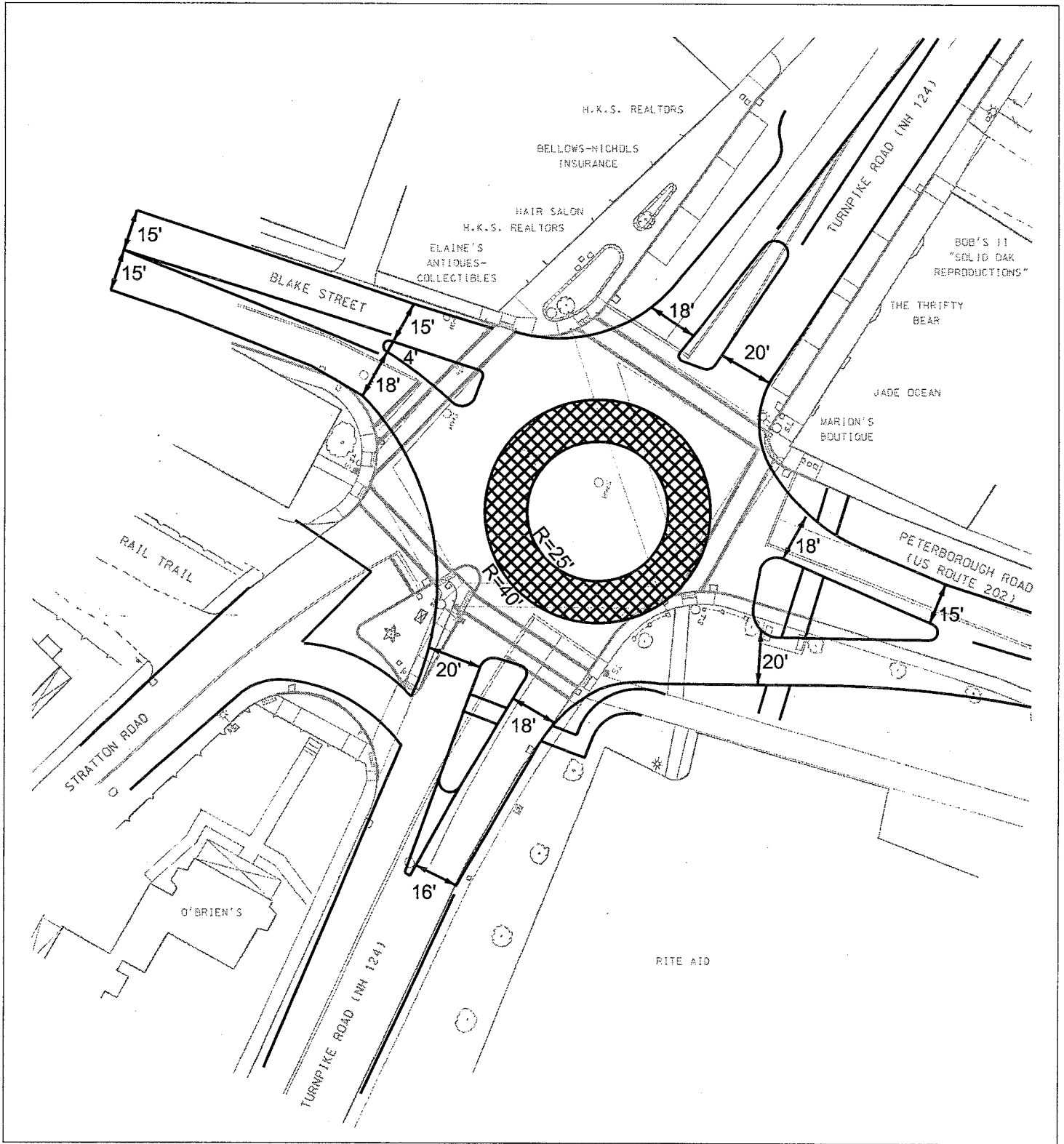
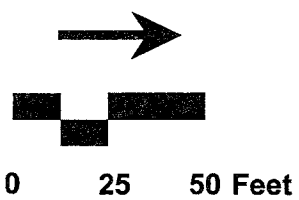


