

US Route 3 Corridor Study



Towns of Pembroke,
Allenstown, & Hooksett,
New Hampshire

January 18, 2008



US Route 3 Corridor Study: Pembroke, Allenstown and Hooksett, NH



For the Towns of Pembroke,
Allenstown and Hooksett and the
NH Department of Transportation

Prepared by:

- Local Advisory Working Group
- Central NH Regional Planning Commission
- Southern NH Planning Commission

With funding from: NH Department of Transportation
Southern N.H Planning Commission
Central N.H Regional Planning Commission
Town of Allenstown



Acknowledgements

This Study was made possible through funding provided by the NH Department of Transportation as part of the State Planning and Research – Special Studies Program. Representatives from the NH Office of Energy and Planning, the Federal Highway Administration, and the NH Department of Transportation were involved in the selection of this project from a pool of potential projects statewide. A great deal of support was given for this project by the Towns of Pembroke, Allenstown, and Hooksett, and the various municipal departments within each community as well as from state and county agencies. The project would not have been possible without the dedicated local volunteers comprising the Local Advisory Working Group.

Local Advisory Working Group Members

- Nicholas Alexander, NHDOT
- Jo Ann Duffy, Town Planner, Hooksett
- Kevin Foss, Pembroke Planning Board
- Jeffrey Gryval, GE Infra, Aviation, US
- Dale Haneon, Highway Director, Hooksett
- Steve Henninger, Assistant City Planner, Concord
- Richard Marshall, Chairman of the Planning Board, Hooksett
- Michael Skelton, Manchester Chamber of Commerce
- Sandrine Thibault, New Hampshire Office of Energy and Planning
- James A. Rodger, Allenstown Planning Board

Contributing Regional Planning Commission Staff

Sharon Wason, AICP, Executive Director, CNHRPC
Timothy H. White, AICP, Senior Transportation Planner, SNHPC
Stephanie Alexander, Principal Planner, CNHRPC
Rodrigo J. Marion, Transportation Planner, CNHRPC
Nicholas Alexander, Program Specialist Planning & Community Assistance, NH Department of Transportation
Jihong "Julie" Chen, Transportation Planner/Engineer, SNHPC
Matthew P. Caron, Transportation Planner, SNHPC
Jon Y. Ding, Regional Planner/GIS Analyst, CNHRPC
Craig Tufts, Regional Transportation GIS Planner, CNHRPC
Heather Rood, Office Administrator, CNHRPC
Ian Thomas, Assistant Planner, CNHRPC
Emily Norton, Planning Intern, CNHRPC

Table of Contents

ACKNOWLEDGEMENTS	1
TABLE OF CONTENTS	2
EXECUTIVE SUMMARY	5
INTRODUCTION	7
GENERAL RECOMMENDATIONS.....	9
CORRIDOR SPECIFIC RECOMMENDATIONS.....	10
US ROUTE 3: PEMBROKE.....	10
US ROUTE 3: ALLENSTOWN	12
US ROUTE 3: HOOKSETT	13
LAND USE AND AESTHETICS	15
NODAL DEVELOPMENT ENCOURAGED	15
MIXED USE ZONING ENCOURAGED.....	16
COMPACT DEVELOPMENT FORM	17
LAND USE CONSIDERATIONS FOR THE US ROUTE 3 CORRIDOR.....	18
AESTHETIC CONSIDERATIONS FOR THE US ROUTE 3 CORRIDOR.....	20
PEMBROKE SUMMARY.....	21
LAND USE SUMMARY.....	21
AESTHETICS SUMMARY	21
PUBLIC INPUT.....	21
MASTER PLAN, 2004	21
ZONING DISTRICTS	23
FUTURE DEVELOPMENT	24
ALLENSTOWN SUMMARY	27

LAND USE SUMMARY 27
AESTHETICS SUMMARY 27
PUBLIC INPUT 27
MASTER PLAN, 2003 27
ZONING DISTRICTS 29
FUTURE DEVELOPMENTS 30

HOOKSETT SUMMARY 33

LAND USE SUMMARY 33
AESTHETICS SUMMARY 33
PUBLIC INPUT 33
MASTER PLAN, 2004 33
ZONING DISTRICTS 35
FUTURE DEVELOPMENT 37

SAFETY ANALYSIS 42

PEDESTRIAN AND BICYCLE ACCOMMODATIONS 46

PEDESTRIAN ACCOMMODATION INDEX 47
BICYCLE LEVEL OF SERVICE (BLOS) 48

ACCESS POINT INVENTORY 49

ACCESS MANAGEMENT 50

ACCESS MANAGEMENT ANALYSIS 52

ALLENSTOWN EXISTING CONDITIONS 52
PROPOSED CHANGES 53
HOOKSETT EXISTING CONDITIONS 55
PROPOSED CHANGES 56

COMMUTING ALONG THE CORRIDOR..... 57

PEMBROKE 57
ALLENSTOWN 58
HOOKSETT 59

TRANSIT OPPORTUNITIES 60

MANCHESTER TRANSIT AUTHORITY (MTA) 60
COMMUNITY ACTION PROGRAM (CAP) OF BELKNAP-MERRIMACK COUNTY 60

CONCORD AREA TRANSIT (CAT)..... 61

TRAFFIC INFORMATION & ANALYSIS 62

TRAFFIC VOLUMES AND CAPACITIES 63

 VEHICLE CLASSIFICATIONS 63

 TRAFFIC PROJECTIONS 65

 INTERSECTION OPERATIONS 67

TRAFFIC CALMING..... 72

 WHAT IS TRAFFIC CALMING?..... 72

 ROUNDBOUT DESIGNS 73

CONCLUSION 74

APPENDIX A: INTERSECTION PEDESTRIAN ACCOMMODATION SCORE INDEX..... 75

APPENDIX B: BICYCLE LEVEL OF SERVICE..... 76

APPENDIX C: TURN COUNT DATA FOR PEMBROKE AND ALLENSTOWN..... 76

APPENDIX C: TURN COUNT DATA FOR PEMBROKE AND ALLENSTOWN..... 77

APPENDIX D: TURN COUNT DATA FOR HOOKSETT..... 79

Executive Summary

This Study was initiated by the Central New Hampshire Regional Planning Commission (CNHRPC) and the Southern New Hampshire Planning Commission (SNHPC) to use State Planning and Research (SPR) funding to conduct a detailed corridor study along the section of US Route 3 from the Manchester city line to the Concord city line.

The overall approach of the Study was to review the existing corridor from a traffic and safety standpoint as well as from the aspect of access management and local regulations. Goals of the Study included:

- Examine the existing town regulations, zoning, fee schedules, and tax parcel information;
- Examine the existing access management;
- Evaluate traffic operations and driveway access points;
- Analyze accident data and locations;
- Evaluate bicycle and pedestrian capability in the corridor;
- Evaluate corridor aesthetics;
- Produce detailed recommendations based on all of the above criteria and public input; and
- Work with town officials to develop a scheme for implementing the recommendations.

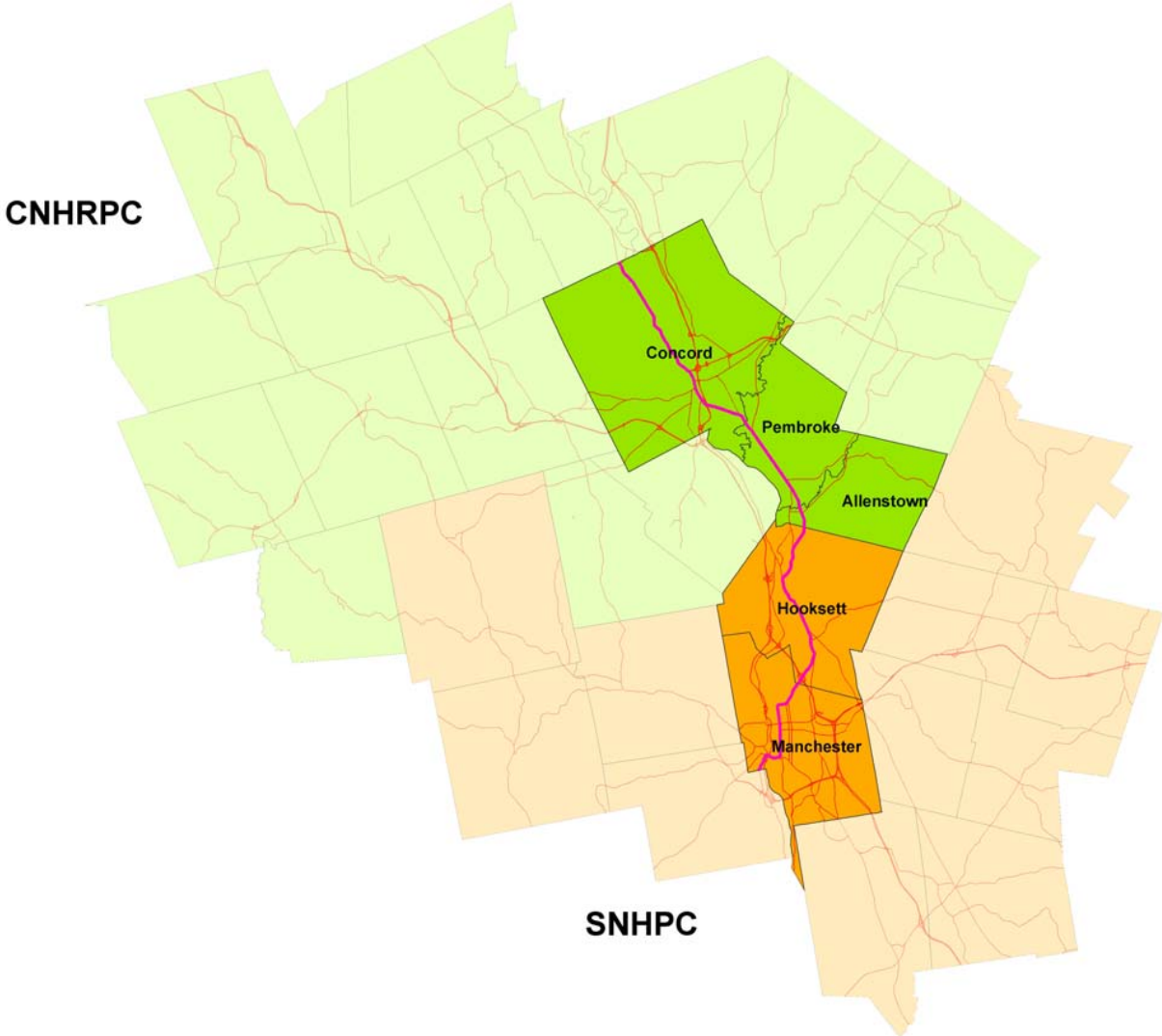
A Local Advisory Working Group (LAWG) was created comprised of representatives from several different municipal boards, committees, and departments. The Committee provided input and feedback to CNHRPC and SNHPC staff at regularly scheduled LAWG meetings throughout the Study.

Early work on the Study focused primarily on collecting basic traffic data, including traffic counts, classification counts, turning movement counts, and accident data. The background data collected as part of this Study is available in a separate appendix.

After collecting the traffic information, the study team began to explore the land use and regulatory aspects of the corridor. The Towns' zoning, subdivision, and Site Plan Review regulations were examined. In discussing this information and the traffic data with the LAWG, it became apparent that the issues facing the corridor dealt with land use, local regulations and transportation.

Many possible solutions and improvements were discussed with the LAWG over the course of the Study. The final recommendations were narrowed down to seven general recommendations and twenty three corridor specific recommendations.

Map 1: Study Corridor – Pembroke, Allenstown & Hooksett



Introduction

The US Route 3 corridor through Pembroke, Allenstown and Hooksett serves a number of functions for travelers and for each community. For Pembroke, US Route 3 serves as the primary road to connect the Town to any major state highway. The land use of US Route 3 in Pembroke is mostly residential with multiple driveway access points along the road. The Town should consider developing a comprehensive economic development plan that includes traffic and transportation needs and impacts. Further, the ability to reconstruct or reconfigure portions of Rte. 3 in Pembroke is constrained by historic development patterns, particularly several historic homes and the town cemetery. For Allenstown, the US Route 3 corridor principally serves local functions similar to a “Business District,” and is used by residents to access their basic needs including work, home, shopping, services, and recreation. For travelers originating in the Hooksett area, US Route 3 is largely viewed as a principal commercial/commuter corridor to access I-93 at Exit 9, and points south.

Much of the corridor in the three communities is heavily developed by residential and commercial uses. Traffic volumes along the corridor range from approximately 9,500 vehicles to 22,400 vehicles per day. While the physical characteristics (road width, shoulders, etc.) of the corridor are largely consistent, land use patterns within the corridor vary greatly from Pembroke, Allenstown and Hooksett, as do the needs of commuters, truckers, tourists, residents, and other users of US Route 3.

In Concord, the land use development is more urbanized, with multiple adjacent commercial and business developments. This section of the US Route 3 Corridor, known locally as Manchester Street, is planned to be expanded from a three lane road to a five lane road. This segment of the road is an important part of Concord’s current and future access for cargo transport, and a better connection to the Concord Airport is of key importance. As Manchester St. continues north, adjacent land becomes increasingly urbanized with dense commercial and residential land use and the road transitions to a more pedestrian friendly local Main Street in downtown Concord. As US Route 3 leaves the City of Concord to the south, the corridor becomes less developed with fewer commercial and industrial buildings and a travel speed posted at 35 miles per hour.

As US Route 3 continues south from Concord, land use transitions to sparse residential development. The three major institutional uses along the Pembroke section of the US Route 3 Corridor are Pembroke Town Hall, the Fire Station and Pembroke Academy. The main concern from local representatives and residents is the need for an alternative, parallel road to alleviate traffic congestion that would also help with emergency needs.



Photo 1: This is a photograph of US Route 3 in Hooksett. This segment of the roadway has light industrial and commercial development.



Photo 2: This photograph shows US Route 3 as it enters Allenstown’s commercial district from Hooksett. The presence of a pedestrian walking in the shoulder demonstrates the need of sidewalks at this particular portion of the corridor.

In Allenstown, the road begins to assume a more local-scale business district character. Along this section, known locally as Allenstown Road, land use is mainly commercial with posted speeds of 35 MPH. This portion of the corridor was examined in the recent public and Working Group meetings that resulted in recommendations directed towards improving pedestrian safety. Allenstown Elementary School is in close proximity to the US Route 3 Corridor, thus there is strong demand for pedestrian and bicycle infrastructure for children living on both sides of the corridor that walk or bike to school. Changing the land use designation from Industrial and Commercial to Mixed Use in this portion of the corridor would likely generate more social activity, which is something that Allenstown residents are willing to have in this area. The proximity of Bear Brook State Park and the importance of its role for Allenstown’s economic development were discussed at the meetings. The Town of Allenstown views the corridor as a vital economic link to Bear Brook State Park and northern location. The efficient flow of transportation as well as sustainable development along US Route 3 will help ensure the community’s future economic viability.

The characteristics of US Route 3 in the Southern section of Hooksett are primarily industrial and commercial. Some inputs from the public meetings were to improve driveway access points and street landscape in this portion of the corridor in order to make it more accessible and attractive for residents to visit. Additionally, connections to I-93 at Exit 11 and use of the Hackett Hill Road park-and-ride facility are not obvious from US Route 3 presently. The middle to the northern portion of the corridor in Hooksett is largely residential and open green space, though new housing developments are proposed for this portion of the corridor which will have significant implications for traffic patterns. This topic is discussed in more detail later in the Study.

The need to thoroughly examine this corridor and to bring the communities together to discuss various issues surrounding the future of the corridor could not be more timely, as several projects within this corridor are currently being considered and discussed. These projects include the new residential developments in northern Hooksett, the proposed alterations to US Route 3/Pembroke Hill Road/Bow Lane, and the expansion of Route 3/Manchester Street in Concord. The three communities face increasing development activity: Pembroke and Allenstown’s residential base is growing and Hooksett’s industrial and commercial development is increasing.

This US Route 3 Corridor Study Report will document the findings and recommendations of the Study in the following section. The data collected as part of this Study is available in a separate appendix.



Photo 3: This is a photograph of US Route 3 as it enters Pembroke. This segment of the corridor is a combination of light commercial, residential, and rural uses.



Photo 4: This photograph shows Allenstown’s commercial district, comprised of a grocery store, a Dunkin Donuts, Family Dollar, and a gas station as well as several other shops.

General Recommendations

- The Towns of Pembroke and Allenstown should continue to explore the possibilities for an expansion of Concord Area Transit (CAT) Service into their region. The Town of Hooksett should explore opportunities to expand the Manchester Transit Authority (MTA) public transit service in Hooksett. In the future, it is possible that CAT and MTA could provide services that link along the corridor, providing transit access from Manchester to Concord via the US Route 3 Corridor.
- The Towns of Pembroke, Allenstown, and Hooksett should work with both regional planning commissions and the NH Department of Transportation to be informed about possible funding opportunities for the Safe Routes to School Program through a Federal-Aid program of the U.S. Department of Transportation's Federal Highway Administration (FHWA). The program is developed to create safe, accountable, flexible and efficient walking and bicycling conditions for children living close to school.
- The three Towns should continue to review their zoning ordinances for to help ensure any new development not detrimental to the surrounding area and land uses. As part of each community's review, they should consider what the neighboring community has zoned for in abutting areas. They should explore the creation of a US Route 3 Mixed Use Corridor Zone that could be adopted by Allenstown and Hooksett to encourage uniform and harmonious development between the southern section of Hooksett and the Allenstown segment.
- The Towns of Pembroke, Allenstown, and Hooksett should review and amend their land use regulations (e.g., Subdivision and Site Plan Review) to encourage harmonious improvements along the undeveloped portions of the US Route 3 Corridor. Each community should review and adopt new regulations, specifically including access management, parking, landscaping, signage and lighting.
- The communities should continue to review permits for driveway access on town controlled roads and should adopt a standard procedure to review existing driveways when they come before the Planning Board for any changes of use. The communities should continue to work with the NH Department of Transportation Highway Districts and the Planning Commissions to review site plans, subdivisions and driveway permits on state-controlled roads.
- The three Towns, working with the NH Department of Transportation, should evaluate the feasibility of installing adequate directional signage along US Route 3, which guides traffic to Interstate 93 by way of Exit 11.
- Improve vehicular intersection safety capacity in locations that show level of service near failure and with high number of crashes.

Corridor Specific Recommendations

US Route 3: Pembroke

Summary

In the Town of Pembroke, US Route 3 travels through the most densely populated area of Town and serves as the primary north-south and east-west route. Over time, many residential developments have been constructed with their sole access onto US Route 3, causing delays and congestion at the intersecting streets. No parallel Class V Roads exist on either side of US Route 3, forcing all traffic from the local roads to utilize the State route. Recently, the NH Department of Transportation examined the intersection of Pembroke Hill Road with US Route 3 for the possible implementation of a roundabout. When people were asked about the roundabout project in the public workshop, those who live closer to the proposed intersection favored it while those who live farther away were opposed, stating that it would slow traffic even more. In addition, there is a high demand for pedestrian crossing on US Route 3, particularly for residents living on the west side of the corridor between Donna Drive and Bow Lane.

Recommendations

*Key agencies & municipalities required for each recommendation are in { }

- Consider opening a parallel access road (Third Range Road/Fourth Range Road) that would contribute to alleviating the existing traffic congestion on US Route 3 as well as providing alternative roadways for emergency access and evacuation purposes.
{Town of Pembroke, Local Residents & NHDOT}
- Revise the existing US Route 3/Pembroke Hill Road/Bow Lane Intersection Study through the Context Sensitive Solution (CSS) process to identify the most feasible proposal.
{Town of Pembroke, NHDOT & CNHRPC}
- Continue to support the development of safe pedestrian facilities in and around US Route 3. Due to the high demand for pedestrian crossing on US Route 3 between Donna Drive and Bow Lane, developing an adequate crosswalk at this location is necessary. An alternative solution would be developing a parallel sidewalk that is linked to the nearest crosswalks.
{Town of Pembroke & NHDOT}
- Review the Table of Uses in the zoning ordinance to ensure that the high traffic generators remain in the appropriate districts of Commercial/Light Industrial and the Limited Office district while retaining the character of the Residential district and making changes as appropriate to the Ordinance.
{CNHRPC, Town of Pembroke}
- Develop a guidance document to encourage new non-residential development to construct consistent and attractive signage, illustrating the location, type, size and materials, in accordance with the Zoning Ordinance and Site Plan Review Regulations.
{CNHRPC, Town of Pembroke}

- Study the use of the existing Class VI roads for alternative transportation such as emergency vehicles or recreational opportunities.
{Town of Pembroke & CNHRPC }
- Study the feasibility of a demand-triggered stop light at the Town Hall/library to allow users to exit more easily. This enhancement will improve the traffic flow between the existing traffic lights at the northern and southern portions of town as well as potentially moderating the travel speeds along the corridor.
{Town of Pembroke, NHDOT & CNHRPC }

- US Route 3: Allenstown

Summary

The Allenstown portion of the corridor, though the shortest, has ample opportunity for new commercial development and redevelopment. For Allenstown, US Route 3 serves as the sole connection for the southern half of Town to travel to Concord and for the majority of the Town to access Hooksett and Manchester. Traffic volumes have increased steadily at locations north of NH Route 28. US Route 3 also separates the traditional village area near Suncook from the rest of the community. Due to the mix of residential and commercial uses in the surrounding areas of the corridor, pedestrian safety is of particular interest for the Town. The northern portion of this corridor is currently being reconstructed and resurfaced as part of the construction of a new double decker bridge over the Suncook River.

Recommendations

*Key agencies & municipalities required for each recommendation are in {}

- Develop a continuous sidewalk network with adequate crosswalks on both Allenstown Road and Granite Street. Pedestrian improvements would benefit local residents by connecting the commercial area of the corridor and would encourage children to walk or bike to school from the west side of US Route 3.
{Town of Allenstown, local businesses, NHDOT & CNHRPC}
- Reduce the width and number of curb cuts in the commercial district.
{Town of Allenstown & NHDOT}
- Improve intersection design for heavy vehicle turns at the Granite Street/US Route 3 intersection.
{NHDOT}
- Add a multifamily mixed used provision as a special exception in the Business District to encourage the creation and enhancement of a walkable community in the US Route 3 area.
{CNHRPC & Town of Allenstown}
- Develop landscaping requirements and standards within the Zoning Ordinance and site plan regulations to address parking, streetscapes, buffers, etc. along US Route 3. These provisions could be retroactively applied when applications for changes of use or amended site plans come before the Planning Board.
{Town of Allenstown & CNHRPC}
- Implement bicycle connectivity from the village district to Bear Brook State Park through US Route 3. Shared-use paths can provide both recreation and transportation alternative routes through natural environments and urban areas.
{Town of Allenstown, CNHRPC & NHDOT}
- Revise the parking requirements in the Zoning Ordinance to reduce the number of minimum required parking spaces. Encourage shared parking for other purposes.
{CNHRPC, Town of Allenstown & NHDOT}

US Route 3: Hooksett

Summary

The Hooksett portion of the US Route 3 corridor extends for 7.6 miles, from the Manchester City line in the south to the Allenstown Town line in the north. Of the primary north-south routes in Hooksett, the US Route 3 corridor serves the highest concentration of development in the Town. Numerous sections of the corridor in Hooksett have average annual daily traffic volumes of over 20,000 vehicles per day, and the segment at Granite State Marketplace sees roughly 36,000 vehicles each day in the summer. The corridor experiences significant peak hour delays and congestion, particularly south of the Granite State Marketplace. Access points throughout the southern section are numerous and detract from the safe and efficient flow of traffic. Based on a review of the accident data, there is a need to evaluate certain areas within this section for the placement of adequate signage.

Recommendations

*Key agencies & municipalities required for each recommendation are in { }

- Review the parking standards to ensure that the number of required spaces per type of use is not too high and amend the Development Regulations as necessary.
{ Town of Hooksett }
- Work with the NHDOT and SNHPC to consider the potential use of impact fees for improvements to State roads.
{ NHDOT, SNHPC & Town of Hooksett }
- Develop access management provisions for the Development Regulations for the commercial area outside of the US Route 3 Performance District to encourage primary access on adjacent streets for new developments and to require connectivity between adjacent parking lots.
{ NHDOT & Town of Hooksett }
- Address the issue of excessive vehicular speeds, particularly on the northern portion of the corridor.
{ NHDOT, SNHPC & Town of Hooksett }
- Continue to investigate expansion of the US Route 3 Corridor Performance Zoning District to other portions of the corridor.
{ Town of Hooksett }
- Continue development of the Town-Wide Traffic Study as a means to address existing and future traffic issues on the corridor.
{ Town of Hooksett & SNHPC }
- Reduce the size, number, and height of standing signs in the Commercial, Industrial and Multi-Use districts in the Zoning Ordinance to encouraged consistency. For amended Site Plan Review applications, provide incentives to replace existing non-conforming signage as part of the project.
{ SNHPC & Town of Hooksett }

- Adopt additional lighting ordinance provisions which provide uniform control over the types of lighting (lumens, height, pole design, etc) that may be used along the corridor after carefully reviewing the Development Regulations and Zoning Ordinance. Consider adopting the Innovative land use techniques model ordinance for light pollution.
{SNHPC & Town of Hooksett}
- Implement sidewalks on the northern residential portion of US Route 3.
{SNHPC, NHDOT & Residential Developers}

Land Use and Aesthetics

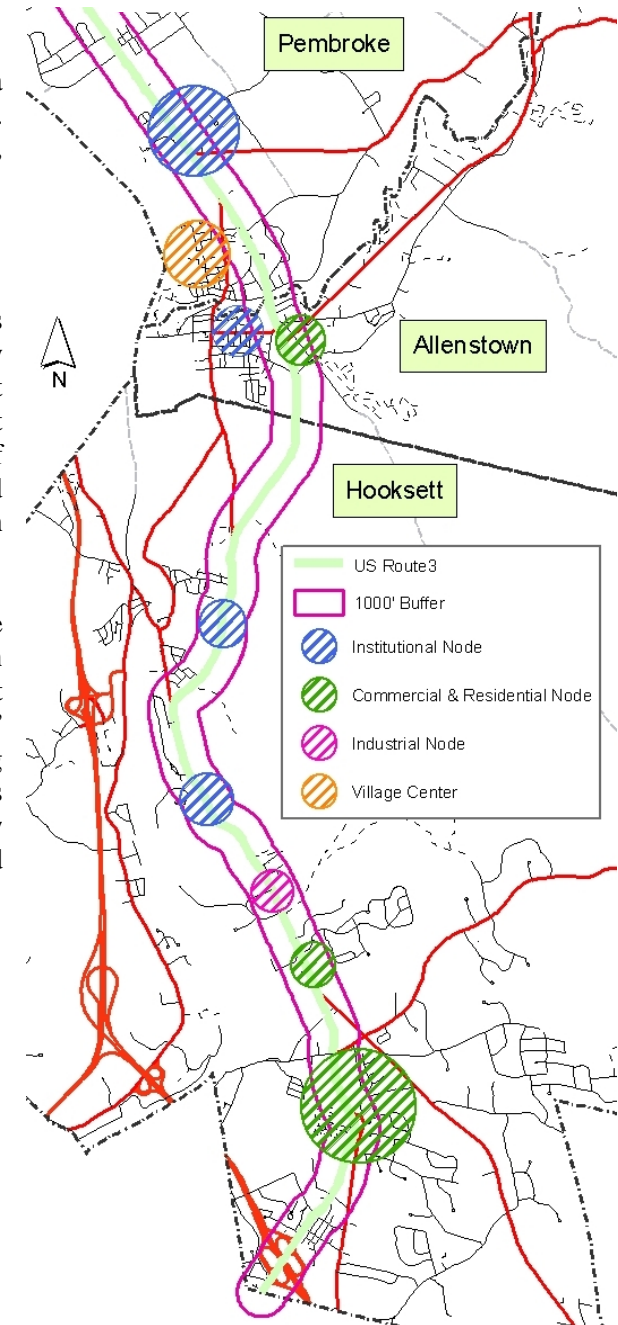
Land use and aesthetics preside over an important role in defining the character of a community. They can also directly impact how well a transportation corridor functions. Interestingly, these are two areas where a community has a significant amount of influence, both through local regulations and the local review process.

