

Chapter

Transportation

This chapter describes the existing transportation system and establishes planning policies for transportation based on the following important principles:

- A.** An integrated approach to transportation throughout the Town of Boscawen is required with particular attention given to transportation efficiency, safety, competitiveness and environmental sustainability;
- B.** Boscawen's principal transportation assets including highways, bridges, and strategically important travel corridors should be preserved, maintained and enhanced;
- C.** Investment in the Town of Boscawen's transportation infrastructure should be made in a sustainable and efficient manner in order to promote the social and economic well-being of the Town;
- D.** Future provision for transportation and infrastructure should be firmly integrated with the Town's overall land use strategies;
- E.** Enhanced quality of life for all, based on high quality residential, working and recreational environments and sustainable transportation patterns.

Introduction

A safe and efficient transportation network is an essential component for the development of a well-functioning and accessible community. Land-use and transportation are inextricably linked. Informed and thoughtful transportation planning is an essential part of guiding development in order to preserve valued features of the community while achieving community goals. Boscawen's transportation system and its connections to the regional and state network provide access to the goods and services that residents and commerce require. It played a large role in the development of the town, and in defining the town's character. With all future development, balancing the desires of residents to maintain Boscawen's rural character with the increasing demand on the transportation system will be vital to the Town's future.

The existing transportation network has a profound influence on the location and development of land use throughout the town. Development trends in Boscawen have traditionally been influenced by US Routes 3 and 4. The Town's village core, and the low density residential and undeveloped areas which give the town its distinct character, have been, and will continue to be, important elements in what it means to live and work in Boscawen.

All land use activities, regardless of scale or type require access to adequate transportation routes and are most likely to locate where access is the easiest and least costly. Due to the financial commitment required for the improvement and maintenance of an adequate transportation system and the direct relationship between land use patterns and traffic circulation, the identification and analysis of current transportation needs is crucial to the orderly accommodation of growth and development. This section of the master plan is intended to provide such an analysis, while also enabling the Town of Boscawen to fully participate in all levels of transportation planning – local, regional, state and federal.

Existing Transportation Network

A key component in planning for future transportation improvements in a community is to carry out a complete inventory of the existing transportation infrastructure serving the town. As previously mentioned, Boscawen's transportation network is dominated by US Routes 3 and 4; however, there are a number of different types of roads existent in the town which are equally important to the overall transportation network.

Highway Classification

The State Aid classification system, which is identified by NH RSA 229:5 and 229:231, establishes responsibility for construction, reconstruction, and maintenance as well as eligibility for use of State Aid funds. This classification system also provides a basic hierarchy of roadways.

Class I: Trunk Line Highways: Consists of all existing or proposed highways on the primary state highway system, excepting all portions of the highways within the compact sections of cities and towns. The state assumes full control and pays costs of construction, reconstruction and maintenance of its sections with the assistance of federal aid. US Routes 3 and 4 are the most obvious examples of a Class I Highway in Boscawen.

Class II: State Aid Highways: All existing or proposed highways on the secondary state highway system, excepting portions of the highways within the compact sections of cities and towns, which are classified as Class IV highways. All sections improved to the state standards are maintained and reconstructed by the state. All other sections must be maintained by the city or town in which they are located until brought up to state standards. The same applies to bridges on Class II highways. Water Street is a Class II highway in Boscawen.

Class III: Recreational Roads: All roads leading to, and within, state reservations designated by the Legislature. NHDOT assumes full control of reconstruction and maintenance. Boscawen does not have any Class II roads.

Class III-a: New Boating Access Highways: Defined as new boating access highways from any existing highway to any public water in the state. All Class III-a highways are limited access facilities defined in RSA 230:44. Boscawen does not have any Class III-a roads.

Class IV: Town and City Streets: Consist of all highways within the compact sections of cities and towns listed in RSA 229:5. Extensions of Class I (excluding turnpikes and interstate portions) and Class II highways through these areas are included in this classification. Boscawen is not included in the designated towns for this classification.

Class V: Rural Highways: This classification consists of all traveled highways that the town or city has the duty to maintain regularly. Goodhue Road, Queen Street, and Academy Street are examples of Class V roads in Boscawen.

Class VI: Unmaintained Highways: This class consists of all other existing public ways, including highways discontinued as open highways and made subject to gates and bars, and highways not maintained and repaired in suitable condition for travel thereon by the town for five (5) or more successive years.

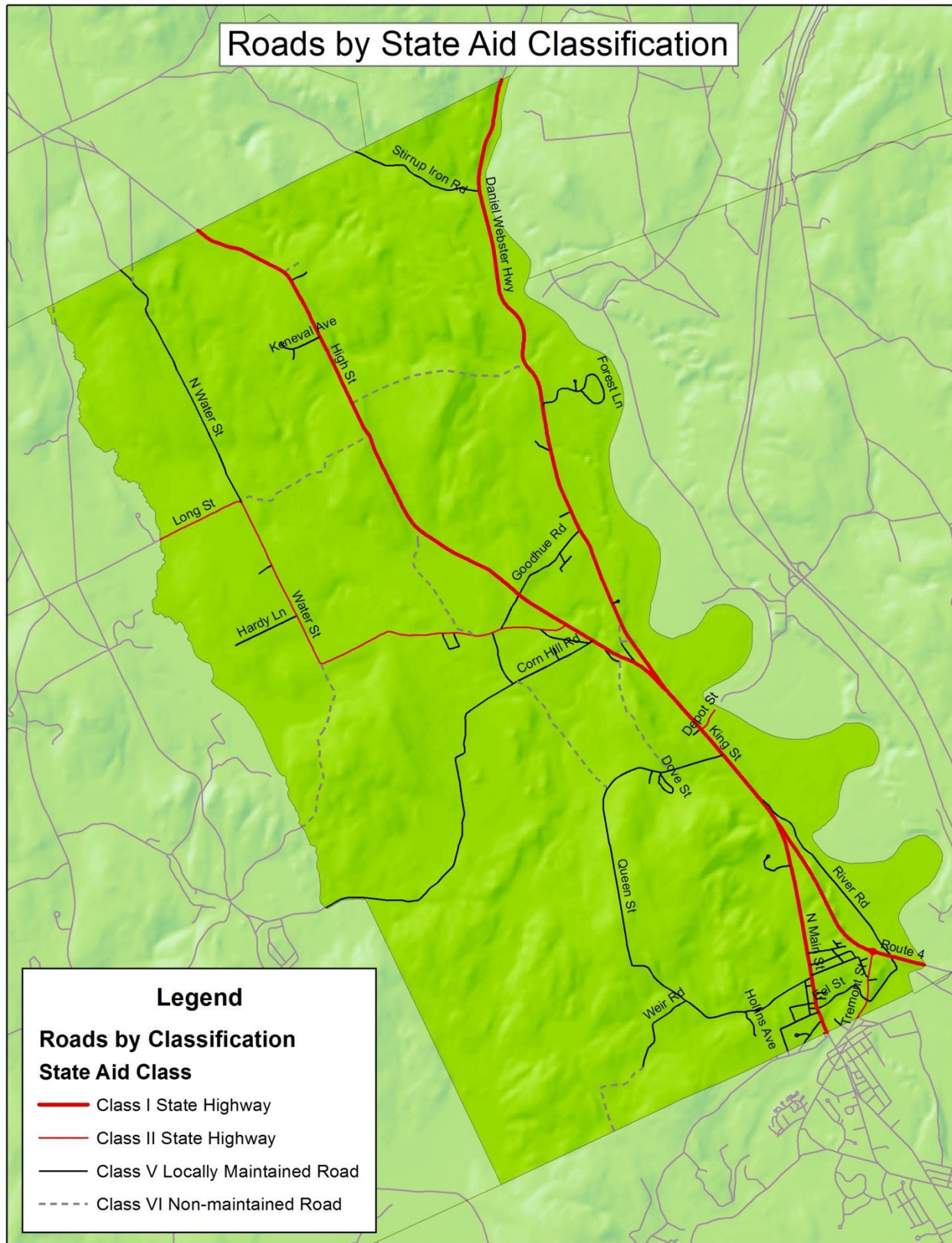
Of the seven possible state classifications, Boscawen's roads fall into four of these: Class I, Class II, Class V, Class VI and private roads. Boscawen's road system is typical of most New Hampshire towns, in that the most mileage is accounted for by Class V roads. **Table TR-1** displays roadway mileage by classification.

Table TR – 1: State Legislative Class of Roads in Boscawen

Legislative Class	Summary Characteristics	Mileage
Class I	<ul style="list-style-type: none"> Consists of all existing or proposed highways on the primary state highway system. Maintained by the State. 	14.6
Class II	<ul style="list-style-type: none"> Consists of all existing or proposed highways on the secondary state highway system. Maintained by State. 	4.6
Class III & III(a)	<ul style="list-style-type: none"> Consists of all such roads leading to and within state parks and reservations. Maintained by the State. 	0
Class IV	<ul style="list-style-type: none"> Consists of all highways within the compact section of cities and towns listed in RSA 229:5, V. (Urban Compacts) 	0
Class V	<ul style="list-style-type: none"> Consists of all other traveled highways that the town or city has the responsibility to maintain. 	23.1
Class VI	<ul style="list-style-type: none"> Consists of all other existing public ways, including highways subject to gates, and highways not maintained in suitable condition for travel for five years or more. 	8.2
Private Roads	<ul style="list-style-type: none"> Not part of town network but may be open to travel 	12.6
Total:		63.1

Source: New Hampshire Department of Transportation

Figure TR – 1: State Legislative Class of Roads in Boscawen



Source: NHGRANIT

Functional Classification System

The functional classification system identifies roads by the type of service provided and by the role of each highway within the state system based on standards developed by the US Department of Transportation. While the state aid classification system outlined above is the primary basis for determining jurisdiction, the following system is important for determining eligibility for federal funds.