Figure 4
Conceptual Roundabout

Jaffrey, New Hampshire



2.5 Bridge Crossing Alternatives

As part of the original Main Street Traffic Study, an evaluation of various alternatives aimed at improving the safe and efficient flow of traffic in the downtown area was conducted. The alternatives included bridge crossings north and south of Main Street. The results of that preliminary traffic evaluation suggested that the bridge crossing should be located somewhere south of Main Street. From a traffic operations perspective, locating the bridge south of Main Street provides the benefit of routing all of the US 202 traffic through the Main Street/Peterborough Street intersection (the new roundabout) and away from the River Street/Front Street area. From a transportation planning and traffic operations perspective, the primary benefit is derived from the crossing being located south of Main Street. It doesn't matter to any great extent as to how far south of Main Street the bridge would be located. On the other hand, the costs, as well as the environmental impacts, are very much dependent on the actual location of the bridge.

The purpose of this Feasibility Study is to begin looking closer at potential river crossing locations south of Main Street. To do that, three alignment alternatives have been developed. Two of the alternatives (Alternatives 1 and 2) cross the river relatively close to Main Street. Alternative 1 (the shortest route) intersects River Street just north of School Street while Alternative 2 intersects River Street in the vicinity of Charlonne Street. Alternative 3 is a much longer alignment as the new roadway would stay on the east side of the river for approximately 1,500 feet before crossing the river and finally intersecting River Street north of Lacy Road.

The total length for each of the alternatives are approximately 1,100 feet for Alternative 1, 1,400 feet for Alternative 2, and 3,900 feet for Alternative 3. Alternatives 1 and 2 are shown with a design speed of 30 mph while Alternative 3 is shown with a design speed of 40 mph. The mainline for each of the alternatives would be limited to a single 12-foot lane in each direction with 10 foot shoulders on each side of the roadway. Where turn lanes are required, the shoulders would be reduced to 4 feet in width. Each alternative would include a 6 foot wide sidewalk on one side of the roadway.

As presented in the next section (Section 2.6) the cost of the longer alignment (Alternative 3) is substantial and as discussed in Chapter 3 the wetland impact is great. However, the two shorter alignments (Alternatives 1 and 2) are located within the Historic District and could impact multiple historic properties including buildings that have been determined to be "contributing structures" for the Historic District.

The three alignment alternatives are depicted graphically in **Figure 5**.

2.6 Preliminary Construction Costs

An order of magnitude preliminary construction cost estimate has been prepared for each of the three identified alternatives. The order of magnitude estimate is based on current (2008) construction costs and does not include the cost of land acquisition. Note that each of the three river crossing alternatives includes the cost to construct the roundabout at Main Street and Peterborough Street. The estimated cost to construct the roundabout (\$800,000) is the same for each of the three alternatives. The estimated costs for each alternative are as follows:

Alternative 1

Roadway	\$1.8 million
Bridge	\$2.4 million
<u>Roundabout</u>	<u>\$0.8 million</u>
Total	\$5.0 million

Alternative 2

Roadway	\$2.8 million
Bridge	\$2.6 million
<u>Roundabout</u>	<u>\$0.8 million</u>
Total	\$6.2 million

Alternative 3

Roadway	\$5.5 million
Bridge	\$2.1 million
Pedestrian Underpass	\$2.0 million
<u>Roundabout</u>	<u>\$0.8 million</u>
Total	\$10.4 million

3

Environmental Resources & Regulatory Process

3.1 Introduction

The environmental process for any public transportation project is a significant issue, and can drive the project timeline and cost. Thus, it is important to understand the environmental resources present and the potential regulatory process early on in the project development cycle.

The National Environmental Policy Act of 1969 (NEPA)¹ is a comprehensive federal law that applies to federal agencies and the programs they fund, and is the primary environmental statute that would be applied to these proposed transportation improvements. The statute is invoked due to the fact that the proposed project would modify a federal highway (US 202), which would require the oversight and approval of the Federal Highway Administration (FHWA). NEPA requires that federal agencies consider the environmental consequences of any major action. In practice, a project is required to meet NEPA guidelines when a federal agency provides any portion of the financing or any federal permit of license for the project.

