

NH 12 SOUTH CORRIDOR STUDY

Keene Swanzey Marlborough Troy Fitzwilliam

Report to the Commissioner of the
New Hampshire Department of Transportation
2015



PREPARED BY SOUTHWEST REGION PLANNING COMMISSION
with assistance from the NH 12 South Advisory Committee



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Name	Organization
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Kenneth Colby	Swanzey Board of Selectmen
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Nancy Carney	Fitzwilliam Board of Selectmen
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Executive Summary

The NH 12 South corridor spans approximately 18 miles through five communities including Keene, Swanzey, Marlborough, Troy, and Fitzwilliam. It connects the regional employment and shopping hub of Keene to the Massachusetts State Line and beyond. The study was conducted as a means to evaluate the corridor as a shared public resource by researching how the corridor relates to local employment, housing opportunities, public infrastructure, environmental and historic resource needs. It also involved a considerable amount of traffic research and data collection.

Since 1999, SWRPC has conducted three corridor studies in the region including NH 101, US 202 and NH 9. Through these studies SWRPC was able to develop:

- an inventory of data which describes the physical characteristics along the corridor;
- an improved understanding of assets and issues relative to transportation, land use and related matters;
- a schedule of possible local capacity and safety improvements;
- recommendations for local land use controls and economic development approaches which are consistent with the protection of highway capacity and public safety, with attention to highway impacts on community quality of life; and
- a comprehensive strategy shared by state and local decision-makers for the future development and use of the corridor.

Each of these studies has proven to be an important tool for encouraging coordination between corridor towns, SWRPC and NHDOT. As an example, many capacity and safety improvements developed in the studies have served as the basis for projects nominated to New Hampshire's Ten Year Transportation Improvement Plan.

Like the previous studies, the NH 12 South study involved a data collection and analysis component, and a public involvement component including an advisory committee representing town officials and other corridor stakeholders. To begin the study, our traffic researchers collected data at various locations along the NH 12 South corridor. The data was analyzed and included in this report and corresponding appendix. In addition to the traffic analysis, the study included an analysis of land uses, zoning requirements, development constraints, environmental and historical resources, demographics, employment and commuting trends, and potential future development.

The public involvement component was used to strengthen the validity of the results with local knowledge from corridor communities. Each community provided up to three members to participate in an advisory committee. The committee met throughout the duration of the study and assisted with recommendations for the corridor. A business survey was also conducted to gather information from businesses within the study area to understand how well the corridor is supporting the business environment. Later, a meeting was held in each community with public officials to present and discuss the findings and recommendations of the study.

Findings

- The Advisory Committee identified a number of locations on the corridor that represent areas of concern. The need for intersection improvements, pedestrian and bicycle safety, speed, and access management were common themes in locations throughout the corridor. Adoption of Access

Management Plans and Complete Street Policies should be considered in each community to address these concerns.

- The intersection at NH 12/NH 119 in Fitzwilliam was identified as a priority for safety improvements. Some form of a road diet or other method of traffic calming is warranted for consideration. The NHDOT and the community should continue to work together to determine feasible alternatives. The need for safe pedestrian crosswalks should also be discussed.
- Traffic volumes peak south of the Main Street and NH 101 intersection on NH 12 in Keene. During the study, average daily traffic (ADT) was observed to be 18,750 vehicles. Traffic volumes were the lowest in Fitzwilliam near Number 4 Road (4,706 vehicles) and at the Massachusetts state line (5,078 vehicles).
- The proportion of vehicles found to be exceeding the posted speed limit in Keene and Swanzey was found to be 90% or higher. In Troy, traffic data indicated that vehicles were significantly less likely to exceed the speed limit. The highest recorded speeds were observed near the Number 4 Road in Fitzwilliam where 15% of vehicles exceeded the posted speed limit by at least 10 miles per hour.
- Intersection level of service (a measure documenting congestion) varied considerably at the intersections observed. The intersection with the poorest performance was the NH 12/32 (Old Homestead Highway) intersection which functioned at a level of service F (very poor) during AM and PM peak hours for vehicles entering onto NH 12 from NH 32. Two changes in the Swanzey portion of NH 12 will likely have a positive impact on this intersection: the installation of a roundabout at the NH 12/Swanzey Factory Road/Lake Street intersection, and the extension of Safford Drive which will make a new connection between NH 12 and NH 32. Both of these changes will provide alternative access to NH 32 south of the NH12/32 intersection.
- Heavy vehicles were roughly twice as numerous in Keene when compared to Fitzwilliam. However, as a percentage of total vehicles, heavy vehicles made up a smaller proportion of all traffic at the northern extent of the corridor. In Keene and Swanzey, weekly heavy vehicles (FHWA classes 8-13) accounted for 1.5% of all traffic (1,600 – 1,900 during a weeklong study). In Troy, there were 1,400 heavy vehicles, approximately 2% of all vehicles and in Fitzwilliam there were about 1,000 heavy vehicles, or 3% of all vehicles. Light vehicles (FHWA classes 1-3), which include motorcycles, passenger vehicles, and light trucks, accounted for between 94% and 97% of counts throughout the study area.
- Stormwater Management is needed to maintain water quality along the corridor. Modifications to local Zoning Ordinances and Site Plan Reviews which are sensitive to stormwater management will help to improve and maintain water quality. An inspection of road/stream crossings will help determine the appropriate sizing of culverts/bridges, and can identify areas of erosion. Prompt repairs of erosion will greatly reduce the amount of silt and contaminants from being carried into adjacent waterbodies thereby preventing further degradation of water quality.



Troy- Vegetation encroaching into sidewalk.

- Several stretches of the highway are experiencing growth of invasive species that are spreading into the right of way, especially in the more rural portions.
- Within these communities, there are fourteen plants and four animals that are considered *endangered*, five plants and two animals considered to be *threatened*, and seven animals that the state has classified as being of *special concern*. In addition to the plant and animal classifications, there are 5 different types of exemplary natural communities within these communities.
- Drainage and surface condition improvements to the rail trail that runs along much of the corridor would benefit the safety and add to the recreational opportunity of pedestrians, cyclists, and other users. Trailhead parking and improved signage are needed in locations within each community.
- There is potential for growth and development along this corridor, especially along the Fitzwilliam and Swanzey portions. While there are some vacant buildings that are available for commercial/industrial use, there are also areas of vacant land. The extension of Safford Drive, currently under construction, will create an opportunity for industrial growth to vacant property with easy access to NH 12 South.
- Population in the towns of Fitzwilliam and Swanzey increased by 70% or more between 1970 and 2010, while the remaining communities experienced between 14 to 24% growth in population. Since 2000, growth has slowed significantly. Only one community, Fitzwilliam, increased in population by more than 10% between 2000 and 2010.
- The City of Keene is the most common workplace destination for residents of the other communities in the corridor study area. According to figures from the Census Bureau Longitudinal Employer Household Dynamics (LEHD) Origin-Destination Employment Statistics, 41% of the people working within the corridor also live in one of the corridor communities. Census statistics also indicated that the commute times of Keene, Swanzey and Marlborough residents are more likely to be less than 20 minutes, but residents in Fitzwilliam and Troy are more likely to travel up to 40 minutes to reach their work destination.
- NH 12 South is an important regional corridor. Communities within the western portion of the Monadnock Region are likely to use NH 12 South to reach popular destinations such as the Greater Boston area. Conversely, NH 12 South would likely be used as a route for communities from the central Massachusetts region to reach the Keene and surrounding communities.
- As part of the study, Master Plans in each of the communities were researched for specific references to NH 12 South. All five communities recognize the importance of the NH 12 South corridor as an economic benefit. Three of the five communities emphasized the importance of pedestrian and bicycle safety and improved crosswalks.



Fitzwilliam- Rail Trail entrance

Introduction

Statement of Purpose

The purposes of the **NH 12 South Corridor Study** are to develop:

- a schedule of local capacity and safety improvements to consider for NH 12 South;
- recommendations for local land use and economic development approaches which are consistent with the protection of highway capacity and public safety, with attention to highway impacts on community life in the existing NH 12 South corridor; and
- a comprehensive strategy shared by state and local decision-makers for the development and use of NH 12 South between Keene and Fitzwilliam (at the NH State Line) – a strategy which addresses NH 12 as a shared public resource.