Recognition of the principal function that a highway, road, or street is intended to serve can reduce potential conflicts between land use activities and traffic movements. For example, from a theoretical standpoint, residential development should never be permitted or encouraged to locate along major highways due to the opportunity for direct land use/traffic conflicts. The need for direct access to residential properties causes numerous left turn and crossover movements as well as ingress/egress movements, all of which slow and/or interrupt the smooth flow of traffic, while substantially increasing the potential for accidents to both pedestrians and vehicles. The five basic functional classifications are described below.

Principle Arterial/Controlled Access: These highways consist of interstates and some primary state routes that form the basic framework of the State roadway system. They primarily function as the main routes for interstate commerce and traffic. In addition, they also link major geographic and urban areas to economic districts of the State. Controlled Access is a designation adopted by NHDOT, the effect of which is to minimize the frequency of curb cuts, thereby controlling the amount of traffic crossing lanes and stopping on the road.

Minor Arterial Systems: These roadways serve as long distance traffic movements and are secondary to primary arterial roadways in that minor arterial primarily serve as links between major population areas, or between distinct geographic and economic regions.

Major Collectors: These roadways differ from arterial roadways due to size and general service area. Collectors serve traffic in a specific area, whereas arterials generally serve traffic moving through an area. Thus, average trip lengths on collectors are shorter than trips on arterials. Furthermore, collectors gather traffic from local roads and streets and distribute them to arterials.

Minor Collector: These roads provide access to smaller communities within a geographic area or economic region. They may link locally important trip generators, such as shopping centers, to surrounding rural areas. They also serve as links between two or more major collectors. Water Street serves as a minor collector in Boscawen.

Local Roads: These roads and streets are used primarily to provide access to adjacent properties. These roads have numerous turning movements in and out of abutting driveways and curb cuts.

Scenic Roads: A major component of a town's rural character can be its scenic roads. These roads help to retain a sense of history and rural quality. The purpose of a designation as a scenic road is to protect the intrinsic qualities of that stretch of road which add to the aesthetic and environmental qualities of an area

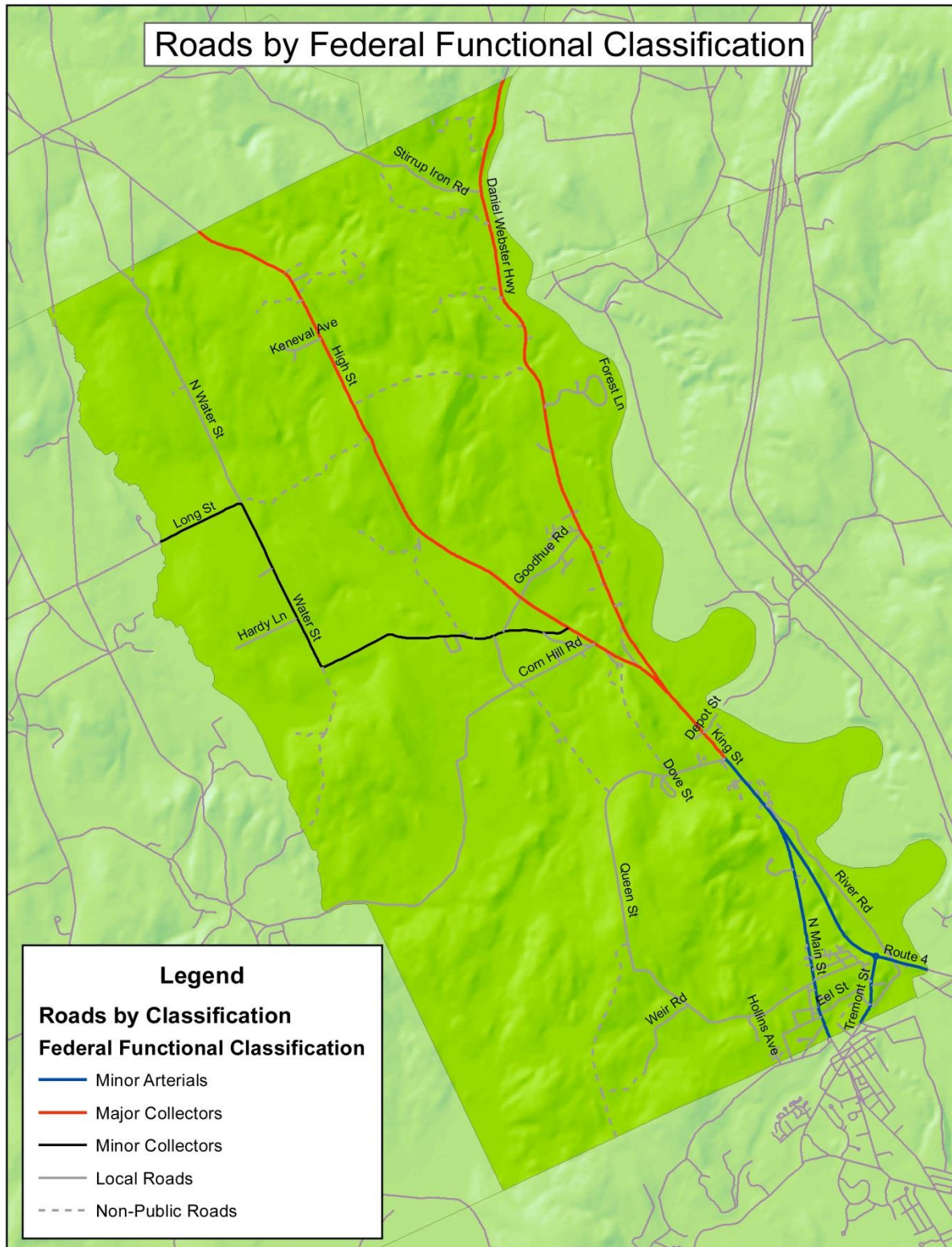
Future development in Boscawen should take place at locations where the primary road function is appropriate for the type of development proposed. The Planning Board should consider the functional classification of any road on which development is proposed to ensure that the proposed development is appropriate for the existing roadway function.

Table TR – 2: Federal Functional Class of Roads in Boscawen

Functional Class	Characteristics	Mileage
Principal Arterial	<ul style="list-style-type: none"> Provides the highest level of mobility at the greatest travel speeds, allowing for travel between major trip generators. Interstate, Freeway, and Other Principal Arterial. Eligible for federal-aid funds. 	0
Minor Arterial	<ul style="list-style-type: none"> Provide access to geographic areas smaller than those served by the higher system by linking towns and cities Can provide the highest level of mobility through rural areas without principal arterials, while providing important connections between the principal arterial and collector network in urban areas. Provides intra-community continuity, but does not penetrate identifiable neighborhoods. Eligible for federal-aid funds. 	4.6
Major Collector	<ul style="list-style-type: none"> Provides service to any county seat not on an arterial route; to the larger towns not directly served by the higher systems; and to other traffic generators of equivalent intra-county importance, such as consolidated schools, recreational areas. Provides links to nearby larger towns or cities, or with routes of higher classifications. Serves the more important intra-county travel corridors. 	10.6
Minor Collector	<ul style="list-style-type: none"> Collects traffic from the local roadway network and distributes it to the major collector or arterial system. Provides service to smaller municipalities. Provides links to important small scale land use serving 	3.9
Local	<ul style="list-style-type: none"> Comprises all highways not on the higher systems. Provides the lowest level of mobility by serving local trip purposes and connecting to higher order roadways. 	23.3
Class VI or Private	<ul style="list-style-type: none"> Not part of town network but may be open to travel 	20.7
Total:		63.1

Source: New Hampshire Department of Transportation

Figure TR – 2: Federal Functional Class of Roads in Boscawen



Source: NHGRANIT

Bridge Network

Bridges are a key component of the highway system. Bridges are the most expensive sections of roads, and a lack of adequate bridges can create transportation bottlenecks, which are often difficult to remedy.

The New Hampshire Department of Transportation (NHDOT) maintains an inventory of all bridges in New Hampshire using Federal Sufficiency Ratings (FSR), a nationally accepted method for evaluating bridges. An FSR represents the relative overall effectiveness of a bridge as a transportation facility. With an FSR greater than 80 a bridge is generally accepted to be in good condition. A bridge having an FSR between 50 and 80 is eligible for Federal bridge rehabilitation funding. A bridge with an FSR less than 50 is eligible for either Federal bridge replacement or rehabilitation funding. These ratings are based on current federal standards, and often historic bridges cannot meet these standards. Table TR-3 shows the bridges in Boscawen as listed on the NHDOT Bridge Summary.

Table TR – 3: Bridges in Boscawen

Bridge	Location	FSR	Owner	ADT/Year
Corn Hill Road	Pond Brook	48.1	Municipality	725/11
Long Street	Beaver Dam Brook	77.8	NHDOT	1,042/13
Raymond Road	Tannery Brook	86.0	Municipality	NA
Tremont Street	Contoocook River	83.0	NHDOT	6,200/11
US Route 3	Tannery Brook	63.9	NHDOT	5,000/11
US Route 3	Stirrup Iron Brook	72.9	NHDOT	3,800/12
US Route 4	Tannery Brook	69.7	NHDOT	3,300/11
US Route 4	Tannery Brook	65.5	NHDOT	3,300/11
US Route 4	Tannery Brook	94.5	NHDOT	3,300/11
US Route 4	Commercial Street	93.4	NHDOT	17,000/12
US Route 4	Merrimack River	93.4	NHDOT	17,000/12