The main provision of NEPA requires an Environmental Impact Statement (EIS) to be written for all major federal actions which may have a significant impact on the environment. If it is unclear whether a major federal action will have a "significant" impact on the environment, the agency may prepare a shorter document called an Environmental Assessment (EA). Some federal actions are excluded from the in-depth analysis required by an EIS or EA if the proposal falls within a previously-established "Categorical Exclusion."

The intent of the NEPA environmental documentation is to aid in decision making, to identify the feasible alternative that has the least impacts and to disclose the environmental consequences of the federal action. Generally, a NEPA analysis is a

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¹ 42 USC 4321

very broadly scoped document which examines virtually all potential environmental, cultural and social impacts. An EIS or EA contains information on everything from natural resources (*e.g.*, wetlands, water quality, farmlands, rare species) to the social/human environment (*e.g.*, air quality, noise, visual impacts, socio-economics) to cultural resources (historical buildings and places, archeological resources).

This chapter summarizes the environmental and cultural resources related to this transportation improvement project for downtown Jaffrey. Because NEPA is so broadly scoped, this chapter touches on many different resources and issues, albeit in a fairly preliminary manner.

The information on the natural and cultural resources contained within the project corridor was obtained from file reviews, agency contacts, GIS database retrieval. Limited field reconnaissance was performed. The data collected is very preliminary. Additional site-specific studies would need to be completed to provide greater detail if the project is to move forward.

3.2 Wetlands

Wetland resources were identified using several databases, as well as a limited field review of the project corridor. The National Wetlands Inventory (NWI), compiled by the US Fish and Wildlife Service, as well as the Cheshire County Soil Survey (compiled by the US Dept. of Agriculture, Natural Resource Conservation Service) were the primary data used to establish the wetland boundaries shown in **Figure 6**. The New Hampshire Fish & Game Department's (NHF&GD) Wildlife Action Plan was also reviewed to evaluate the potential functional value of wetlands within the study area.

Wetlands are a substantial constraint on the development of roadway alternatives for this project. Most notably, there is a significant freshwater scrub-shrub wetland community upstream (west) of Main Street that presents a major constraint to locating a new roadway corridor. This wetland is mapped as some of the highest ranked habitat in New Hampshire by the NHF&GD "Wildlife Action Plan."

The conceptual alignments were developed to avoid the most significant and valuable wetlands. Nevertheless, some impact to the river and associated riparian wetlands will result from all of the three alternatives. Permits from both the NH Department of Environmental Services (RSA 482-A) and the US Army Corps of Engineers (Section 404 of the Clean Water Act) would be needed.

Permitting for any new crossing of a major river such as the Contoocook will be difficult, and a clear "Purpose and Need" statement must be developed. A full range of alternatives would need to be developed and fully analyzed to properly address the permitting criteria.

3.3 Surface Waters

All of the alternatives would need to cross the Contoocook River, and this is perhaps the most obvious natural resource in the study area. The Contoocook flows for 71 miles from Poole Pond in Rindge northward to Concord, where it enters the Merrimack River.

The watershed above the conceptual crossing location is approximately 29.6 square miles. The USGS monitors water statistics at the Contoocook River downstream of the project area in Peterborough, NH (USGS 01082000). In the calendar year of 2007 the stream gage fluctuated from 0.09 feet (September 4) to 7.09 feet (April 16), indicating a challenging hydraulic situation.

This portion of the Contoocook River is classified as a community river under the NH Rivers Management and Protection Act (RSA 483). This provides special protection to the river, and a "Local Advisory Committee" made up of citizens from each of the corridor communities (14 towns from Rindge to Concord). As such, no new channel alteration activities can be permitted *"which interfere with or alter the natural flow characteristics of the river or segment or which adversely affect the resources for which the river or segment is designated."* Despite this, there are no prohibitions in the Rivers Management Act that would explicitly prohibit the construction of a new crossing.

3.4 Floodplains

Information on floodplains and floodways for the project area was obtained by reviewing the appropriate Flood Insurance Rate Maps published by FEMA. This review revealed flood hazard zones and base flood elevations of 1,012 feet south of NH Route 124 along the Contoocook River. Flood hazard zones and the base flood elevations are depicted on **Figure 7**.

Like wetlands, floodplain concerns associated with a new crossing of the Contoocook has the potential to become a significant issue. Most of these concerns, however, can be addressed in a rigorous and quantifiable manner through the use of engineering analysis and good engineering design of any new crossing structure.