Nodal Development Encouraged

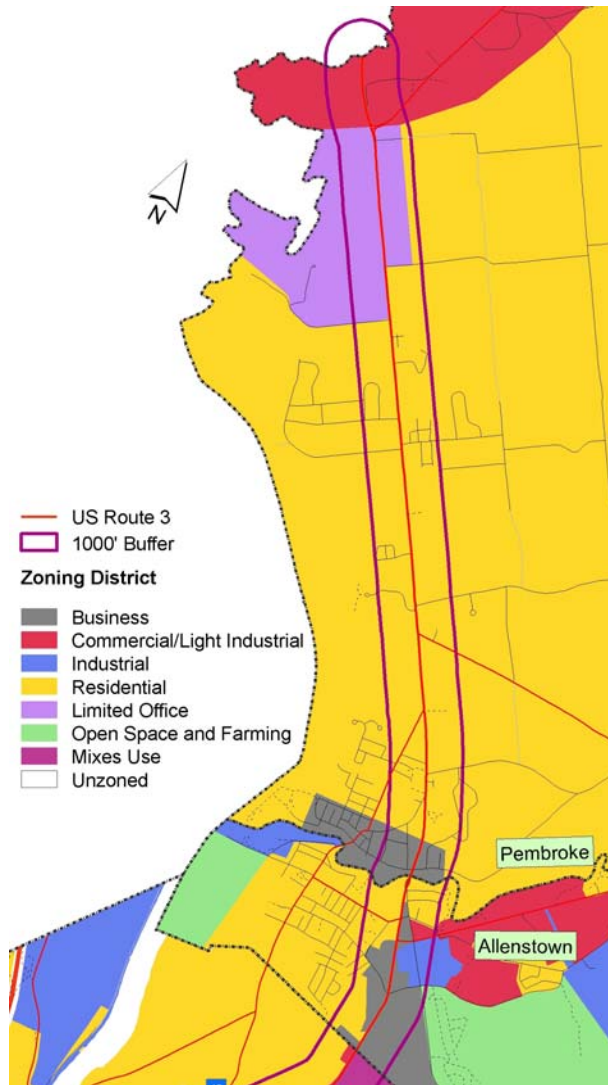
Under traditional zoning, commercial zones were placed along the busiest roadways and as such, have promoted an era of “strip” commercial development where businesses line a busy street, often for miles, such as what is found in southern Hooksett. This type of development has an enormous impact on the road where it occurred as every new shopping plaza has at least one driveway and every individual store has an access point. With the magnitude of traffic entering and exiting commercial establishments at each access point, the original road becomes severely congested. Many communities have been trying to build a way out of such “strip” commercial zones with everything from bypasses to dividing the road.

The focus of nodal development is to create “nodes” where commercial and even mixed use development could be concentrated. This existing development patten found in northern Pembroke and in southern Allenstown follow this model. This dense type of development allows driveways and access roads to be shared much more easily than under “strip” development. The density of development also provides additional opportunities for walking between commercial establishments. These two features benefit the road by eliminating access points and vehicles. Undoubtedly there is still congestion at a node, but traffic is able to flow much more freely from one node to the next instead of the continuous congestion observed under “strip” conditions.

Map 2: Nodal Development



Map 3: Zoning Map Pembroke and Allenstown

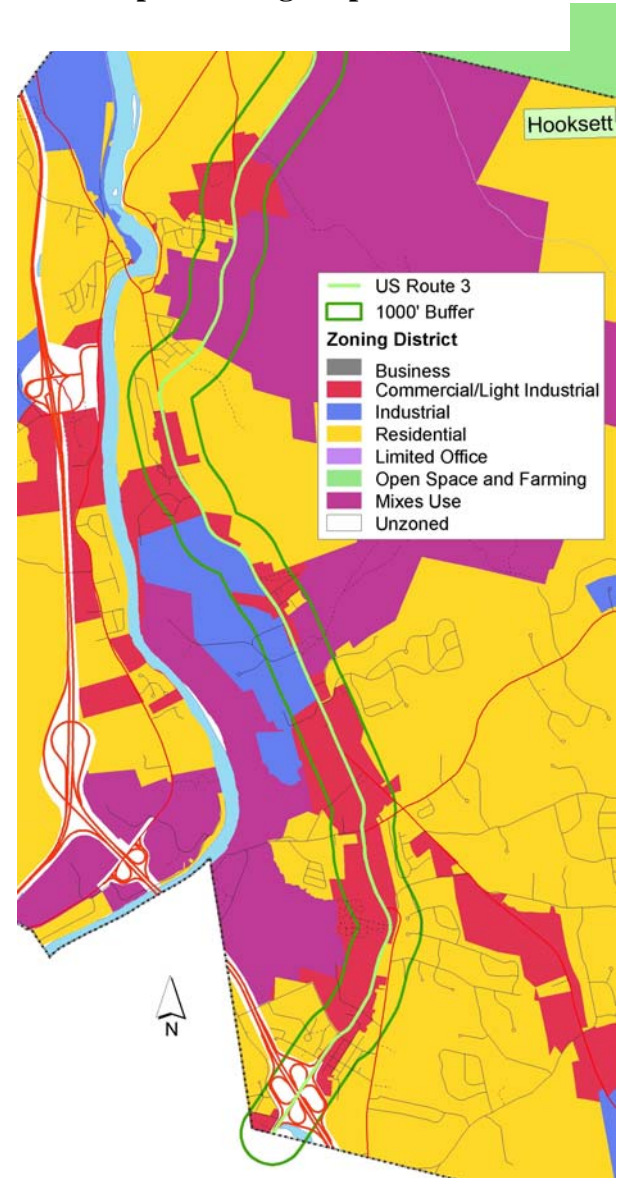


Mixed Use Zoning Encouraged

Mixed use zoning encourages and allows more than a single category of use to be developed on a single parcel or within an area of a community, such as downtown. Many traditional New England towns historically have contained just such a mixture of uses in their urban centers. This mix of land uses created an environment where the number of vehicle trips was reduced by allowing residents to bike and walk to access their needs and wants. The same effect can be created by locating numerous designations within a comfortable walking district of public parking areas. One of the advantages of having a mixed use area is the atmosphere of liveliness and activity that is often present.

Mixed use zoning can encourage the vertical mixing of uses (within the same structure), the horizontal mixing of uses (throughout an area), or both. Communities should be careful to ensure that compatible uses are permitted in a zone that allows mixed uses. For mixed use zoning to be effective, many communities have found the need to offer incentives to developers. Such incentives might include density bonuses and decreased requirements for off-street parking. Some communities, such as Hooksett, have gone as far as mandating mixed use development in certain districts in Town. Allowing multifamily housing within commercial areas for example, can provide a pedestrian oriented “captive audience” for nearby services and amenities. Additionally, as Pembroke and Allenstown have expressed interest in Concord Area Transit bus service, a mixed use zone, at least in Allenstown, would allow concentrations of population to easily utilize the service.

Map 4: Zoning Map Hooksett



Compact Development Form

As a means of preserving valuable rural land and open space, as well as maximizing use of existing infrastructure resources, many communities are looking toward revising their ordinances and regulations to encourage new development and redevelopment in existing developed areas. Within the US Route 3 Study Corridor, the obvious areas to encourage a more compact development form are in the southern segment of Hooksett and in the southern Allenstown segment. Compact development form can be achieved in a variety of ways, first and foremost by zoning. Techniques utilized within the Zoning Ordinance can ensure and encourage increased densities in the urban areas by allowing smaller lot sizes; reducing frontage requirements; allowing for on-street parking where possible; and allowing for opportunities for shared parking to reduce parking areas and encourage more development and green space.



Photograph 5: This photograph illustrates a successful example of compact village center development in New England. This development was designed to accommodate both pedestrians and vehicles for seasonal events. The physical form of this dense mixed-use center supports “tight,” vertical, compact structures while promoting open space activities and streetscape design. These developments could be constructed as infill developments in town centers or in newly established village center districts that allow for mixed use zoning, walkability, transit and neighborhood connectivity.

Land Use Considerations for the US Route 3 Corridor

Many individual factors are evaluated in assessing local land use. Combined, they provide an accurate representation of the conditions found within the three communities. Provisions within the Site Plan Review Regulations and Zoning Ordinances are discussed within each section. A general analysis is provided, and recommendations for each of the following components are provided after the respective sections.

Public Input and Recommendations

Information obtained through the public process during public meetings held to discuss issues regarding US Route 3, the CTAP Community Assessments, and the recent Master Plans have been considered as a preliminary focus in the analyses.

Land Use Patterns

Utilizing aerial imagery, land use for the corridor was interpreted and then displayed on a map of the three communities. This geographic data layer is the basis for the following interpretations on this generalized land use. These patterns have formed the basis for further discussion within this section.

Zoning Districts

Zoning ordinances are typically revised on an annual or more frequent basis. Each community's zoning has its own purpose, which is clearly stated in the beginning of the document. Permitted uses in the districts along US Route 3 will be examined for potential conflicts.

Parking

The location of parking in relation to the buildings and the driveways onto US Route 3 affects access management, congestion, and overall aesthetics. The number of parking spaces, the materials used in parking lot construction, and landscaping will affect the impervious surface and enhance stormwater management issues.

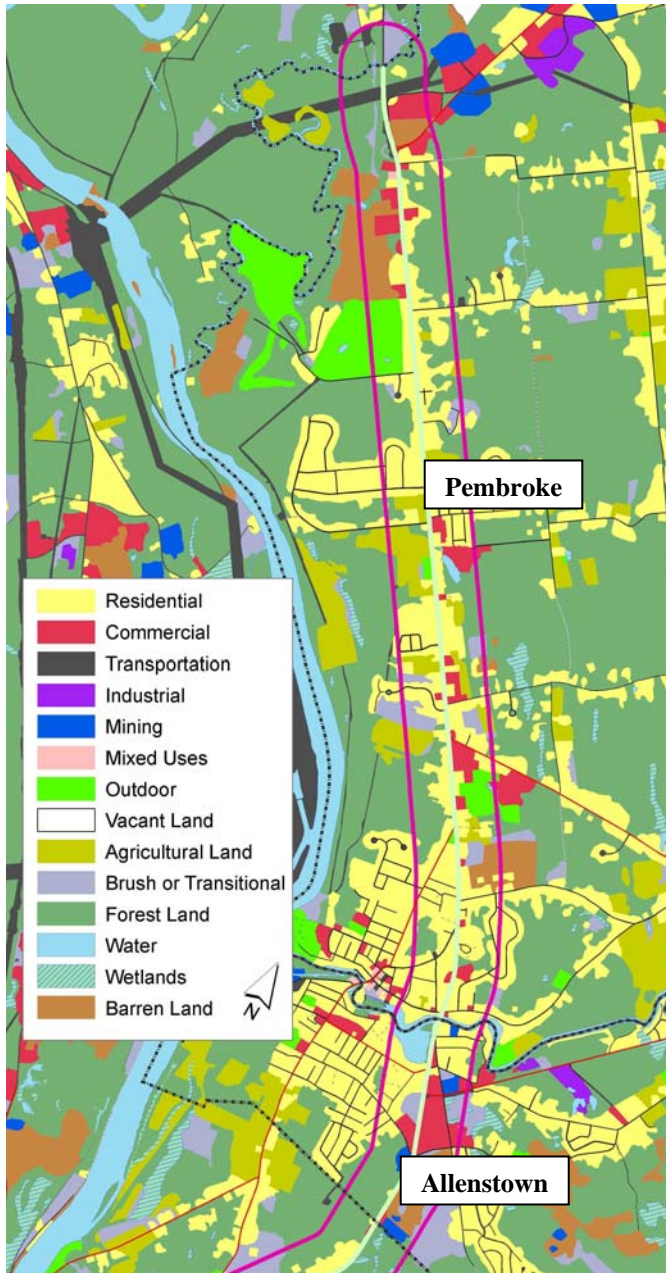
Impervious Surface

The ratio for impervious surface on the building lots will be discussed. A higher rate of impervious surface without proper drainage or green areas will increase stormwater runoff.

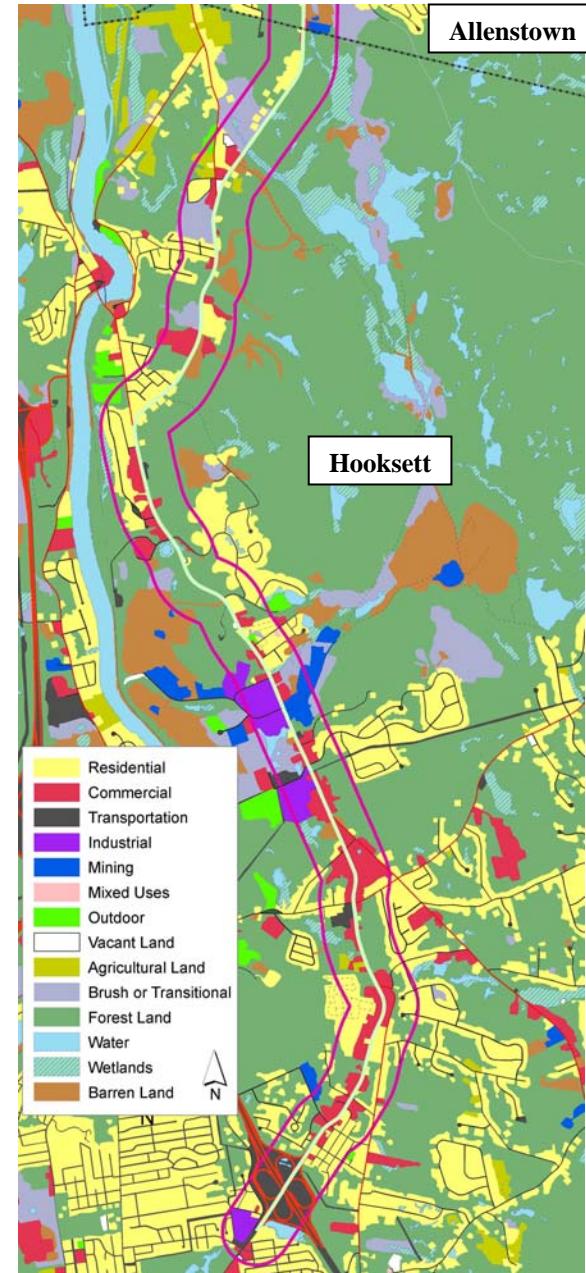
Future Development

The location and types of future development along US Route 3 will provide an overview of the growth of the corridor. Where feasible, recommendations from other sections may be applied prior to granting final approval of the project.

Map 5 - Land Use Map: Pembroke and Allenstown



Map 6 - Land Use Map: Hooksett



Aesthetic Considerations for the US Route 3 Corridor

Aesthetics relate to the “look” and character of an area and are often subjective in nature. Agreeable aesthetics have the ability to enhance residents’ quality of life and visitors’ perceptions, both of which can lead to a stronger local economy. This section considers multiple aspects of aesthetics and relies on the support of the Zoning Ordinance and Site Plan Regulations to examine the existing conditions and discuss issues to consider for the four components listed below.

Signage

When signage is done well, it can contribute to a safer highway for motorists trying to find a destination and can enhance the character of the neighborhood in which they are located. Poor signage, however, can be distracting to motorists, block important sightlines at intersections and driveways, and contribute to the visual blight within an area. Signage in this section of the study will focus primarily on signs related to advertising as opposed to those serving traffic control and safety functions.

Lighting

Lighting can have a tremendous impact on the visual characteristics and traffic safety of the corridor. Light needs to be controlled to prevent glare to motorists, a nuisance to residents, and to curb light pollution. Appropriate lighting is beneficial in terms of vehicular and pedestrian safety and can help create a more appealing environment after dark.

Buffers

Buffering involves separating abutting land uses with landscaping, grassed areas, earth berms, fences, and other similar features to reduce impacts on each other.

Landscaping

Landscaping is an integral part of any building site and of key importance when considering the character of a roadway. Landscaping can help shield less attractive features of physical development from the roadway, such as parking lots and the buildings themselves. This creates a more attractive setting for travelers can also assist in calming the speed of traffic through built-up neighborhoods, and reduce heat island effects of large paved and roof areas.

Pembroke Summary

Land Use Summary

Pembroke is currently comprised of several nodes of more concentrated and non residential developments separated by residential areas. The current layout with the vehicle trip focus on the nodes and residential uses in between is generally considered a good land use scenario. This practice should be continued so limited additional trip generators are added between the nodes. The traffic generators are concentrated at the ends of the corridor in Pembroke. The number of individual lots with driveway access to US Route 3 and development roads with no alternative or parallel route creates a situation of congestion and turning conflicts.

Opportunities for zoning changes are present, including changes to the Suncook Business Overlay, expanding the Architectural Overlay, requiring parking to the side or rear portions of the lot where feasible, developing comprehensive landscaping requirements, and developing impervious surface restrictions.

Opportunities for Site Plan Review regulation changes are also present, including developing comprehensive architectural design standards.

Aesthetics Summary

Pembroke's rural nature in the middle of US Route 3 is attractive, yet landscaping, signage, and lighting is inconsistent. The inconsistency is also found in the commercial area of the US Route 3 intersection with NH Route 106.

Opportunities for addressing these issues include developing specific buffer and lighting requirements, negotiating with developers to enact aesthetic measures during an amended site plan review process, and developing a streetscaping plan.

Public Input

As received during several planning projects undertaken in the last few years is summarized below:

Master Plan, 2004

Community survey results for the Master Plan showed that only 14% of the respondents felt that future residential development should occur in the US Route 3 area. Objectives relevant to land use and aesthetics included to sustain and enhance the opportunities for safe pedestrian activities throughout Pembroke; to use the Existing Land Use, Development Constraints and Transportation maps and other informational materials to examine the existing patterns of business and commercial development throughout the town in order to identify those areas which are most suitable for future commercial use; and to focus business growth along NH Route 106, US Route 3, and in Suncook Village. Some of the specific recommendations developed to meet these objectives included to identify locations for additional crosswalks where warranted (such as at intersection of Dearborn and US Route 3); and to promote commercial activities in those areas of town which have, or will have, access to the municipal water and sewer infrastructure.

CTAP Community Assessments, 2007

Recommendations for land use included to develop a separate plan for Suncook Village. Although Pembroke has access management standards in place, these are currently applied only in the Soucook River District area. Another suggestion was to expand the access management plan. Further recommendations included to expand design guidelines for new commercial development to include the entire Town, not just the Soucook River District; to apply these to all new commercial development; and to develop an economic development plan to identify community assets, address economic development challenges, and devise strategies to enhance the business environment.

US Route 3 Public Input Meetings, 2007

Resident suggestions are dedicated right or left arrows at lights where appropriate; better illumination for driver and pedestrian safety; and encouraging business development and growth in Suncook Village.

Land Use Patterns

In Pembroke, beginning at the Concord city line and ending at Brickett Hill Road, land use on US Route 3 is predominately undeveloped and forested on the west and residential on the east. Specific areas of commercial and institutional development are found along the west and east sides of US Route 3, including activity off Sand Road, a real estate office, an ice cream stand, a gas station, and a church. While not directly fronting on US Route 3, a large warehouse is situated on the west side that generates significant traffic.

After Brickett Hill Road, land use categorizations identify the majority of land as residential, with some agricultural, up to US Route 3's intersection with Pembroke Hill Road. Numerous traffic generators exist in the section between Church Road and Broadway, including schools, businesses, and the Town's Safety Building on the east side of US Route 3; on the west side, residential uses continue.

After Broadway, the appearance of US Route 3 begins to alter. While residential uses do continue along both sides, the roadway widens and a transition area has been entered. The US Route 3 corridor in Pembroke can generally be characterized as residential, with a commercial expansion node at the intersection of Route 106 to the north and the second node just south of the Allenstown Town line. There seems to be a mix of home businesses within the residential portion of the corridor.

Although Suncook Village is not within the US Route 3 corridor, public input suggests that an enhanced economic development strategy to redevelop the area could bring more people to the corridor.

Issues to consider

- Continue to limit uses that would adversely affect congestion along the corridor by focusing new commercial development at the US Route 3 and NH Route 106 node and toward the US Route 3 and NH Route 28 node in Allenstown.
- Develop a plan to enable the redevelopment of Suncook Village which will form a new commercial node and a walkable destination with historic character for visitors and residents.

Zoning Districts

The 2007 Zoning Ordinance was developed in accordance with the Pembroke Master Plan. The Ordinance is designed to lessen congestion in the streets; to secure safety from fires, panic and other dangers; to promote health, safety, and the general welfare of its citizens; to provide adequate light and air quality to prevent the overcrowding of the land; to facilitate the adequate provision of transportation, solid waste facilities, water, sewerage, schools, parks, child day care; and to assure proper use of natural resources and other public requirements.

The Town of Pembroke is divided into seven zoning districts:

- 1) Medium Density-Residential (R1)
- 2) Rural/Agricultural-Residential (R3)
- 3) Business/Residential District (B1)
- 4) Central Business District (B2)
- 5) Commercial/Light Industrial (C1)
- 6) Limited Office District (LO)
- 7) Soucook River Development District (SR)

The Town also has seven overlay districts:

- 1) Architectural Design District (AD)
- 2) Aquifer Conservation District (AC)
- 3) Floodplain Development District (FD)
- 4) Home Business Overlay District (HB)
- 5) Shoreland Protection District (SP)
- 6) Suncook Business District (SB)
- 7) Wetlands Protection District (WP)

The US Route 3 corridor enters Pembroke from Concord in the Commercial/Light Industrial District. At US Route 3's intersection with NH Route 106, the highway enters the Limited Office District which continues to the intersection with Whittemore Road.

At Whittemore Road, US Route 3 enters the Medium Density-Residential District which continues until about 1,200 feet north of the Allenstown border. Here, the district becomes Business/Residential until US Route 3 reaches Allenstown. Within a 500 foot buffer of the entire distance of US Route 3 in Pembroke are the Architectural Design and Home Business Overlay Districts. The Limited Office District permits a use of residential, commercial, agriculture and town facilities, among other uses.

Issues to consider

- Review the Table of Uses to ensure that the high traffic generators remain in the appropriate Commercial and Limited Office Districts while retaining the character of the Medium Density-Residential District and making changes as appropriate to the Ordinance.
- Develop regulations to support the Suncook Business Overlay District beyond the existing zoning ordinance provisions, including possibly extending the Architectural Design District to this location and developing infill, reuse, and streetscaping provisions.

- Develop comprehensive architectural design guidelines in the Site Plan Review Regulations, including illustrations of preferred building styles, listings of preferred materials, sign design examples, etc.

Parking

Parking is addressed in Article VII in the Zoning Ordinance. Off-street parking requirements are stated per different type of use. The location of the parking spaces is not specified in terms of whether they should be located to the front, side, or rear of the property. Landscaping for parking lots is not addressed in the zoning ordinance. Off-street parking is also addressed in the Site Plan Review Regulations which refers to the design, layout, screening, and landscaping as proscribed in the Zoning Ordinance.

Issues to consider

- Modify the Zoning Ordinance to require that parking for new residential or nonresidential development is located to the rear or side of the building in order to provide space for landscape enhancements to allow safer pedestrian access along US Route 3.
- Review the parking Table of Uses to ensure that the number of parking spaces required per type of land use is not excessive.
- Develop landscaping requirements and standards within the Zoning Ordinance to address parking, streetscapes and buffers along US Route 3. These provisions could be retroactively applied when applications for changes of use or amended site plans come before the Planning Board.

Impervious Surface

The zoning ordinance states that accessory buildings shall not occupy more than 25% of the required rear yard. In the Soucook River Development District, incentive bonuses permit an open space/impervious surface reduction of up to 90% if land of equal or greater size is donated to the town or an appropriate organization.

Issues to consider

- Develop impervious surface restrictions for each of the residential and commercial zoning districts to increase absorption and to reduce stormwater runoff.
- Incorporate stormwater BMP's in town regulations to apply to new amended site plans and changes of use.

Future Development

Construction is presently being undertaken at the intersection of Route 3 and NH Route 106. A commercial development has already been approved and built on the west side of US Route 3. However, the existing intersection was approved to be reconfigured to a four-way intersection to accommodate the additional traffic that will be generated by these developments. Other future developments, such as a 40 unit elderly housing development proposal, will be located south of the US Route 3 and NH-106 intersection. This proposal, although only in its preliminary conceptual stage, has raised considerable attention regarding further traffic congestion along the corridor.

With build-outs indicating that further development pressure will likely take place at this intersection, special attention must be paid to the design and location of these developments. If additional units are built haphazardly and premature, without addressing all of the concerns regarding access management, this section of the US Route 3 corridor will continue to experience further strains on the transportation infrastructure.

Issues to consider

- Continue to apply the Zoning Ordinance and Site Plan Review provisions to ensure that future commercial and residential development remains compatible in the area. Where specific landscaping, signage, streetscaping, and architectural provisions do not exist in the regulations, negotiate with developers to ensure that these components get incorporated into the final design.

Aesthetics

US Route 3 in Pembroke is characterized as mostly residential with a few light commercial businesses. There is a sidewalk along the west side of the road. Improvements can be made to signage, street lighting, and streetscaping as discussed within the recommendations below.

On Premise Signage

Proper and safe signage for businesses and other attractions is of utmost importance since traffic tends to be through-traffic which moves at relatively higher speeds. Pembroke has addressed the issue of signage in the Zoning Ordinance in Article VIII and 143-72.15. These provisions include signage design performance standards, indicating that signage is to not only serve the function of providing safety, but also be a method for preserving and enhancing the town character. Current signage in Pembroke does not appear to be out of scale with the character of the town, as the signage Table of Uses generally restricts sign sizes.

Issues to consider

- Negotiate existing non-conforming signage as part of project consideration for amended Site Plan Review applications.
- Develop a guidance document to encourage new non-residential development to construct consistent and attractive signage, illustrating the location, type, size and materials, in accordance with the Zoning Ordinance and Site Plan Review Regulations.

Lighting

Street lighting along the corridor in Pembroke appears to be limited area near the Concord town, and around the Town Hall. Other lighting along the corridor is limited to small amounts of parking lot lighting in commercial areas. Pembroke currently has no exterior lighting performance standards in the Zoning Ordinance except for 143-72.16, which is intended for the Soucook River Performance District. The regulation is intended to address issues of excessive lighting and glare, light pollution, and aesthetic issues concerning the style and size of the light fixture itself. It appears that regulations appropriately address lighting issues along the corridor.