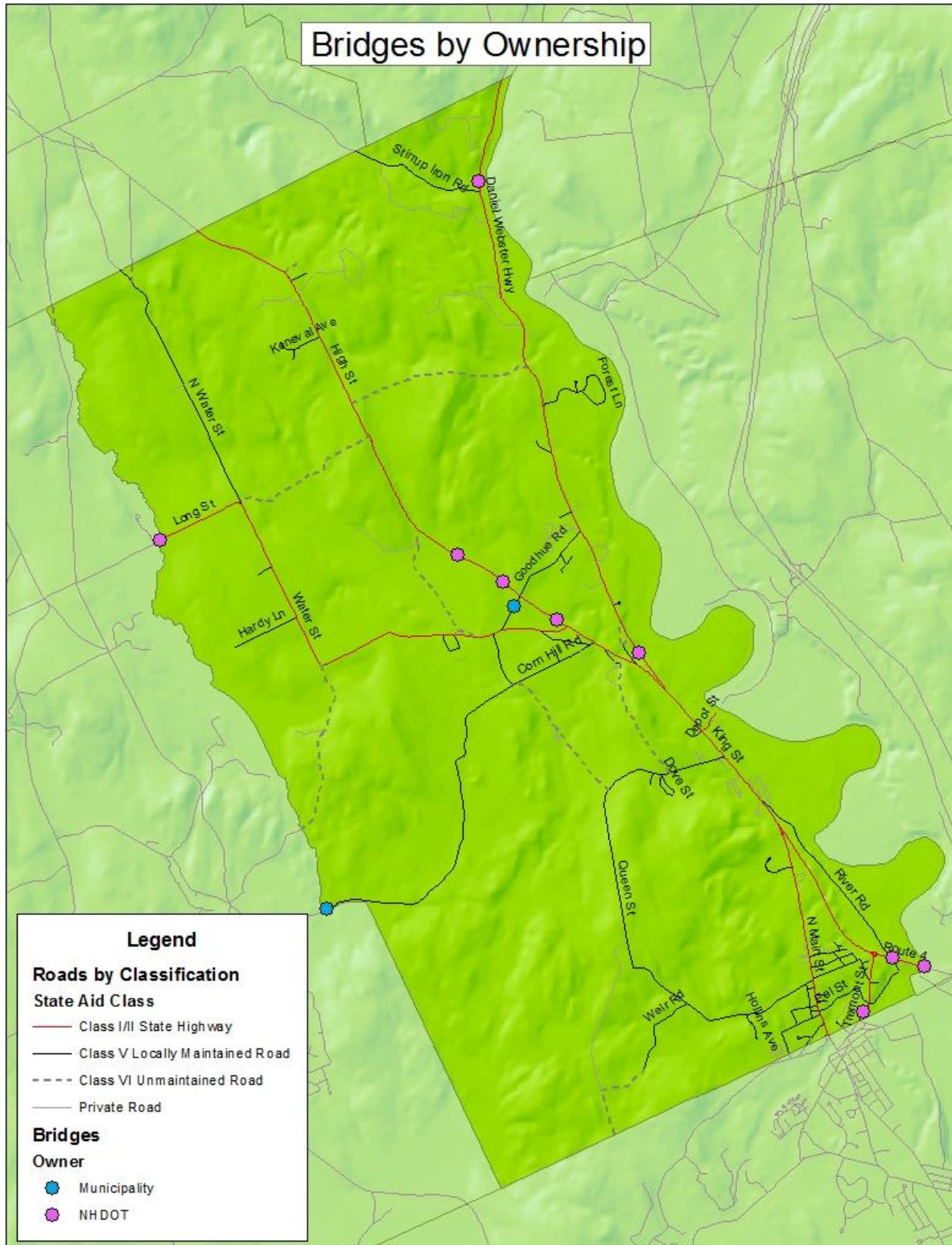
Source: NHDOT

ADT= Average Daily Traffic

The following bridges are classified as “Red Listed” bridges by the NH DOT which are deemed to be either structurally deficient and/or functionally obsolete and require additional monitoring through yearly inspections:

- Corn Hill Road at Pond Brook

Figure TR – 3: Boscawen Bridges



Source: NHGRANIT/NHDOT

Traffic Volumes

The Central New Hampshire Regional Planning Commission (CNHRPC) maintains an ongoing traffic count program for monitoring the region's transportation network. In addition, CNHRPC collects traffic count data for the New Hampshire Department of Transportation (NHDOT) in accordance with federal guidelines under the Federal Highway Performance Monitoring System (HPMS).

Figure TR-4 displays the Average Annual Daily Traffic (AADT) volumes for 2002 – 2014, which are published on the NHDOT website at <http://www.nh.gov/dot/org/operations/traffic/documents.htm>. AADT is a basic measure of traffic demand for a roadway and represents the volume of traffic travelling in both directions. As stated above, CNHRPC provides traffic count data to the NHDOT, who then calculates the AADT by applying correction factors to raw data to account for weekday and seasonal variations in traffic volumes.

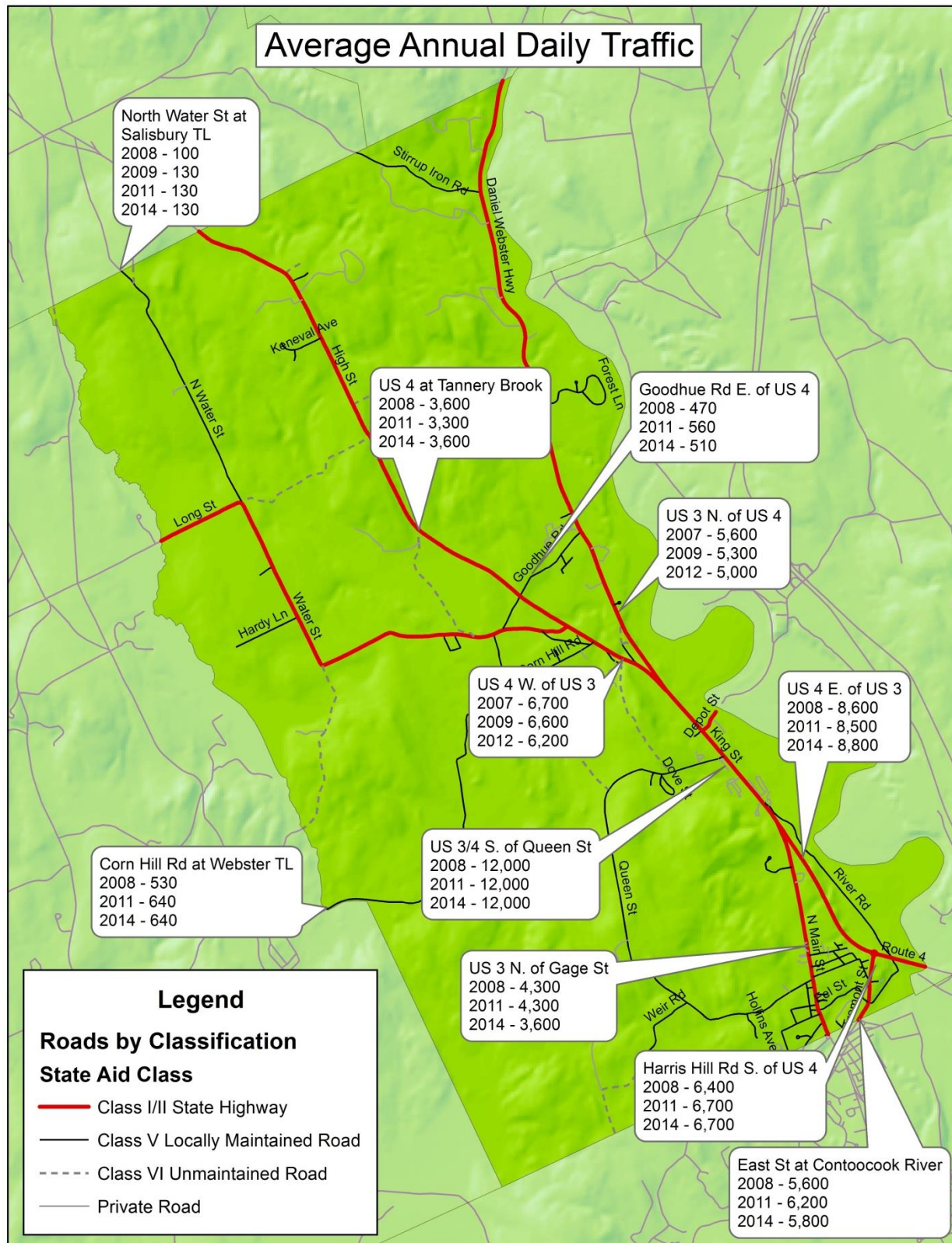
Of the eleven (11) locations where AADT volumes have been calculated for the years 2007-2013, only five (5) show slight increases in volumes, with the remaining locations either remaining static or showing a slight decrease (See Figure TR-4). Six (6) of the eleven (11) locations have been on the NHDOT three year count cycle including 2002, 2005, 2008 and 2011. The data is displayed in Table TR 4.

Table TR – 4: AADT 2002-2014

Location	2002	2005	2008	2011	2014
EAST ST AT CONTOOCOOK RIVER	6200	6700	5600	6200	5800
HARRIS HILL RD SOUTH OF US 4	6700	6600	6400	6700	6700
US 3 (NORTH MAIN ST) NORTH OF GAGE ST	5200	5700	4300	4300	3600
GOODHUE RD EAST OF US 4	550	560	470	560	510
US 4 (HIGH ST) AT TANNERY BROOK	3600	3700	3600	3300	3600
CORN HILL RD AT WEBSTER TL	530	590	530	640	640
Totals	22780	23850	20900	21700	20850
Annual Percent Change		4.5%	-14.1%	3.7%	-3.9%