The central principal of the study is the established public purpose for supporting the development of transportation infrastructure: providing safe and efficient access and mobility. This includes access to the social and natural environment.

This report is provided to local officials and citizens for their use in making decisions and establishing policy regarding development along NH 12 South. Of particular interest is enhancing public understanding and awareness of the relationships among regional development trends, local land use management, the physical landscape, and highway function.

Description of Study Area and Problem Definition

NH 12 South is a rural arterial in the State’s highway network, and a link in the National Highway System. The NH 12 South Corridor Study examines approximately 18 miles of the corridor from its intersection with NH 101 in Keene through Cheshire County to the Massachusetts state line including the communities of Keene, Swanzey, Marlborough, Troy, and Fitzwilliam. The study also looked at the Cheshire Rail Trail, which parallels most of the highway, as well as parcels of land 1,000 feet or less from the center road line. The relationship

between land use and transportation, and thus the access points that link the highway to land, is an important consideration in the corridor study. No part of the highway study area is “limited access” (areas where access between the highway and abutting properties is not permitted). The majority of the route is “controlled access”, where future access points correspond to predetermined points of access assigned by NHDOT. The remaining “driveway permitted access” areas tend to have the highest share of driveways and where there tends to be more traffic turning in and out of the main highway. NHDOT regulates these areas of the road as well, though through a less restrictive driveway permitting process.

Table 1: Access Management on NH 12 South

City/Town	Road Miles		
	Limited Access	Controlled Access	Driveway Permitted Access
Keene	0	0	1
Swanzey	0	3.1	0.3
Marlborough	0	1.5	0
Troy	0	0.9	3.5
Fitzwilliam	0	5.5	2.4
Totals	0	11	7.2

Source: NHDOT and SWRPC

On an annual basis, NH DOT creates annualized traffic volume figures from short term studies and trends from permanent traffic recorders throughout the state. These annual average daily traffic (AADT) volumes are directly comparable, because they have been adjusted based on seasonal variations in traffic. According to 2013 annualized figures, vehicle traffic on NH 12 South ranged from 4,200 AADT at the Massachusetts state line up to 18,000 AADT south of its intersection with NH 101. By comparison, traffic volumes at the same locations in 1990 were 4,900 and 17,000 AADT, reflecting decreased traffic at the southern extent of the corridor and a slight increase in traffic at the northern extent. The range in traffic volumes ranges from a more population dense area that leads to a busy bypass system at the northern extent around Keene, to a more rural and sparsely-settled southern portion in Fitzwilliam. Keene also acts as a major workplace destination for residents of the four other corridor communities, whose residents are more than five times more likely to travel out of their home community to work.

Approach

The NH 12 South Corridor Study is a regional planning study that focuses on what communities can do alone and together to prepare the corridor for the future. If desired by the communities, the study can serve as the beginning of a management approach for coordinating local land development and state transportation improvements. Phase 1 of the study contains professional research to establish a credible factual basis for public discussions about the future. The study uses existing data as well as original data derived from research specific to the corridor study area. The analyses produce a first-time compilation of previously isolated as well as new data sets in a unified Geographic Information System created and managed by SWRPC. The subject areas of research are:

- Traffic and Roadway Conditions;
- Environmental Resources;
- Demographic and Economic Conditions;
- Land Use and Development Patterns; and
- Community Plans and Regional Trends.

Phase 2 of the study contains information from various resources to capture *local knowledge* which is a vital component in the planning process. It includes public involvement comprising several elements:

- NH 12 South Corridor Study Advisory Committee;
- Business Surveys; and
- Local Officials Workshops.

Summary of Findings

Traffic

Traffic volumes were calculated at 8 locations directly on NH 12 using 7-day hourly traffic counts. The approach used in the study does not account for seasonal variations in volumes, therefore, the figures may vary slightly from the NHDOT annualized volume counts. Vehicle classification and speed data were collected at each location to monitor typical operating speeds, freight movement, and other measures. An additional 18 traffic count locations in the study area, regularly-visited sites studied by NHDOT and SWRPC, were integrated into the analysis.

Traffic volumes peaked at the counter location south of the Main Street and NH 101 intersection on NH 12 in Keene. During the study, average daily traffic (ADT) was observed at 18,750 vehicles. In Swanzey, ADT south of Rust Way dropped to 14,095 vehicles. Just north of the Troy Town Common, ADT fell to 10,590 vehicles. Traffic volumes were the lowest in Fitzwilliam near Number 4 Road (4,706 vehicles) and at the Massachusetts state line (5,078 vehicles).

Heavy vehicles were roughly twice as numerous during the weeklong studies in Keene when compared to studies in Fitzwilliam. However, as a percentage of total vehicles, heavy vehicles made up a smaller proportion of all traffic at the northern extent of the corridor. In Keene and Swanzey, heavy vehicles (FHWA classes 8-13) were 1,600-1,900 in number, or 1.5% of all traffic. In Troy, there were 1,400 heavy vehicles, approximately 2% of all vehicles. In Fitzwilliam there were about 1,000 heavy vehicles, or 3% of all vehicles. Light vehicles (FHWA classes 1-3), which include motorcycles, passenger vehicles, and light trucks, accounted for between 94% and 97% of counts throughout the study area.

At some locations in Keene and Swanzey more than 90% of vehicles exceeded the posted speed limit. In Troy, traffic study locations indicated vehicles were significantly less likely to exceed the speed limit. At the NH 12 intersection with Prospect Street in Troy, 33% of vehicles were exceeding the posted speed limit and near Water Street, 66% of vehicles exceeded the speed limit. The highest recorded speeds were observed near the Number 4 Road in Fitzwilliam where 15% of vehicles exceeded the posted speed limit by at least 10 miles per hour.

Traffic volumes observed throughout the study corridor area have increased slightly since 1990. The only permanent traffic counter, located in Marlborough at the Swanzey town line, demonstrates that annual traffic has been in decline since 2004 (over the period 1990-2013).

Intersection Capacity Analysis

Vehicle turning movement counts were conducted at 4 unsignalized intersections and 1 signalized intersection along the NH 12 South corridor. An additional intersection capacity analysis integrated into this study utilized NHDOT anticipated 2015 volumes at the intersection of NH 12, Lake Street, and Swanzey Factory Road in Swanzey, if a roundabout (programmed for construction in 2015) were not installed. Of the sites studied by SWRPC, the turning



Fitzwilliam- NH 12 and NH 119 intersection

movements and through traffic reaching the intersections were recorded during the peak morning and peak evening periods, as well as one hour of time before and after the peak period. Level of service, which assigns a letter grade based on delay per vehicle, was estimated using Highway Capacity Software (HCS).

Table 2: Signalized Intersection Level of Service Results

Location	Period	Level of Service
NH 12 at Main Street and NH 101 in Keene	A.M. Peak	D
	P.M. Peak	E

Table 3: Unsignalized Intersection Level of Service Results

Location	Period	Movement	Level of Service
NH 12 at NH 32 (Old Homestead Highway)*	A.M. Peak	NB Left EB Left & Right	A F
	P.M. Peak	NB Left EB Left & Right	B F
NH 12 at Swanzey Factory Road	A.M. Peak	NB	A
		SB	A
	P.M. Peak	WB	D
		EB	C
A.M. Peak	NB	A	
	SB	A	
P.M. Peak	WB	E	
	EB	C	
NH 12 at Flat Roof Mill Road*	A.M. Peak	NB Left EB Left & Right	A C
	P.M. Peak	NB Left EB Left & Right	A C
NH 12 at Marlborough Road*	A.M. Peak	SB Left & Through WB Left & Right	A C
	P.M. Peak	SB Left & Through WB Left & Right	A C
NH 12 at NH 119	A.M. Peak	NB Left	A
		SB Left	A
	P.M. Peak	WB	B
		EB	B
A.M. Peak	NB Left	A	
	SB Left	A	
	WB	B	
	EB	B	

Source: SWRPC

*Minor turning movements are not depicted.