Issues to consider

- Develop specific lighting requirements for the zones along US Route 3 for parking lots or enable lighting standards such as found in 143-72.16 for the Soucook River Performance District in other parts of town.
- Install street lighting where sidewalks or crosswalks are present.
- Address lighting issues while discussing possibilities for a new intersection improvements at the intersection of US Route 3 and Bow Lane/Pembroke Hill Rd.

- Address lighting concerns whenever other streetscape improvements are made.

Buffers

Pembroke has established regulations, through Zoning Ordinance 143-54 and 55, for the Limited Office District and Commercial District that require screening residential from non-residential uses. Many of the land uses along the US Route 3 corridor in Pembroke have vegetative buffers or pockets of landscaping to differentiate uses. Yet along certain sections of US Route 3, there is a lack of vegetation to separate pavement from property lines as well as screening and buffering of parking. This is a potential safety issue as well as a concern for the aesthetics and character of the Town.

Issues to consider

- Develop specific buffer requirements for all edges of parking lots and enable landscaping standards such as found in the Zoning Ordinance provisions (143-72.18 & 19) for the Soucook River Performance District and other portions of the town.
- Incorporate streetscape requirements in the Site Plan Review Regulations, concerning the relationship between vehicular and pedestrian traffic, to provide buffers to improve upon the safety of US Route 3.

Landscaping

There is little planned landscaping in Pembroke. Landscaping on commercial properties is inconsistent. Section 203-38 of the Site Plan Review Regulations requires that all developments make adequate provision for landscaping. The design, type, location and number of trees need to be approved by the Board. Section 203-30 requires that natural and other features that would add value to development or to the town as a whole such as trees, water courses, and other features be preserved. This section also prohibits removing trees until after a certificate of approval has been granted.

Issues to consider

- Develop comprehensive landscaping requirements for new development, including along parking lots, or enable landscaping standards such as found in 143-72.18 for the Soucook River Performance District and other portions of the town.
- Plant street trees and engage in streetscaping where existing sidewalks or crosswalks occur. Street trees can act as traffic calming devices and also improve overall aesthetics.
- Include provisions for landscaping and street trees during the possible reconfiguration or roundabout at the intersection of US Route 3 and Bow Lane/Pembroke Hill Road.
- Investigate interest in a community street tree program for residential properties.

Allenstown Summary

Land Use Summary

US Route 3 and NH Route 28 enter a commercial/industrial area in Allenstown which continues to the Hooksett Town line. Between vacant land and various redevelopment alternatives, there is land which could be utilized to attract a retail center. The Town has concerns about impervious surfaces and storm water management in this area, both from the road way and the existing large, paved parking lots. As landscaping amenities are linked in the area it will be critical to provide these improvements in the future. (See Access Management Plan for Allenstown p.52)

Opportunities for zoning and regulatory changes include revising parking regulations to increase recharge and examine parking requirements, revising the Business zone to accommodate appropriate residential and other uses, and revising the lot coverage requirements to include driveways and parking lots.

Opportunities for Site Plan Review changes include access management requirements and revisions to landscaping reqs.. Reducing the number of curb cuts should be a priority participating at the intersection of US Route 3 and Granite Street. Under the Planning Board's charge to protect public safety, they have the ability to negotiate for some of the items mentioned in this section even if they do not yet exist within the regulations.

The Town of Allenstown should work with the Town of Pembroke to develop plans to revitalize Suncook Village which will create a friendly gateway into the community that will assist with economic development.

Aesthetics Summary

Lighting and signage were found to be inconsistent with limited existing buffers and landscaping along US Route 3. Recommendations included developing performance standards for lighting, developing guidance on signage, and enacting a streetscaping program. Many of the land use suggestions can be utilized for both the US Route 3 corridor and for Suncook Village.

Public Input

Input received during the varieties of land-use public processes over the last few years are summarized below.

Master Plan, 2003

Community visioning session results for the Land Use and public discussion groups found that a need existed for installing "Entering Allenstown" welcome signs, economic development other than gas stations or fast-food restaurants should be encouraged, pedestrian safety measures (crosswalks and sidewalks) were necessary along US Route 3, and that traffic flow through Allenstown from other communities needed to be better handled. Objectives relevant to land use included to improve the non-motorized infrastructure and increase non-motorized safety and activity in Allenstown; and to encourage businesses to locate to Allenstown that will sustain or increase the economic vitality of the Town.

Specific recommendations developed to meet these objectives included: to minimize traffic speed, volume, noise, congestion, and hazards to pedestrians; to minimize the amount of paved area to reduce stormwater runoff, thereby protecting water resources and reducing construction costs; to use traffic calming and other methods to increase safety, which could include such techniques as raised crosswalks, striped or colored

sidewalks, increased signage, or walkways separated from the road and enhanced by landscaping; and to develop a streetscaping program for Main Street with consistent landscaping, benches, historic markers, and signage to invite people to Allenstown.

CTAP Community Assessment, 2007

Recommendations relevant to land use included to develop an economic development plan to identify community assets, address economic development challenges, and devise strategies to enhance the business environment; and to develop a village plan alternative ordinance to create a pedestrian-oriented mixed-use Town center which could help improve access and connectivity in Allenstown.

US Route 3 Public Input Meetings, 2007

Resident suggestions included improving and or increasing/addressing the inefficient lighting from Granite Street to NH Route 28 and on and after the bridge; and reducing the amount of paved areas between Granite Street and NH Route 28 to reduce storm water runoff.

Land Use Patterns

Beginning at the Suncook River at the Pembroke Town line, the roadway is significantly widened. A portion of the river is located on the west side, and the primary land use is residential on the east side up until the intersection with Chester Turnpike.

From Chester Turnpike to US Route 3's intersection with Granite Street, nearly the entire eastern side of the highway is commercial land. Enterprises include a restaurant, a pharmacy, an old building reused to house a number of stores and restaurants, a market, a bank, and a gas station as well as the headquarters of The Allenstown Police Department. The western side is a mixture of residential and commercial uses.

Land use in Allenstown could be characterized by small lot residential uses followed by a wide commercial and industrial strip to the Hooksett town line. Additional land appears to be available for future development. The Town should consider which types of uses may be best served in that area. The gateway from Pembroke into Allenstown is less attractive due to the lack of green space in the overall width and length of pavement. Although Suncook Village is outside the area of the US Route 3 corridor, it serves as an important destination. Reuse and revitalization of this historic town center would be of great benefit to both Allenstown and Pembroke.

Issues to consider

- Determine the appropriate use for vacant land along the US Route 3 corridor and develop a plan to attract the type of desired uses.
- Retain single-family residential on the northern section of the corridor and retain the restrictions on no residential development in the Business zone if appropriate. If walkable mixed use is a priority to the community, certain residential uses should be permitted in the Business zone.
- Enact measures to create a gateway at the Allenstown Pembroke town line, including enhanced lighting, banner signs on existing light posts, planting trees and other landscaping prior to the bridge, erecting welcome signs, and other features.
- Develop a plan to redevelop of Suncook Village which will function as a new commercial node and a walkable destination for visitors and residents.

Zoning Districts

The Allenstown Zoning Ordinance was last amended in March 2007. In the document, the purpose of the Zoning Ordinance is as stated in RSA 31:62, which has since been repealed by the Legislature. Now cited in RSA 674:17, the purposes of a municipal Zoning Ordinance are to lessen congestion in the streets; to secure safety from fires, panic and other dangers; to promote health and the general welfare; to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population; to facilitate the adequate provision of transportation, solid waste facilities, water, sewerage, schools, parks, child day care; to assure proper use of natural resources and other public requirements; to encourage the preservation of agricultural lands and buildings; and to encourage the installation and use of solar, wind, or other renewable energy systems and protect access to energy sources by the regulation of orientation of streets, lots, and buildings; establishment of maximum building height, minimum set back requirements, and limitations on type, height, and placement of vegetation; and encouragement of the use of solar skyspace easements under RSA 477.

The Town is divided into five zoning districts:

- 1) Open Space and Farming Zone
- 2) Residential Zone, I and II
- 3) Business Zone
- 4) Industrial Zone
- 5) Commercial/Light Industrial Zone

Beginning at the Pembroke town line, US Route 3 is zoned Residential on either side of the road until its junction with Chester Turnpike. At this location, the parcels on the east side of the highway are zoned Business, while those on the west remain Residential until the intersection with NH Route 28.

US Route 3 north of NH Route 28 is primarily zoned Business on both sides of the highway. However, there is a section of US Route 3 zoned Industrial near the intersection and a Residential-zoned parcel fronts the highway near the Hooksett town line.

In the Residential district, single-family dwellings, accessory gardens, family child care, and recreation and community indoor and outdoor facilities are permitted, which is consistent with what is found currently in the Residential Zone. The Business district, which lines most of the US Route 3 highway, seems to permit reasonable uses for the type of zone. The goal is to keep the major traffic generators in this location where direct access to NH Route 28 is available.

In the Industrial district, uses include warehouses and manufacturing facilities in addition to the offices and restaurants commonly found in the Business district. Provisions for multifamily housing are located only in a Residential district, where it may be beneficial to have residents within walking distance of the commercial center on US Route 3.

Issues to consider

- Add a multifamily provision as a special exception to the Business district to encourage a walkable community in the US Route 3 area.

Parking

Regulations for parking are found in the Zoning Ordinance Section 1112. With the exception of residential uses, every use requires a minimum of a certain number of paved all-weather parking spaces. There are no provisions for access management, which would enable access to adjacent parking lots without needing to enter US Route 3 and would enable access on to neighboring streets instead of US Route 3.

Issues to consider

- Revise the parking requirements in the Zoning Ordinance to determine the appropriate number of parking spaces and to establish a maximum number of parking spaces.
- Permit developers the option to include pervious parking areas, improve recharge, and utilize stormwater BPM's in their parking design.
- Encourage the Planning Board to approve the minimum number of parking spaces required to adequately serve the development instead of allowing an unrestricted number of parking spaces
- Develop an access management plan to be incorporated in the Site Plan Review Regulations for the commercial area to combine curb cuts, minimize number of curb cuts, and utilize adjacent intersecting streets to the extent possible where feasible.
- Require compliance with access management standards for all site plan applications.

Impervious Surface

Each district in Allenstown has its own maximum lot coverage limitation. The Residential zone requires that no more than 40% of the lot may be covered by building or structures. The Business and Industrial zones permit 70% lot coverage by buildings and structures. Driveways and parking areas have not been included in calculating this percentage. Impervious surfaces are not discussed directly.

Issues to consider

- Develop impervious surface requirements in the Zoning Ordinance to include parking areas and driveways in addition to the maximum lot coverage by buildings and structures requirements consistent with best management practices to enhance the aesthetic character of the corridor and to reduce of stormwater runoff.

Future Developments

There is land available for future development along US Route 3 close to the junction of NH Route 28. Because of the visibility of this location, quality commercial uses should be recruited for this site.

Issues to consider

- To maximize the amount of commercial space available, new homes should only be permitted in the existing Residential district.

Aesthetics

Developing a consistent streetscaping program as far as feasible along US Route 3 and in Suncook Village outside of the corridor area would provide an attractive gateway into the community. Street lighting in appropriate areas would enhance the safety of pedestrians and encourage walkability on both US Route 3 and in Suncook Village.

Signage

Signage in the Town of Allenstown is primarily controlled through provisions in the Zoning Ordinance, Section 1111, and the Site Plan Review Regulations, Section 7.07. The regulation of signage is based on a variety of criteria, including size, height, illumination, and type. One outdoor sign is permitted for a business, industrial or other commercial use. The total square footage may not exceed 32 square feet, but there are many existing large signs out of scale with surrounding buildings and the general character of Allenstown.

Issues to consider

- Develop a guidance document to encourage new non-residential development to construct consistent and attractive signage, illustrating the location, type, size and materials, in accordance with the Zoning Ordinance and Site Plan Review Regulations.

Lighting

There is currently limited street lighting along the US Route 3 corridor in Allenstown. Lighting is primarily found in parking lots, and through illuminated signs on commercial development along the corridor. Allenstown references lighting in the Site Plan Regulation that has provisions for lighting that prohibit glare onto neighboring properties, prohibit flashing or blinking, and generally restricts lighting to advertising, safety and security of the development.

Issues to consider

- Install new or improve existing street lighting along US Route 3, particularly where sidewalks or crosswalks are present.
- Develop performance standards for lighting for development along the corridor in order to express desired style and coverage. Standards should specifically prevent light pollution onto adjacent properties. Using cutoff fixtures should reduce the distraction to drivers.

Buffers

Many of the uses in Allenstown appear to have little physical or visual buffers separating them. Site Plan Regulation 7.03 discusses buffer strips along zoning district boundaries and incompatible uses. Section 7.04 indicates that screening must be provided to reduce visual pollution for storage areas. These sites must be screened from adjoining parking and neighboring properties using either fencing or hedging. The current separation of uses and the separation of US Route 3 from properties do not appear to meet these requirements. In walkable locations, a vegetative buffer along US Route 3 would help to alleviate any of the safety concerns associated with vehicular travel in close proximity to pedestrian activity.

Issues to consider

- Screen the edges of parking through landscaping or other methods by developing enhanced screening regulations.

- Incorporate a streetscape element into the Site Plan Review Regulations, concerning the relationship between vehicular and pedestrian traffic, to provide buffers to improve upon the safety of US Route 3.

Landscaping

Section 6.02(e) of the Site Plan Review Regulations requires submission of a landscape plan prepared by a professional landscape architect. The provisions also require that there be only minimal disturbance to existing vegetation, and that existing trees are reserved and protected. Existing landscaping along the corridor in Allenstown is minimal.

Issues to consider

- Develop detailed landscaping regulations for the Site Plan Review Regulations.
- Plant street trees and other streetscaping, particularly where existing sidewalks or crosswalks occur.
- Enforce the minimum landscaping requirements during an expansion or change in use.
- Encourage techniques to reduce non-point source pollution and increase groundwater recharge and use stormwater management BPMs.

Hooksett Summary

Land Use Summary

Low density residential development along the corridor is generally separate from the intensive uses generated by multifamily, commercial, and industrial uses. The northern section of US Route 3 is more rural, while the southern commercial segment has few, but available, opportunities for further growth. The goal of local residents and the Town of Hooksett is to preserve the northern section while encouraging economic development and further multifamily development in the southern segment. The Town of Hooksett has encouraged primary commercial development in the southern half of the corridor and has worked to implement a corridor plan to mitigate congestion. However, the northern half has experienced substantial residential development without the benefit of such a plan.

Aesthetics Summary

A challenge for the Town of Hooksett is to amend the site plan regulations with provisions that retroactively address deficiencies in zoning and development standards along the southern portion of the US Route 3 corridor. The Planning Board can require a change of use or an expansion of use would trigger application of landscaping and signage requirements. Incorporating a streetscape element with uniform and attractive buffers between uses will also enhance the appeal of the corridor.

Public Input

Input received during the land-use public processes over the last few years are summarized below:

Master Plan, 2004

Community visioning session results included tasks such as: analysis of traffic congestion on US Route 3; to promote economic development; to manage traffic on main arteries to separate through-traffic from destination traffic; to develop/encourage alternate routes; to encourage public transportation; to provide for sidewalks, paths and streetlights; to minimize traffic safety hazards; to reevaluate zoning to provide for a mix of commercial-residential uses, the location of industrial and community development closer to interchanges, increased buffer zones on new development, and a review of community and industrial strip zoning; to consider aesthetic preservation techniques such as preserving trees and natural habitat; to lessen residential and commercial sprawl; to ensure that infrastructure is available to allow for economic growth, specifically water, sewer, natural gas and transportation systems; and to develop a long-term plan for highway improvements for both vehicles and pedestrians.

Relevant guiding principles in the Hooksett 2004 Master Plan included locating traffic intensive land uses with access at major arterial highways and in reasonable proximity to the major transportation corridors and the municipal services support systems. Specific recommendations include to rebuild the intersection of US Route 3 and Industrial Park Drive, facilitating development of the commercial/retail area where the MS&G Scale House currently exists; to redevelop US Route 3 and Industrial Park Drive, as the east side of the intersection of US Route 3 and Industrial Park Drive has long been zoned for mixed use (MUD5) and one day would be re-developed for commercial/retail uses; to enable incremental development of the parkway from near the Allenstown border to West Alice Avenue; and to establish Economic Development areas, potentially at Exit 10, Exit 11, Hooksett Village, US Route 3 North, US Route 3 South, and the NH Route 28 Bypass.

CTAP Community Assessment, 2007

Recommendations relevant to land use included to develop an economic development plan to identify community assets, address economic development challenges, and devise strategies to enhance the business environment; and to establish a Village Center zoning district for the Town to enable a walkable community and permit mixed uses on one lot.

US Route 3 Public Input Meetings, 2007

Resident suggestions for land use results they would like to see solutions for included the following: inadequate lighting paired with distracting lights from businesses; more green spaces and quality stores and restaurants; inconsistent business signage; and a desire to preserve architecture and existing historic structures on the northern portion of the corridor.

Land Use Patterns

Beginning in the northern portion of Hooksett, land use on the eastern side of US Route 3 is mostly undeveloped until the intersection with Pleasant Street. On the west, residential parcels are interspersed with undeveloped land until a small commercial pocket is found at the Pleasant Street intersection.

Continuing south, a residential neighborhood is located on the west side while the east side continues to be primarily undeveloped, with sporadic homes, until the intersection of a new roadway crossing US Route 3. Here, business uses are found along both sides of the roadway and residential use is found on the east side. Shortly thereafter, US Route 3 junctions with Main Street, which is a highly concentrated residential area.

After Main Street, commercial uses on the west side are dominant until the intersection of Egawes Drive and Shannon Road. Shannon Road is an extensive residential development while the former is the location of commercial uses. From this intersection to Industrial Park Drive, land use to the west remains primarily undisturbed and intense residential development continues on the east side, with the occasional commercial use. At this point, the dense commercial land uses of the Town begin.

At the intersection with Mammoth Road, commercial uses line the majority of both sides of US Route 3, with multifamily housing along the roadway until the highway reaches the Interstate 93 exit ramp.

Public comment has identified that many historical homes dot US Route 3, and that there is a strong wish to preserve them. The southern portion of the corridor is mostly built up but there is vacant land for sale which will be developed either for commercial use or for multifamily residential use.

Issues to consider

- Ensure that the historic and rural nature of the northern segment of US Route 3 is maintained by reviewing and strengthening the Zoning Ordinance and Development Regulations.
- Continue to ensure that commercial development is focused to the southern segment of US Route 3.

Zoning Districts

The Zoning Ordinance, last amended in 2007, was established for the purpose of promoting the health, safety, morals, prosperity, and convenience of the development of the inhabitants of the incorporated Town of Hooksett. The document takes into consideration security, safety from fire, the avoidance of panic and other dangers, the provision of adequate area between buildings and various rights-of-way, the preservation of the rural charm in the town, the promotion of good civic design and arrangements, the wise and efficient expenditure of public funds, and the adequate provision of public utilities and other public requirements, among other issues.

The Town of Hooksett is divided into twelve zoning districts:

- 1) Low Density Residential District (LDR)
- 2) Medium Density Residential District (MDR)
- 3) Urban Density Residential District (UDR)
- 4) High Density Residential District (HDR)
- 5) Commercial District (COM)
- 6) Industrial District (IND)
- 7) Mixed Use District 1 (MUD1)
- 8) Mixed Use District 2 (MUD2)
- 9) Mixed Use District 3 (MUD3)
- 10) Mixed Use District 4 (MUD4)
- 11) Mixed Use District 5 (MUD5)
- 12) US Route 3 Corridor Performance Zone

The Town also has two overlay districts:

- 1) Wetlands Conservation District
- 2) Groundwater Resource Conservation District

The corridor often has different zoning districts on either side of US Route 3. Where US Route 3 enters Hooksett from Allenstown, one parcel is a Commercial District, and the remainder of the parcels are either zoned Medium Density Residential (on the west) or Mixed Use District 5 (on the east). In the vicinity of US Route 3's intersection with Pleasant Street, the parcels are once again in the Commercial District until the vicinity of the new intersection of College Park Drive which is zoned Mixed Use District 1 (on the west) and zoned as Mixed Use District 2 to the east, with a block of Medium Density Residential-zoned parcels and a Mixed Use District 5 for one parcel abutting a larger Mixed Use District area encapsulated by the Commercial and Mixed Use Districts. Thereafter, parcels zoned Medium Density Residential are found to the west and east until the junction with Main Street.

The Main Street intersection area continues to have Medium Density Residential-zoned parcels in the southerly direction, while Commercial-zoned parcels are found on either side of US Route 3. The area surrounding the Hooksett Industrial Park, on both the west and east sides of the highway, is zoned Industrial in places, in addition to Commercial-zoned parcels and Mixed Use District 5 frontage. Continuing into the intersection with NH Route 28, the parcels are zoned Commercial on the west and east.

At the NH Route 28 intersection continuing south, the zoning district along US Route 3 is primarily Commercial, with one section zoned as High Density Residential south of the intersection with Mammoth Road. As US Route 3 approaches Interstate 93, a Medium Density Residential district is located on the west side just north of the interchange.

Zoning along US Route 3 in Hooksett can be characterized in general as a more residential flavor in the northern section, with nodes of commercial development, with a significant node spanning the remainder of the corridor to Interstate 93. This southern section contains a high use of commercial and industrial enterprises, zoned as such, although the land use examination shows that many, usually singular, residential properties are located in commercial zones.

The U.S. Route 3 Corridor Performance Zoning District was established on a portion of the southern part of the corridor to provide landowners and municipal officials with a workable tool to facilitate future development and re-development. By identifying a broad series of permitted uses together with land use controls, the zoning district provides flexibility and choices for land owners and developers and promotes maximization of the limited land resources available in the District. Applicants must demonstrate that proposed uses will meet each of the performance standards and/or land use controls established and will not result in negative impacts on surrounding properties. The zoning district includes specific standards for issues such as access, circulation and off-street parking requirements.

Issues to consider

- A parcel-based Subdivision ordinance should be adopted. All new subdivision developments would be required to follow a set of environmental standards in order to minimize the disturbance to wildlife habitat, the impacts on drainage and erosion, and ensure that the aquifer doesn't become contaminated.

Parking

Parking standards in Hooksett are addressed within the Development Regulations in Section 15. The number of parking spaces required depends on the type of use and typically the square footage of the building. Alternative surface materials may be permitted on a case by case basis. Access management techniques are not addressed in the development regulations.

Issues to consider

- Encourage alternative parking lot surface materials that are more pervious in nature, such as pavers, for new developments and require these materials for expansions of existing parking areas.
- Develop access management provisions for the commercial area outside of the US Route 3 Performance District to encourage primary access on adjacent streets for new developments and to require connectivity between adjacent parking lots.
- Review the parking standards to ensure that the number of required spaces per type of use is not too high and amend the Development Regulations as necessary.

Impervious Surface

Limitations on impervious surfaces have been addressed in the Zoning Ordinance mainly through the maximum percentage of lot coverage by buildings located within each district. The Commercial, Industrial, and Mixed Use District 1 permit 75% lot coverage; Medium Density Residential permit 30%. In the Mixed Use district 5, depending on the density, the provisions refer to other districts although 100% coverage may be attained in a Village Center.

However, the US Route 3 Corridor Performance District permits a variety of impervious surface lot coverage percentages, ranging from 50% to 65%, based on where the business is located. A 10% bonus incentive of the area of each parcel can be utilized for exercising access management provisions by eliminating an excessive numbers of curb-cuts.

Issues to consider

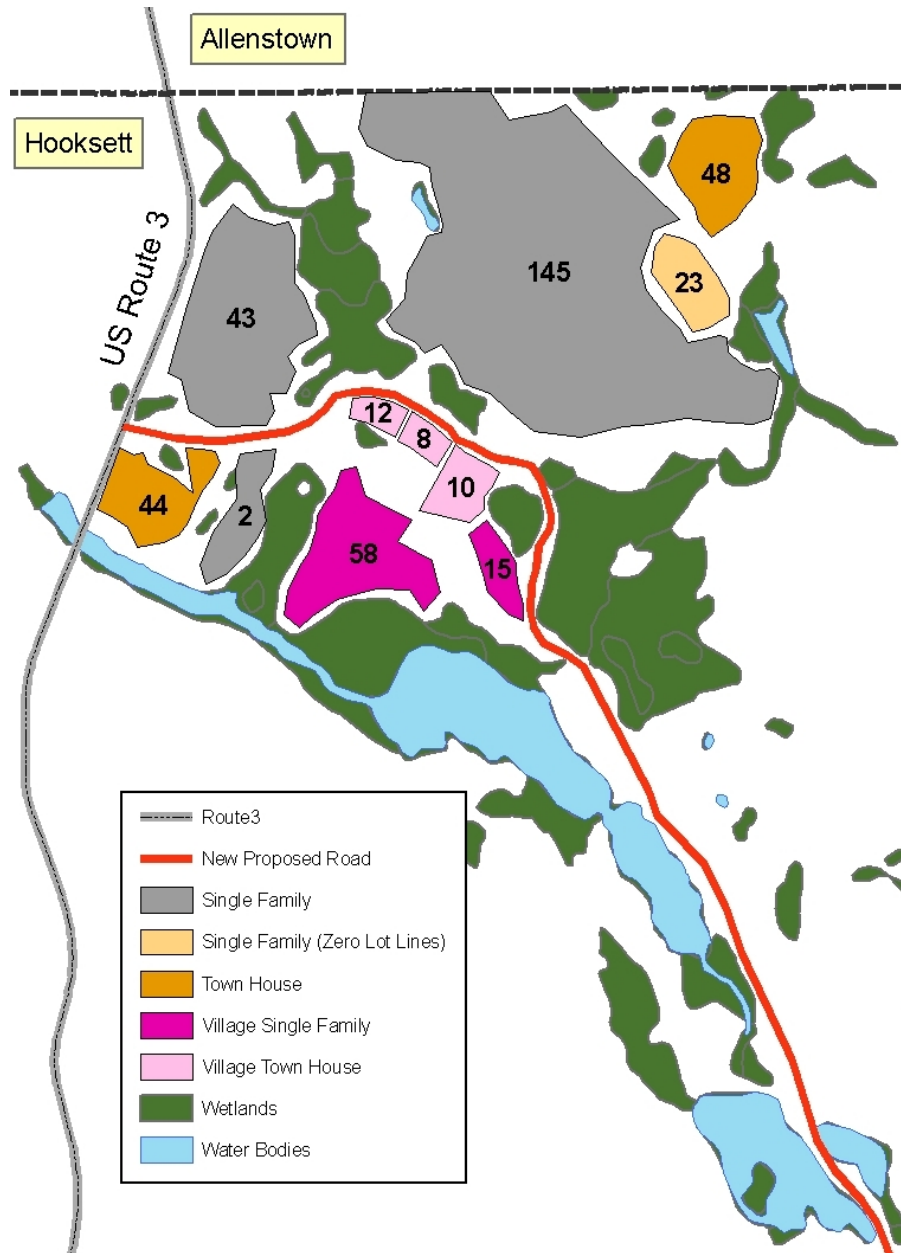
- Develop impervious surface requirements in the Zoning Ordinance for districts outside the US Route 3 Performance District to include parking areas and driveways in addition to the maximum lot coverage by buildings requirements consistent with best management practices to enhance the aesthetic character of the corridor and to reduce the damaging effects of stormwater runoff.

Future Development

Currently, several large developments have been submitted for approval or are under construction in Hooksett near the Allenstown border. One of the major proposed developments is the Head's Pond Subdivision on land owned by Manchester Sand, Gravel and Cement Co. The development proposes 428 units, which will impact the local and regional transportation network, housing stock, shared facilities and existing aquifer.