Source: NHDOT

Figure TR – 4: Average Annual Daily Traffic Counts in Boscawen

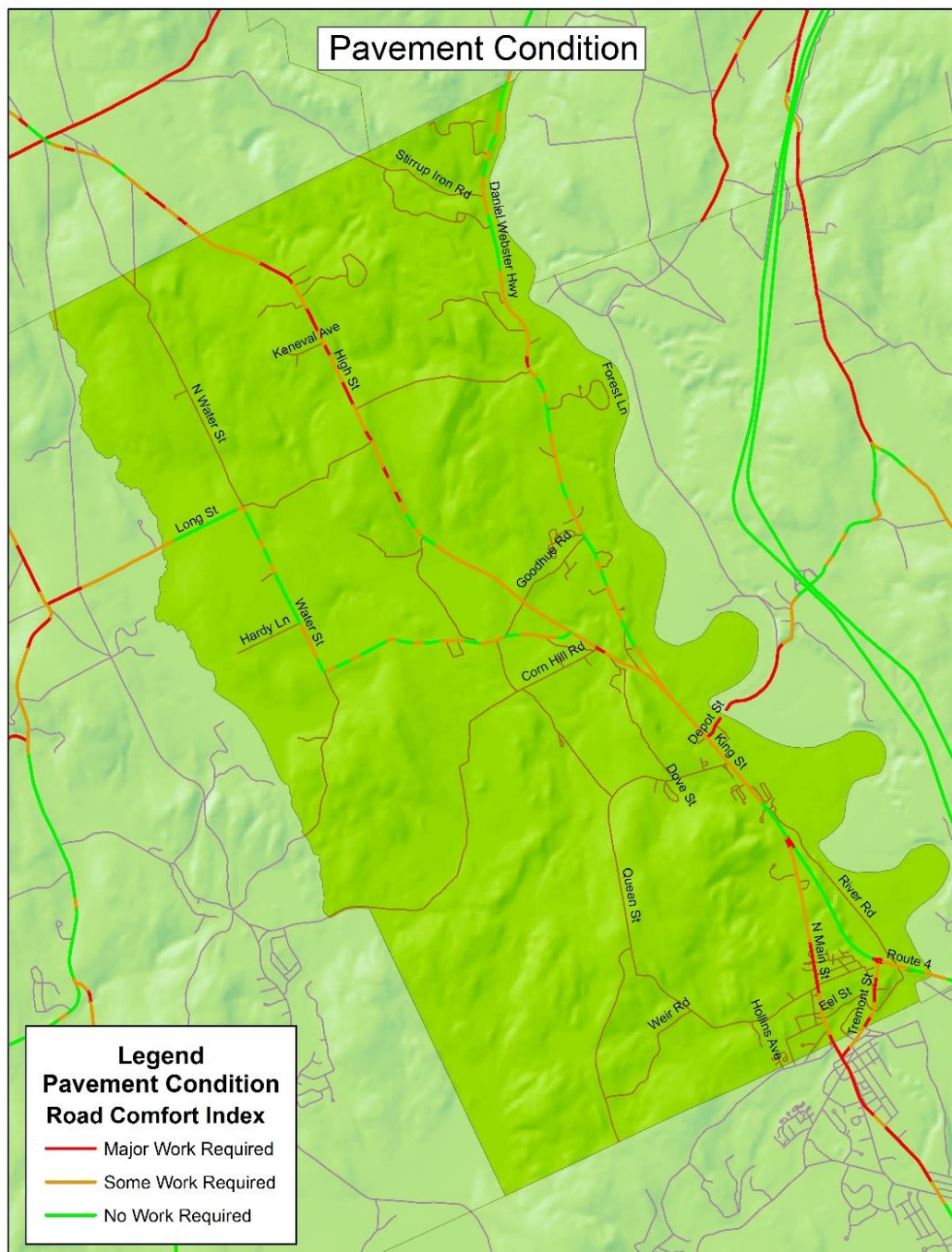


Source: NHDOT, 2012

Roadway Conditions

Pavement condition data from 2013 and 2014 was obtained from the NHDOT's Pavement Management Section for state-maintained (Class I and II) roads and is displayed in Figure TR-5. The pavement condition is rated based on its Ride Comfort Index (RCI), which is calculated directly from the average pavement roughness measured in the left and right wheel paths of roadways. That data indicates that the majority of state maintained roadways in Boscawen require some work.

Figure TR – 5: NHDOT Pavement Condition 2014



Source: NHDOT, 2014

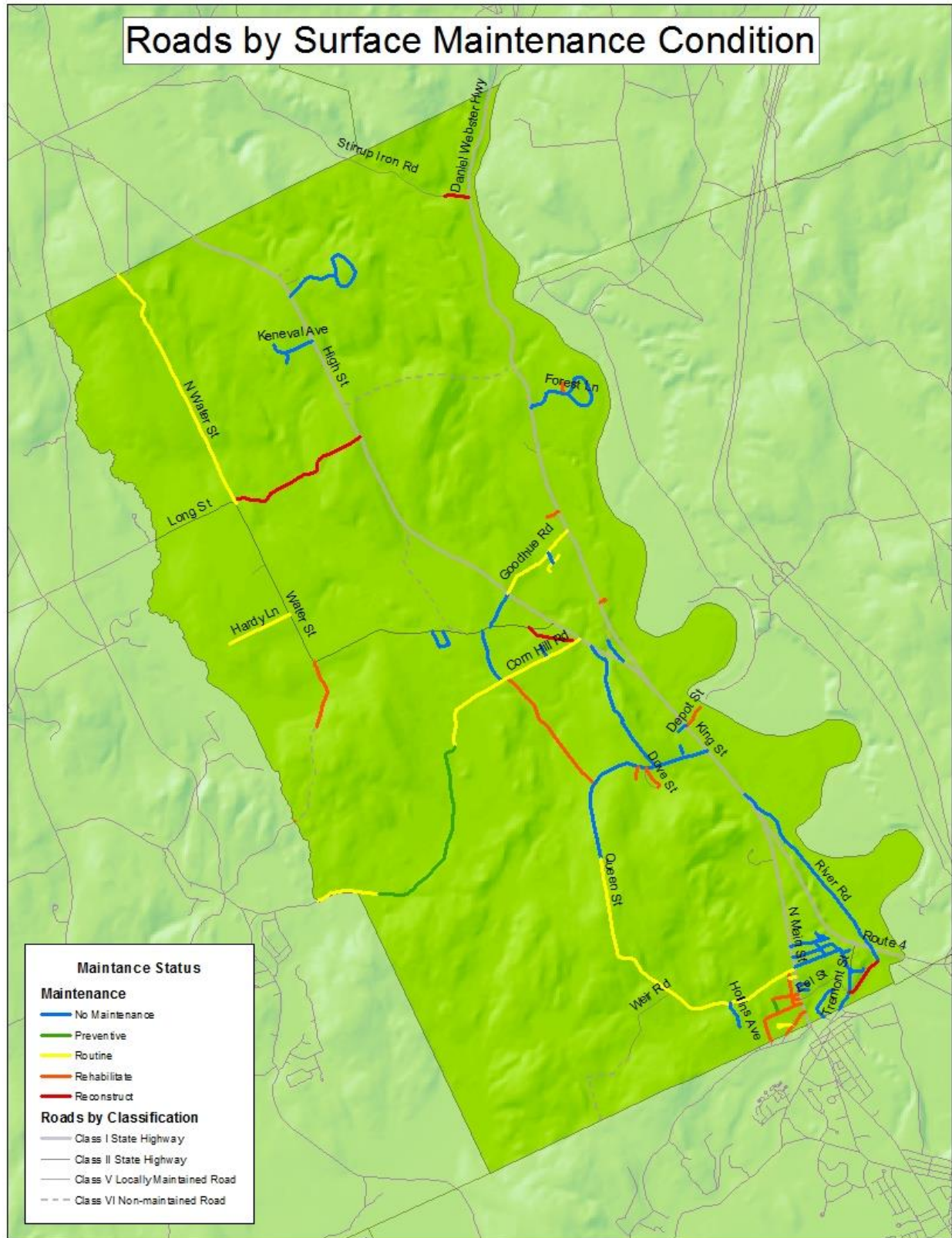
The road surface conditions on town maintained roads vary by location. The Town's Highway Department and Board of Selectmen are to be commended for taking a proactive approach to local road maintenance. The Town's Capital Improvement Program regularly schedules improvements to the local road network and the Highway Department has a repaving and maintenance schedule that the Town's residents have supported.

Central NH Regional Planning Commission has assisted the Boscawen Highway Department in establishing a Road Surface Management Systems (RSMS) to help prioritize road improvements and develop a transparent system for short, medium and long term improvements. RSMS is basically a methodology intended to provide an overview and estimate of a road system's condition and the approximate costs for future improvements. RSMS provides a systematic approach for local officials to answer basic questions about their road system, to gauge current network conditions and to guide future improvement and investment in line with the Town's Capital Improvement Program.

The RSMS involved a detailed road surface survey of all local roads in the town. Data was collected and input into the RSMS software which then provided maintenance category's for each roadway segment surveyed. The surface conditions are displayed in Figure TR-6. In addition to a 2012 road surface survey, CNHRPC also inventoried all locally owned culverts in the town of Boscawen. Each culvert was given an overall condition rating based on the following rating system:

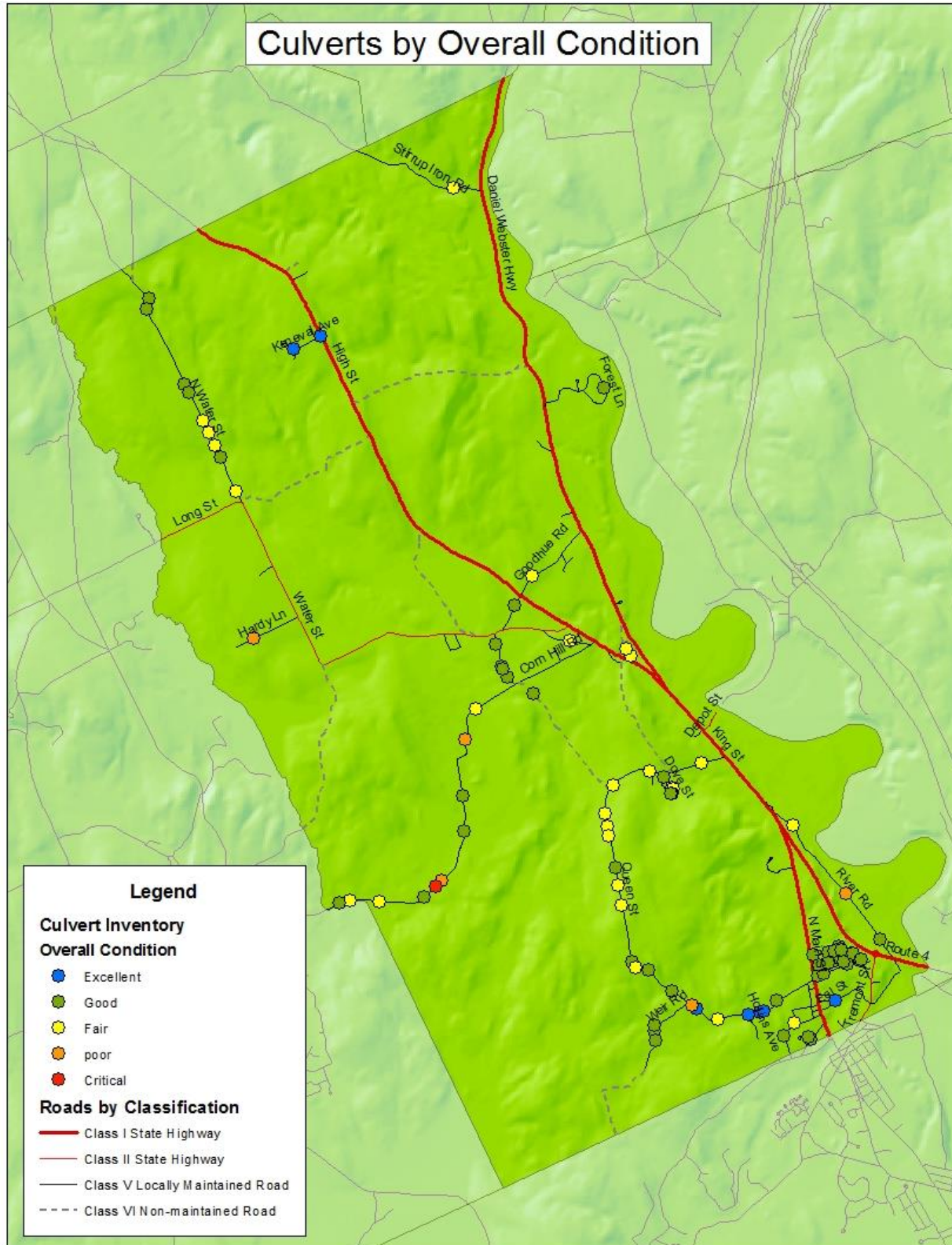
- Excellent – recently constructed, no visible deficiencies.
- Good – at least 75% open, few if any minor deficiencies.
- Fair – at least 50% open, some existing or developing deficiencies.
- Poor – at least 25% open and/or has serious deficiencies.
- Critical – less than 25% open and/or has critical deficiencies.

Figure TR – 6: Locally Owned Roads by Surface Maintenance Condition



Source: Boscawen Public Works, 2015

Figure TR – 7: Locally Owned Culverts by Overall Condition



Source: CNHRPC, 2012

Motor Vehicle Crashes

Motor vehicle crash data from 2009 – 2013 was obtained from NHDOT, who receives the data from the Department of Safety for crashes that exceed \$1,000 in damage. The Department of Safety crash data includes crash data collected by the Boscawen Police Department and the New Hampshire Highway Patrol. The data represents roughly 80% of all crashes with over \$1,000 in damage that took place during this time period; the remaining 20% of crashes are not locatable based on the information contained in the accident reports. Locatable crashes that occurred in Boscawen were reviewed and are summarized graphically on Figure TR-8 and in a summary table for the most frequent locations in Table TR-5. The majority of accidents in the Town of Boscawen are located along either Route 4 or Route 3.

Table TR – 5: Accident Hot Spots 2009-2013

State Maintained Highways	Number of Accidents 2009-2013	5 Year Average
US Rt. 4 Southern Section	27	5.4
US Rt. 3 Southern Section	29	5.8
US Rt. 3/4 (King St)	32	6.4
US Rt. 4 Northern Section	42	8.4
US Rt. 3 Northern Section	28	5.6
Town Maintained Roads	Number of Accidents 2009-2013	
Corn Hill Road	8	1.6
Queen Street	5	1
North Water Street	5	1
Raymond Rd	2	0.4
Forest Lane	1	0.2
Intersection Locations	Number of Accidents 2009-2013	
US 4/Harris Hill Rd	4	0.8
US 3/US 4 Southern merge	4	0.8
US 3/US 4 Northern merge	3	0.6
Tremont, Eel, Commercial Street	2	0.4

Source: NHDOT/NH Department of Safety

It is reasonable to assume that a number of smaller accidents may also have occurred during this time period which did not require the intervention of the police department because the estimated value of damage was below \$1,000 and no person was injured.

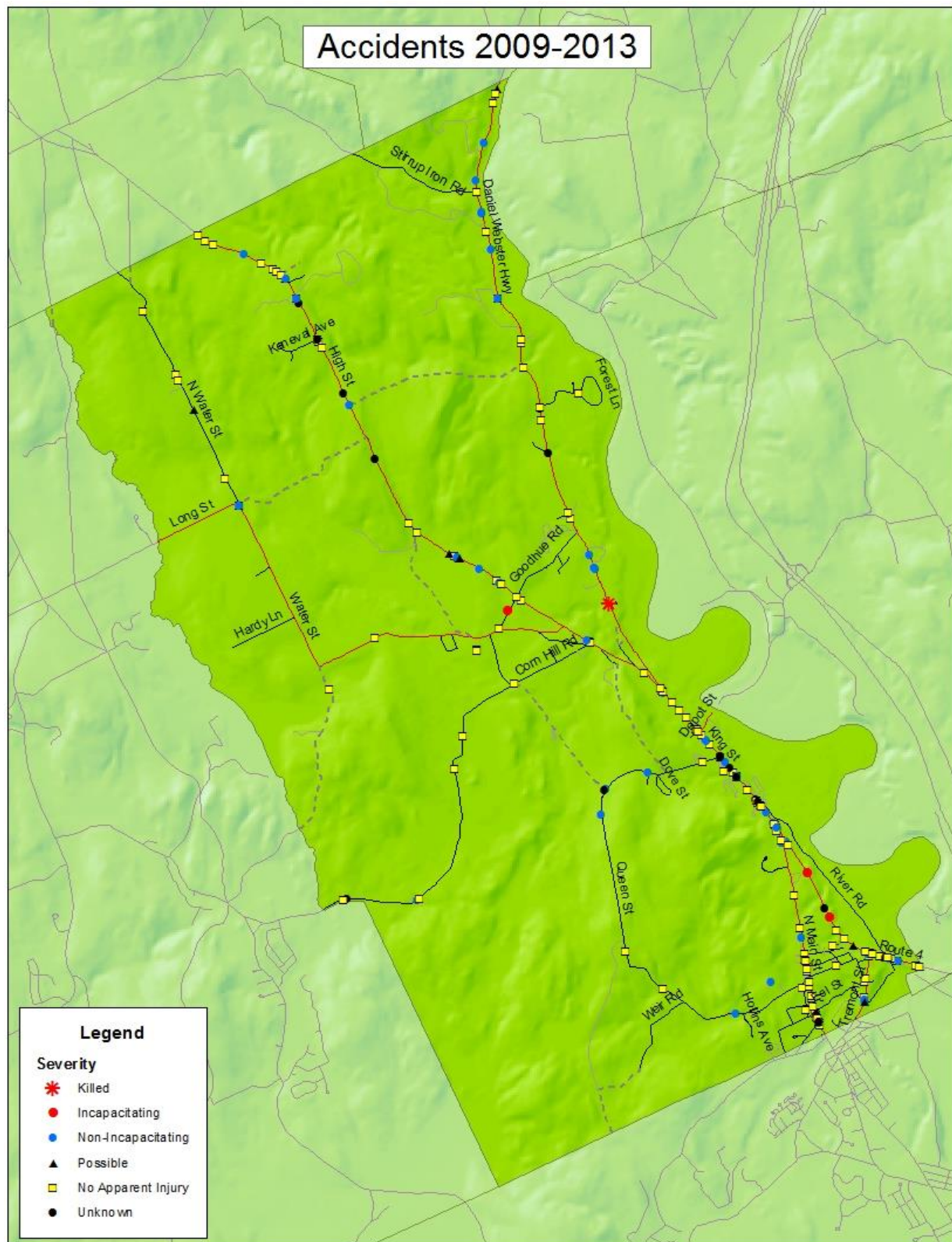
Accidents reported in Boscawen where fatalities or personal injuries occur are a cause for concern and should be monitored at regular intervals to determine if these locations require further study or action. Where any discrete segment of highway or intersections have three or more accidents per year, or a fatality has occurred, these locations should be studied to determine if any safety improvements can be made to reduce the number and/or severity of accidents.

The following intersections or road segments should be considered for further study:

- The Route 4/Tremont Street intersection should be studied to determine the effect off the recent roundabout construction on accidents at this location. Data for this should be retrieved from the Boscawen Police Department
- The US 3 and 4 northern and southern merges should be studied to determine if additional safety improvements are warranted at these intersections.

- Corn Hill Road has the highest total number of accidents between 2009-2013 of any road in the community. Accidents on Corn Hill Road should be reviewed to determine if additional signage is warranted or realistic improvements can be made to the grade and alignment of this road to reduce the number of accidents.
- It appears that accidents appear to be clustered at a number of locations along Route 3 and Route 4. These locations should be identified and studied to determine if safety improvements, such as speed limit reductions, additional signage or rumble strips are warranted.
- The accident history should be compared before and after the construction of the roundabout at the intersection of NH 4 (King Highway) and Harris Hill Road.

Figure TR – 8: Reportable and Locatable Vehicle Crashes 2009 - 2013



Source: NHDOT/NH Department of Safety

Public Transportation

The Town of Boscawen is not directly served by a fixed route public transportation service. The Concord Area Transit System's Penacook route extends to within a quarter mile of the town line with Boscawen. The Winnepesaukee Transit system extends to Franklin about five miles north of the northern limits of town along Route 3. The Belknap-Merrimack Community Action Program (BMCAP) operates a senior transit program providing service to the Merrimack County Nursing Home. BMCAP has also identified the potential to extend a route from Penacook to Franklin along US Route 3 through Boscawen. This route would help address the transportation needs at the Merrimack County Department of Corrections.