Demographics and Economics

Population Trends

This analysis relies on two primary sources: the US Census Bureau, and the New Hampshire Office of Energy and Planning (OEP). Information for population encompasses the years from 1970 to 2010. This time period gives a good indication of relevant trends. As illustrated in Table 3, the communities along the study area experienced significant growth between 1970 and 2010. Fitzwilliam, Troy, and Marlborough are similar in population, however, Fitzwilliam has grown the fastest while Troy experienced negative growth between 1980 and 2000. In 2010, Troy had a similar population as in 1980.

Populations in the towns of Fitzwilliam and Swanzey increased by 70% or more during this period, while the remaining communities experienced much slower growth in population. For the period 2000-2010, the population growth trend for corridor towns was a noticeable decline for the most part.”

Over this period, only Fitzwilliam, experienced an increase in population of greater than 10%.

Table 3: Population Growth by Communities 1970-2010

City/ Town	1970	1980	1990	2000	2010	% Change 1970-2010	% Change 2000-2010
Keene	20,467	21,449	22,430	22,563	23,409	14.40%	3.70%
Swanzey	4,254	5,183	6,236	6,800	7,230	70.00%	6.30%
Marlborough	1,671	1,846	1,927	2,009	2,063	23.50%	2.70%
Troy	1,713	2,131	2,097	1,962	2,145	25.20%	9.30%
Fitzwilliam	1,362	1,795	2,011	2,141	2,396	75.90%	11.90%

Source: US Census Bureau

Table 4 shows the same information as Table 3, but the figures show how the rate of growth has changed during each of the last four decades and compares the five communities to the county, region, state and country.

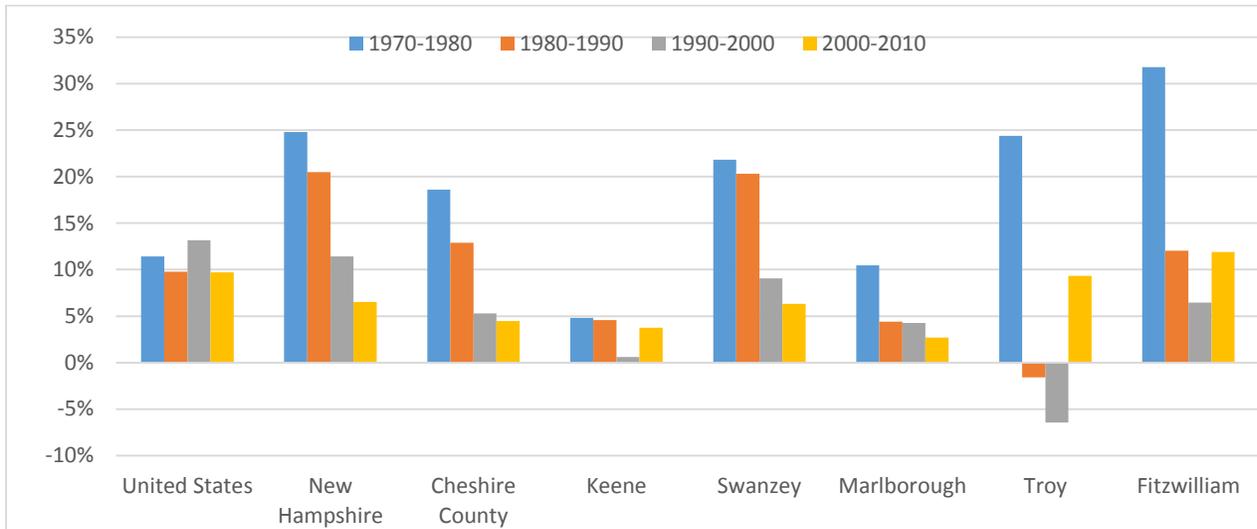
Table 4: Population Trends -1970-2010 (percent change)

	1970-1980	1980-1990	1990-2000	2000-2010
United States	11.4%	9.8%	13.2%	9.7%
New Hampshire	24.8%	20.5%	11.4%	6.5%
Cheshire County	18.6%	12.9%	5.3%	4.5%
Southwest Region	20.0%	16.2%	6.2%	5.1%
Keene	4.8%	4.6%	0.6%	3.7%
Swanzey	21.8%	20.3%	9.0%	6.3%
Marlborough	10.5%	4.4%	4.3%	2.7%
Troy	24.4%	-1.6%	-6.4%	9.3%
Fitzwilliam	31.8%	12.0%	6.5%	11.9%

Source: US Census Bureau

New Hampshire is currently experiencing low population growth and has experienced a declining rate of growth in each decade since 1970 (See Figure 1). For corridor communities, the rate of growth between 2000 and 2010 was higher than Cheshire County’s overall rate of growth in Swanzey, Troy and Fitzwilliam, but lower in Keene and Marlborough. Despite these different growth rates experienced by the communities, Keene’s population increased by 846 people during the decade; almost the same number of people as all other towns combined (922).

Figure 1: Population Trends-1970-2010 (Growth Rate by Decade)



Source: US Census Bureau (2010)

For the most part, the communities along the NH 12 South corridor experienced a significantly lower rate of population growth after the “housing boom” in the 1980’s. The City of Keene’s rate of growth was considerably lower than the State during each of the decades but still maintained a positive growth in each period. The Town of Troy was the only community that experienced a decline in population. Town officials believe that this was primarily due to out-migration after the closing of Troy Mills, a large manufacturing business with many employees.

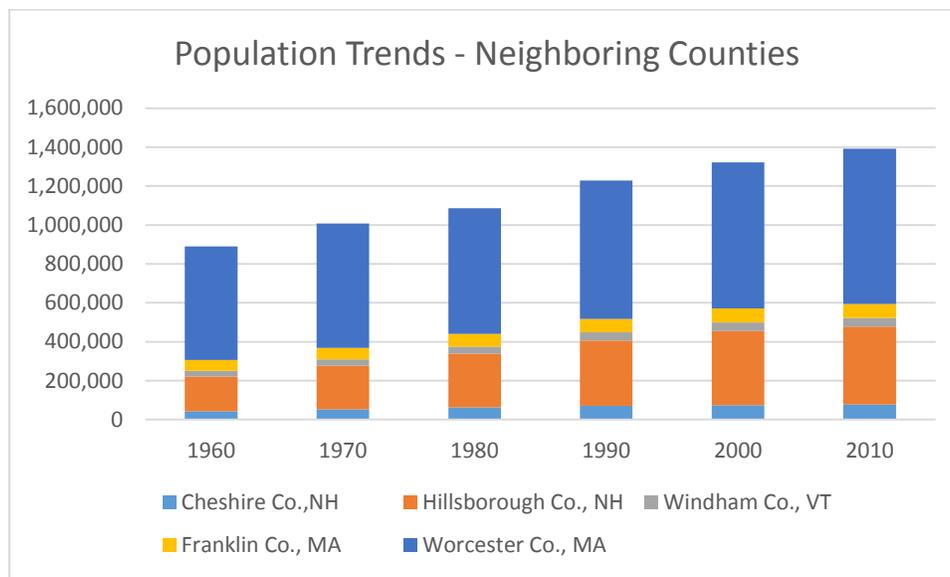
Population Growth by County (1970 – 2010): Since NH 12 South serves both local trips and regional through traffic, an analysis of the past and projected population growth rates in the surrounding region will help build a better understanding of the size of the regional economy and labor supply that continue to influence growth on the NH 12 South corridor. Between 1970 and 2010, the total population of the five counties adjacent to the NH 12 South corridor grew by 38.3%. The counties experiencing the largest increases were in Cheshire and Hillsborough Counties in New Hampshire with 47.3% and 78.9% increases, respectively. However, short term growth after the most recent decade suggests that the entire surrounding area may grow much slower.