The 428 units represent an 8.7% increase in Hooksett's housing stock and a 4.3% increase to the region's housing stock, which consists of neighboring towns along the US Route 3 Corridor. The increase in housing units will require the construction of additional roadways, increasing the total number of trips generated. Based upon ITE Trip Generation numbers, the development, comprised of townhouses and single family units, will provide for 3,586 additional vehicular trips per day, which will all utilize Rt. 3. An increased number of trips presents traffic controlling issues, such as the possibility of traffic lights, acceleration, deceleration and designated left turn lanes where appropriate, roundabouts, or some other traffic control method at the intersection of Route 3 and Proposed Head's Pond Boulevard.

The issues associated with this development not only impact the existing transportation network, but place strains on wildlife habitat. It is also possible the development could impact the aquifer located under the northern portion of the site and have wetland impacts. The 102 foot wide boulevard layout proposed to serve the development and any future development fragments the existing wildlife corridor that connects to Bear Brook State Park to the north. Many native plants and animals can be found in this site and according to a study done by the Society For The Protection of New Hampshire Forests the area surrounding Head's Pond Subdivision exhibits four components of the highest quality of habitat. Severing the wildlife corridor may cause negative impacts to the natural habitat.



The updated Zoning Ordinance, as well as other development regulations, permit developments of this magnitude in areas that currently lack proper infrastructure to support further large-scale developments. In order to ensure that the existing links to surrounding wildlife are preserved, special consideration should be placed on reducing the total amount of imperviousness. After measures are taken to preserve important ecologically sensitive features, the design and size of culverts and other drainage devices should be monitored in order to allow for fish and other wildlife to freely move from water bodies.

Map 7: Head's Pond Subdivision Project Proposal Map

This map shows the proposed developments in the northern portion of Hooksett of US Route 3. The numbers represent the proposed number of units.

Issues to consider

- Negotiate with developers on topics such as signage, lighting, parking lot surface materials and landscaping to ensure that the character that the community desires is reflected within the developments.
- Require Drainage reports that present the pre- and post- drainage for proposed developments to understand the full impacts of developments located in proximity to existing water bodies and other sensitive resources.
- Require utilization of drainage methods such as culverts to enable continuity of the natural flow of water between severed water bodies.

Aesthetics

Inconsistent signage, distracting lighting, and a lack of green spaces were some of the aesthetic issues identified in the public involvement process. An examination of the Zoning Ordinance and Development Regulations illustrated opportunities to revise or enhance the existing provisions to better achieve the desired vision.

Signage

Hooksett has established regulations in the Zoning Ordinance, Articles 10-A and 20, and in the Development Regulations, 16.10, that place restrictions on signage regarding the size, height and motion. Although advertising signs serve an important purpose for businesses along the corridor, they should not result in information overload for the traveler. This is especially the case regarding large signs, such as billboards, which appear throughout Town. Although Hooksett has a variety of unique signs and appropriately sized signs, there are many signs that detract from the aesthetics of the town, such as electronic billboards and strobe lights that could potentially impact traffic safety.

The full capabilities of municipal authority to regulate sign should be used to protect and enhance the corridor. Rather than simply establishing sign size limits, or allowing signs of a size proportional to the building size, consideration should be given to the context in which the signs are located. Travelers are driving at a slower speed in the southern segment of US Route 3, and therefore smaller signs may be more appropriate. Signs that are legible to the passing motorist may be permitted along the more rural northern segment, but should not be so large as to distract the driver from the road. Allowing smaller signs closer to the roadway is one way that large signs can be avoided in the rural area while still allowing for some advertising along the rural stretch of the corridor. The height of signs should be carefully evaluated to better fit terrain and location

Issues to consider

- Reduce the size and height of standing signs in the Commercial, Industrial and Multi-Use districts in the Zoning Ordinance to allow consistency. For amended Site Plan Review applications, negotiate existing non-conforming signage as part of project consideration.
- Develop provisions in the Zoning Ordinance to require smaller signs closer to the roadway in the northern segment of the corridor, whether Residential, Commercial, or Multi-Use districts.

Lighting

The primary areas illuminated with streetlights are at intersections near I-93 and in the commercial district near the border of Manchester. Section 16 of the Town's Development Regulations and the Zoning Ordinance in Article 30 have provisions for outdoor lighting. Although there are no specific streetlight requirements, guidance for residential subdivisions and nonresidential site plans is provided. Lighting is in place in numerous

large parking lots and retail areas along the corridor. Hooksett has recently adopted an outdoor lighting ordinance, but has not yet included any information that addresses dark sky protection. No streetlights have been installed in areas of major residential development.

Issues to consider

- Adopt additional lighting ordinance provisions that provide uniform control over the types of lighting (lumens, height, pole design, etc) that may be used along the corridor after carefully reviewing the Development Regulations and Zoning Ordinance.
- Improve lighting at the major intersections to multi-family developments and other areas where sidewalks or crosswalks are present.
- Design lighting to avoid spillover onto adjacent properties through the use of cutoff shields in the Development Regulations for properties seeking amended site plan review.

Buffers

In many cases, lots within the Commercial district are separated by wood and chain link fencing, and the residential areas tend to separate lots using vegetative techniques. It is important to make sure screening efforts from residential to commercial do not inhibit pedestrian movement. There are examples, such as near I-93, that provide vegetative swales in the front of commercial activity. Buffers and screening are established in Development Regulations 3.03.4.3 and in Zoning Ordinance Article 10-A, H.4 as well as in Articles 10 and 11.

Issues to consider

- Develop screening regulations for the Multi-Use 5 district, which has the potential to locate commercial and industrial uses next to residential uses.
- Screen the edges of existing parking through landscaping or other methods. This may be best accommodated during the amended site plan review process.
- Incorporate a streetscape element into the Development Regulations, concerning the relationship between vehicular and pedestrian traffic, to provide buffers to improve upon the safety of US Route 3. This may be best accommodated during the amended site plan review process.

Landscaping

Landscaping design criteria is found in Development Regulations 3.03. Section 11.12 of the Town's Development Regulations which states that street trees shall be planted in the esplanade areas of all new streets. Landscape performance standards are applicable pertinent to the US Route 3 Corridor Performance District in Article 10-A. There is currently no landscaping in front of most large commercial development, and landscaping is inconsistent overall. Any regulations on landscaping should consider the character of the portion of the corridor in question. Landscaping should be required when existing commercial and industrial uses submit an application to change of use or amend their site plan permit.

Issues to consider

- Apply landscaping regulations and standards to the extent feasible when applicants for a change of use or amended site plan for an existing commercial or industrial use.
- Encourage techniques to reduce non-point source pollution and utilize water recharge/stormwater management BMP's in landscaped areas.
- Avoid landscaping provisions that may require excessive use of water or fertilizer or require high levels of maintenance.

Safety Analysis

Traveler safety along a corridor is always one of, if not the most important attributes of a roadway. While many factors contribute to how safe a particular section of road or intersection is, before they can be discussed the accident history of a corridor must be understood. As part of this Study, accident reports by the NHDOT for the Towns of Pembroke, Allenstown and Hooksett were collected for the last several years and the locations of the accidents were mapped. This information and the factors that contributed to why these accidents occurred were then explored.

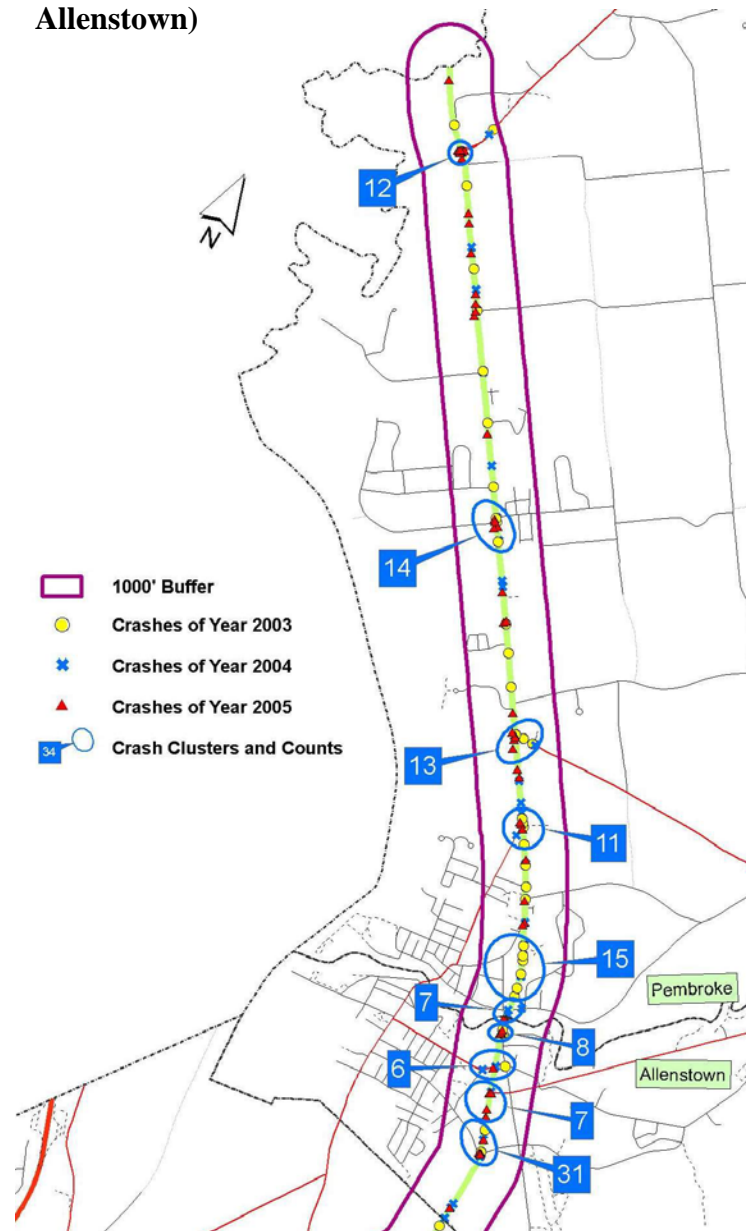
Vehicle Accident Information

Detailed crash data for the full length of the Study Corridor was collected as part of this Study for the last three years (2003 – 2005). For each crash site, the data consisted of the location, date and time, number of vehicles involved, type of accident, road condition, lighting condition, and point of impact of the vehicles. Data sets are summarized in **Table 1** and accident locations are visible on **Map 8** and **Map 9**.

In this three year time span, there were 115 reported vehicular crashes in the Town of Pembroke, a total of 59 vehicular crashes in the Town of Allenstown and 432 in the Town of Hooksett for a total of 606 vehicular crashes along the corridor. The 606 vehicular crashes resulted in 59 injuries in Pembroke, 13 in Allenstown and 128 injuries in Hooksett. There was one fatality reported during this timeframe along the corridor. The majority of the accidents reported were results of collisions with other vehicles, wildlife, or fixed objects. In Pembroke, there was a gradual increase in the average number of accidents along the corridor from 36 in 2003 to 41 in 2005, representing an increase of about 7% per year. In Allenstown, the average number of crashes per year has been relatively consistent over the time span, at around 21 accidents. In Hooksett, there was a gradual decrease in the average number of accidents along the corridor from 167 accidents in 2003 to 141 accidents in 2005, representing a decrease of about 5% per year (**Graph 1**).

At many of the intersections, the majority of reported accidents were characterized by rear-end collisions. Along the more rural stretches of the corridor, most accidents involved collisions with animals or losing control of the vehicle and veering off the road. The data was analyzed to determine where along the corridor crashes were happening. This analysis revealed seventeen hot spots where either a significant number of crashes occurred or the type of accident merited further review. The seventeen locations are shown in **Table 2**.

Map 8: Accident Location Map (Pembroke and Allenstown)



Graph 1 - Number of Accidents on the US Route 3 Corridor

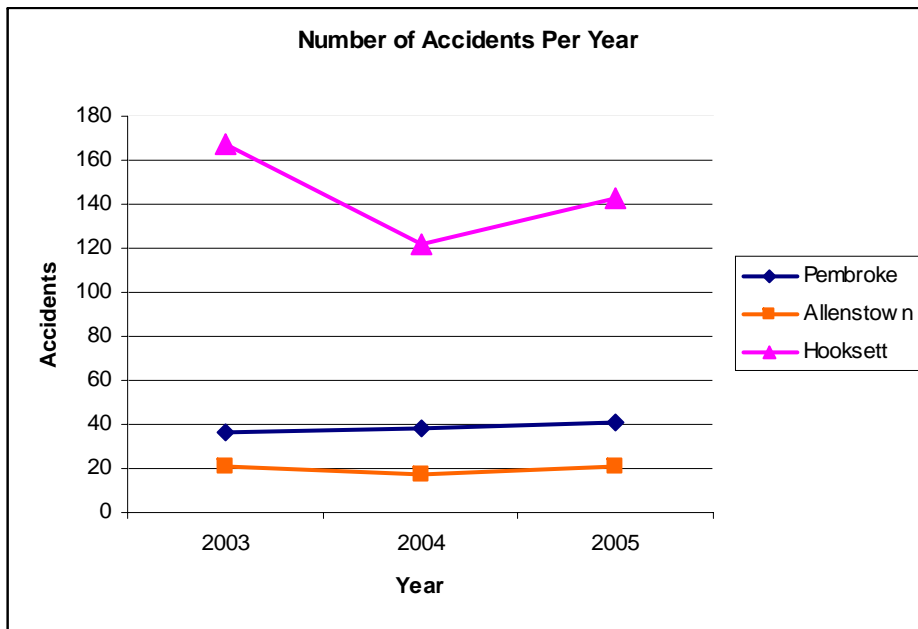


Table 1 - Percentage Change of Accidents 2003-2005

	Pembroke		Allenstown		Hooksett	
	Accidents along Corridor	Percent Change	Accidents along Corridor	Percent Change	Accidents along Corridor	Percent Change
2003	36	---	21	---	167	---
2004	38	5.56%	17	-	122	26.95%
2005	41	7.89%	21	23.53%	143	17.21%
Total	115	---	59	---	432	---
Average Per Year	38	6.73%	20	0.0224	144	-4.87%

Source: CNHRPC

Map 9: Accident Location Map (Hooksett)

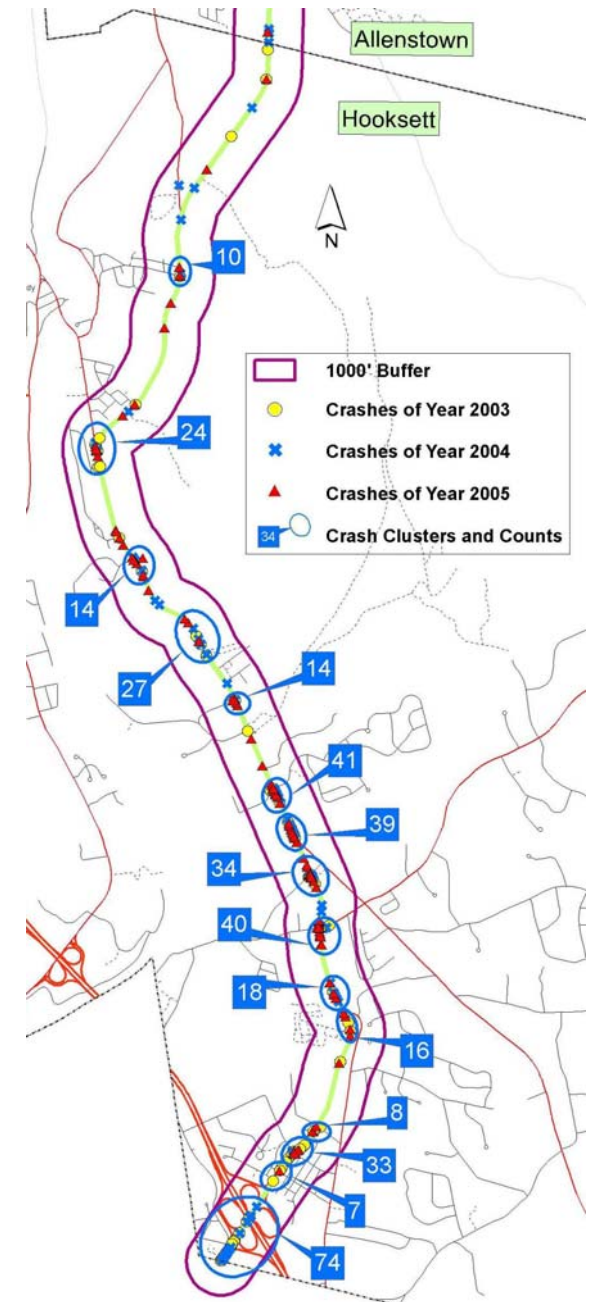


Table 2 - Accident Locations and Observations

LOCATION	ACCIDENTS 2003-05	OBSERVATIONS
PEMBROKE		
Beacon Hill Road	12	All accidents involved two vehicles and were intersection related. Some accidents were in wet surface conditions and most occurred in 2005.
Bow Lane	14	The majority of accidents occurred between two vehicles and a few involved fixed objects. One out of three of the accidents occurred during snow/wet conditions. Some accidents occurred at night and there were five injuries at this location.
Academy Road	13	Most accidents involved two vehicles and all occurred on dry surface conditions primarily during the day. Most occurred in a parking lot, along the road, and at the intersection.
Broadway	11	60% of these accidents occurred at the intersection. One out of three accidents occurred in snow/wet surface. There were 6 injuries.
Main Street and Glass Street	15	There were 11 injuries at this intersection and many accidents occurred in the dark due to lack of street lighting. One accident involved a bicyclist and most occurred in dry conditions.
Glass Street	7	Most accidents occurred during the day and some occurred at night with no street lights. Some accidents occurred at driveway access points.
ALLENSTOWN		
Bartlett Street	8	All accidents involved two vehicles and were intersection related. Road conditions were normal and dry and most accidents occurred during the day.
School Street	6	All accidents were intersection related. There was one person injured at this location.
Rt. 28 Pinewood Road	7	Most of these accidents occurred in 2005. These accidents happened at the NH-28 ramp and in parking lot areas. Two out of seven accidents involved fixed objects. Icy road conditions were a common factor.
Granite Street	31	Most of these accidents involved two vehicles and occurred in the parking lot and intersection. Most accidents occurred during the day under primarily normal road conditions and a dry or a wet surface.
HOOKSETT		
Bert Street	10	A majority of these accidents involved two vehicles and occurred along the road. Road conditions were normal and dry and most accidents occurred during the day.
Main Street	24	Most of the accidents that occurred at this location involved at least two vehicles. Road conditions were normal and dry and most accidents occurred during the day.
Memorial Drive	14	A majority of the accidents involved two vehicles and occurred at the intersection. Most of these accidents occurred during snowy conditions.
Gary Av	27	Accidents at this location were primarily collisions while passing. These types of accidents are usually the result of drivers weaving in and out of traffic.
Lehoux Drive	14	
Legends Drive	41	Most of the accidents involved at least two vehicles and occurred at the intersection. The accidents occurred during the day time and the road conditions were dry for the most part.
Rt 28 Londonderry Turnpike	39	Majority of the accidents at this location were the result of rear end collisions. These types of accidents are usually the result of stop and go traffic and heavy traffic volume.
Benton Road	34	The majority of accidents at this location involved at least two vehicles. The weather conditions were clear and the roadway conditions were dry.

Martins Ferry Road	40	The majority of accidents at this location involved at least two vehicles. The weather conditions were clear and the roadway conditions were dry.
North of Mammoth Road	18	
Mammoth Road	16	Most of the accidents at this location were the result of rear end collisions. The weather was clear and road conditions were dry. The accidents are likely the result of heavy traffic volume.
Silver Av.	8	A majority of the accidents at this location were rear end collisions. The surface condition of the roadway was wet for the most part and they occurred on rainy days.
Alice Av.	33	The majority of accidents at this location involved at least two vehicles. The weather conditions were clear and the roadway conditions were dry.
North of I-93	7	
I-93	74	Most of the accidents at this location were collisions while passing with the majority of accidents occurring on cloudy days. These types of accidents are often the result of congestion and traffic weaving in and out.

Source: NHDOT-2003 & 2005 Crash data

Pedestrian and Bicycle Accommodations

Pedestrian and bicycle amenities generally can improve travel choices and the overall quality of life in communities. The presence of sidewalks is an important corridor feature. Adequate sidewalks can link residential areas to commercial areas, link potential transit stops to surrounding areas, and can provide improved overall circulation as a viable alternative to the motor vehicle. The Central New Hampshire Regional Planning Commission (CNHRPC) and the Southern New Hampshire Planning Commission’s vision as well as the New Hampshire Long Range Transportation initiative all call for designing land development and transportation projects to support and proactively create vibrant communities. The system proposed in the Central New Hampshire Regional Transportation Plan focuses primarily on linkages between commercial and residential areas; however, substantial benefits can be realized from pedestrian and bicycle improvements.

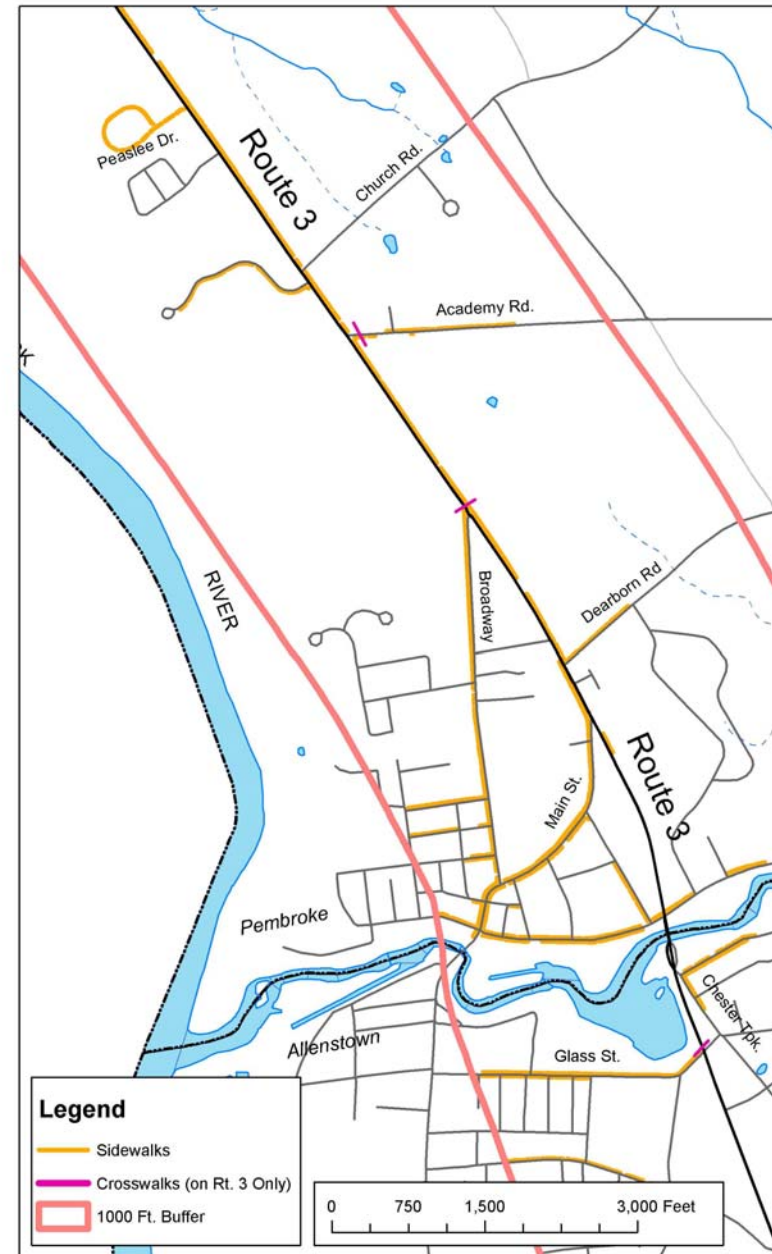
Some portions of US Route 3 have very good sidewalk infrastructure, while other areas require improvement. Sidewalks are provided along the east side of the corridor between Route 106 and Main Street in the Town of Pembroke. From this point and beyond, there are limited sidewalks within the US Route 3 study area. For this reason, the Pedestrian Accommodation Index and the Bicycle Level of Service was only made for the Towns of Pembroke and Allenstown. The following diagram illustrates the existing sidewalk locations within the study area.



For planning purposes, CNHRPC’s staff has developed a Pedestrian Accommodation Index in order to evaluate the “friendliness” of intersections to pedestrians throughout the Corridor. This study was only done for the Towns of Pembroke and Allenstown due to the pedestrian and bicycle demand on this portion of the corridor.

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Map 10: Existing Sidewalks along US Route 3



Pedestrian Accommodation Index

Based on a set of specific characteristics, each signalized intersection along the US Route 3 Corridor in Pembroke and Allenstown was evaluated and scored according to how friendly the intersection is to pedestrians. The index ranges from A to F with level A representing the highest level of pedestrian accommodation and level F representing the lowest level of pedestrian accommodation. The index is only based on the physical characteristics of the intersection and amenities that are present. Other factors such as vehicular traffic volume, pedestrian volume, and approach speed are not included, although the relatively high traffic volumes along US Route 3 make it difficult to cross. The results of this pedestrian accommodation inventory are summarized in Table 3 and suggest that there are certain intersection deficiencies within the corridor from a pedestrian accommodation standpoint.