The Mid-State Regional Coordinating Council for Community Transportation runs a volunteer driver program that serves the region's elderly and disabled populations. The primary purpose of these trips are for essential social services and medical appointments (including long distance medical). Currently, there is no charge for both of these systems although donations are accepted.

Park and Ride

The Town of Boscawen is served by a 42 space park and ride lot on Route 4 adjacent to the Merrimack River and the City of Concord. This lot is usually full to overflowing. The NH Department of Transportation should consider providing additional Park and Ride capacity in this area, preferably the construction of a secondary lot with room to expand since the environmental impact and cost to expand the existing facility may be excessive.

Non-Motorized Transportation

Residents of Boscawen value the rural and historic character of the town. In certain locations the volume of traffic and associated speeds can be detrimental to the sense of place. Pedestrian facilities, such as paved sidewalks and gravel walking paths are essential features for roadways with high volumes of traffic or high speeds. The primary purpose of sidewalks is to improve safety for pedestrians by separating them from travel lanes of roadways. In addition to this, sidewalks can also serve as a source of recreation for residents or even stimulate economic activity in rural and village settings.

Similar to the provision of pedestrian infrastructure, planning for a bicycle network requires a different approach from that of motorized transportation planning. Bicyclists have different needs from those of motorists, including wider shoulders, better traffic control at intersections, and stricter access management. By creating adequate local bicycle & pedestrian infrastructure, members of the community will have the ability to travel within Town for employment, shopping, and recreational purposes without driving.

Boscawen has been successful in obtaining Safe Routes to School (SRTS) and Transportation Enhancement (TE) grants to improve walking and bicycling infrastructure. Improvements have been focused near US Route 4, US Route 3 and the Boscawen Elementary School. Future improvements may be eligible for the Transportation Alternatives Program (TAP), a federally funded program administered through NHDOT for pedestrian and bicycle infrastructure.

The Northern Rail Trail is a 56 mile long multi use path utilizing an abandoned railroad corridor that once connected Concord, NH to White River Junction, VT. The rail trail begins in Lebanon, NH and terminates in Boscawen, NH on River Rd just north of the Hannah Dustin Memorial. The four season path accommodates non-motorized transportation in the warmer months as well as cross country skiing,

snowmobiling and snowshoeing during winter months. Access between the trail and local amenities can be developed and maintained to connect trail users to businesses and services in Boscaawen. Trail counts can be completed in the summer months to gauge the number of users on the trail. Further studies may also be conducted to determine the feasibility of extending the trail to Concord and linking to the proposed Merrimack River Greenway Trail.

Commuting Patterns

The US Census Bureau's American Community Survey (ACS) provides data every year in the form of 1-, 3- and 5-year period estimates representing the population and housing characteristics over a specific data collection period. The ACS differs from the decennial Census in that the Census shows the *number* of people who live in an area by surveying the total population every 10 years. The ACS shows *how* people live by surveying a sample of the population every year. ACS collects and releases data by the calendar year for geographic areas that meet specific population thresholds; for areas with populations under 20,000, such as Boscaawen, 5-year estimates are generated. The most recent release represents data collected between January 1, 2008 and December 31, 2012.

Journey to Work Commuting data from the 2008-2012 5-year estimates for Boscaawen were reviewed and is displayed graphically in the charts below. In general, the majority of the working population residing in Boscaawen works outside of the community but within New Hampshire, drives to work alone, and commutes an average of about 23.6 minutes to work. It should be noted that the category "public transportation," is an option under "Means of Transportation to Work," however, there were zero respondents who chose that option.

Just over one quarter (26.4) percent of the work force in Boscaawen commutes to locations categorized as "All Other Locations". In reviewing the raw data, the "All Other Locations" are widely distributed to many communities in New Hampshire, Massachusetts, Maine, and even further afield. None of these destinations attract more than 1.5% of the total resident workers. The closest employment center (Concord) attracts about forty one (41) percent of the commuters.

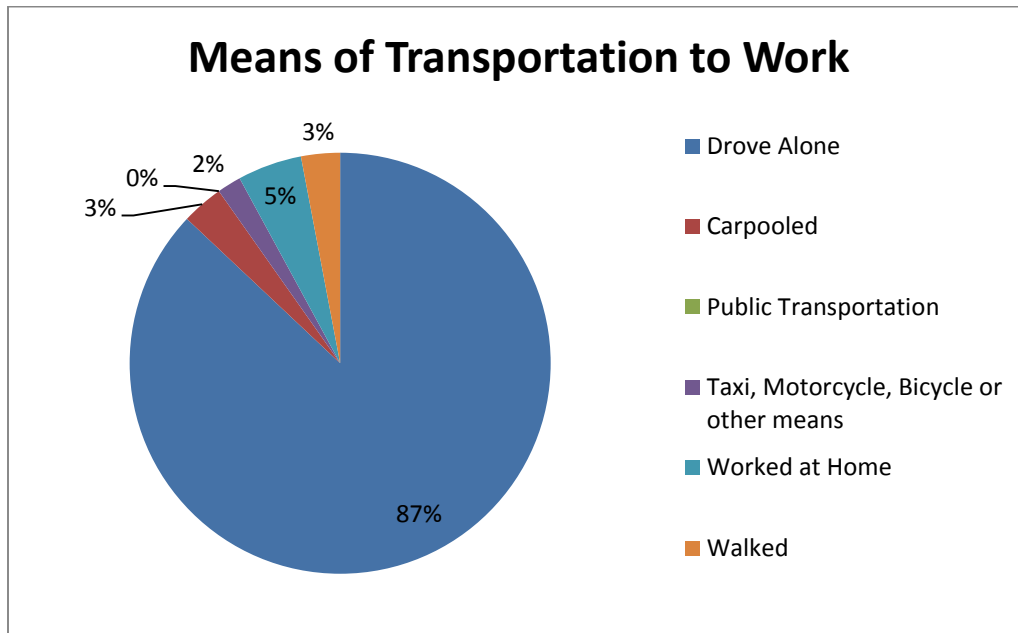
Boscaawen is fortunate to have a NH Park and Ride along US Route 4 near exit 17 on I-93. The park and ride contains 42 parking spaces and is often used for parking to access the Hannah Dustin Memorial and Northern Rail Trail in addition to providing carpoolers with a safe place to leave their cars. CNHRPC has conducted monthly occupancy counts at the park in ride over the last several years. In line with national standards, the counts are conducted between 9:00am and 3:00pm on Tuesday, Wednesday or Thursday. The last five (5) years of data are displayed in the table below.

Table TR – 6: Park and Ride Occupancy Data

Year	Mean (occupancy)		Minimum (occupancy)		Maximum (occupancy)	
2014	51%	21.38	33%	14	81%	34
2013	60%	25.36	33%	14	91%	38
2012	55%	23	29%	12	76%	32
2011	69%	29	48%	20	100%	42
2010	55%	23	21%	9	74%	31