3.5 Groundwater Resources

Information on groundwater resources in the form of aquifers mapped by the US Geological Survey were retrieved from the GRANIT database. This analysis indicates that a significant portion of the eastern portion of the project area is underlain by stratified drift aquifer. The project area is underlain by a low to moderate yield aquifer (with a transmissivity of 0-2000 square feet per day).

Additionally, a portion of the project area is within a designated Community Well Head Protection Area (WHPA), as mapped by the NHDES. Of the three alternative alignments studied, only one (Alternative 3) would encroach on this WHPA. There is one mapped private water supply well within 750 ft of the centerline of this same Alternative. Taken together, the groundwater resources in the area are important considerations for development of a new roadway corridor, and protective measures would). The water resources are depicted in **Figure 8**.

3.6 Farmland

Farmlands are protected under NEPA and the Federal Farmland Protection Policy Act (FFPA). Information on "*Important Farmland Soils*" was retrieved from GRANIT. This mapping indicates that a portion of the property along the eastern side of US 202 is classified as farmland of local and statewide importance. However, these lands do not qualify for formal protection under the FFPA because they are classified within an "*Urbanized Area*" according to the 2000 Census database. Additionally, this land is already developed with uses other than agriculture. A Farmland Conversion Impact Rating form will still need to be prepared for review by NRCS for compliance with FFPA. However, this matter is not expected to be an issue with the project. The farmland soils are depicted in **Figure 9**.

3.7 Wildlife & Protected Species

VHB contacted the NH Natural Heritage Bureau (NHB) to determine whether there are any records of any rare, threatened, or endangered species or exemplary natural communities in the project area. An email response from Sara Cairns at NHB on April 25, 2008 revealed that the only record in the project area is for a turtle species that is of special concern (i.e., a species which is being tracked because it is rare, but has not been officially designated as either "threatened" or "endangered" under state or federal law). Additionally, Kim Tuttle at the NHF&GD confirmed that the entire corridor is a potential crossing area for a rare turtle species. More information on the project would need to be supplied to the NHB and the NHF&GD to solicit a more formal project review. Such a review often prompts a request for more information in the form of additional field studies and/or mitigation measures to offset potential impacts. While rare species concerns are often a significant issue, it would be unusual for these concerns to derail a transportation project with a clear Purpose and Need.

The New Hampshire Fish and Game's Wildlife Action Plan (NHWAP) shows that there are several designated habitats in the project area, and the potential effects on wildlife would need to be examined. Alternatives 1 and 2 do no impact any habitat designated for protection in the NHWAP. However, the longest of the three

alternatives (Alternative 3), would impact habitat along the Contoocook River some of which is ranked as "Tier 1" in the NHWAP, a classification which indicates that it is among the highest ranked habitat in NH (by ecological condition). Other portions of the corridor are identified as "Tier 2" habitat, i.e., the highest ranked habitat in the biological region (by ecological condition), or "supporting landscape," also generally containing important wildlife resources. Obviously, field studies of these areas would be important to better understand the significance of these areas, but the potential effect on such wildlife is another important issue, especially if Alternative 3 is chosen for further study. The wildlife resources are depicted in **Figure 10**.

3.8 Air Quality

The proposed project is not expected to adversely impact local or regional air quality in the study area. The proposed project is located in Cheshire County, which is an attainment area for carbon monoxide and ozone. The minor changes in traffic and geometry are not expected to result in any adverse local air quality impacts. In fact, air quality will likely improve as a result of this project as the proposed roadway improvements are expected to alleviate traffic congestion in the project area.

3.9 Noise

The proposed project is not expected to substantially change the existing noise environment in the study area along the existing US 202 corridor. In fact, the new roadway will reduce traffic volumes and may even lower sound levels along US 202 in the downtown Jaffrey area in the areas that are to be bypassed.

However the proposed new roadway will introduce vehicular traffic to new areas. A detail noise evaluation for each of the alternatives should be conducted to see what type and how many receptors would be impacted as a result of the proposed roadway according the NHDOT's Noise Abatement Criteria (NAC). Specifically, the noise analysis would need to focus on the River Street residences just south of Main Street for Alternatives 1 and 2, while Alternative 3 would focus on the impacts to residences along Libby Court, Burrinton Street, and Aetna Street.