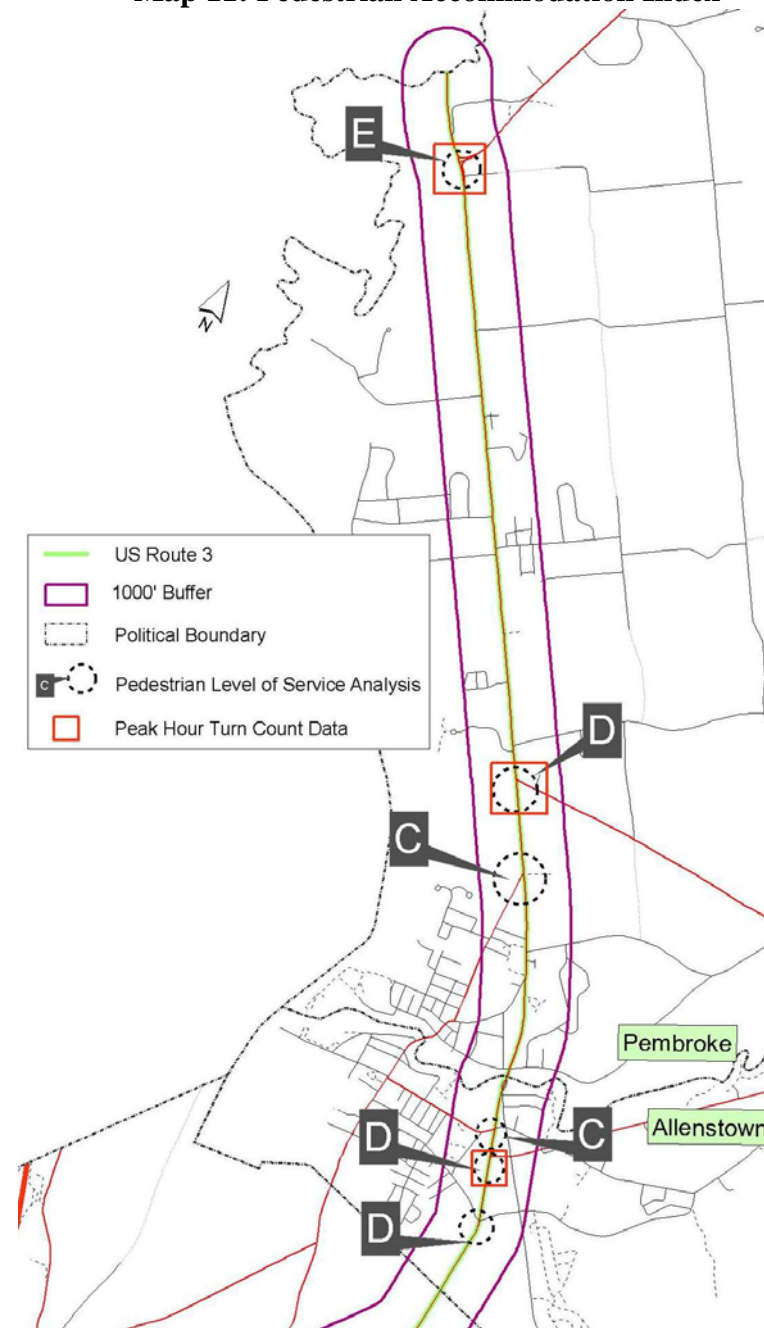
These deficiencies consist of various characteristics such as long crossing distances, allowance for right turn on red which increases pedestrian/vehicular conflicts, large intersection radii, lack of painted crosswalks, lack of active pedestrian signal indications on certain approaches, and intersection lighting, among others. (Appendix A shows more details of the Pedestrian Accommodation Index process of evaluation)

Table 3 - Intersection Pedestrian Accommodation Score

Intersection	Pedestrian Accommodation Index
<i>US Route 3 at</i>	
NH Route 106, Pembroke	E
Academy Rd, Pembroke	D
Broadway, Pembroke	C
School St, Allenstown	C
NH Route 28, Allenstown	D
Granite St, Allenstown	D

Source: CNHRPC data collection

Map 11: Pedestrian Accommodation Index



Bicycle Level of Service (BLOS)

Similar to the pedestrian inventory, a bicycle inventory was conducted along US Route 3 in the Towns of Pembroke and Allenstown as a measure of the quality of service for this mode of travel. The bicycle level of service (Bicycle LOS) model measures bicycle conditions of shared roadway environments and is based on industry research published by the Transportation Research Board¹.

Criteria such as volume and composition of traffic (percent heavy vehicles), pavement condition, curb side lane width, presence of parking, presence of bike lanes, presence of drainage structures, and roadway speed were documented and evaluated according to the bicycle model procedures. Table 4 summarizes the results of the analysis and shows that the bicycle level of service on US Route 3 is marginal. Relatively high speeds, high traffic volumes and the lack of a dedicated bicycle lane contribute significantly to the overall LOS “F” rating along the corridor in both directions. (**Appendix B** shows more details of the BLOS process of evaluation)

Table 4 - Existing Bicycle Level of Service

Road Segment	Directional	LOS
Concord City Line to Route 106	SB*	F
	NB*	F
Route 106 to Whittemore Road	SB	F
	NB	F
Whittemore Road to Broadway	SB	F
	NB	F
Broadway to Main Street	SB	F
	NB	F
Main Street to School Street	SB	F
	NB	F
School Street to Granite Street	SB	F
	NB	F
Granite Street to Hooksett Town Line	SB	F
	NB	F

*SB: Southbound; NB: Northbound

Source: CNHRPC

¹ Landis, Bruce W. “Real-Time Human Perceptions: Toward a Bicycle Level of Service” Transportation research Record 1578, Transportation Research Board, Washington DC 1997

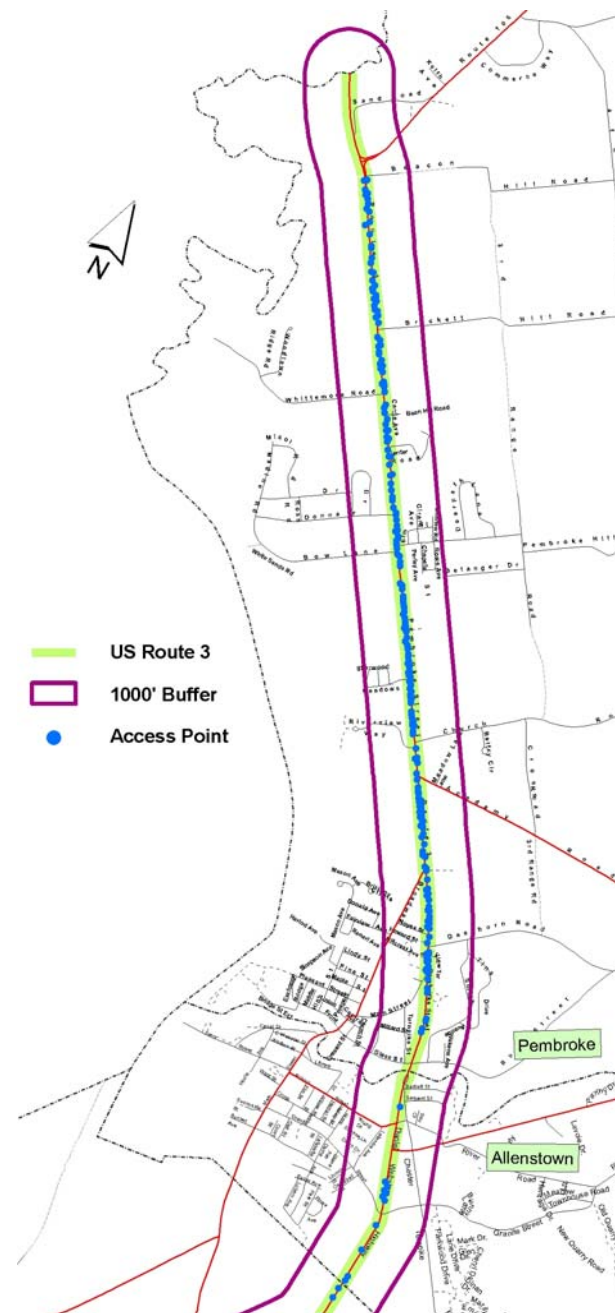
Map 12: Access Points (Pembroke and Allenstown)

Access Point Inventory

Access points along a corridor can affect the overall operation of the corridor. Each access point that intersects a highway provides a point of potential conflict as a vehicle turns on or off the highway. As a result, traffic slows down and the efficiency of the highway is reduced, increasing the potential for crashes. If access points are controlled and kept to a minimum, the traveling public will have less interference from traffic entering and exiting the highway and thus will operate more efficiently with less potential for crashes. Alternatively, the more access points that exist along a corridor, the more interference drivers will encounter, thus decreasing the efficiency of the corridor and increasing the potential for crashes.

In addition to the number of access points, the width and type of access point will also affect the efficiency of the corridor. Access points with a well-defined or channelized entrance/exit allow for more efficient operation of the corridor because approaching vehicles will more clearly be able to determine where vehicles will be entering or leaving those access points. Access points that do not have a well-defined entrance/exit, or are very wide, allow entering and exiting vehicles to make many different movements that an approaching vehicle cannot anticipate. The wide-open unchannelized access point has been shown to be detrimental to the efficient operation of a corridor.

There are varying types of access points along the Study corridor. To better define the various types of access points along the corridor, an inventory of all access points was performed using a Global Positioning System (GPS) (See **Maps 12** and **13**). The inventory consisted of the location and width of the access point. This information was then mapped for discussion and study purposes. There were a significant number of access points along the corridor that were wide open and contained no channelization.



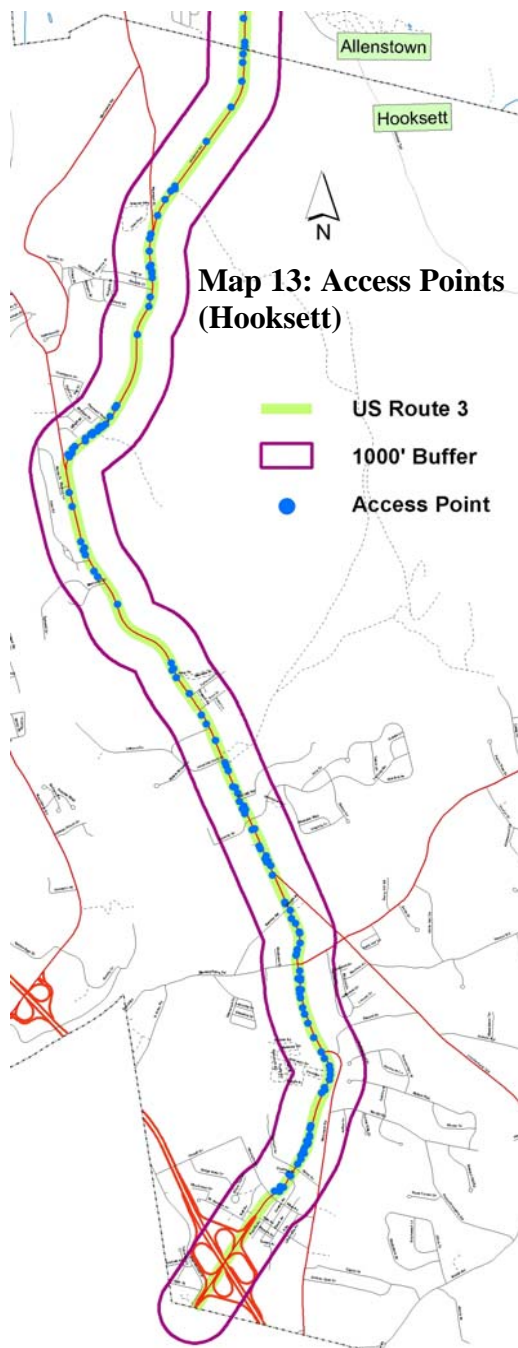
Access Management

Access management is the control and regulation of the spacing and design of driveways, intersections, and other points of access to and from the highway system and the land that abuts it. For communities, access management usually means controlling the number and spacing of driveways along a roadway, as well as the construction of new roads which access the existing highway system. In addition, access management involves the creation of left and right turning lanes, medians, and median openings.

The purpose of access management is to preserve the capacity of roadways and improve traffic safety by limiting turning movements and ensuring that the design of access points allows for the safe and efficient movement of vehicles. There are a variety of techniques that can become part of a local access management program. These techniques include:

- Ensuring adequate distance between driveways to reduce the number of access points that a driver must observe.
- Ensuring that corner lots are accessed from the least traveled road or side street.
- Limiting the number of access points per lot.
- Encouraging, and at times requiring, the use of shared driveways between two or more adjacent lots.
- Providing interconnections between non-residential sites to allow employees and customers to move from site to site without repeatedly entering and exiting the highway system.
- Ensuring that driveways have an adequate throat length (i.e. depth) to prevent vehicles from backing up on the highway system as they wait to access a site.
- Providing right-turn deceleration and acceleration lanes as warranted.
- Providing dedicated left turn lanes where warranted.
- Defining driveway openings clearly to eliminate wide open access points to a site that creates confusion and an unsafe situation.
- Ensuring that access points are adequately set back from intersections to ensure that vehicles accessing a site do not interfere with the operation of the intersection.
- Providing medians to limit or prohibit left turn possibilities on busy stretches of road where left turns from sites onto the highway system are unsafe.
- Providing traffic signals where traffic volumes and situations warrant them.

In order to obtain a better understanding of what currently exists for access points along the corridor, each access point was mapped using a Global Positioning System (GPS). **Table 5** summarizes the numbers and characteristics of the access points along the corridor. The “Number of Access Points per 100 feet” column in **Table 5** provides a very good indicator of the density of access points in a given



section. A higher number of access points per 100 feet will lower the capacity of that section, causing travel speeds to reduce and congestion to increase. As would be expected, when the number of access points decreases, vehicles are able to flow more freely and travel times decrease. As every access point creates an additional opportunity for an accident, traveler safety for all modes, including bicycle and pedestrian, also increases as the number of access points decrease.

Access point quality is also a key feature in access management. Ten well-defined and signed access points are substantially safer and have smaller impacts to the corridor than ten poorly defined ones. Two columns in **Table 5**, “Maximum Length of Access Points” and “Average Length of Access Points,” clearly describe one feature of access point design: length. Even the largest trucks have a turning radius of only 47 feet and most delivery trucks do not exceed 30 feet. Access points should be constructed to easily accommodate typical vehicles and should accommodate an infrequent larger delivery vehicle. For properties with more than one access point, one-way entrances and exits can also assist traffic flow, increase safety, and allow for reductions in the size of the access points. Signage for all access points, particularly multiple access points, is vital for safe and efficient traffic flow.

The construction of access points is controlled both by the New Hampshire Department of Transportation through the Highway District Engineer’s Offices and by communities. Both the District Engineer and the community can work cooperatively to ensure that access points are constructed in the best locations and to safe standards.

Table 5: Access Point Inventory

Section of US Route 3	Number of Access Points	Maximum Width of Access Points (ft)	Minimum Width of Access Points (ft)	Average Width of Access Points (ft)	Length of Section (ft)	Number of Access Points per 100 feet
NH Route 106 - Bow Lane (Pembroke)	94	103.6	9.3	24.4	8,916	1.1
Bow Lane - Church Road (Pembroke)	61	85.7	8.9	18	4,309	1.4
Church Road - Allenstown Town Line (Pembroke)	74	52	8	19.6	7,527	1.0
Allenstown Town Line - Hooksett Town Line (Allenstown)	18	52.4	18	31	5,089	0.4
Hooksett Town Line - Main Street (Hooksett)	52	112	8.2	24.8	13,500	0.4
Main Street - Industrial Park (Hooksett)	38	161.6	13.8	43.6	8,724	0.4
Industrial Park - Martins Ferry Road (Hooksett)	48	66.6	8	29	7,200	0.7
Martins Ferry Road - West Alice Road (Hooksett)	57	165.2	8	36.5	7,200	0.8

Source: CNHRPC

Access Management Analysis

Allenstown Existing Conditions

The intersection of US Route 3 and Granite Street in Allenstown presents many problems associated with poor access management, parking and overall aesthetics. Many of the businesses, ranging from light industrial to commercial, are designed to accommodate large volumes of traffic due to their parking arrangements, building orientation and lack of landscaping and vegetative buffers. The structures are set back from the street at great distances so as to provide ample parking in front, along abutting properties and in the rear where overflow parking is provided. Parking and access management are interrelated subjects, thus an examination of traffic patterns and accident locations plays an important role in identifying potential solutions to improve the site and reconfigure the parking arrangements.

The amount of traffic generated from this site and the amount of traffic that travels along the corridor have created concern about traffic congestion and safety. Many of the driveways can be accessed at both right and left turns, which has resulted in an increase in the number of accidents. In 2005, 31 vehicular accidents were reported at this intersection, with the majority caused by parking related incidents. The locations and severity of these accidents indicate that there is a lack in overall parking design characterized by insufficiently defined parking spaces.

Safety is the most important concern when designing a street for vehicles and pedestrians. Many residents live in proximity to this site, but cannot access any of the businesses without use of an automobile. The lack of linking affordable housing units along Granite Street with the Suncook Village District and Allenstown Elementary School via sidewalks could create a safety issue as well as an economic loss for businesses. The Granite Street and Route 3 intersection lacks pedestrian infrastructure, making this section of the corridor nearly impassable for pedestrians.

When examining the components of the pedestrian infrastructure to ensure that safety, aesthetics and connections are established, the use of

Map 14: Access Management Analysis in Allenstown



landscaping is a necessity. Many of the businesses have minimal landscaping. There are few landscaped buffers separating lots and parking from the street. The lack of landscaping impacts the safety of the site by failing to separate uses, and also increases the rate of stormwater run-off during periods of heavy storms. These items suggest landscaping can be an important element in establishing and enabling connections whether they be pedestrian, automobile or greenways.

Proposed Changes

In order to make this section of the corridor safer for pedestrians and automobiles, changes and additions are necessary. Through a thorough analysis of the site, potential improvements that would enhance the overall character and function of the area have been identified and are depicted in **Map 15**. The first proposed improvement consists of reducing the number of curb cuts to make the road more pedestrian and bicycle accessible and create a more efficient traffic flow. Reducing curb cuts onto Rt. 3 and redirecting traffic onto Granite Street, which has a traffic light that facilitates vehicular circulation. To achieve this on the east side of the corridor, we suggest the implementation of one driveway between both business developments by eliminating the existing ones on US Route 3. We also recommend creating a landscaped bed to function as snow storage as well as a buffer at the corner of the Bi-Wise Market parking lot. On the west side of the corridor, we suggest a similar combination of curb cuts.

The reconfiguration of existing driveway access points will play an important role in improving safety. When considering the issues relating to driveway design, other site specific issues related to parking, landscaping, pedestrian circulation and overall aesthetics are critical in providing a functional circulation system. By reducing the access points into the parking areas, parking will have to be adjusted according to the new circulation patterns created. In order to accommodate landscaping beds and streetscape improvements parking spaces could be placed at diagonals, and create one-way aisles, which can also improve safety in the parking lots.

Map 15: Proposed Changes in Allenstown



In this instance, the centers of commercial activity are no more than a 15 minute walk from residential sites, which could be walked with relative ease if sidewalks existed. The creation of a sidewalk system could be pivotal in establishing a walkable community. The importance of a pedestrian circulation system goes beyond the concept that sidewalks are only meant to get people from one place to another. Sidewalks would serve as a tool to empower residents, students and all those interested in living healthier lifestyles. This project has potential to be eligible for the Safe Routes to School Program. The Safe Routes to Schools Program (SRTS) is a Federal-Aid program of the U.S. Department of Transportation's Federal Highway Administration (FHWA). The Program is developed to create safe, accountable, flexible and efficient walking and bicycling conditions for kids living close to school. SRTS is a statewide program that encourages children to walk and bike to school.

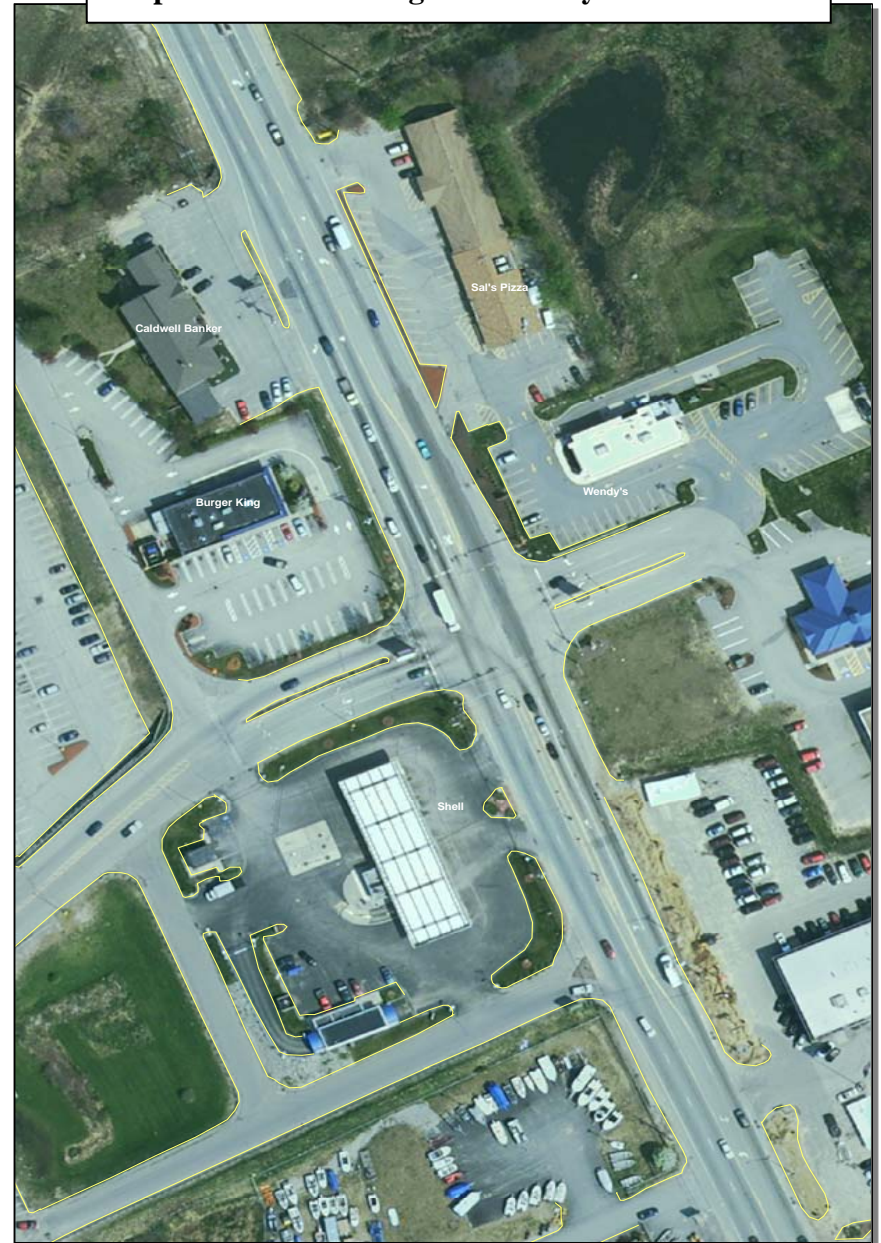
Another concern illustrated in this example, which is also important to encouraging enabling walking is the lack of a safe “path” from the sidewalk paralleling Rt. 3 to the businesses and other destinations. Reconfiguration of parking lots as suggested to eliminate or minimize lost parking spaces would provide opportunities to delineate pedestrian ways through fields of asphalt.

Hooksett Existing Conditions

The US Route 3/Walmart Plaza Driveway intersection, shown on the accompanying photograph, is located just north of the US Route 3/NH Bypass 28 intersection in the southern portion of the corridor in Hooksett. The western leg of the signalized intersection provides access to the Walmart Plaza while the eastern leg of the intersection provides access to a fast-food restaurant and other retail facilities located to the north and south. Other curb cuts directly on US Route 3 are located on the east and west side of the corridor in close proximity to the US Route 3/Walmart Plaza Driveway intersection. These curb cuts provide access to a service station located on the southwest quadrant of the intersection and to the other retail and service-related establishments located to north.

The existing conditions on this portion of the corridor contribute to inefficient and unsafe traffic flows resulting from the combination of significant traffic volumes and the numerous side streets and uncontrolled driveways in this area. Because this portion of the US Route 3 corridor in Hooksett serves significant amounts of through traffic as well as local trip-making, frequent turning movements to and from the side streets and uncontrolled driveways in the area restricts the normal flow of traffic, causing stopping and starting, delays, driver frustration and accidents. Access management improvements for this portion of the corridor would be designed to balance the mobility and access needs of the roadway to both improve through traffic and enhance safe and efficient access to properties.

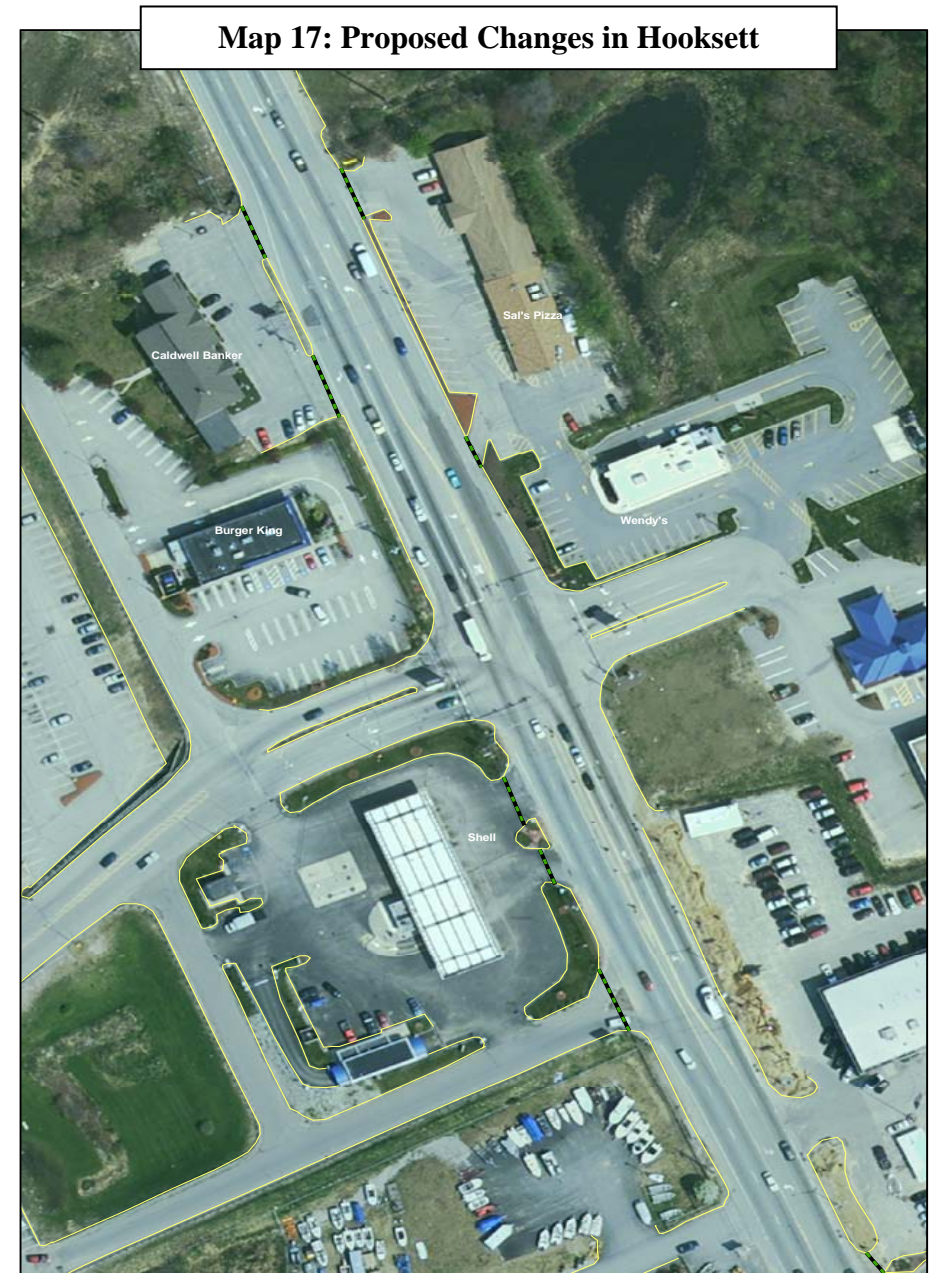
Map 16: Access Management Analysis in Hooksett



Proposed Changes

The proposed changes to this portion of the corridor involve the development of the access management principles, including those described in the US Route 3 Corridor Performance Zoning District Ordinance. Specifically, the access management plan for this portion of the corridor could generally include treatments such as limits on the number of driveways per lot, development of frontage or service roads, shared driveways and internal connections between lots. Examples of many of these treatments are shown on the accompanying photograph. These treatments would be utilized in an effort to develop proper continuation of streets, separation of through and local traffic and provision of driveway connections to adjoining lots. Closing the curb cuts providing access to the Shell service station south of the intersection would improve traffic flows on US Route 3, increasing efficiency and safety. Access to the site would still be available from the western leg of the US Route 3/Walmart Plaza Driveway.