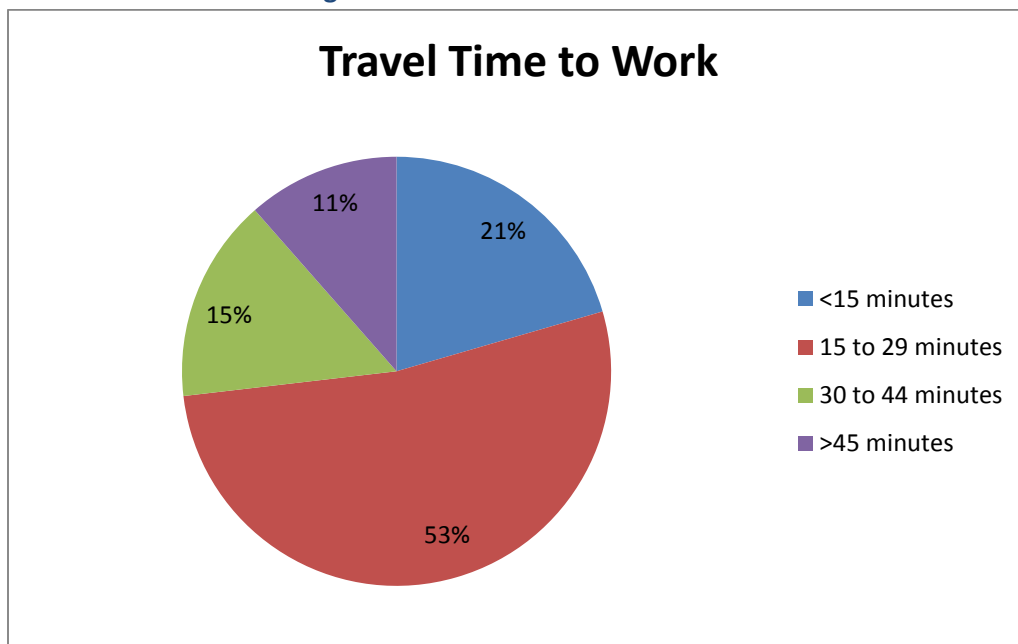
Source: CNHRPC

Figure TR – 9: Means of Transportation to Work



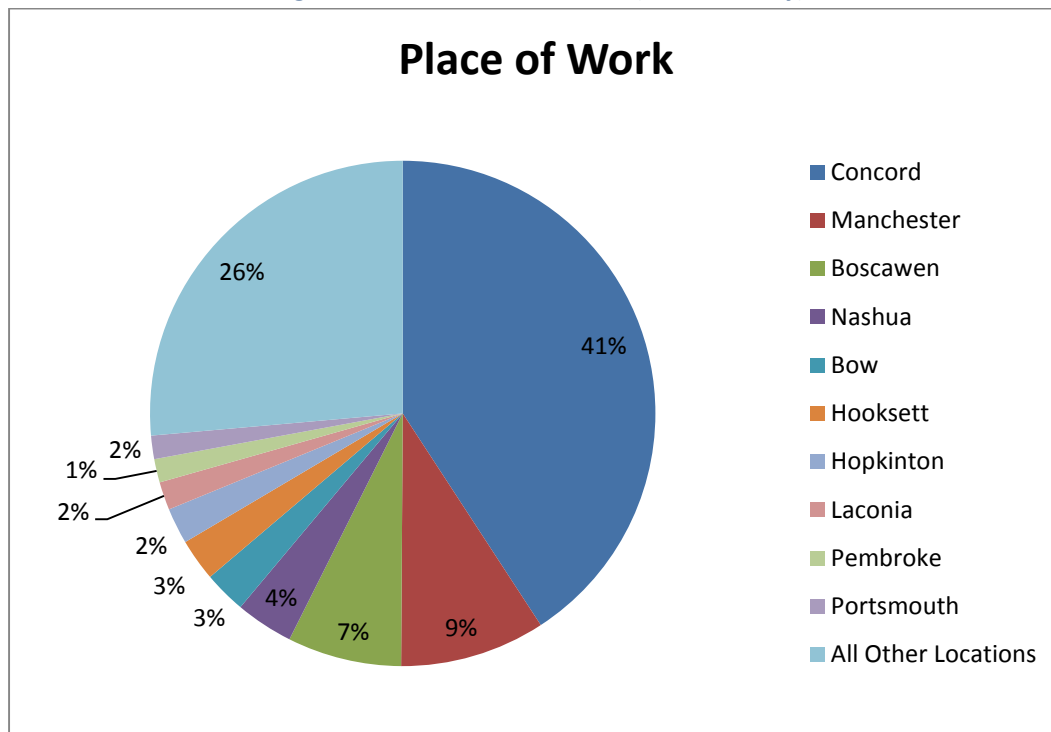
Source: U.S. Census Bureau, 2008 – 2012 American Community Survey

Figure TR – 10: Travel Time to Work



Source: U.S. Census Bureau, 2008– 2012 American Community Survey

Figure TR – 11: Place of Work (Town or City)



Source: U.S. Census Bureau, 2008– 2012 American Community Survey

Recommendations for Managing the Transportation System

New development is often phased over extended periods of time and the ultimate, as well as the immediate, impacts of development on traffic volumes and transportation systems should always be considered. The magnitude of new development obviously determines the traffic impacts that the development will have. Depending on existing roadway traffic volume, distribution patterns, and the physical condition of local roadways, small scale as well as large-scale development can often have significant impacts on the surrounding roadway network. By requiring transportation/traffic impact studies for new developments of a certain size or for developments located in areas where significant transportation problems are known to exist, the Town of Boscawen's Planning Board can effectively evaluate the scope of impacts associated with any new development. Through this kind of scrutiny, recommendations for project phasing, and developer participation in necessary improvements can be ascertained and problems of safety, congestion, and the expensive upgrading of existing roads can be mitigated.

As federal and state assistance for local road construction has decreased in recent years, the construction, improvement, and maintenance of local roads has increasingly become the responsibility of municipalities and developers. The developer providing all necessary "on-site" infrastructure improvements is now considered standard practice. However, where developments will have significant impact on the transportation infrastructure in Boscawen, developers should also be responsible for addressing these issues.

The two basic methods for securing developer participation in roadway and other infrastructure improvements necessitated by new development are through negotiated development agreements and through the assessment of formula based development impact fees.

The Town of Boscawen has a traffic impact fee for “Town Roads” which was created in March of 2007, and subsequently amended by the Planning Board in August of 2012. Fees for “Town Roads” are only assessed for new residential building permits. The Town may wish to consider adding the “Town Road” category to the “Non-residential Development” Impact fee table.

Negotiated development agreements can be structured to address impacts which are largely caused by the development or would result in the premature expenditure of public funds. A sub-standard local street providing access to a new development can be improved to handle the new traffic generated by the development, or the Planning Board has the option to declare the development to be Scattered and Premature under RSA 674:4.

Access Management

Access management is one of the principal tools a local government can utilize to preserve or enhance the capacity of a collector or arterial street while simultaneously enhancing the safety of motorists, pedestrians and bicyclists. Access management is the practice of coordinating the location, number, spacing, and design of access points to minimize site access conflicts and maximize the traffic capacity of a roadway. Current planning efforts focus on all modes of transportation including vehicles, public transit, bicycles, and pedestrians. In general, there are a number of techniques that the Town of Boscawen can use to take a proactive approach to access management.

1. Think land use AND transportation.

Before approving a subdivision or rezoning, determine what road design and improvements will be needed to support the development and link it to the surrounding area.

2. Identify and plan for growth areas.

Support economic growth by planning and investing in a local road network to support development. Uncoordinated and improperly sited development will not lead to a livable community or a healthy business climate.

3. Develop a complete hierarchy of roads.

Maintain a functional road classification system. A viable community requires a variety of roadways organized as an integrated system. Highways and arterials are needed for longer, higher speed trips. Local streets and collectors provide access to homes and businesses.

4. Link access regulations to roadway function.

Access standards in the zoning, subdivision and site plan regulations should be designed for each roadway’s functional classification. Recognize that the greatest access control is needed for arterial and collector roads intended to serve longer, higher speed trips.

5. Avoid strip development. Promote commercial nodes.

Commercial development should be located in compact nodes adjacent to and visible from the highway, with controlled and coordinated access.

6. Connect local streets between subdivisions.

Give residents convenient options for travel from one neighborhood to another by connecting local streets from one subdivision to the next.

7. Design subdivisions with access onto local streets.

Avoid lot designs with driveways that enter onto major state or county highways. Orientate business and residential driveways to local streets that feed onto the highway at a few carefully designed and spaced intersections.

8. Practice good site planning principles.

Locate entrances away from intersection corners and turn lanes. Provide adequate space on the site for trucks to maneuver and for vehicles to queue at drive-through windows without backing or stacking on the roadway. Adjacent businesses should provide shared driveways and cross access so customers can make multiple stops without entering arterial or collector roadways.

9. Correct existing problems as opportunities arise.

Adopt a long range vision for improving access along older, developed corridors. Correct unsafe accesses as individual parcels expand or redevelop. Work with affected property owners to consolidate driveways and provide internal access between parcels.

10. Coordinate local development plans with NHDOT.

Share plans for subdivisions, rezonings, and site plans with NHDOT and the abutting towns where applicable. Take every opportunity to coordinate transportation, land use and economic planning with the NHDOT, abutting towns and the City of Concord.

Connectivity

The functional roadway classification system provides an organized hierarchy to the Town's roadway system. However, for the roadway system to be effective, efficient, and to serve to maintain a sense of community, the roadway system needs to exhibit a sense of connectivity. Roadway connectivity refers to a street system that provides multiple routes and connections to the same origins and destinations.

One of the difficulties that the Town of Boscawen, like other municipalities, faces is development projects that come before the Planning Board exhibiting poor connectivity. This can often be seen with residential subdivisions, where the subdivisions are designed as a series of cul-de-sacs. Although the residents who live on these types of streets generally prefer this type of disconnected street system because of the resulting low volume of traffic, the impact to the community as a whole can be negative.

A well connected street system provides motorists, pedestrians and bicyclists better, more direct and shorter travel routes to schools, shopping and other neighborhoods. A well connected street system not only provides shorter and more efficient connections but also serves to reduce traffic congestion along the major arterial roadways. The result is a more efficient roadway system with less need to be continually adding capacity to the Town's major roadways. A well connected street system also improves emergency response times for firefighters, police, and ambulance services. In addition to the traffic operational benefits, a well-connected street system also serves to create a sense of community as opposed to a sense of isolation that cul-de-sacs can at times create. Cul-de-sacs are an important part of communities throughout the state and where appropriate should be encouraged. However, a well-planned and connected street system should be a key element in Boscawen's transportation planning policy and accurately represented in the decisions of the Planning Board.

Traffic Calming

Traffic calming is a significant challenge for many communities in the United States. This is particularly true for small, rural communities in New Hampshire where the main roadway through the town serves a dual role. Outside the town, the roadway provides high-speed travel over long distances; within the built-up area, however, the same roadway accommodates local access, pedestrians of all ages, on-street parking, bicycles, and the many other features unique to the character of a community. This convergence of roadway purposes presents both an enforcement challenge for the community and a potential safety problem for the public.

Addressing the issue through law enforcement alone often leads to temporary compliance at a significant cost. A more permanent way to reinforce the need to reduce speed is to change the look and feel of the road by installing traffic calming treatments that communicate to drivers that the function of the roadway is changing. Traffic calming has been evaluated and used extensively within low-speed urban areas in the United States but less so in rural areas where driver expectations and traffic characteristics are different.

Lowering speed limits is a well-established method of improving pedestrian safety and other non-motorized modes of travel. NH RSA 265 establishes speed limits of 30 miles per hour in a business or residence districts, 35 miles per hour in a rural residence districts on any class 5 highway outside an urban compact or 55 miles per hour on all other roads. Based on an engineering or traffic investigation local authorities may adjust maximum speed limits. Limits can be made lower at intersections (RSA 265:63) and in school zones (RSA 265:60). However, traffic calming also suggests road design techniques using active or physical controls (bumps, barriers, curves, rumble strips, etc.) and passive controls, such as signs, landscaping and traffic regulations, to reduce vehicle speeds.

The most effective traffic calming programs combine regulatory and signage actions along with physical modifications to the public right-of-way. Traffic calming measures foster safer and quieter streets that are more accommodating to pedestrians and cyclists and enhance neighborhoods and downtown environments. The potential benefits of traffic calming include reduced traffic speeds, reduced traffic volumes – by discouraging “cut-through” traffic on residential streets – and often improved aesthetic quality of streets. An example of some effective and applicable traffic calming techniques include:

Speed Humps, Speed Tables, and Raised Crosswalks: All of these techniques involve raising the height of the pavement in a more subtle fashion than with a speed bump, allowing vehicles to pass over them at the intended speed of the road, but preventing excessive speeds and alerting drivers to the existence of non-motorized users. These applications are not appropriate for arterial and collector streets as well as emergency response routes.