Land use immediately adjacent to the roadway is a mix of residential, commercial, and industrial development. Although there are no churches, schools, or cemeteries along US 202, there are two schools and a church within a half mile of the corridor.

3.10 Public Parks, Recreation, and Conservation Areas

Recreational resources such as public parks, conservation lands, wildlife refuges and similar areas as depicted in **Figure 11** are protected under Section 4(f) of the federal Department of Transportation Act and Section 6(f) of the Land and Water Conservation Act (LWCF Act).²

LCHIP & LCIP Properties

The occurrence of any properties in the corridor acquired under either the Land and Community Investment Program (LCHIP) or the Land Conservation Investment Program (LCIP) was verified by contacting their respective offices. This contact revealed that there are no LCHIP properties and no LCIP properties.

Section 6(f) LWCF

The New Hampshire Department of Resources and Economic Development (DRED) have also determined there are no properties in the vicinity of the corridor that have received funds from the Land and Water Conservation Fund and hence would be considered as Section 6(f) resources.

Section 4(f) Recreational Resources

The baseball field located on the east side of the Contoocook River at the end of Blake Street could qualify as a public park or recreation area under Section 4(f) of the National Transportation Act. As such, the proposed roadway alignment has been designed to avoid or at least minimize any impacts to this recreational property. Any project-related takings (*i.e.*, for right-of-way purposes) will require a thorough alternatives analysis with the conclusion that there is no prudent or practicable alternative. Mitigation in the form of a replacement property is unlikely as impacts are expected to be avoided.

3.11 Hazardous Materials

Contaminated sites, as depicted in **Figure 12**, can impact a project by causing unplanned cleanup costs and affecting worker health and safety. A review for potential sites revealed that there are three recorded contaminated sites that are

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² Section 4(f) also protects historical sites, discussed below. This law prohibits the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge or historic site of national, state or local significance unless 1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreation area, wildlife and waterfowl refuge, or historic site resulting from such use.

classified as Leaking Underground Storage Tanks (LUST) within the northern end of the project area. The three sites, which all have a risk level of “No Sources/No AGQS VIO’s from onsite are as follows:

- General Automotive Supply: This site lies on the northeast corner of Peterborough Road (US 202) and NH Route 124.
- NHDOT/Whirlidley Waters Inc.: This site is located on Blake Street approximately 300 feet south of NH Route 124.
- Aubuchon Hardware: This site lies on the northwest corner of Peterborough Road (US 202) and NH Route 124.

Additionally, there is an Active RCRA Site (NHDES) located on River Street just north of the proposed alignment of Alternative 3.

Right-of-way will likely only need to be acquired from the NHDOT/Whildley Waters Inc. Site, which is required for all three Alternatives. Further site-specific studies of the potential for contamination would be important task for any further project development.

3.12 Cultural Resources

“Cultural resources” include standing historic structures (**Figure 13**) and buildings as well as pre-contact and historical archaeological resources. Because the project may require permits from New Hampshire state agencies it will be subject to compliance with New Hampshire RSA 227-C. Eventually, the project would also require action and/or funding from the FHWA, and would therefore be subject to the National Historic Preservation Act of 1966, as amended (NRHP).

VHB conducted a search of the archaeological and architectural site files and records at the New Hampshire Division of Historical Resources (NHDHR), to determine if any listed or inventoried historic and archaeological resources were on or adjacent to the project. The background and literature review also included a review of historic maps for the project vicinity.

3.12.1 Above Ground Resources

A review of the National Registers of Historic Places and the NHDHR site files revealed the presence of the District. The District was listed in 2002 and it includes 134 contributing buildings, sites, structures, and objects and 38 non-contributing buildings and sites. Historically, the various elements functioned as domestic, commerce, education, government, religious, and recreation/cultural elements. The contributing elements were determined eligible under criteria A and C in two areas of significance: community planning and development and architecture, respectively, between c. 1800 and 1952.



Appendix A summarizes the contributing and non-contributing elements that are adjacent to the three alternatives. No visual impact assessment has been completed for elements outside of these corridors.

3.12.3 Archaeological Resources

The archaeological study area for the background and literature review was a 1.25-mile radius from the project. This radius is mandated by NHDHR and allows for the development of a more comprehensive picture of the level of archaeological sensitivity in the area.