Table 5: Population Growth by County (1970 – 2010)

County	1970	1980	1990	2000	2010	% Change 1970-2010	% Change 2000-2010
Cheshire Co., NH	52,364	62,116	70,121	73,825	77,117	47.3%	4.50%
Hillsborough Co., NH	223,941	276,608	336,073	380,841	400,721	78.9%	5.20%
Windham Co., VT	33,476	36,933	41,588	44,216	44,513	33.0%	0.67%
Franklin Co., MA	59,210	64,317	70,092	71,535	71,372	20.5%	-0.23%
Worcester Co., MA	637,969	646,352	709,705	750,934	798,552	25.2%	6.34%
Total	1,006,960	1,086,326	1,227,579	1,321,351	1,392,275	38.3%	5.4%

Source: US Census Bureau (2010)

Figure 2: Population Growth by County (1970 – 2010)



Source: US Census Bureau (2010)

Age Distribution

The NH 12 South Corridor Study analyzed the age distribution of the study area’s population in three categories: school age, working age, and senior population (retirement age). This analysis is not meant to show an equal distribution since the age categories are not divided up into equal years. It is however, very useful in planning for public improvements and services such as schools and senior services. In Table 6, the trends in the school age population have been on a slow but steady decline in nearly every community and in each decade. Meanwhile, there has generally been a steady increase in the senior population during the same period.

Table 6: Age Distribution-1980-2010

Location	1980			1990			2000			2010		
	0 - 17 yrs	18 - 64 yrs	65+ years	0 - 17 yrs	18 - 64 yrs	65+ years	0 - 17 yrs	18 - 64 yrs	65+ years	0 - 17 yrs	18 - 64 yrs	65+ years
Cheshire County	16,727	37,725	7,664	17,066	43,867	9,188	17,197	46,542	10,086	15,112	50,663	11,342
Keene	5,279	13,437	2,733	4,747	14,426	3,257	4,416	14,722	3,425	3,882	16,088	3,439
Swanzy	1,472	3,113	598	1,562	3,892	782	1,704	4,215	881	1,473	4,684	1,073
Marlborough	483	1,112	251	485	1,170	272	449	1,252	308	408	1,313	342
Troy	711	1,207	213	606	1,257	234	539	1,223	200	495	1,404	246
Fitzwilliam	484	1,047	264	532	1,234	245	521	1,389	231	501	1,562	333

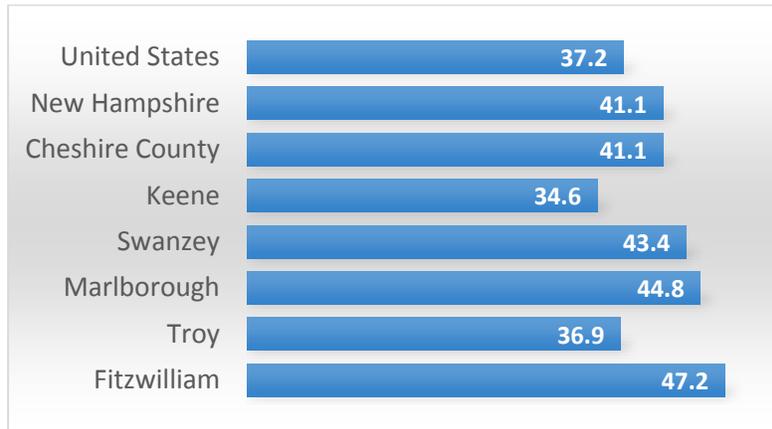
Location	1980			1990			2000			2010		
	0 - 17 yrs	18 - 64 yrs	65+ years	0 - 17 yrs	18 - 64 yrs	65+ years	0 - 17 yrs	18 - 64 yrs	65+ years	0 - 17 yrs	18 - 64 yrs	65+ years
Cheshire County	26.9%	60.7%	12.3%	24.3%	62.6%	13.1%	23.3%	63.0%	13.7%	19.6%	65.7%	14.7%
Keene	24.6%	62.6%	12.7%	21.2%	64.3%	14.5%	19.6%	65.2%	15.2%	16.6%	68.7%	14.7%
Swanzy	28.4%	60.1%	11.5%	25.0%	62.4%	12.5%	25.1%	62.0%	13.0%	20.4%	64.8%	14.8%
Marlborough	26.2%	60.2%	13.6%	25.2%	60.7%	14.1%	22.3%	62.3%	15.3%	19.8%	63.6%	16.6%
Troy	33.3%	56.6%	10.0%	28.9%	59.9%	11.2%	27.5%	62.3%	10.2%	23.1%	65.5%	11.5%
Fitzwilliam	27%	58.3%	14.7%	26.5%	61.4%	12.2%	24.3%	64.9%	10.8%	25.8%	80.3%	17.1%

Source: US Census Bureau 2010

Median Age

The median age for each corridor community as compared to Cheshire County, New Hampshire and the United States are shown in Figure 3. New Hampshire has the third oldest median age in the country. Swanzy, Marlborough and Fitzwilliam exceed the state and country's median age while Keene and Troy are below the national figure.

Figure 3: Median Age

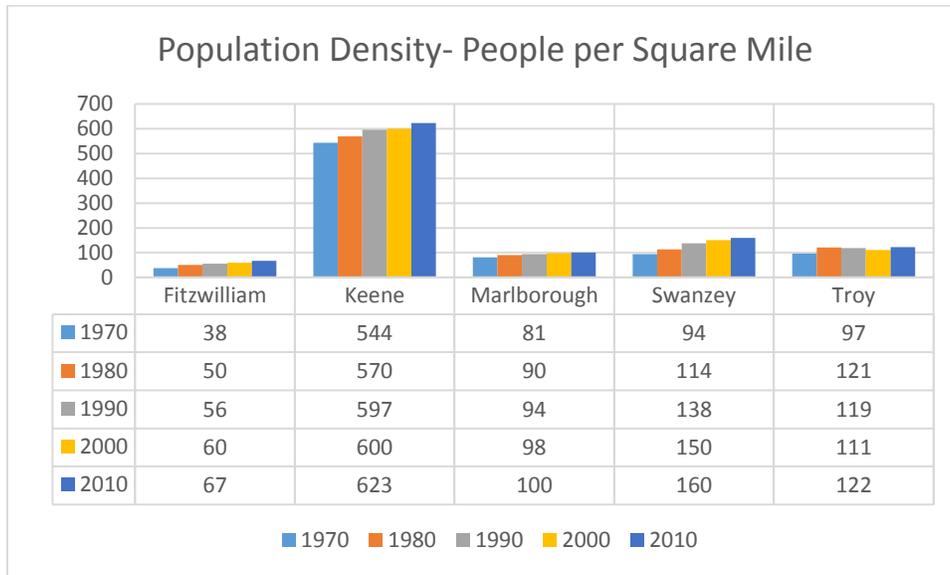


Source: U.S. Census Bureau- ACS 5-Year Estimates (2008-2012)

Population Density

Population density provides a look at each community to see the amount of land per person. As the population increases, the need for housing, public infrastructure, and municipal services also increases. By utilizing data showing the change in population density, we can plan for public needs and are better able to prepare budgets for larger and costlier infrastructure projects.

Table 7: Population Density (1970-2010)



Source: U.S. Census Bureau 2010

An analysis of Census blocks within, or mostly within, the corridor study area provides additional insight into residential development patterns at the municipal level. Overall, development is considerably denser along the corridor in Keene, Swanzey, and Troy when compared to their municipal averages in Table 8. In Keene, the population density along the corridor was calculated to be approximately 2,038 persons per square mile. This figure is considerably higher than other communities due in part to a portion of the Keene State College group quarters population located within the study area. In

Swanzy, population density along the corridor was calculated to be 740 persons per square mile, and in Troy, density was 701. Residential development in each of these communities is concentrated heavily along the highway. In Fitzwilliam, the town with the largest area in the study corridor, the concentration of population was less pronounced at about 170 persons per square mile. And in Marlborough, where very little residential development exists in the study area, the population density along the corridor was observed to be 51 persons per square mile, half of the town's overall population density (Table 8).