Chicanes, Diagonal Diverters or Medians: These devices effectively narrow road width and slow down traffic by placing a physical impediment either in the middle of the road (median) or on the side of the road (chicane). These traffic-calming devices lend themselves to landscaping and improve the visual experience for all users of the road, as well as reducing speeds. Both techniques can provide additional safety for crossing pedestrians. Medians may serve as a refuge by allowing pedestrians to cross one lane of travel at a time, while chicanes provided at crosswalks reduce the overall distance from one side of the road to another and slow down traffic at those crossings. Medians are effective on arterial and collector streets while diagonal diverters are suitable for low volume local streets.

Narrow Lane Widths: Many residential streets have been constructed to such a width that getting motorists to obey a 25 or 30 mph posting is extremely difficult. In addition, it can be costly to physically

narrow the roadway or install various physical traffic calming measures. A low-cost way of reducing speeds is to narrow the roadway lane through the use of edge lines and centerlines. A number of jurisdictions across the country have installed this type of pavement marking application to create 9 to 10-foot-wide lanes. Narrow lanes can force drivers to operate their vehicles laterally closer to each other than they would normally be accustomed to. Slower vehicular speeds are often a result.

Intersection improvements: Roundabouts should be evaluated along with all-way stop intersections and traffic signals whenever an intersection is proposed for improvement. Slower speeds and splitter islands at the approaches can also allow pedestrians to safely negotiate intersections.

Corridor Improvements: Narrowing thru lanes, adding on street parking, installing bump outs and adding speed feedback signs are all examples of roadway improvements intended to calm traffic.

Class VI Roads & Class A and B Trails

Class VI roads are roads that are not maintained by the Town, may be subject to gates and bars, and normally consist of a gravel or dirt surface. Table TR –7 lists the Class VI roads in Boscaawen and those trails which are designated Class A or B. A Class V road can become a Class VI road if the Town has not maintained it for five years or more. Under RSA 674:41, I(c), for any lot whose street access (frontage) is on a Class VI road, the issue of whether any building can be erected on that lot is left up to the "local governing body" (Town Selectmen) who may, after "review and comment" by the planning board, vote to authorize building along that particular Class VI road, or portion thereof. Without such a vote, all building is prohibited. The purpose of RSA 674:41, I(c) is to prevent scattered and premature development. The Town of Boscaawen does not allow new building construction on Class VI roads.

Across the State, many communities are beginning to look at Class VI roads as candidates for designation as Class A Trails. These roads have little or no development associated with them, are scenic, have no inherent liability concerns, public access is already allowed, and also serve to connect large areas of open space, conservation, and/or agricultural lands. By reclassifying certain roadways that meet these criteria to Class A Trails, the community could be taking a step in creating a community-wide system of greenway trails. Unlike Class VI roads that the Town does not maintain, Towns, at their option, may conduct maintenance on Class A Trails. Class B trails are similar to Class A trails however they cannot be used by abutters for non-development forestry uses or agricultural uses. Weir Road and Marlboro Road are already designated as Class A or Class B trails.

It is important to stress that reclassification of Class VI roads to Class A Trails will not inhibit the access rights of landowners along the roadways. In the case of a Class A trail, landowners can continue to use the trail for vehicular access for forestry, agriculture, and access to existing buildings. However, under such classification, new building development as well as expansion, enlargement, or increased intensity of the use of any existing building or structure is prohibited by New Hampshire Statute. Class B trails are similar to Class A trails however they cannot be used by abutters for non-development forestry or agricultural uses, nor can they be used to access existing buildings. The Town and owners of properties abutting Class VI roads are not liable for damages or injuries sustained to the users of the road or trail.

Class VI roads are an important component of a Town's transportation infrastructure due to their rural character and potential recreational opportunities. The Town should evaluate if any additional Class VI roads may be designated as Class A or B trails.

Table TR – 7: Town Unmaintained Roads (Class VI)

Class VI (Town Unmaintained) Roads	Approximate Length (ft)
Cathole Road	9,000
Chadwick Hill Road	5,000
Marlboro Road Segments	3,500
Marlboro Road (Class A Trail)	2,500
Morse Hill Road	6,000
Mutton Road	750
Newbury Street	5,700
Round Road Segment	1,500
Stirrup Iron Road Segment	2,000
Tote Road (East)	2,000
Tote Road (West)	2,750
Weir Road (Class B Trail)	6,500
TOTAL	47,200

Source: NHDOT

Transportation Funding

Boscaawen's primary source of funding for the Town's transportation network is the Highway Block Grant Aid. These funds are distributed by the State of New Hampshire on a yearly basis with partial disbursements made four times a year. The payments are made as follows: 30% in July, 30% in October, 20% in January and 20% in April with unused balances carrying over. The funds come from a portion of the total road toll and motor vehicle registration fees collected by the State. The funds can only be used to fund or match funding for constructing, reconstructing or maintaining Class IV and V (town maintained) highways as well as equipment for maintaining local roads.

The funds are allocated from an annual apportionment of not less than twelve percent (12%) of the total highway revenues collected from the preceding year. Half of that total apportionment is distributed based on population and the other half is distributed based on Class IV and V road mileage. This comes out to approximately \$1,200 for each mile of Class IV and V highway and about \$11 for each person.

A second apportionment of funds is allocated from a sum of \$400,000. The formula for disbursement is based on the value of property and roadway miles. The formula is designed to give the greatest benefit to municipalities with low property values (on an equalized basis) and high road mileage.

To ensure each town receives the proper allotment it is crucial towns provide accurate information regarding Class IV and Class V road mileage. Highway Block Grant Aid distribution formulas do not take into consideration the condition or amount of traffic on municipal roads.

Table TR – 8: Highway Block Grant Aid Allotments

FY12	FY13	FY14	FY15
\$ 83,939.91	\$ 73,283.93	\$ 73,364.39	\$ 73,679.73

Source: NHDOT Block Grant Aid Report

NH Senate Bill 367, also known as the Road Toll or Gas Tax, may increase the state highway revenue beginning in fiscal year 2016 which would increase the Highway Block Grant Aid Boscawen receives. The law is only in place for a limited timeframe (approximately 20 years) and once it runs out the funding will be restored to previous amounts if no new legislature is introduced.

The New Hampshire Ten Year Plan (TYP) identifies and prioritizes the critical transportation projects in New Hampshire in an ongoing effort to address transportation needs at the local, regional and statewide levels. The TYP is updated every two years – allowing transportation priorities to be revisited, existing projects to be removed as appropriate and allowing new projects including, roads, bridges, transit, rail and aviation projects to be added.

With the previous TYP as a starting point, the plan process includes input from individual communities, development of regional Transportation Improvement Plans (TIPs) by the Regional Planning Commissions (RPCs), numerous public hearings by the Governor's Advisory Commission on Intermodal Transportation (GACIT) and review and approval by the Governor and Legislature before it is adopted.

Performance measures and conditions such as pavement condition, bridge ratings, congestion levels, safety issues, economic impacts, user surveys and available funding levels are considered in determining project need and prioritizing project implementation.

The process to prepare the Central NH Regional Transportation Improvement Plan (TIP) begins with the CNHRPC soliciting project requests from local communities, followed by an evaluation process by the Planning Commission's Transportation Advisory Committee (TAC) where new and existing projects are prioritized.

Table TR – 9: Projects and Action Plan

Year	Project	Location	Estimated Cost	Funding Source
NA	Merrimack River Bridge	Depot St/West Road	Unknown	Unknown
NA	Realignment US 3 and US 4	At northern intersection	Unknown	NH DOT and Town of Boscawen
NA	Shoulder/Bike Lane Widening and resurfacing	US 3 and US 4	Unknown	NH DOT. To be undertaken with roadway resurfacing
NA	Sidewalk Reconstruction and driveway reconstructions	US 3 (North Main Street)	Unknown	NH DOT and Town of Boscawen. To be undertaken with roadway resurfacing
NA	Park and Ride -50 spaces expandable	US 4 near existing lot	\$200,000	NH DOT
NA	Intersection upgrade study	King Street (US-4) at Queen Street	Unknown	NH DOT and Town of Boscawen.

The replacement of the Depot Street Bridge over the Merrimack River would link Route 3 on the west side of the Merrimack River by way of Depot Street and West Road in Canterbury to I-93 at Exit 18 east of the river. The derelict bridge was removed in 2014 and a replacement bridge would run between 10-20 million dollars. The replacement of the Depot Street Bridge over the Merrimack River is not

incorporated in any NH DOT existing or planned improvement program. Unless entirely funded locally, this project would need to compete for state funding through the TYP process. However, this would be an excellent location for a new pedestrian/snowmobile bridge given the existing bridge piers and the ability to link the two towns at a location away from bridges with high volumes of traffic.

The northern intersection of US 3 (High Street) and US 4 (Daniel Webster Highway) intersect at an acute angle adjacent to the Boscawen Congregational Church. Given the volume of traffic on all three approaches, this intersection should conform to standard engineering geometry. A traffic signal or roundabout may be warranted at this intersection in the future.

Existing shoulders are found all along Route 3 and Route 4, however, the width and condition of the shoulders varies, and at some locations wide uncontrolled access exists at businesses along the roadway. The shoulders need to be separated from the adjacent parking areas and conforming driveways created. This work would best be undertaken as part of any resurfacing project proposed by the NH DOT.

Existing sidewalks are located on one or both sides of North Main Street (US 3) from Concord north to just south of the US 4 (King Street) intersection. The width and condition of the sidewalks vary and at some locations wide uncontrolled access exists at businesses along the roadway. The sidewalk needs to be separated from the edge of the roadway and the adjacent parking areas and conforming driveways created. This work would best be undertaken as part of any resurfacing project proposed by the NH DOT.