Similar improvements to traffic efficiency and safety would be possible for northbound US Route 3 traffic flows through the closing of the curb cuts on the east side of the corridor north of the intersection. Access to the retail establishments to the north and south would still be possible through the eastern leg of the US Route 3/Walmart Plaza Driveway intersection and the existing internal connection between them. The possibility of providing a new internal connection between the fast-food restaurant located on the northwest quadrant of the intersection and the financial establishment located directly to the north could also be pursued. Further improvements to traffic efficiency and safety at the US Route 3/Walmart Plaza Driveway could be accomplished by restricting the use of curb cuts on the Wal-Mart Driveway that are located in close proximity to the signalized intersection at US Route 3. This would eliminate conflicts between vehicles entering and exiting the lots north and south of the Wal-Mart Driveway and vehicles approaching the traffic signals on the western approach of the intersection.



Commuting along the Corridor

The US Route 3 Corridor plays a critical role in commuters' journey to work. Most of Pembroke and Allenstown and much of Hooksett are dependent on this corridor. Most work destinations are north or south of the study area, so US Route 3, as the major north-south connector corridor, is the primary route for many residents. The Merrimack River to the west of the corridor acts as a barrier, forcing commuters to travel along the corridor to reach job destinations that are only a short distance west across the river.

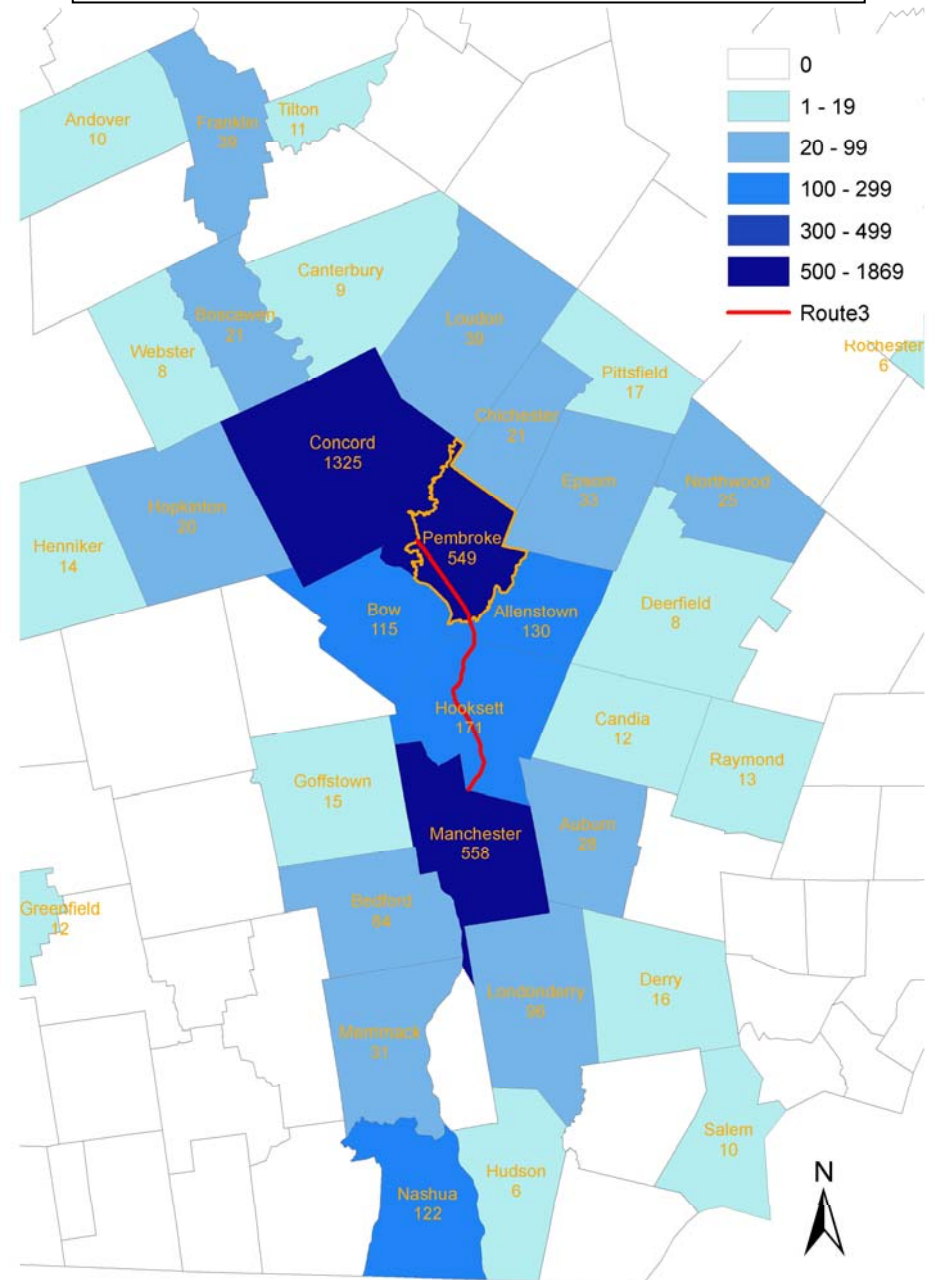
Pembroke

A total of 549 residents live and work in Pembroke. There were 3,141 commuters leaving Pembroke in 2000 (not including travel to other states). The US Route 3 Corridor is the main route for Pembroke residents that work outside the Town, especially for the 1,325 Pembroke commuters traveling north to Concord. In addition, more than 250 commuters travel to communities west and north of Concord, which would require a trip through the Concord area. There are only two alternative routes that connect Pembroke and Concord: Route 106 and Pembroke Rd. A majority of the approximately 1,600 commuters travel on the northern stretch of the US Route 3 Corridor during their journey to work.

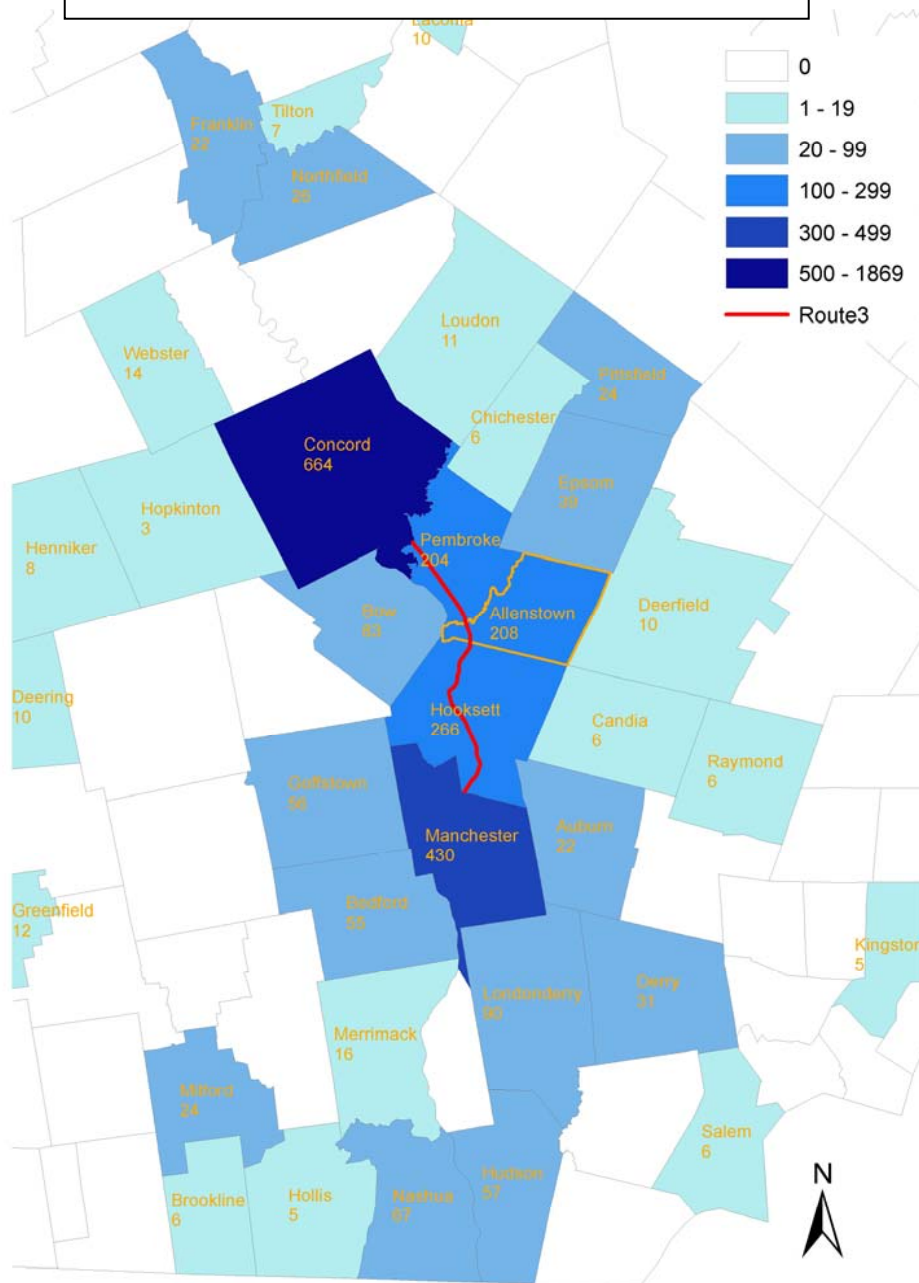
A total of 558 commuters from Pembroke travel to Manchester, and many of them travel a portion of the corridor to reach I-93 at Exit 11 or travel the entire route to Manchester. More than 500 commuters travel to communities south of Manchester (not including those traveling to Massachusetts). Many of these commuters would travel a similar route as those traveling to Manchester.

Map 18 shows the number of commuters from Pembroke that travel to each destination.

Map 18: Commuters to Work from Pembroke in Central and Southern New Hampshire regions



Map 19: Commuters to Work from Allenstown in Central and Southern New Hampshire Regions



Allenstown

There were 2,374 commuters leaving Allenstown in 2000. The corridor is a major route for Allenstown residents on their journey to work. The only other major route through town is Route 28 to the northeast. The “Commuters from Allenstown” map shows that a relatively small number of commuters would leave town via Route 28. Most work destinations are either north or south of Allenstown and require north/south travel along the US Route 3 corridor. More than 1,000 commuters travel towards Concord or further north and about 1,000 residents commute south into Hooksett and Manchester. These commuters likely travel the corridor into Hooksett to I-93 Exit 11, and some continue all the way to Manchester. (Map 19)

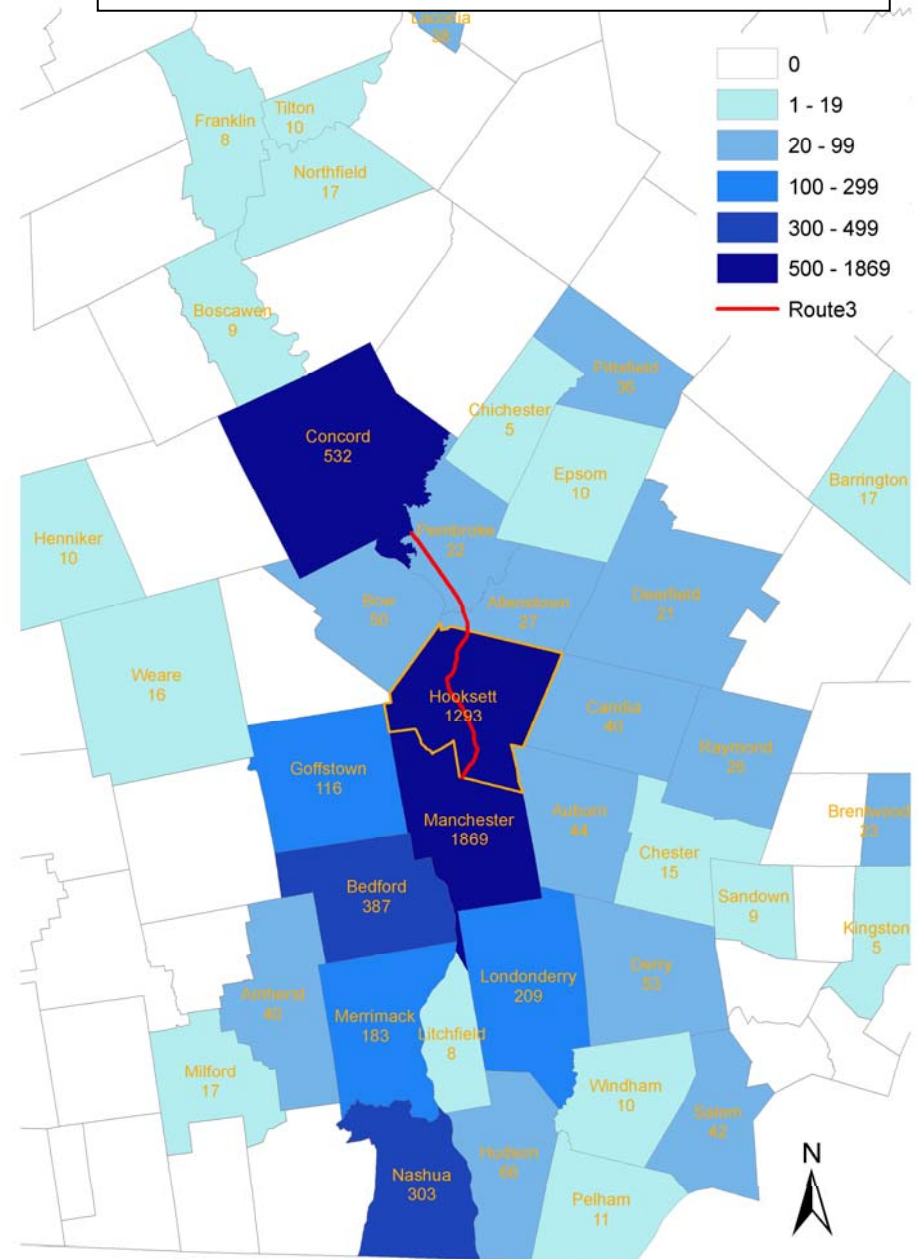
Hooksett

There are 1,293 residents that live and work in Hooksett. A total of 4,477 residents commute out of town. Unlike Pembroke and Allenstown, there are numerous other major routes entering and exiting Hooksett. Even so, the US Route 3 corridor is a main connector to the other roadways, including the Route 28 bypass, 27, 3A, and I-93. More than 600 commuters travel north of Hooksett, and in order to do so, residents east of the Merrimack River need to travel a portion of the corridor to access Exit 11 of I-93 or travel the length of the corridor towards Concord.

A majority of the commuters from Hooksett travel south and the route they take depends on where they live in town and their work destination. US Route 3 is likely traveled by a large percentage of these commuters, but other routes also play a significant role. It should be noted that there are some parts of Hooksett that still depend almost solely on this corridor in order to leave town for work. Since the corridor is the major collector for the central part of town, there are few alternative routes in that area.

The numbers represented for each town on **Map 20** show the number of commuters traveling to certain towns from Hooksett as well as the number of people who live and work within Hooksett.

Map 20: Commuters to Work from Hooksett in Central and Southern New Hampshire Regions



Transit Opportunities

Currently, there is limited transit availability along the corridor as there is no fixed-route regularly scheduled transit service. Special needs transit is available on an on-call basis service in Pembroke and Allenstown. Fixed-route service could help reduce congestion on the corridor and provide easier access to services for those with limited means of travel. Concord Area Transit (CAT) has considered options for an expansion of service into Pembroke and Allenstown. In the future, a link between Concord Area Transit and the Manchester Area Transit (MTA) would be ideal for travelers. Examining the numbers of commuters from the three towns commuters from the five Rt3 communities suggest significant numbers of commuters may exist to at least support rush-hour transit service.

Table 6: Commuters from the Three Towns to the Five US Route 3 Communities

	Concord	Pembroke	Allenstown	Hooksett	Manchester	US Route 3 Commuters
Pembroke	1325	549	130	171	558	
Allenstown	664	204	208	266	430	
Hooksett	532	22	27	1293	1869	
Total	2521	775	365	1490	3857	9008

Source: US 2000 Census Report

Manchester Transit Authority (MTA)

MTA route 9 goes from the “Northside Plaza/Hannaford” (which is off US Route 3 just south of I-93) to downtown every hour from 6:43am to 5:43pm weekdays and 8:43am to 4:43pm on Saturdays. It is a direct route with only one other stop on the way. The bus route takes 13 minutes and the fee is \$1 for adults and 50 cents for seniors or disabled persons. There is no MTA service on the corridor. The schedule of service can be accessed through MTA’s web page at <http://www.mtabus.org/>

Community Action Program (CAP) of Belknap-Merrimack County

The CAP Rural Transit System provides services for seniors (aged 60 and over) and disabled individuals. Vehicles are routed through the community with service tailored to offer door-to-door service and assistance in loading and unloading. Rides are available for Allenstown and Pembroke on Wednesdays from 10am to 12:45pm by contacting the CAP call center.

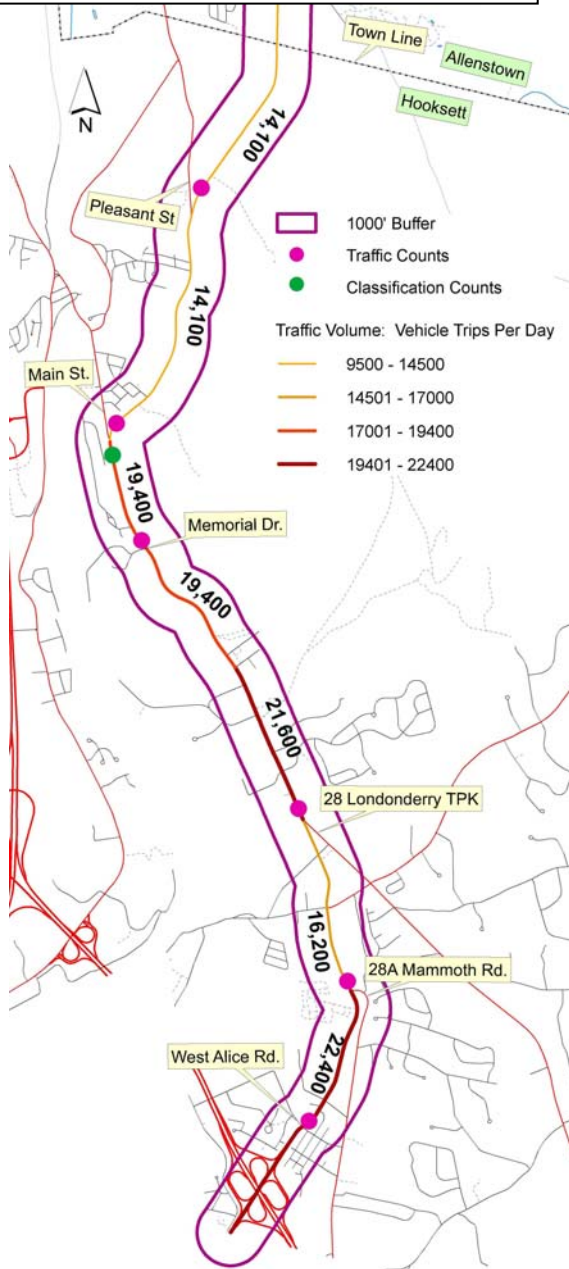
Concord Area Transit (CAT)

Concord Area Transit provides scheduled fixed-route service throughout most of Concord with a route extending to areas of Penacook just south of Boscawen. The “Concord Area Transit Expansion Study” completed in September 2003 by TranSystems Corp. recommended expanding service to include Pembroke and Allenstown. In the inbound (northbound) direction, the route would start at the Bi-Wise parking lot near the intersection of US Route 3 and Route 28 in Allenstown. Ideally, an arrangement could be worked out with the owner of the parking lot to allow commuters to use surplus spaces as a park-and-ride lot. Alternatively an adjacent Park and Ride facility could be developed. From the Bi-Wise, the route would travel north on US Route 3 to School Street, then left into the center of Suncook Village at Main Street, right to Broadway, then left on Broadway to rejoin US Route 3. The route would take US Route 3 all of the way to Eagle Square, extending to the Concord Trailways terminal off Stickney Drive. Overall, the Study recommended several incremental changes to the CAT system to offer expanded and improved service to the area.



Photo 6: This photo shows existing bus service offered in the Concord Area. Considering options for an expansion of service into Pembroke and Allenstown could help reduce congestion on the corridor and provide easier access to services for those with limited means of travel.

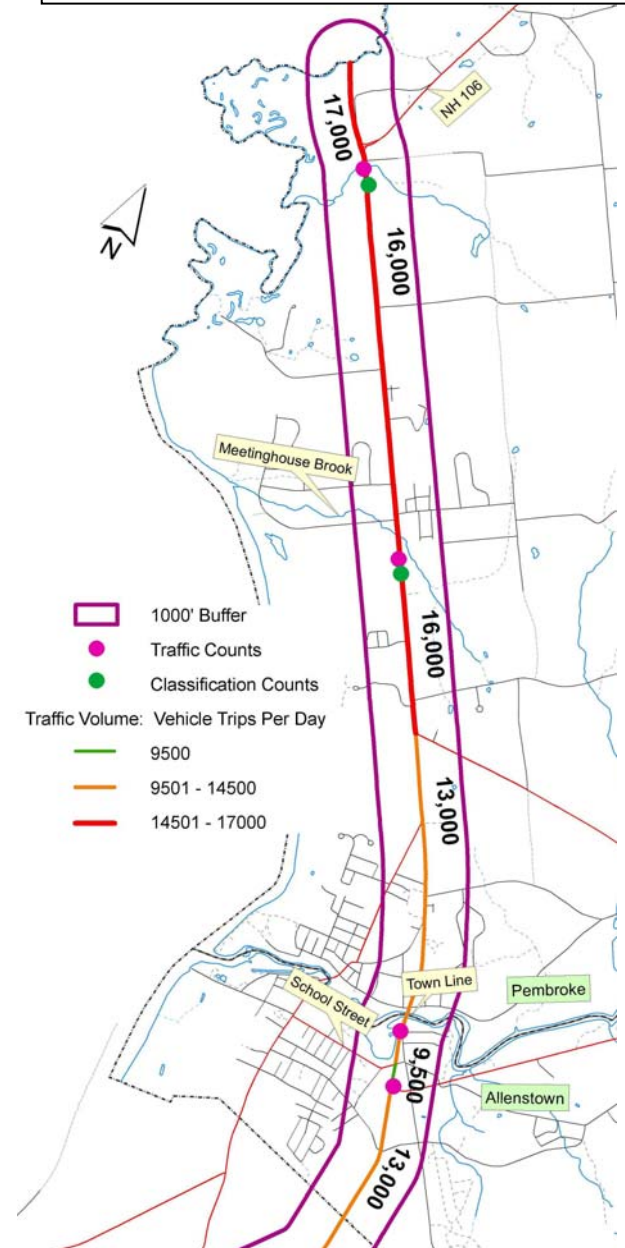
Map 21: Traffic Volume and Traffic Count Location Map



Traffic Information & Analysis

Basic traffic information serves an important role in any corridor study as many recommendations may be based directly or indirectly on it. Existing traffic information was utilized for the Study. However, much of that data was old and has been updated. The following is a discussion of the data collected during this Study.

Map 22: Traffic Volume and Traffic Count Location Map



Traffic Volumes and Capacities

Congestion, vehicular and pedestrian safety, aesthetics, and travel speed are all characteristics of a roadway that are directly affected by the number and type of vehicles traveling along particular portions of the roadway. As such, determining the traffic counts and vehicle classifications at various key sections of the Study Corridor was one of the first steps undertaken as part of this Study.

Vehicle Classifications

Vehicles are classified into various categories for the purposes of determining how many of the various classifications are traveling over a certain section of roadway. Once vehicles are classified, the numbers are used to determine the capacity of the roadway, to predict future traffic, and to assist in the design of the roadway. Manual classification counts were taken at the following locations along the Study Corridor and are illustrated in **Map 21 and Map 22**:

- Pembroke Street (US Route 3) south of the NH Route 106 intersection in Pembroke;
- Pembroke Street (US Route 3) south of Meeting House Brook at Pembroke;
- Allenstown Road (US Route 3) south of Pembroke/Allenstown Town Line;
- Allenstown Road (US Route 3) at south of Granite Street in Allenstown.
- NH 28 & US 3 South of Main Street

The classification counts were taken at all four locations during the AM (6:00 – 9:00 AM) and PM (2:00 – 5:00 PM) peak traffic periods. For the purposes of this Study, it was determined that traffic would be categorized into the following three classifications:

- Passenger (four-wheeled passenger car, pickup, etc);
- Six-wheeled vehicles (vans, small delivery trucks, dump trucks, etc); and
- Tractor (larger than six-wheeled vehicles).

The results of the classification analysis are presented in **Table 6** below. The number of trucks, both six-wheeled and larger than six-wheeled, using the corridor ranged between 1.7 and 8 percent depending on the time of day and direction of travel. This percentage is considered normal for the corridor considering the mix of industrial, commercial, and residential land uses along the corridor. Passenger vehicles as defined above accounted for between 79 to 94 percent of vehicles traveling the corridor.



Photo 7: View from the northern end of Pembroke Street (US Routes 3) and Broadway split looking to the southeast. The Pembroke Park is on the left.

Table 7 - Classification Data

LOCATION	PEAK PERIOD	DIRECTION	PASSENGER VEHICLE		6-WHEELED VEHICLES		LARGE TRUCKS		TOTAL	
			Count	Percent	Count	Percent	Count	Percent	Count	Percent
South of NH 106 (Pembroke)	AM	North	833	90.90%	20	2.20%	63	6.90%	916	100%
		South	461	90.70%	18	3.50%	29	5.70%	508	100%
	PM	North	552	79.00%	15	2.10%	132	18.90%	699	100%
		South	825	92.00%	23	2.60%	51	5.70%	899	100%
South of Meetinghouse Brook (Pembroke)	AM	North	862	93.00%	16	1.70%	49	5.30%	927	100%
		South	590	93.20%	16	2.10%	30	4.70%	633	100%
	PM	North	666	91.60%	14	1.90%	47	6.50%	727	100%
		South	836	93.30%	16	1.80%	44	4.90%	896	100%
NH 28 & US 3 South of Main Street	AM	North	620	88.00%	54	8.00%	33	4.00%	707	100%
		South	848	92.00%	57	6.00%	19	2.00%	924	100%
	PM	North	933	91.00%	47	4.60%	46	4.40%	1026	100%
		South	871	91.40%	49	5.10%	32	3.50%	952	100%
NH 28 & US 3 North of Granite St	AM	North	300	90.00%	12	3.00%	23	7.00%	335	100%
		South	615	94.00%	21	4.00%	15	2.00%	651	100%
	PM	North	586	92.00%	16	2.00%	37	6.00%	639	100%
		South	382	89.00%	13	3.00%	34	8.00%	429	100%

Source: CNHRPC Manual Classification Counts, 2007 and SNHPC Annual Traffic Counts

AM Peak = 6:00 AM to 9:00 AM
 PM Peak = 2:00 PM to 5:00 PM

Traffic Projections

Transportation agencies use various data to determine the future needs of a roadway. One data set used most frequently is the volume of traffic on the roadway. The method normally used to determine future needs is to periodically collect traffic volume data and then, using the historical growth of traffic, project what the volume of traffic would be in a future year. Traffic is normally projected out ten (10) or twenty (20) years for planning purposes.