Table 8: NH 12 South Corridor Population and Housing Density (2010)

Keene	In Corridor	% Corridor Total	In Municipality	% Municipality
Housing Units	206	21.8%	9,719	2.1%
Population	734	34.0%	23,409	3.1%
Area (sq. mi.)	0.36	10.4%	37.6	1.0%
Population Density (persons/sq. mi.)	2,038	N/A	623	N/A
Swanzy	In Corridor	% Corridor Total	In Municipality	% Municipality
Housing Units	357	37.8%	3,205	11.1%
Population	644	29.8%	7,230	8.9%
Area (sq. mi.)	0.87	25.0%	45.3	1.9%
Population Density (persons/sq. mi.)	740	N/A	160	N/A
Marlborough	In Corridor	% Corridor Total	In Municipality	% Municipality
Housing Units	7	0.7%	946	0.7%
Population	13	0.6%	2,063	0.6%
Area (sq. mi.)	0.26	7.4%	20.5	1.2%
Population Density (persons/sq. mi.)	50	N/A	101	N/A
Troy	In Corridor	% Corridor Total	In Municipality	% Municipality
Housing Units	264	28.0%	932	28.3%
Population	568	26.3%	2,145	26.5%
Area (sq. mi.)	0.81	23.4%	17.6	4.6%
Population Density (persons/sq. mi.)	701	N/A	122	N/A
Fitzwilliam	In Corridor	% Corridor Total	In Municipality	% Municipality
Housing Units	110	11.7%	1,257	8.8%
Population	201	9.3%	2,396	8.4%
Area (sq. mi.)	1.18	34.0%	36	3.3%
Population Density (persons/sq. mi.)	170	N/A	67	N/A

Source: U.S. Census Bureau 2010, Census Block geography within or mostly within corridor study area

Housing

Housing-related data is useful for illustrating residents living within the corridor and their relationships to transportation. For example, the number of new homes being constructed provides data that can help predict the amount of additional users of the highway and the intersections along the corridor. Keene and Swanzey have consistently outpaced other corridor communities in new residential development. Following housing costs, transportation costs are consistently the largest proportion of household expenses in the United States. Data below provides some insight on how housing and transportation costs affect the household budget together. Data suggests that households in communities on the corridor outside of Keene are more likely to pay more for their annual transportation needs, due in part to longer commutes and fewer transportation options outside of the automobile. However, according to figures from the Census Bureau (below), households outside of Keene are more likely to pay less towards their housing expenses.

Table 9: Housing and Transportation Expenses

	Keene	Swanzey	Marlborough	Troy	Fitzwilliam
Owner/Renter Household Ratio	1.2	2.6	2.3	2.2	5.7
Median Expenses (Owners w/ a Mortgage)	\$1,764	\$1,598	\$1,521	\$1,657	\$1,530
Median Expenses (Owners w/o a Mortgage)	\$828	\$674	\$734	\$644	\$562
Median Gross Rent (2011)	\$962	\$965	\$1,036	\$828	\$951
Median Budget Needed for Transportation*	\$1,149	\$1,406	\$1,444	\$1,487	\$1,467

Source: U.S. Census Bureau, New Hampshire Office of Energy and Planning, *Center for Neighborhood Technology

Building Permits

The number of building permits has fluctuated among the corridor communities over the past decade. Keene and Swanzey saw a sharp increase during 2004, but both have been on a general decline since then.

Table 10: Residential Building Permits-2000-2013

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average per year
Keene	45	21	28	32	82	27	26	23	20	29	40	72	25	10	34.3
Swanzey	24	25	38	52	117	28	21	25	-1	46	9	13	9	32	31.3
Marlborough	7	10	11	5	15	9	6	0	0	2	2	2	1	25	6.8
Troy	4	4	10	14	6	18	4	3	2	4	5	3	0	1	5.6
Fitzwilliam	0	2	6	0	0	6	6	0	0	6	5	1	2	2	2.6
Total	80	62	93	103	220	88	63	51	21	87	61	91	37	70	80.5

Source: NH Office of Energy and Planning Current Estimates and Trends in New Hampshire's Housing Supply
Expired permits may result in negative values; Includes single, multi-family, and manufactured housing categories

Table 11 shows a trend in housing from 1970 to 2010 for each community within the NH 12 South corridor study area, Cheshire County, and the State of New Hampshire. The increase in the number of housing units has outpaced the population increase indicating that the number of persons per household is getting smaller. It may also indicate a surplus of housing units. This information provides a snapshot of the changes that have occurred and helps to prepare for similar trends.

Table 11: Housing Units

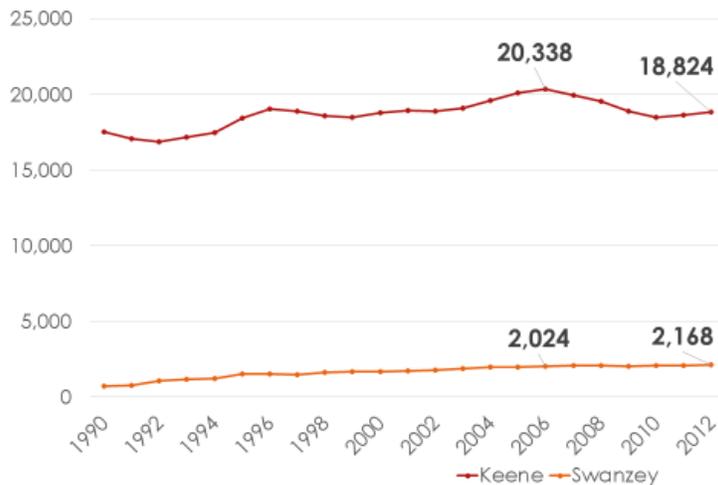
	1970	1980	1990	2000	2010	% Change 1970-2010	% Change 2000-2010
New Hampshire	235,529	347,758	503,541	547,024	614,754	161.0%	12.4%
Cheshire County	17,241	23,274	30,350	31,876	34,773	102.0%	9.1%
Keene	6,597	7,934	8,841	9,295	9,719	47.3%	4.6%
Swansey	1,382	1,894	2,582	2,818	3,205	132.0%	13.7%
Marlborough	568	703	856	893	946	66.5%	5.9%
Troy	595	782	867	778	932	56.6%	19.8%
Fitzwilliam	474	745	1,031	1,074	1,257	165.2%	17.0%

Source: US Census Bureau

Employment

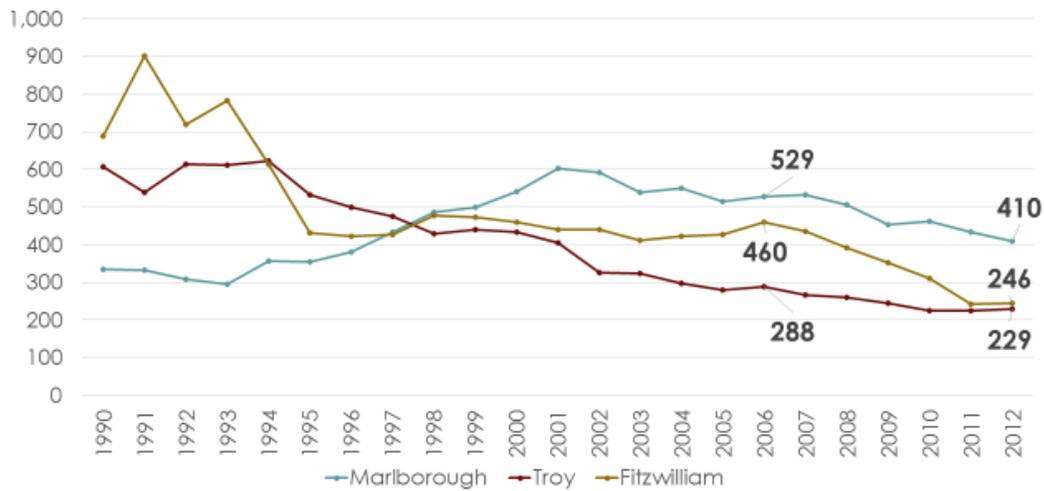
The following figures show employment in each municipality, based on private and government jobs at area employers. The recent pre-recession peak levels of employment (2006), as well as the 2012 figures are noted on each Figure. Keene, for example, has experienced marked growth since 1990, however, employers have not recovered from the job losses following the Great Recession. Swansey employers were seemingly unaffected by the recession and have grown in total employment between 2006 and 2012 (Figure 4a). Marlborough has grown in employment since 1990 but has experienced a general decline in employment since 2000. Troy and Fitzwilliam exhibited the strongest decreases in local jobs following the loss of major employers (Figure 4b).