The NHDHR archaeological site files contain information on 25 archaeological sites within the study radius. Of these, one site (27-CH-67) lies between Alternatives 2 and 3 just south of Tyler Hill Road on the west terrace of the Contoocook River. Three sites, all Pre-Contact Native American, are within ¼ mile of the Project. These four sites are summarized in the table in **Appendix B**.

The previously reported sites are all located in immediate proximity to existing water sources. Prior work in the area by Nicholas (1979) and Kenyon (1980) suggests that surface conditions, however, may not accurately reflect Pre-Contact period topography. Nicholas (1979) recommended seven areas for additional work based on the current setting. Kenyon (1980) subsequently tested six of the seven and found that subsurface conditions did not reflect the implied setting at five of the locations. The sixth was determined to be archaeologically sensitive based on soil type rather than setting. The seventh location was not examined because it was outside of revised project boundaries.

Kenyon (1980) also completed site boundary definition at the Tyler Hill Site. She recommended that a proposed sewer project avoid the site area by at least 25 feet. Though she recommended avoidance, in general the site testing revealed low artifact densities and suggested that deeply buried deposits were unlikely on this terrace setting.

No other work has been completed on the terraces in the Jaffrey vicinity. It is unknown if deeply buried deposits might be expected. However, the 1898 and 1949 Monadnock 15-minute USGS maps of the Project illustrate wide floodplains and 1st terraces along the Contoocook River south of Main Street. This suggests a strong possibility for buried levels assuming storm events like the 1938 hurricane have not periodically scoured the valley.

3.12.3 Regulatory Process

3.12.3.1 Local Regulations

Certified Local Government

The Town of Jaffrey is registered with the NHDHR as a Certified Local Government (CLG). As defined by NHDHR, a town's CLG "must create a local historic district commission or heritage commission, conduct a local historical resources survey, enforce state and local historic preservation legislation (which includes establishing a local historic district and adequate regulations for enforcing the district ordinance), and provide for public participation in the local historic preservation program. CLGs are responsible for reviewing National Register nominations for all properties within their communities, and are eligible for federal matching grants from a special "pass-through" fund set aside for the exclusive use of CLGs.

Jaffrey Master Plan

The Jaffrey Master Plan was originally completed in 1997 and it was updated in 2007. The Master Plan has an overview chapter (pages 89-102) and an associated appendix which provides background to various items called out in the main text. At the time of the update, a consultant, Elizabeth Durfee-Hangen, was working on a town-wide Historic Preservation Plan. This plan is not on file at NHDHR. However, the 2007 Master Plan lists goals for historic preservation in the Town and these include, among others: stone wall and historic road preservation; development of guidance for historic dwelling conversion to commercial use; identify historic archaeological sites; and protect scenic and cultural vistas.

3.12.3.2 State Regulations

RSA 227-C

The Project may require permits or consider funding from New Hampshire state agencies, and therefore may be subject to compliance with RSA 227-C:9, Directive for Cooperation in the Protection of Historic Resources.

RSA 227-C requires the completion of a cultural resources assessment of the Project if so directed by NHDNR. Thus, the first step in the review process for cultural resources assessment is to provide NHDHR with Project particulars including mapping and pictures. NHDHR may determine that no additional cultural resources work is required in the Project and that conclusion concludes the cultural resources work. The NHDHR, however, may determine that some level of work is needed. In

this case, the NHDHR guidelines for the completion of Phase IA, Phase IB, or subsequent advanced stages of study are followed.

Stone Walls

Stone walls are evaluated when adjacent to scenic byways. Other State of New Hampshire laws also require consideration of stone walls. The most commonly cited of these is RSA 472:6 which is focused on boundary markers. Under this regulation, a stone wall which serves as a boundary marker cannot be removed unless there is mutual agreement between the landowners, authorization by government officials in order to replace the boundary, an adjudicated court order or decree, or a law which allows for the movement or alteration.

On the Town level, some jurisdictions have stone wall ordinances. The Town of Jaffrey, as of 2007, was developing stone wall guidance.