Along the Study corridor, traffic counts were available for past years from data collected by the regional planning commissions and the NHDOT. To update this information, traffic volumes were measured at the following locations along the corridor:

- US Route 3 South of Meetinghouse Brook (SB-NB) in Pembroke
- US Route 3 at Pembroke/Allenstown Town Line
- US Route 3 South of School Street in Allenstown
- NH 28 & US 3 North of Pleasant St
- NH 28 & US 3 North of Main St
- NH 28 & US 3 North of Memorial Dr.
- NH 28 & US 3 North of Bypass 28 Londonderry TPK
- NH 28 & US 3 North of 28A Mammoth Rd.
- NH 28 & US 3 North of West Alice Rd.

Using traffic volumes from 1996 to 2006 and those taken for this Study in 2007-08, an average traffic volume growth per year was determined. Using this growth rate, the traffic for this corridor was projected out to the year 2015 and 2025. As shown in **Table 7**, the 2006 estimated traffic at the above locations along the corridor ranges from approximately 9,772 to over 28,593 vehicles per day. Projecting those traffic figures out ten (10) and twenty (20) years results in a 13.70 percent increase over the next ten (10) years and a 29.98 percent increase over the next twenty (20) years. All numbers in *blue italics* represent estimates or projections (2015 and 2025).

Table 8 – Projections: Average Daily Traffic, 2015 and 2025

Location	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2015 Projection	2025 Projection	10-Year Growth	20-Years Growth
Pembroke TL	8,300			8,000			9,000			13,000	<i>13,373</i>	<i>23,930</i>	<i>44,050</i>	<i>13.70%</i>	<i>29.98%</i>
South of School St.			8,200			9,400				9,500	<i>9,772</i>	<i>9,887</i>	<i>10,289</i>		
South of Meetinghouse Brook (SB-NB)	14,000	13,000	1,300		12,000		16,000				17,917	<i>22,236</i>	<i>28,643</i>		
NH 28 & US 3 North of Pleasant St							14,000			14,000	<i>14,228</i>	<i>15,500</i>	<i>17,400</i>		
NH 28 & US 3 North of Main St					14,000		14,000			12,100	<i>12,165</i>	<i>12,700</i>	<i>13,400</i>		
NH 28 & US 3 North of Memorial Dr.							20,000		19,000		<i>19,364</i>	<i>21,100</i>	<i>23,200</i>		
NH 28 & US 3 North of Bypass 28 Londonderry TPK		27,000	20,000	27,000	29,000		29,000	28,000			<i>28,593</i>	<i>30,400</i>	<i>32,600</i>		
NH 28 & US 3 North of 28A Mammoth Rd.							18,000			16,000	<i>16,229</i>	<i>17,000</i>	<i>19,600</i>		
NH 28 & US 3 North of West Alice Rd.							17,000				<i>17,851</i>	<i>20,000</i>	<i>22,600</i>		

Source: CNHRPC & SNHPC Projections, 2007-08

Intersection Operations

One of the ways transportation planners examine the operation of an intersection is through an evaluations of turning movement data. This data demonstrates turning patterns in an intersection and can help to determine what, if any, intersection improvements are warranted (see **appendix C** for more details). As part of this Study, turning movement data at the following major intersections along the Study Corridor were collected:

- US Routes 3 and Route 106 in Pembroke
- US Routes 3 and Academy Road in Pembroke
- US Route 3 and NH-28 in Allenstown
- US Route 3 and Pleasant Street in Hooksett
- US Route 3 and Granite Street in Hooksett
- US Route 3 and Main Street in Hooksett
- US Route 3 and Londonderry Turnpike in Hooksett
- US Route 3 and Whitehall Road in Hooksett
- US Route 3 and West Alice Road in Hooksett

Peak hour intersection capacity and traffic operations at the above-mentioned intersections were evaluated using methodologies described in the 2000 Highway Capacity Manual (HCM). Operations at these locations are defined through level of service measures. In the HCM, level of service (LOS) is defined as a quality measure describing operational conditions within a traffic stream. Six LOS ranging from LOS A to LOS F are defined for intersections, with LOS A representing the best operating conditions and LOS F the worst. Most design or planning applications typically use operating conditions from LOS A to LOS D to define acceptable service levels.

Table 8 provides a summary of the results of the LOS analysis for the nine study area intersections. The analyses included six signalized intersection and two unsignalized intersections. Separate analyses were completed for the weekday AM and PM peak hours for existing and future scenarios. The future scenarios involved the use of projected traffic levels generated through the methodology described earlier in this section.

Table 9 - Intersection Level of Service

Signalized Intersections¹				
Location	AM Peak Hour		PM Peak Hour	
	Existing	Future	Existing	Future
US3/West Alice (Hooksett) ⁴	C/22	C/24	C/26	C/35
US3/NH 28 Bypass (Hooksett) ⁵	C/22	C/23	C/31	C/26
US3/Martins Ferry Road (Hooksett) ³	C/30	C/26	E/72	F/92
US3/NH 28 (Pinewood Road) (Allenstown)	C/26		C/31	
US3/Academy Road (Pembroke)	E/58		F/130	
US3/NH 106 (Pembroke)	D/39		E/69	
Unsignalized Intersections²				
Location	AM Peak Hour		PM Peak Hour	
	Existing	Future	Existing	Future
US3/Main Street (Hooksett)	D/35	F/104	C/25	F/62
US3/Pleasant Street (Hooksett)	C/23	F/191	B/13	E/40

Source: SNHPC

¹ Results reflect overall intersection LOS (LOS/Delay in seconds)

² Results reflect LOS for critical turning movement at intersection (LOS/Delay in Seconds)

³ AM peak hour results reflect Saturday midday peak - future LOS reflects intersection improvements in 1995 Corridor Study

⁴ AM peak hour results reflect weekday noon peak

⁵ Future LOS reflects intersection improvements in 1995 Corridor Study

Map 23: AM/PM Peak Hour Traffic Map for Pembroke and Allenstown

US Routes 3 and Route 106 in Pembroke

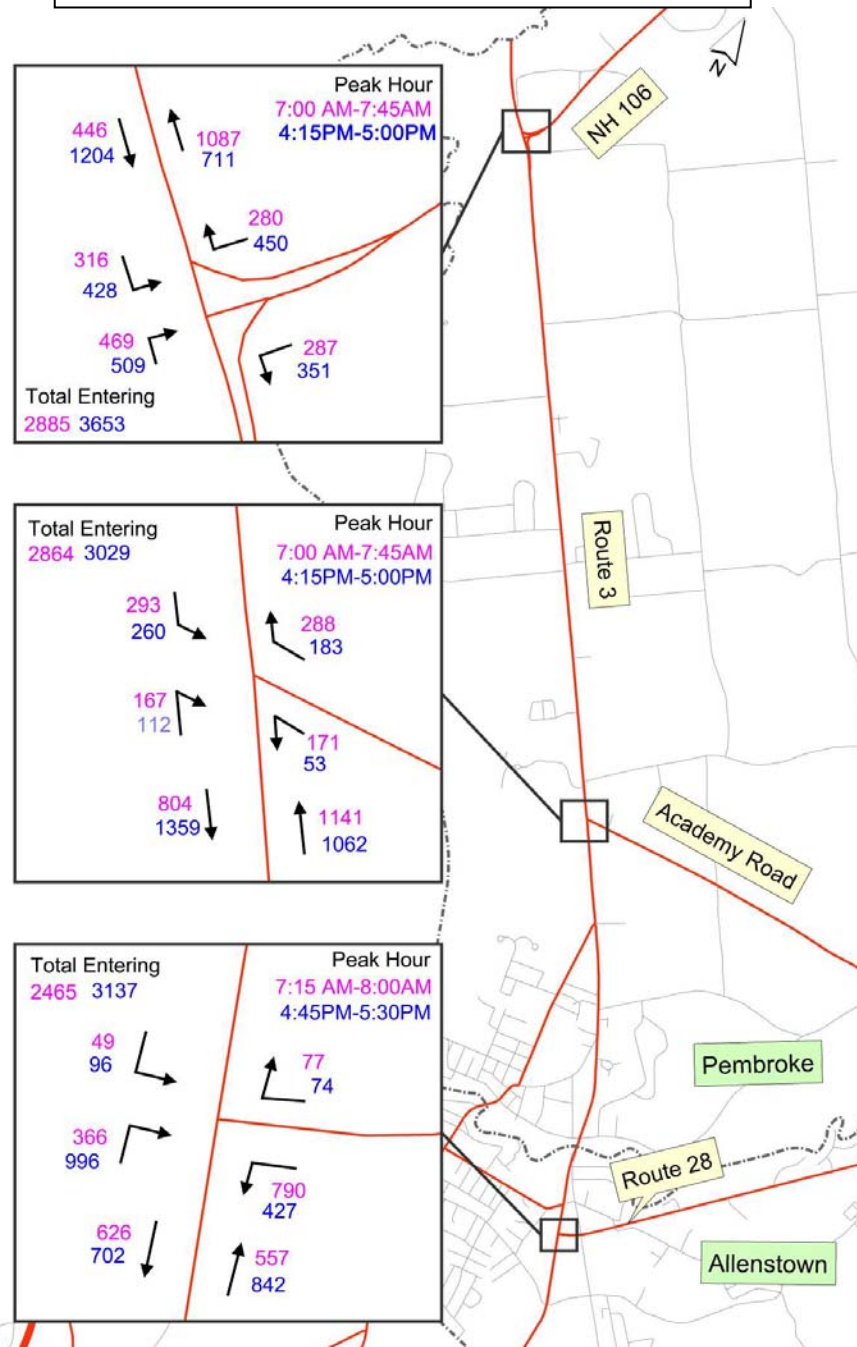
The majority of the AM peak hour traffic through this intersection is traveling north, with approximately 47% of the total traffic heading north through the intersection and 25% traveling south. However, the PM peak period traffic pattern is not an exact reverse of the AM traffic pattern. 44% of the traffic through the intersection in the PM peak is traveling south on US Route 3 with 31% traveling north. 27% of the traffic is traveling east on US Route 106 in the AM peak and 25% in the PM peak.

US Routes 3 and Academy Road in Pembroke

The majority of the AM and PM peak hour traffic through this intersection is traveling north and south with only a small portion of the traffic entering or exiting Academy Road during the beginning and ending of shift times. Approximately 50% of the total traffic through the intersection is AM peak hour traffic traveling north and 38% is traveling south on US Route 3. The PM peak traffic pattern is nearly split, with 41% traveling north and 46% traveling south. On Academy Road, east and west-bound traffic is more closely split with 8% traveling east and 12% traveling west during the PM peak. The AM peak is evenly split with 16% traveling west and 16% traveling east.

US Route 3 and NH-28 in Allenstown

The majority of the AM peak hour traffic through this intersection is traveling south with approximately 57% of the total traffic through the intersection and 25% is traveling north on US Route 3. Around 36% of the traffic through the intersection in the PM peak is traveling south on US Route 3 and 29% is traveling north. About 35% of the traffic is traveling east on Route 28 in the PM peak and 17% in the AM peak. West-bound traffic on Route 28 is 35% in the AM peak hours and 16% in the PM peak hours.



Map 24: AM/PM Peak Hour Traffic Map for Hooksett

US Route 3 and Pleasant Street in Hooksett

The majority of the AM peak hour traffic through this intersection is traveling south with approximately 71% of the total traffic through the intersection and 26% is traveling north on US Route 3. 38% of the traffic through the intersection in the PM peak is traveling south on US Route 3 with 55% traveling north. On Pleasant Street, east and west-bound traffic is split, with 8% traveling east and 3% traveling west during the AM peak. The PM peak is split between 7% traveling west and 4% heading east.

US Route 3 and Main Street in Hooksett

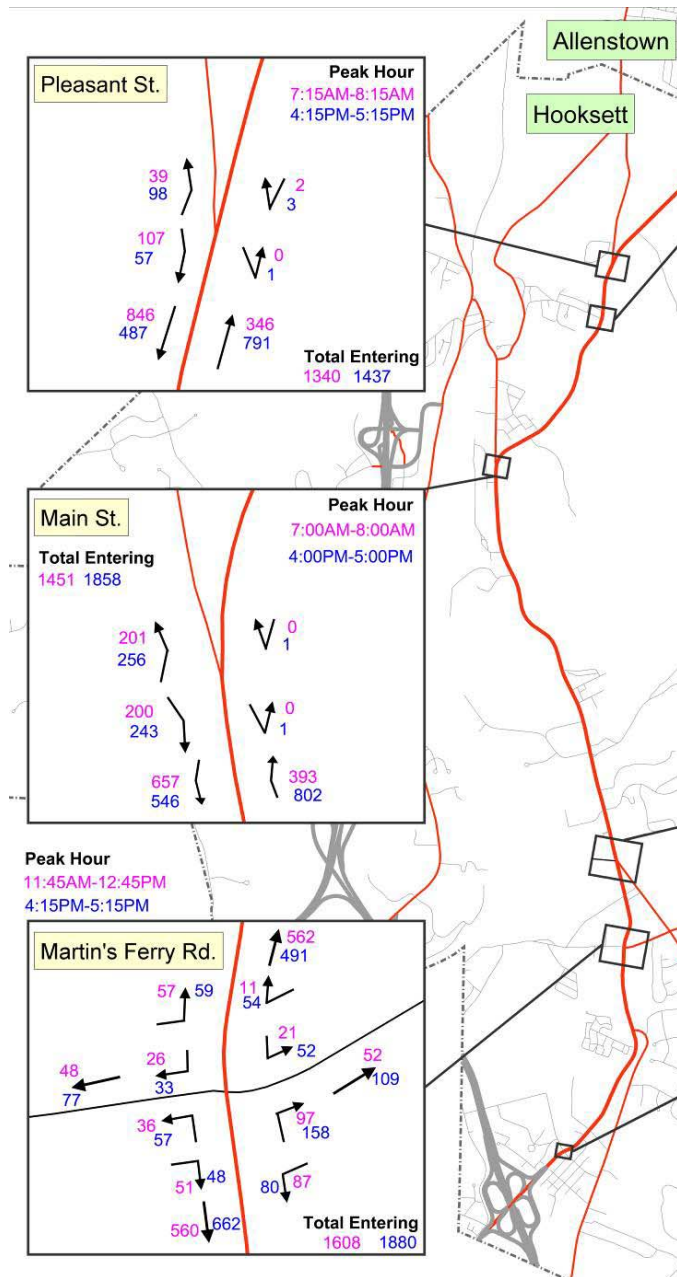
Main Street and US Route 3 is a skewed intersection. There is no left turn on the southbound direction of US Route 3 and Main Street. The PM peak period traffic pattern is exactly split between those traveling north and south at 43%. The majority of the AM peak hour traffic through this intersection is traveling south with approximately 59% of the total traffic through the intersection and 27% is traveling north. On Main Street, the southeast and northwest traffic is more closely split with 14% traveling southeast and northwest in the AM peak hour. In the PM peak hour, 13% travels southeast and 14% travels northwest.

US Route 3 and Martin’s Ferry Road in Hooksett

Of the eight potential movements through this intersection, the main direction taken by 43% of the AM peak hour travelers is southbound on US Route 3, with 39% traveling north. The PM peak pattern is split between those traveling north with 32-33% and 42% heading south.

On Martin’s Ferry Road, 7% of the traffic traveled westbound and 10% traveled eastbound in the AM peak hour. In the PM peak time, the percentages are almost the same with eleven (11) nine (9) percent traveling west and seventeen (17) eleven (11) traveling east.

On Whitehall Road, in the AM peak time 9% of the traffic heads westbound and 11% heads eastbound. In the PM peak, 11% travels west and 17% travels east.



US Route 3 and Granite Street in Hooksett

The majority of the AM peak hour traffic through this intersection is traveling south with approximately 55% of the total traffic through the intersection and 27% traveling north. The PM peak period traffic pattern is nearly an exact reverse of the AM traffic pattern. About 55% of the traffic through the intersection in the PM peak is traveling north on US Route 3 and 32% is traveling south. The traffic on Granite Street at this intersection shows that 8% of the traffic heads west in the PM peak hour with 16-18% in the AM peak hour.

US Route 3 and Londonderry Turnpike in Hooksett

The majority of the AM and PM peak hour traffic through this intersection is traveling north and south on US Route 3 and Londonderry Turnpike with only a small portion of the traffic entering or exiting the Shopping Center. The AM peak hour traffic through this intersection is traveling north with approximately 39% of the total traffic through the intersection and 41% is traveling south on US Route 3. The PM peak period traffic pattern is approximately split between those traveling north with 53% and 29% traveling south. On Londonderry Turnpike, the southeast and northwest traffic is more closely split with 17% traveling southeast and 20% traveling northwest during the PM peak. The AM peak is almost evenly split with 16% percent traveling northwest and 18% heading northeast.

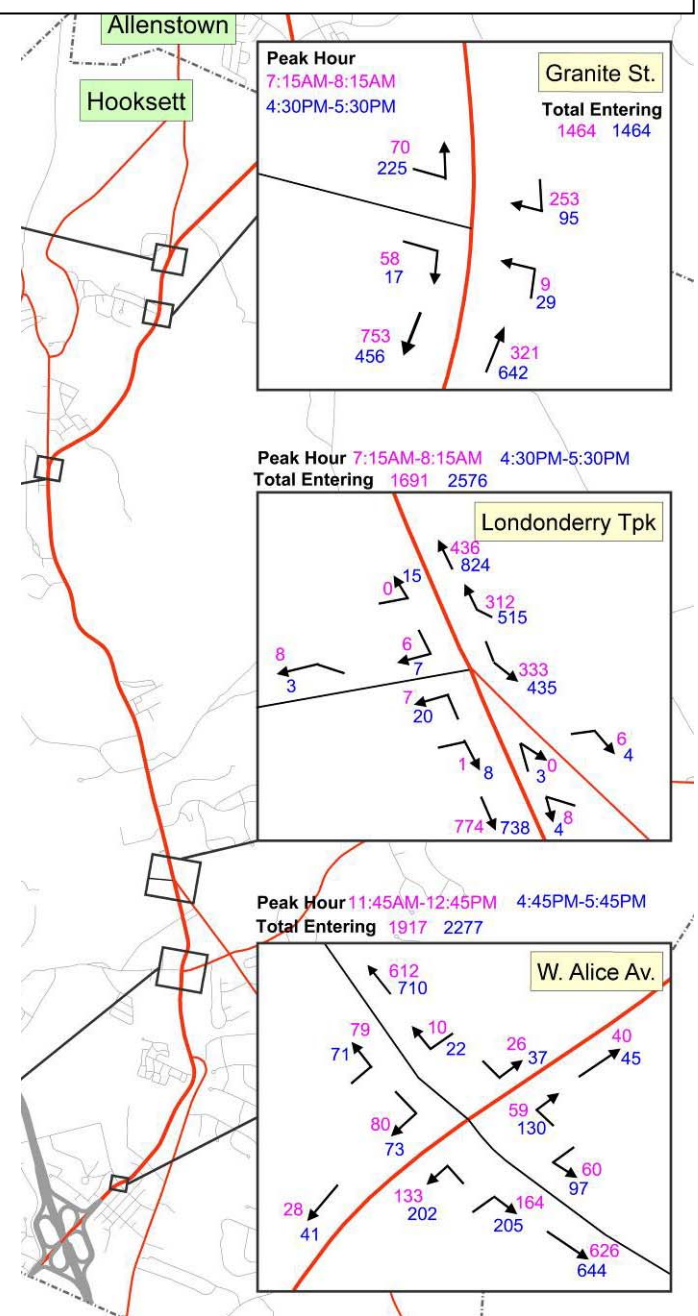
US Route 3 and West Alice Road in Hooksett

In both the AM and PM there is a majority of southbound travel at this intersection. During the morning peak, 44% of traffic headed south and 37% headed north. These percentages remain about the same in the PM with 42% traveling south and 35% traveling north.

In the AM on the west side of West Alice Road, 13% travel west while 15% travel east. Travel is evenly split in the PM, with 14% headed in each direction.

The east side of West Alice road has more eastbound traffic overall, with 7% headed east and 5% headed west in the AM, and 9% headed east and 7% headed west in the PM.

Map 25: AM/PM Peak Hour Traffic Map for Hooksett



Traffic Calming

What is Traffic Calming?

The term “traffic calming” is used to describe methods of altering the behavior of drivers to suit the character of the area they travel through. As concern over safety and the desire for improved pedestrian and bicycle safety increases, communities across the country are using traffic calming measures for improving safety and reducing vehicle speeds in school zones, neighborhoods, and more urbanized areas.

The overall purpose of traffic calming is to discourage non-local motorists from driving at excessive speeds through neighborhoods and village areas. There are several other benefits to the process as well. Because many traffic-calming strategies reduce vehicle speeds for all vehicle traffic on the street, safety on that street is increased. Because many traffic-calming strategies use landscaping and pavement treatments, these serve to enhance the aesthetic look of the neighborhood. Slower moving traffic and a more pleasant street environment encourage greater bicycle and pedestrian activity, reducing the number of vehicles on the roadway and automobile-related congestion.

The need for traffic calming normally stems from an increase in complaints about traffic on neighborhood streets. Increased traffic through neighborhoods threatens the integrity and character of the neighborhood and places non-motorized users at risk. Limited resources of communities do not always allow for comprehensive enforcement on all neighborhood streets, including the US Route 3 corridor itself. The increase in traffic along the corridor, through the Towns of Pembroke, Allenstown and Hooksett is likely due to several factors, including:

- 1) New development in adjacent neighborhoods creating increased traffic;
- 2) Increased residential and commercial development along the US Route 3 corridor; and
- 3) Increased commuter traffic seeking a direct route to and from Interstate 93.

Roundabout Designs

The modern roundabout has gained renewed interest in the United States because of the safety benefits, high capacity, traffic calming effect, and aesthetic value they can bring to an intersection. They are very different from traffic circles, which have fallen out of favor. Traffic circles faulted because they relied on high speed merging traffic and because traffic jams would result from drivers in the circle yielding to entering traffic. Roundabouts utilize slower speeds, but still improve traffic flow 30-50% over a conventional traffic light because of their continuously flowing traffic. In a roundabout, a driver slows and enters the circle only when there is a gap in the traffic. Vehicles in the circle have the right of way and exit when they approach their turn. With fewer conflict points and slower speeds than conventional intersections, accidents are reduced and are generally less severe. Other benefits include: a better and longer level of service at intersections, reduced pollution and fuel use, fiscal savings on traffic signals and electricity, and allowing for U-Turns. Roundabouts also have a traffic calming effect which slows the speed of motorists and can make for a friendlier pedestrian environment.



Photo 8: This is a successful example of a roundabout in Keene, NH.

Source: NHOEP

Roundabouts are designed to accommodate fire trucks and large tractor trailer vehicles. Large vehicles use a raised truck apron around the central island while going through the roundabout. Typically the trailer rides up onto the truck apron. The truck apron has a rough, raised surface a few inches higher than the driving pavement to discourage cars from using it.

When compared to a signal, studies show that roundabouts provide:

- 90% reduction in fatal crashes,
- 75% reduction in injury crashes,
- 30-40% reduction in pedestrian crashes, and
- 10% reduction in bicycle crashes

In New Hampshire, roundabouts have recently been completed in Rye, Meredith, Plymouth, Goffstown, and Keene. More information on Roundabouts can be seen at: <http://www.nh.gov/dot/projects/roundabouts/roundabouts.htm>

Conclusion

As at this point in time it seems that the economy may go into a recessionary phase, the communities will have a window of opportunity to refine their regulations, administrative and permitting processes. Although the Towns are members of two different regional planning commissions, all five entities are committed to identifying and implementing cooperative solutions to managing the issues identified in this study, including access management and increasing opportunities for transit, pedestrians and bicycling alternatives. As these objectives are consistent with the NHDOT's goals, we can only believe that they are similarly committed towards these improvements and would participate in any joint efforts.

As all three Towns have been designated as CTAP communities, they should submit a Phase 2 Local CTAP Collaborative project grant as the means to update their site plan, subdivision, and other regulations. The example of the southern end of the corridor suggests that the corridor is an attractive location for redevelopment. The towns should also examine their use regulations in the Zoning Ordinances to determine whether higher value investment can be encouraged. Pembroke, in particular, has a substantial challenge in getting this work done before they have additional sewage capacity.

Lastly, the towns have expressed the need to identify a mechanism to continue this collaborative planning partnership. While the Development of Regional Impact (DRI) process will provide chances to review the traffic and other impacts of large developments, the towns recognize that the incremental additive small projects or "background" growth is of equal importance in understanding how the corridor grows and changes of the decade or so. The three Towns and two Regional Planning Commissions should commit to meet quarterly or so to all work towards a cooperative access management system and coordinate land use regulatory improvements. The NHDOT should be invited to participate in these efforts as well.

Most obviously, and no surprise to anyone involved in this study, is that the land use and transportation are intimately linked. As non-residential development continues, traffic congestion will increase, and perceived quality of life may decline over time. The negative impacts of uncontrolled development and inadequate transportation options can be avoided by adopting the recommendations of this study including continued cooperation between the Towns, State entities and Planning Commissions.