Figure 4a: Annual Employment 1990-2012



Source: Economic and Labor Market Information Bureau, NH Employment Security Private and Government

Figure 4b: Annual Employment 1990-2012



Source: Economic and Labor Market Information Bureau, NH Employment Security Private and Government

Median Household Income

With the economic downturn and an increase in the unemployment rate, median household incomes dropped between 2000 and 2011 across the region as well as the county, state and country when adjusted to 2013 dollars. Fitzwilliam was the only community in the study area that saw an increase in median household income, and Marlborough remained stable. According to the American Community Survey (2007-2011), Keene’s median household income was lower in 2011 than it was in 1990.

Table 12: Median Household Income 1990, 2000, 2011

	1990*	2000*	2011*
United States	\$56,466	\$58,720	\$54,643
New Hampshire	\$68,251	\$69,170	\$66,970
Cheshire County	\$59,457	\$59,263	\$57,211
Keene	\$58,681	\$51,783	\$50,168
Swanzey	\$55,885	\$62,670	\$57,894
Marlborough	\$58,959	\$62,789	\$62,657
Troy	\$55,442	\$58,554	\$56,788
Fitzwilliam	\$67,610	\$67,293	\$68,915

Source: U.S. Census Bureau Decennial Census (1990, 2000) and ACS (2007-2011)

*Adjusted for 2013 Dollars

Commuting

The City of Keene is the most common workplace destination for residents of the other communities in the corridor study area. Furthermore, 41% of the area's jobs are held by people living within one of the five communities. Census statistics also indicated that the commute times of Keene, Swanzey and Marlborough residents are more likely to be less than 20 minutes, but residents in Fitzwilliam and Troy are more likely to travel more than 40 minutes to reach their work destination.

Table 13: Mean Travel Time to Work (2011)

	0-19 Minutes	20-39 Minutes	40 and more Minutes
Cheshire County	57.4%	30.5%	12.1%
SWRPC	53.1%	31.3%	15.5%
Keene	77.7%	15.5%	6.7%
Swanzey	61.5%	30.0%	8.5%
Marlborough	67.2%	23.2%	9.6%
Troy	37.6%	48.6%	13.8%
Fitzwilliam	20.8%	56.8%	22.5%

Source: US Census ACS 2007-2011

On NH 12, directional traffic data shows a large wave of migration north in the morning and a migration south in the evening. Besides Keene, communities on the corridor could be considered "bedroom communities" in that they have many more workers than jobs. In these communities, Keene is the most common work commute. Table 14 describes the origin and destination of workers in corridor study communities. Over 8,000 Keene, Marlborough, Swanzey, Troy, and Fitzwilliam residents work in one of the corridor study communities. According to the Census Bureau, these workers held about 41% of the 19,585 jobs in the same area.

Table 14: Origin and Destination of Workers (2011)

	Origin	Destination					Totals
		Keene	Swanzey	Marlborough	Troy	Fitzwilliam	
	Keene	4,667	315	106	37	10	5,135
	Swanzey	1,314	347	29	29	19	1,738
	Marlborough	304	61	35	25	7	432
	Troy	289	53	37	29	7	415
	Fitzwilliam	230	67	9	12	36	354
	Totals	6,804	843	216	132	79	8,074
	Proportion of Jobs	84%	10%	3%	2%	1%	

Source: U.S. Census Bureau Longitudinal Employer Household Dynamics (2011)

NH 12 South is a north-south travel-shed for many. At least 15 communities on the western side of the Southwest Region of New Hampshire are likely to use NH 12 South to reach destinations into southern New England such as the Metropolitan Boston area. Conversely, the corridor also serves as a likely travel-shed for communities from the central Massachusetts region to reach NH 12 corridor communities as well as destinations such as Lebanon, NH and Vermont destinations.

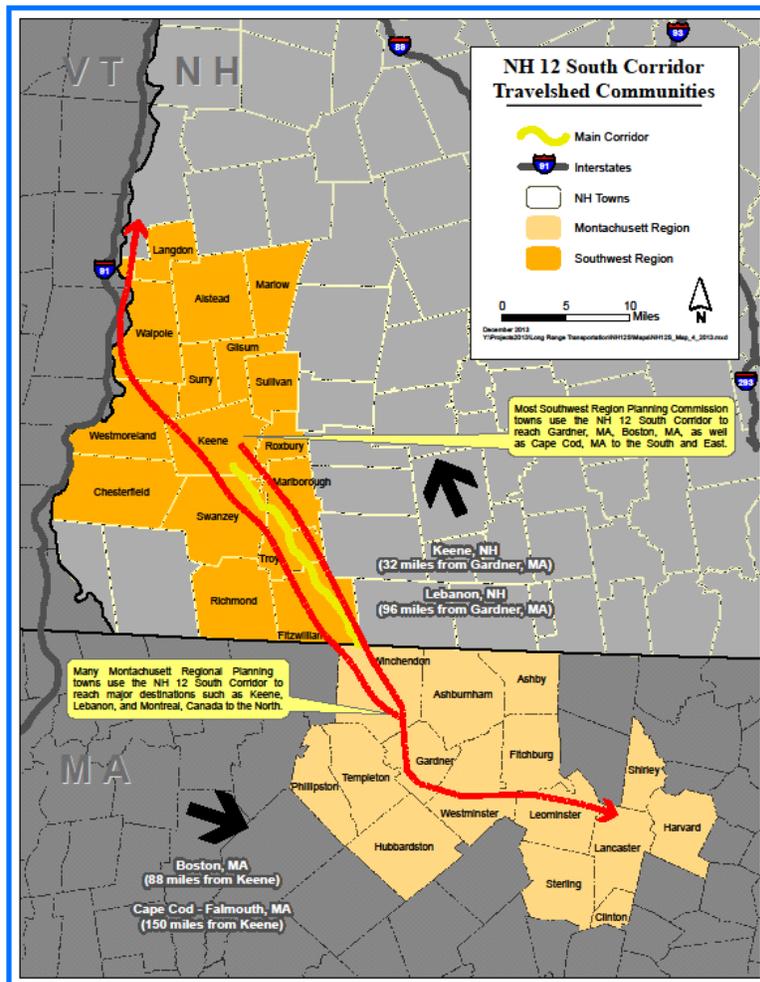
Table 15: Common Destinations using the NH 12 South Corridor

Common Destinations Using NH 12 S	Time	Distance
Keene to Fitzwilliam	23 min	13.4 mi
Keene to Richmond	24 min	13.5 mi
Keene to MA 2 in Westminster, MA	51 min	33.8 mi
Keene to Fitchburg, MA (MRPC Town)	62 min	38.3 mi
Keene to Worcester	91 min	67 mi
Keene to Boston	131 min	91.3 mi
Keene to Providence, RI	137 min	106 mi
Gardner, MA to Lebanon, NH	113 min	96.4 mi
Gardner, MA to Brattleboro, VT	68 min	46.1 mi

Source: Google Maps

The map in Figure 5 shows the travel-shed communities that depend on the NH 12 South corridor to reach their destinations in a safe and efficient manner.

Figure 5: Travelshed



Source: SWRPC Southwest Connects: Southwest Region Transportation Plan

Highway Support Network

Another important consideration for understanding the corridor usage is the highway support network that is used by travelers to access NH 12 South. Maintaining a good *Level of Service* at these locations is necessary to alleviate driver frustration and reduce the occurrence of accidents. Below is a list of the arterial and collector roads that NHDOT and the Federal Highway Administration recognize as part of the essential networks or roads connected with NH 12.