3.12.3.3 Federal Regulations

Section 106 of the National Historic Preservation Act (NHPA), as amended

If the Project has any federal involvement, such as permits (Army Corps of Engineer [ACOE] permits, for example), funding, or licenses, then the Project will need to be reviewed for its effects on historic properties as required by Section 106. Section 106 of the NHPA requires federal agencies (such as the ACOE) to take the effects of their involvement on historic properties. The review process is a multi-step sequential process (identification and evaluation of historic properties, determination of project effects to historic properties, mitigation) requiring consultation between NHDHR, the federal agency, the Jaffrey Historical Commission (for the CLG), and any other parties who have a direct interest in the historic property (called consulting parties).

The review process is similar to the state review process. The first step in the Section 106 process is to determine if there is a federal undertaking that may affect historic properties. Again, this review is only triggered if federal funds, licenses, or permits are involved in the Project. If there is a federal undertaking, then historic properties within the Project area need to be identified and evaluated for their significance that are officially deemed historic (those listed in or formally determined eligible for the National Register of Historic Places), followed by the identification and evaluation of effects to the historic properties. If an adverse effect is concurred upon by all parties (federal agency, NHDHR, the CLG, and consulting parties), then mitigation of the adverse effect is determined and memorialized in a Memorandum of Agreement.



Section 4(f) of the US Department of Transportation (DOT) Act of 1966

Section 4(f) prohibits the use of funds for Projects that will take land from or substantially impair the historic qualities of an historic property unless there is no prudent and feasible alternative. Further, the agency must clearly demonstrate that it has done everything possible to minimize the harm to the property. Finally, Section 4(f) considers all cultural resources and traditional cultural properties that might be eligible to or already listed on the National Register of Historic Places. Thus, identification surveys and the evaluation of all resources identified must be completed to ensure that all eligible properties have been considered.

Historic Landmarks

The National Park Service National Historic Landmarks survey (www.cr.nps.gov/nhl) lists one landmark in Cheshire County: the Harrisville Historic District. The district was initially listed in 1971 (NRHP #71000072) and it was elevated to National Historic Landmark status in 1977. The NHL is located about 12.3 miles north/northwest of Jaffrey. The landmark encompasses about 200 acres and multiple buildings including the entire historic mill complex of the town. The State of New Hampshire does not maintain a State Landmark listing.

Historic Markers

The State of New Hampshire, Division of Historical Resources (NHDHR) maintains a list of state Historical Markers. A single marker is located in the Town of Jaffrey. Designed Marker 13, it commemorates Hannah Davis and Amos Fortune. The marker is located in Jaffrey Center, about two miles west of the Project.

Scenic Byways

Both the federal and state governments have established scenic byway programs. Scenic byway designations are important in New Hampshire as such designations trigger stone wall preservation guidelines for state and federal highways. The federal program is designated the National Scenic Byways Program (www.byways.org). Three scenic byways are designated in New Hampshire. These are the Connecticut River Byway, shared with Vermont; the Kancamagus Scenic Byway; and the White Mountain Trail. None of the byways cross through Jaffrey. The New Hampshire Scenic and Cultural Byways program is mandated under RSA 238:19-23 (www.nh.gov/oep/programs/SCBP). In the Monadnock Region, there are three designated byways: Currier & Ives Trail; Lake Sunapee Scenic & Cultural Byway; and River Heritage Trail. None of these pass through Jaffrey.

3.12.4 Interim Conclusions and Next Steps

The three Project alternatives impact the NRHP District. If these alternatives, or any future alternatives within the District, require the removal of any buildings and/or widening of existing roads, such actions will be considered an adverse effect. In addition, if DOT funds are used in the project, Section 4(f) will be triggered. In this case, the Project proponent will be obligated to show that the chosen alternative is the most prudent and feasible of alternatives under consideration.

With these conclusions in mind, three initial steps are needed if the project advances:

1. A walkover of the Project alternatives is warranted to accurately determine the number and identity of buildings and structures that would be affected by the three alternatives and the current condition of the contributing buildings in the study corridors.
2. Consultation with the Town of Jaffrey Historical Commission should begin to determine the status of the various programs that they have instituted and to determine if the Historic Preservation Plan for the Town has been finalized.
3. The final initial step should be the submission of the Request for Project Review to NHDHR. This form provides the basis for the initiation of consultation with the State Historic Preservation Office.

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