Appendix A: Intersection Pedestrian Accommodation Score Index

Route 3

Merrimack County Signalized Intersection Pedestrian Crossings - Final Scores

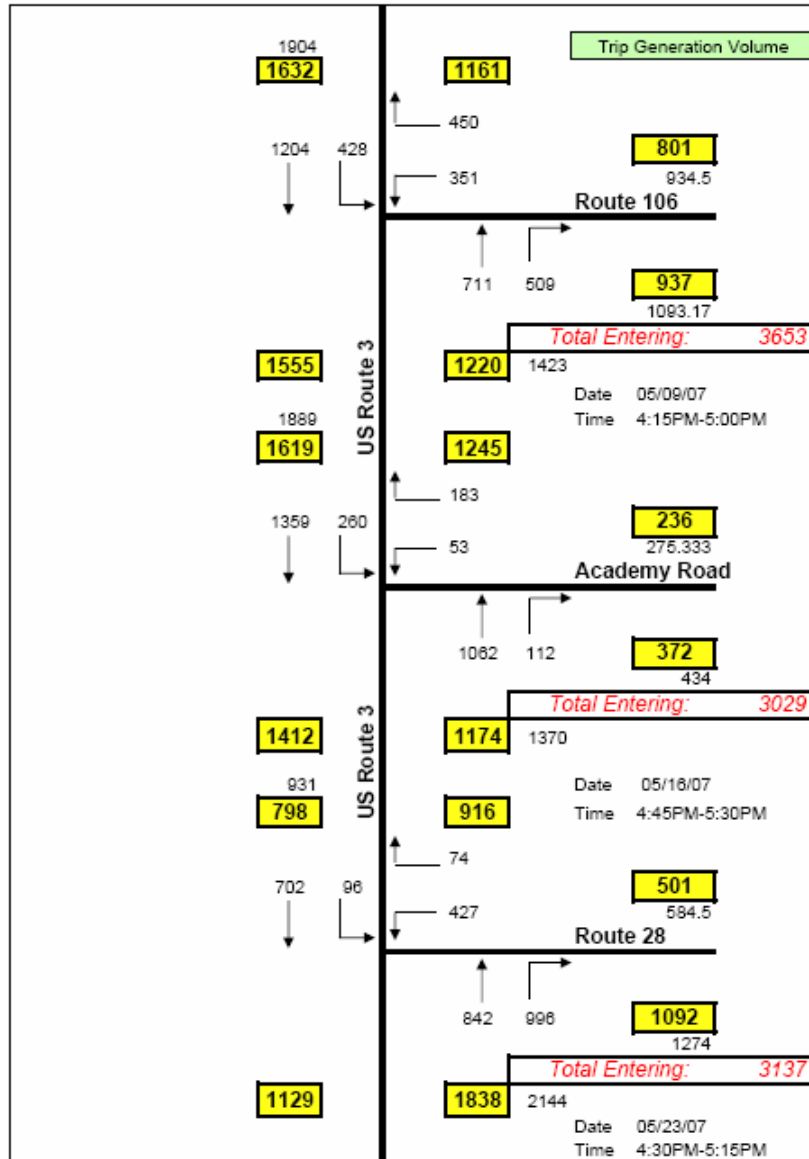
<i>Intersection</i>	Route 3	Route 3	Route 3	Route 3	Route 3	Route 3
	and	and	and	and	and	and
	Rt. 106	Academy Rd	Broadway	School St	Rt. 28	Granite St.
<i>Total # of Lanes at the Intersection</i>	2	3	4	3	3	2
<i>Greatest # of Lanes Across Any Road</i>	0	3	3	2	2	2
<i>Left Turn Lanes</i>	2	2	4	2	2	2
<i>Right Turn Channel</i>	2	4	4	4	3	4
<i>Right on Red Prohibited</i>	0	0	0	0	0	0
<i>Signal Phasing</i>	1	1	0	1	1	1
<i>Crosswalks Present</i>	0	1	1	1	0	0
<i>Crosswalk Type</i>	0	1	1	1	0	0
<i>Crosswalk Condition</i>	0	1	2	3	0	0
<i>Pedestrian Buttons</i>	0	1	1	1	0	0
<i>Accessible Pedestrian Buttons</i>	0	0	0	1	0	0
<i>Pedestrian Signals</i>	0	1	1	1	0	0
<i>Sidewalks</i>	0	2	2	1	0	0
<i>Approach Grade</i>	2	2	2	2	2	1
<i>Blocked Views</i>	4	4	3	4	4	4
<i>ADA Compliant Curb Cuts</i>	0	0	0	0	0	0
<i>ADA Compliant Refuge Islands</i>	0	0	0	0	0	0
<i>Turn Radius</i>	2	1	2	2	1	1
<i>Skewed/Offset Intersection</i>	1	1	0	0	1	0
<i>Lighting</i>	3	1	3	2	3	3
<i>Special Features</i>	0	0	0	0	0	0
<i>Overall Score</i>	19	29	33	31	22	20
	E	D	C	C	D	D
Average			25.67			
			D			

Appendix B: Bicycle Level of Service

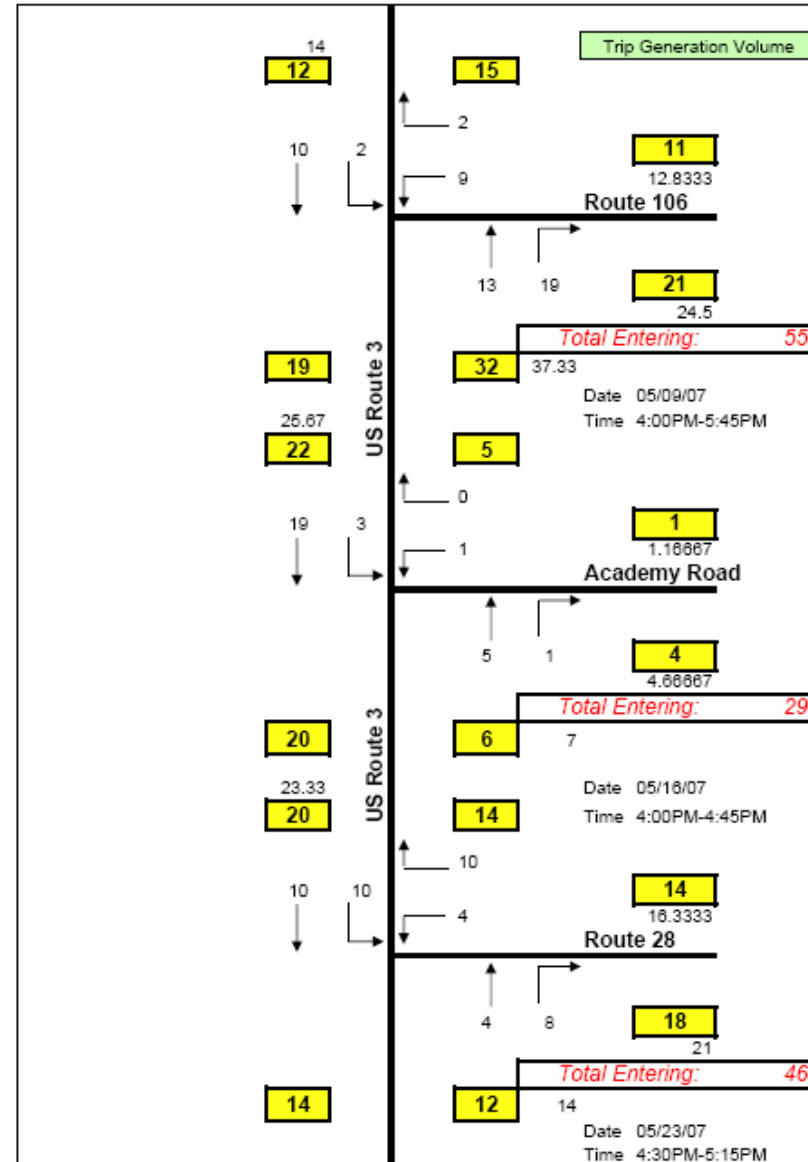
Road Name	From	To	Juris.	Len. Dir. of Sur. (#)	Lanes (L) Th. To Can. #	Traffic Vol. Data			Post. Spd. (mph)	Width of Pavement			# of Grates (N)	Percent of Occupied Parking (OSP)		Design. OSP (%)	Pavement Condition (PcI)		Bike Lane? (Y/N)	BLOS			
						Vol. (ADT) (ypd)	Pct. (HV) (%)	Spd. (SPP) (mph)		(ft)	(ft)	(ft)		Left	Right		(PcI) (1-5)	(PcI) (1-5)		Score	Grade (A-F)		
Route 3	Concord City Line	Sand Road	Town of Pembroke	0.20 SB	2	0	15,643	4	35	120	4.5	0	0	0	0	0	4.0	4.0	0	8.11	1.00	F	
Route 3	Sand Road	Concord City Line	Town of Pembroke	0.20 NB	2	0	15,643	4	35	120	5.5	0	2	1			4.0	4.0		8.05	1.00	F	
Route 3	Sand Road	Route 105	Town of Pembroke	0.10 SB	2	1	15,643	5	35	120	3.0	0	0	0	0				3.0	3.0	8.77	2.00	F
Route 3	Route 105	Sand Road	Town of Pembroke	0.10 NB	2	0	15,643	5	35	120	3.0	0	0	0	0				4.0	3.0	8.97	2.00	F
Route 3	Route 105	Cooperative Road	Town of Pembroke	0.20 SB	1	0	13,332	5	35	125	6.0	0	0	0	0				5.0	5.0	8.16	1.00	F
Route 3	Cooperative Road	Route 105	Town of Pembroke	0.20 NB	1	0	13,332	5	35	120	7.0	0	2	3					5.0	5.0	8.20	1.00	F
Route 3	Cooperative Road	529 Pembroke Street	Town of Pembroke	0.10 SB	1	0	13,332	4	35	120	9.0	0	0	0	0				3.0	3.0	8.07	1.00	F
Route 3	529 Pembroke Street	Cooperative Road	Town of Pembroke	0.10 NB	1	0	13,332	4	35	120	7.0	0	2	5					3.0	3.0	8.79	2.00	F
Route 3	529 Pembroke Street	Whittemore Road	Town of Pembroke	0.50 SB	1	0	13,332	4	35	120	5.0	0	0	0	0				4.0	4.0	8.53	2.00	F
Route 3	Whittemore Road	529 Pembroke Street	Town of Pembroke	0.50 NB	1	0	13,332	4	35	125	7.0	0	2	2					4.0	4.0	8.24	1.00	F
Route 3	Whittemore Road	Donna Road	Town of Pembroke	0.50 SB	1	0	13,332	4	35	120	8.0	0	0	0	0				3.0	3.0	8.53	2.00	F
Route 3	Donna Road	Whittemore Road	Town of Pembroke	0.50 NB	1	0	13,332	4	35	120	8.5	0	2	2					3.0	3.0	8.49	1.00	F
Route 3	Donna Road	Bow Lane	Town of Pembroke	0.10 SB	1	0	13,332	4	35	120	6.5	0	0	0	0				3.0	3.0	8.92	2.00	F
Route 3	Bow Lane	Donna Road	Town of Pembroke	0.10 NB	1	0	13,332	4	35	120	9.0	0	2	3					3.0	3.0	8.65	2.00	F
Route 3	Bow Lane	Sherwood Meadows	Town of Pembroke	0.50 SB	1	0	13,332	4	35	120	6.0	0	0	0	0				3.0	3.0	9.11	3.00	F
Route 3	Sherwood Meadows	Bow Lane	Town of Pembroke	0.50 NB	1	0	13,332	4	35	120	8.0	0	2	6					3.0	3.0	8.83	2.00	F
Route 3	Sherwood Meadows	Church Road	Town of Pembroke	0.20 SB	1	0	13,332	4	35	120	6.0	0	0	0	0				3.0	3.0	9.20	3.00	F
Route 3	Church Road	Sherwood Meadows	Town of Pembroke	0.20 NB	1	0	13,332	4	35	120	8.0	0	2	4					3.0	3.0	8.96	2.00	F
Route 3	Church Road	Academy Road	Town of Pembroke	0.10 SB	1	1	13,332	4	35	120	5.0	0	0	0	0				3.0	3.0	9.45	3.00	F
Route 3	Academy Road	Church Road	Town of Pembroke	0.10 NB	1	1	13,332	4	35	120	6.0	0	2	4					3.0	3.0	9.51	4.00	F
Route 3	Academy Road	Broadway	Town of Pembroke	0.30 SB	1	0	13,332	4	35	120	6.5	0	0	0	0				3.0	3.0	9.26	3.00	F
Route 3	Broadway	Academy Road	Town of Pembroke	0.30 NB	1	0	13,332	4	35	110	7.5	0	2	5					3.0	3.0	9.98	3.00	F
Route 3	Broadway	Noyes Road	Town of Pembroke	0.20 SB	1	0	13,332	4	35	120	6.0	0	0	0	0				3.0	3.0	9.42	3.00	F
Route 3	Noyes Road	Broadway	Town of Pembroke	0.20 NB	1	0	13,332	4	35	120	8.0	0	2	6					3.0	3.0	9.24	3.00	F
Route 3	Noyes Road	Main Street	Town of Pembroke	0.10 SB	1	0	13,332	4	35	120	8.0	0	0	0	0				3.0	3.0	9.11	3.00	F
Route 3	Main Street	Noyes Road	Town of Pembroke	0.10 NB	1	0	13,332	4	35	120	8.0	0	2	2					3.0	3.0	9.25	3.00	F
Route 3	Main Street	N Double Decker Bl	Town of Pembroke	0.20 SB	1	0	14,615	4	35	120	5.0	0	0	0	0				3.0	3.0	9.77	4.00	F
Route 3	N Double Decker Bl	Main Street	Town of Pembroke	0.20 NB	1	0	14,615	4	35	120	3.0	0	2	0					3.0	3.0	9.25	3.00	F
Route 3	N Double Decker Bl	S Double Decker Bl	Town of Allenstown	0.10 SB	1	0	14,615	4	35	130	1.0	0	0	0	0				5.0	5.0	9.94	4.00	F
Route 3	S Double Decker Bl	N Double Decker Bl	Town of Allenstown	0.10 NB	1	0	14,615	4	35	130	1.0	0	2	2					5.0	5.0	9.94	4.00	F
Route 3	S Double Decker Bl	School Street	Town of Allenstown	0.10 SB	1	0	14,615	4	35	150	2.5	0	0	0	0				3.0	3.0	###	4.00	F
Route 3	School Street	S Double Decker Bl	Town of Allenstown	0.10 NB	1	0	14,615	4	35	130	12.0	0	0	0	0				3.0	3.0	8.21	1.00	F
Route 3	School Street	Route 28	Town of Allenstown	0.10 SB	2	1	14,615	4	35	110	9.0	0	0	0	0				3.0	3.0	9.02	3.00	F
Route 3	Route 28	School Street	Town of Allenstown	0.10 NB	1	0	14,615	4	35	130	6.5	0	0	0	0				3.0	3.0	9.49	3.00	F
Route 3	Route 28	Granite Street	Town of Allenstown	0.20 SB	1	1	14,615	4	35	120	10.5	0	2	1					3.0	3.0	8.93	2.00	F
Route 3	Granite Street	Route 28	Town of Allenstown	0.20 NB	1	0	14,615	4	35	115	12.0	0	2	1					3.0	3.0	8.71	2.00	F
Route 3	Granite Street	Hooksett Town Line	Town of Allenstown	0.30 SB	1	0	14,615	4	35	110	11.0	0	0	0	0				3.0	3.0	9.05	3.00	F
Route 3	Hooksett Town Line	Granite Street	Town of Allenstown	0.30 NB	1	0	14,615	4	35	120	11.0	0	0	0	0				3.0	3.0	8.84	2.00	F

Appendix C: Turn Count Data for Pembroke and Allenstown

2007 Evening Peak Hour Counts
US Route 3 Corridor Study (Town of Allenstown and Pembroke)

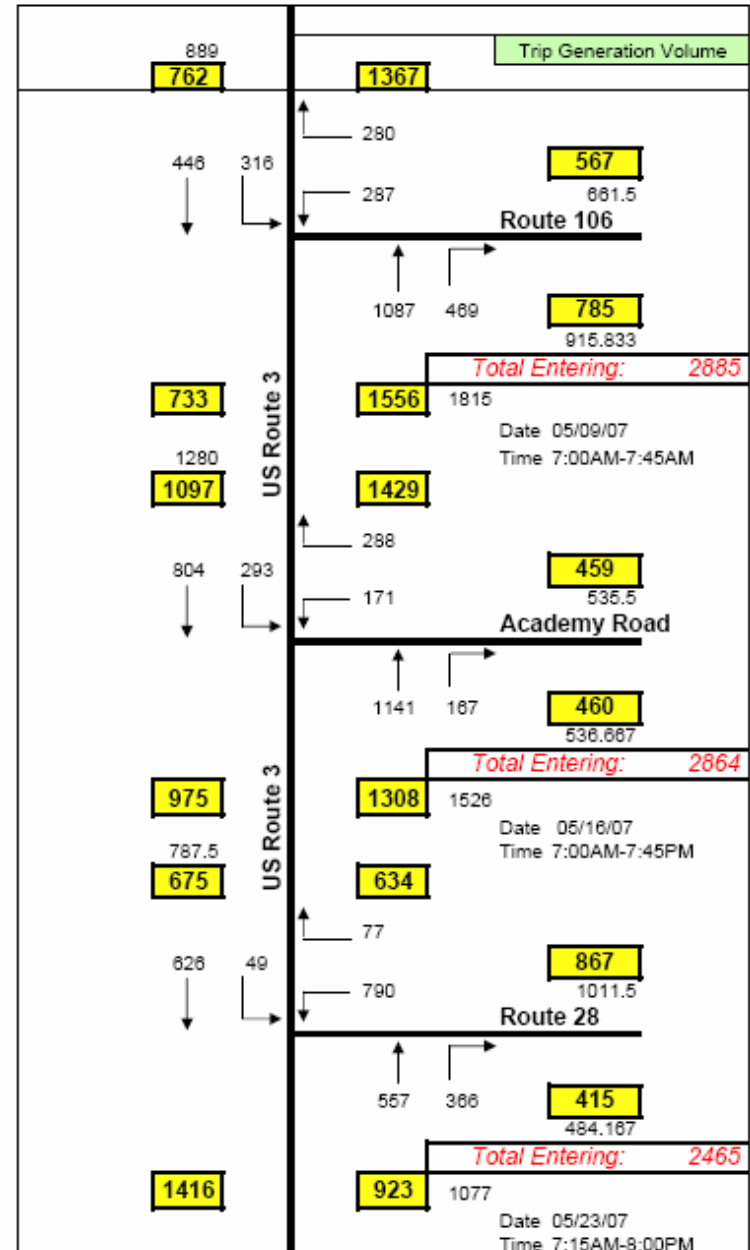
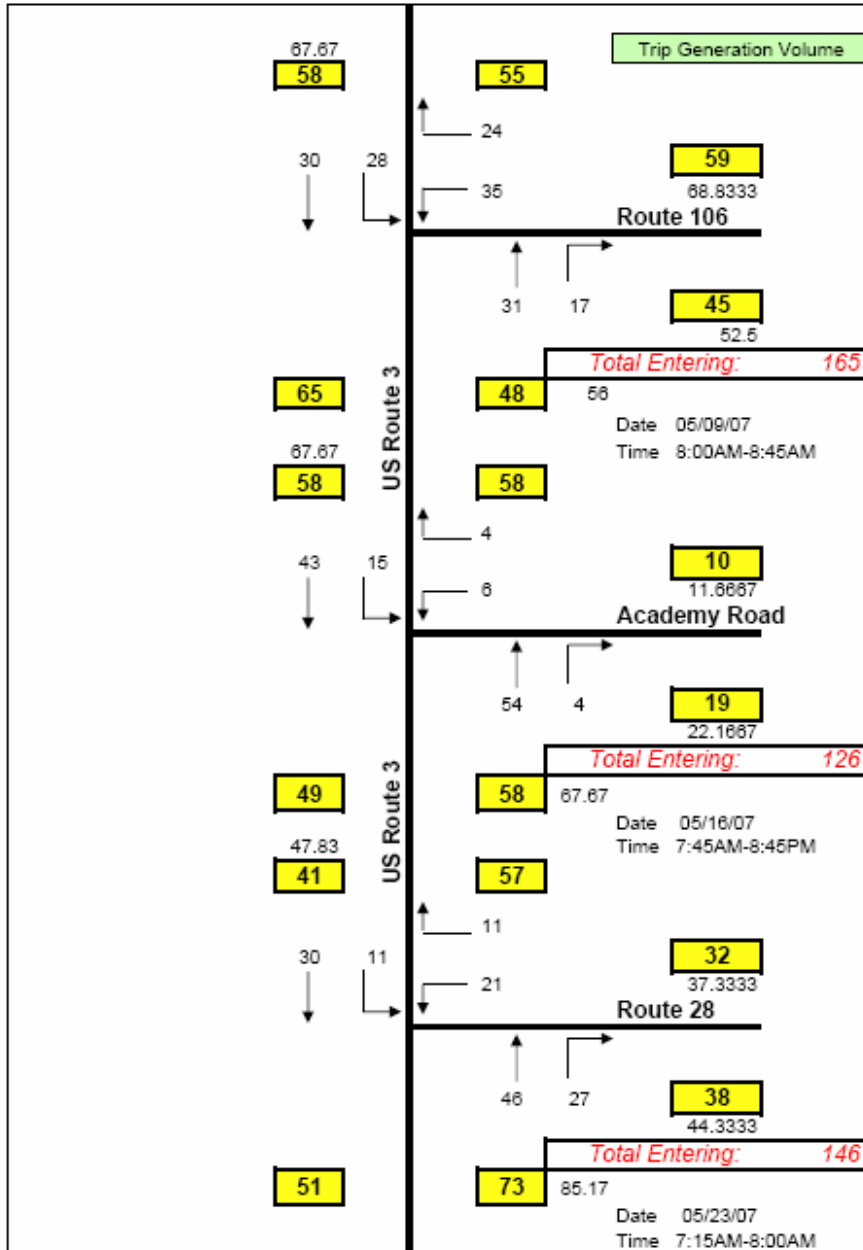


2007 Evening Peak Hour Truck Counts
US Route 3 Corridor Study (Town of Allenstown and Pembroke)



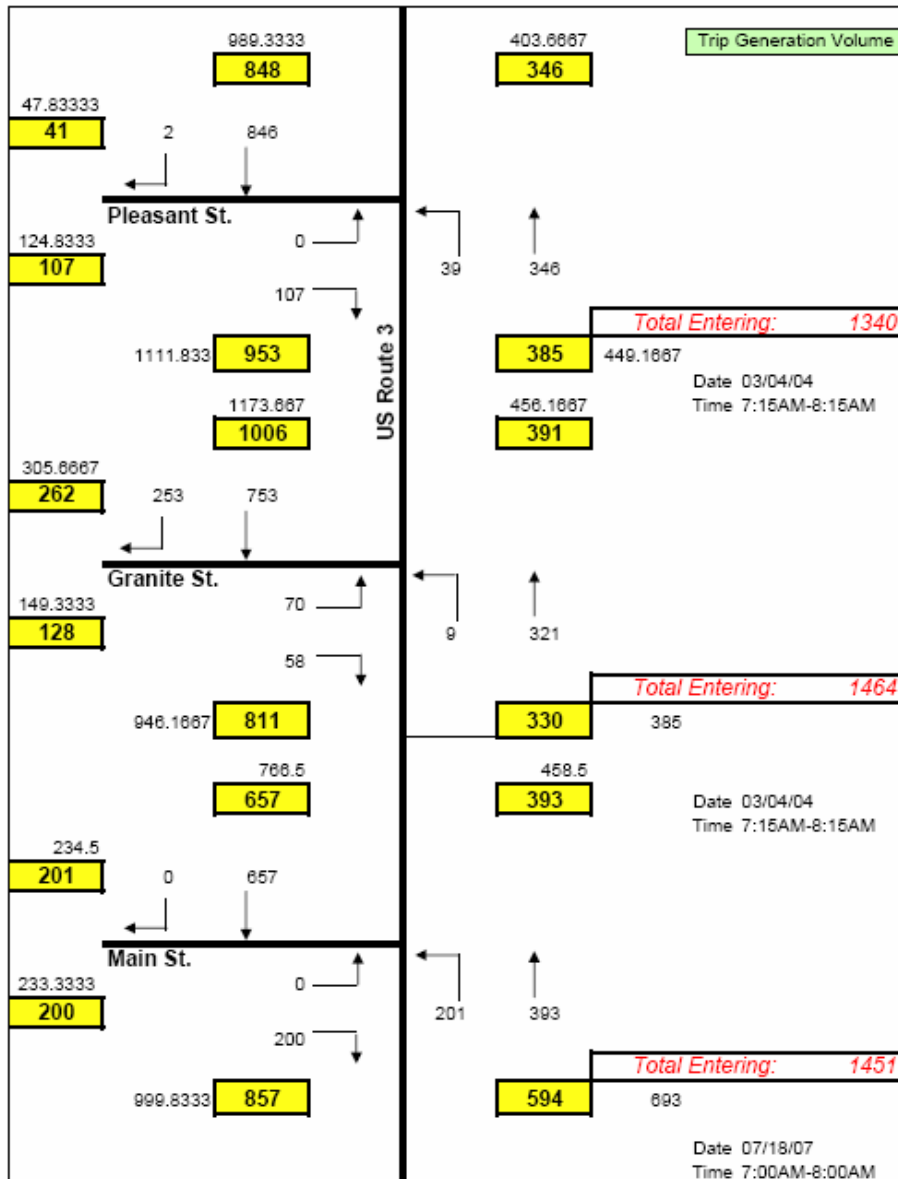
2007 Morning Peak Hour Truck Counts
US Route 3 Corridor Study (Town of Allenstown and Pembroke)

2007 Morning Peak Hour Counts
US Route 3 Corridor Study (Town of Allenstown and Pembroke)

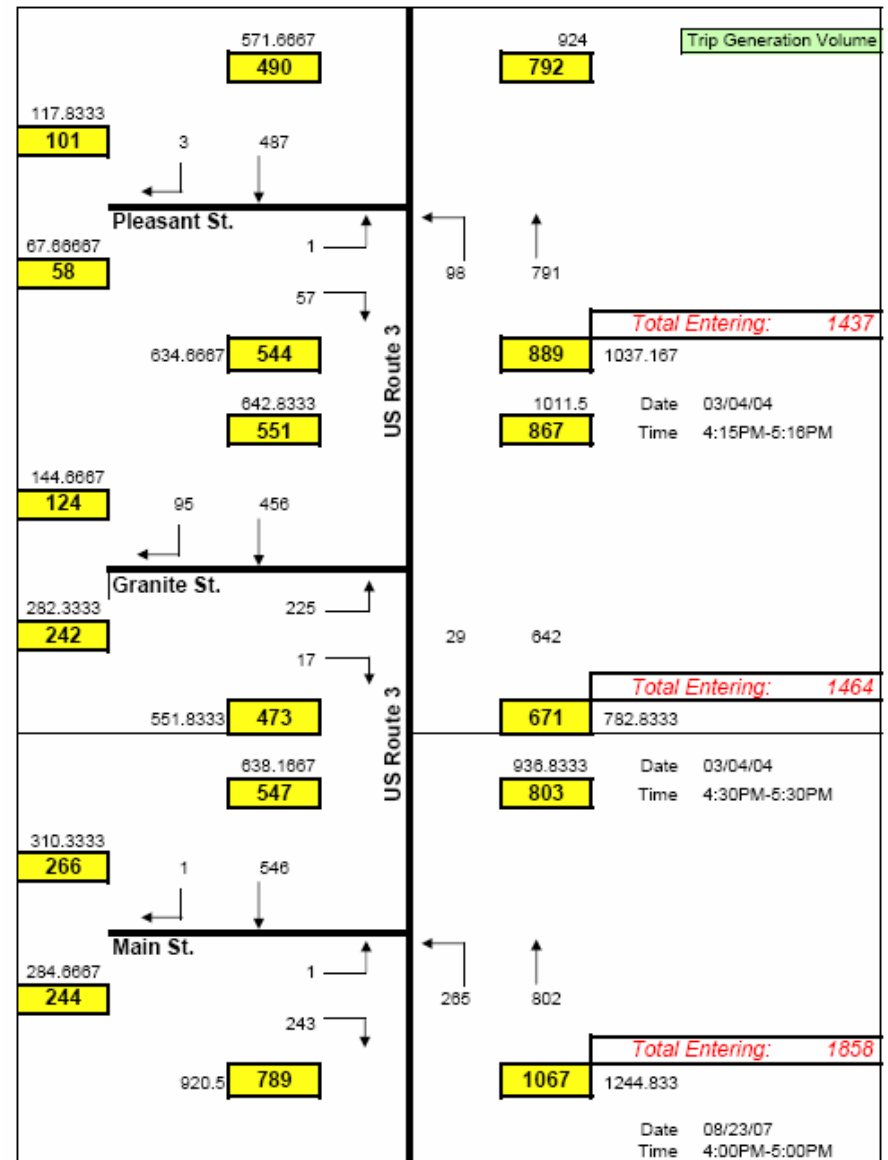


Appendix D: Turn Count Data for Hooksett

2007 Morning Peak Hour Counts
US Route 3 Corridor Study (Town of Hooksett)



2007 Evening Peak Hour Counts
US Route 3 Corridor Study (Town of Hooksett)



2007 Morning Peak Hour Counts
US Route 3 Corridor Study (Town of Hooksett)

2007 Evening Peak Hour Counts
US Route 3 Corridor Study (Town of Hooksett)