Table 16: Southwest Region Transportation Plan NH 12 South Support Network

Community	Principal Arterials	Minor Arterials	Major Collectors	Minor Collectors
Keene	NH 12 South	Main Street		
		NH 32		
Swansey	NH 12 South	NH 32	NH 32	Flat Roof Mill Road
			Airport Road	
Marlborough	NH 12 South			
Troy	NH 12 South		Monadnock Street	
Fitzwilliam	NH 12 South		NH 119	Royalston Road

Source: SWRPC Southwest Connects: Southwest Region Transportation Plan

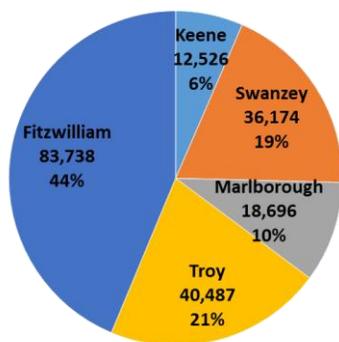
Community Planning

Zoning

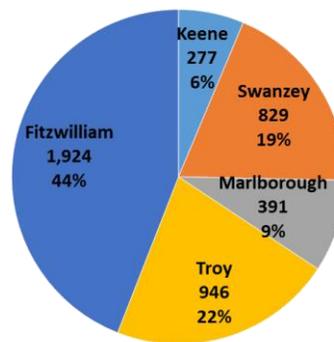
As mentioned earlier, this corridor study involves providing information to improve coordination between land and highway development at the local and state levels. In order to understand current land use planning guidelines, land use and zoning information was collected for each of the corridor communities. Fitzwilliam has the most road mileage, frontage, and land along the corridor, nearly as much as Swansey, Marlborough, and Troy combined.

Figure 6: Highway Frontage and Acreage

NH 12 South Highway Frontage in Feet



NH 12 South Zoned Acreage Within 1,000'



Source: SWRPC GIS

All figures estimated. Highway frontage includes both sides of the highway

The tables below show the dimensional requirements for the zones that fall within the corridor study area. This information can be used with other data, such as development constraints and undeveloped land, to calculate the potential for new development as well as understand potential demand for driveways and entrances accessing NH 12 and the potential encroachment of building structures in relation to the highway.

Table 17: Dimensional Requirements

Keene Districts	Min. Lot Area	Min. Frontage	Min. Front Setback	Min. Rear Setback	Min. Side Setback	Min. Lot Width
Low Density	10,000 s.f.	60'	15'	20'	10'	70'
High Density	6,000 s.f.	50'	15'	15'	10'	50'
Commercial	15,000 s.f.	50'	20'	20'	20'	---
Industrial	---	50'	20'	20'	15'	---
Agriculture	10 acres	50'	50'	50'	50'	200'
Conservation	5 acres	50'	50'	50'	50'	200'
Rural	5 acres	50'	50'	50'	50'	200'

Swansey Districts	Min. Area	Min. Frontage	Min. Front Setback (structures)	Min. Side & Rear Setback
Residential	1 ac.	150'	30'	20'
Rural Agricultural	3 ac.	225'	30'	20'
Business	1 ac.	125'	75'	20'*
Industrial Park	2 ac.	200'	50'	20'

Marlborough Districts	Min. Area	Min. Frontage	Min. Front Setback	Min. Rear Setback	Min. Side Setback
Rural Residential (R-3) *	5 ac. w/o sewer	200'	40'	40'	25'
Rt. 12 Commercial (C-4)**	2 acres	200'	40'	20'	20'

*Additional setback may apply in abutting residence

**Some restrictions may be applicable

Troy Districts	Min. Lot Area	Min. Frontage	Min. Front Setback	Min. Rear Setback	Min. Side Setback
Highway Bus.	1 ac/2ac.	100'/200'	20'	20'*	20'*
Light Industrial	2 ac.	200'	50'	30'*	30'*
Village	½ ac.	100'	20'	15'	15'
Rural	2 ac.	200'	35'	20'	20'
Residential	1 ac.	100'	35'	20'	20'

*Some restrictions may be applicable

Fitzwilliam Districts	Min. Lot Area (sq. ft.)	Min. Frontage	Min. Front Setback	Min. Rear Setback	Min. Side Setback	Min. Lot Depth
Residential District	40,000	100'	50'	10'	10'	100'
Rural District	120,000	125'	75'	20'	20'	125'
Village Center Business District	---	---	10'	102'	102'	---
General Business District	40,000	200'	50'	30'	30'	80'
Light Industrial District	160,000	200'	100'	503'	503'	50'
General Industrial District	160,000	200'	100'	504'	504'	50'

Source: Municipal Data

Master Plans

Master Plans in each of the communities were also researched for specific references to NH 12 South. All five communities recognized the importance of the NH 12 South corridor as an economic benefit. Keene, Swanzey and Troy also emphasized the importance of pedestrian and bicycle safety and improved crosswalks. The appendix of this plan contains additional information that was extracted from the Master Plan of each corridor community.

Environmental Resources

Waterbodies

The impact that the roadways and land use development have on the environment must be considered in preparing a corridor plan. According to NH Department of Environmental Services, it is estimated that over 80% of pollutants that enter surface waterbodies are attributed to non-point source pollution. This is often the result of insufficient vegetative buffers between impervious surfaces, such as roads, and the watershed or waterbodies themselves. Greater protection of this valuable natural resource can be achieved through buffer requirements in local land use regulations. Stormwater management and erosion control methods are also very important to reduce the sheet flow of sand, salt and other debris from being carried into waterbodies. Communities are encouraged to implement these forms of protection and the use of best management practices during any land disturbance.

Several areas exist along the NH 12 South corridor with waterbodies on one or both sides of the road. Annual inspections should be made to identify any erosion areas and make the necessary repairs to eliminate further erosion. Road/stream crossings should also be inspected to determine the proper sizing of culverts and bridges, and the potential for erosion.

Plants

Invasive plant species is a growing concern among communities. These plants have been known to grow rapidly along roadways and forest buffers. Eradication of invasive species is difficult and can be costly if they have overtaken a large area. Communities are encouraged to be proactive in the removal of invasive species and to ensure that proper methods are being used to avoid additional spreading. Several areas along the NH 12 South corridor are experiencing rapid growth of Japanese Knotweed, especially in the Towns of Marlborough, Troy, and Fitzwilliam. To address mounting concerns over invasive plants and the role construction and maintenance activities play in the spread of these plants along roadsides, Best Management Practices (BMPs) have been developed with input from several departments within NHDOT and the NH Department of Agriculture. In addition, Cooperative Weed Management Areas (CWMA) provide a mechanism for multiple agencies to set priorities and manage outbreaks and infestations in a particular area. The Peterborough Conservation and Open Space Committee have written an identification guide book for the Monadnock Region which can be viewed [here](#).



Marlborough- Invasive species growing into the highway right of way.

Threatened and Endangered Species and Exemplary Communities

Maintaining natural habitats is essential in continuing the natural heritage within corridor communities. The study examined endangered plants and animals in the five corridor communities in order to determine the level of protection needed to maintain their existence.

Within these communities, there are fourteen plants and four animals that are considered *endangered*, five plants and two animals considered to be *threatened*, and seven animals that the state has classified as being of *special concern*. In addition to the plant and animal classifications, there are 5 different types of *exemplary natural communities* within these communities. The current listing of plants and animals that are classified by the State as threatened, endangered, or are of special concern in the communities within this study can be found in the appendix of this report in the Natural and Historic Resources section.

The State of New Hampshire defines endangered species as any native species whose chances of survival in New Hampshire are in immediate danger for reasons such as a loss or change in habitat, over-exploitation, predation, competition, disease, disturbance, or contamination. Threatened species is defined as any species which is at risk of becoming endangered if conditions begin or continue to deteriorate. Special Concern species are those species that are somewhat uncommon in New Hampshire, and are on the watch list. In addition to the plant and animal classifications, the Natural Heritage Bureau recognizes exemplary natural communities, which are natural communities that display a rare quality or represent the best examples of NH biological diversity.

Maintaining a healthy habitat will aid in the survival of those plants and animals with these various designations. Protecting them by methods mentioned above, including control of invasive species and maintaining water quality, is a start, but long-term maintenance will be necessary.

Historic Resources

To assess the presence of cultural and historic resources, SWRPC consulted advisory committee members, the New Hampshire Office of Energy and Planning, and records from the National Parks Service National Register of Historic Places. In Troy, the Town's historic district lies within the study area roughly from Marlborough Road south to Quarry Road. Throughout the study area are many dry-fit masonry highway and railroad bridges, the railroad alignment and its associated buildings and numerous locally-significant historic sites but have not yet been added to the National Register of Historic Places.

Keene

Several registered historic sites lie just outside the corridor study area in Keene on Main Street. The City has maintained a strong effort to preserve the community's heritage through policies and regulations. The Keene Comprehensive Master Plan includes many references to the importance of maintaining the historic areas as an integral part of the quality of life. It further states that the dense development pattern promotes walkability and "allows residents to be automobile-independent". It is encouraged to consider adaptive re-use of historic structures as a way of being more environmentally sound and renovating with energy efficient alternatives.

Swanzey

The NH 12 South Corridor, through the Town of Swanzey, has seen many changes as land development increased over the past 50 years. Although there are no structures listed on the National Registry of Historic Places, several structures remain that have historic significance in Swanzey. Today, the following structures remain:

- The Cheshire County Fairgrounds
- Residential home behind Sam's Outdoor Outfitters
- Residential home on Old Lake Street - previously used as the school house
- Diverter dam off Swanzey Factory Road
- Edgewood Subdivision - original homes date back into the late 1920's. This was the first subdivision with common land area
- Concrete step structure - remains of an outdoor theatre
- Remains of the an old well house near Paige Homestead was the original water source for North Swanzey

Marlborough

The Old Stone Arch Bridge on Webb Depot Road is regarded as a historical landmark in Marlborough. The Town includes funding in the budget annually for maintenance. It is the only remaining historic structure in this portion of Marlborough since other historic structures no longer exist. The former Stage Coach Inn burned down between 1960 and 1970. The property remains vacant today. Also, the site of the Black Lantern Restaurant is vacant after the structure closed and became uninhabitable. It was eventually razed in 2001.



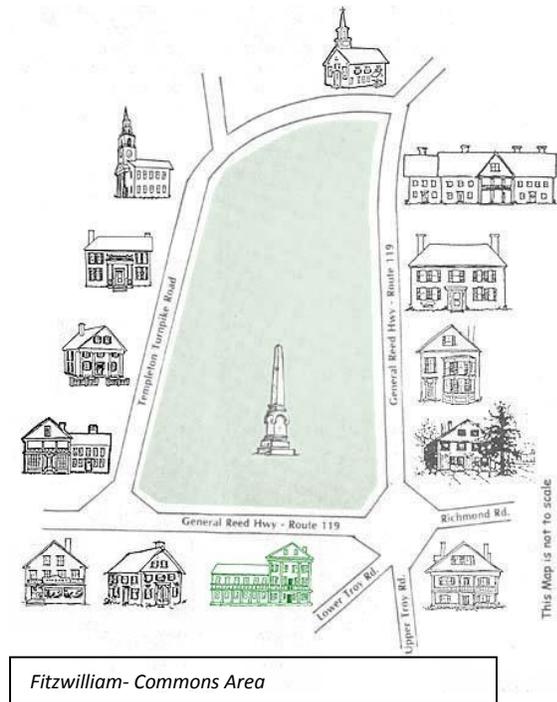
Troy

Through the sponsorship of the Troy Heritage Commission, contributions from Troy residents, local businesses and the Badger Monadnock Fund, and several years of hard work that followed the NH Route 12 Environmental Assessment, the Secretary of the Interior, National Park Service listed 241 buildings, sites, structures and objects on the National Register of Historic Places on December 13, 2002, creating the Troy Village Historic District. The Troy Village Historic District boundary encompasses nearly 177 acres, made up mostly of small house lots and a few larger properties, including the Town Common, streets radiating from the common, and a large area surrounding the mill. The Troy Village Historic District contains a total of 225 buildings, 9 sites, 5 structures, and 2 objects

which support the historical qualities of the area. The Historic District comprises a mix of building and property types, including residences, public buildings, churches, commercial structures and a factory structure, which illustrate a range of architectural styles including the Federal and Greek Revival periods and turn-of-the-century residences.

Fitzwilliam

The Town of Fitzwilliam has been successful in preserving the historic character of the Village Commons. It is considered to be one of the most preserved commons in the State of New Hampshire.



Although most of the Commons is slightly outside of the NH 12 South study area, it is worthy of mention since this historic area has been a destination for travelers in search of the region’s (and country’s) early American history. The Fitzwilliam Inn has been a common destination for travelers to sleep and dine for over 200 years.

Public Participation

Advisory Committee Meetings

The NH 12 South Advisory Committee held five meetings between March 5, 2014 and March 25, 2015. The committee included up to three members of each community within the study area. The committee members hold a variety of roles in their communities and provided a well-rounded mix of experience to assist with the project.

A summary of the committee meetings is below, and minutes of the meetings are in the Appendix of this report.

March 5, 2014- Meeting 1: SWRPC staff made a presentation of the scope of the NH 12 South Corridor Study and explained the approach that would be used including the analysis of recent trends, current conditions, and probable futures. Similar to previous studies, the NH 12 South study area includes property of 1,000’ on both sides of the road centerline. The role of the Advisory Committee members was discussed as well as the level of commitment that would be involved to produce a successful corridor study.

Maps of each section of the study area were laid out and committee members were asked to circle areas of concern within their communities, and then to do the same task on the other sections of the corridor.

April 9, 2014- Meeting 2: Michael Dugas, NHDOT Chief of Preliminary Highway Design was present to speak to the committee about the areas of concern that they have for the study area. He discussed upcoming state-funded NH 12 South improvements as well as historical areas of concern. He commented on each of the locations that the committee had identified as areas of concern in the previous meeting.

June 18, 2014- Meeting 3: SWRPC staff gave a presentation of findings on the traffic, demographics, and land use planning analyses for each community. The committee discussed the staff's findings and provided feedback. Staff shared a preliminary list of recommendations for each section of the corridor for the committee to review. The committee provided additional information and assisted in editing the recommendations.

August 20, 2014- Meeting 4: SWRPC staff presented the edited draft recommendations with the inclusion of the Advisory Committees input. The recommendations were reviewed by the committee and additional comments were included. Staff discussed the maps that have been drafted for the study and those that were still being prepared. Draft maps were presented including development constraints, land use, natural resources, and other maps. The committee provided input on the maps. Staff requested that the committee members talk to their respective communities and assist SWRPC staff during the planned community presentations by attending that meeting and showing their support of the findings and recommendations.

April 2, 2015- Meeting 5: SWRPC staff gave a presentation to summarize the meetings that had occurred with each of the five communities in the study area. The findings of the data that had been collected on the demographics and the traffic research and analysis results were also presented. Staff distributed the recommendations of the report and discussed the changes that were made since the previous meeting. Changes that were discussed included stormwater management and adding an opportunity for consideration of underground infrastructure coordination with NHDOT projects. The committee will be given an opportunity to give the report and appendices a final review. They will be sent a copy of the plan and will have ten days to submit comments to staff. Communities will be provided a final copy upon completion of the report.

Community Meetings

SWRPC staff contacted each community within the study area and arranged to meet with the Planning Board and Board of Selectmen in Swanzey, Marlborough, Troy and Fitzwilliam. In the City of Keene, the presentation was given to the Planning Board, and the Planning, Licensing, and Development Committee. In each community, the SWRPC staff gave a presentation and shared the recommendations that were prepared with the assistance of the Advisory Committee. Below is a summary of each of the meetings with the communities.

Town of Troy

SWRPC staff gave a presentation to the Troy Planning Board and members of the Board of Selectmen on September 17, 2014. West Hill Road connectivity was discussed. Today, West Hill Road only has one outlet to NH 12 at the Troy Town Common, creating a potential safety concern. Attendees noted that the highway was previously connected to NH 12 in Marlborough. If the connection were ever re-established, it could influence development on West Hill Road.

The intersection of NH 12 and Marlborough Road near the Minute Mart was discussed. Attendees agreed that there was a speed issue at this intersection which creates short gaps and turning delays. Recent accidents, including one where a business sign was destroyed, were noted. The left turn onto Marlborough Road from the southbound lane was highlighted as the most difficult turning movement. It was suggested that a traffic light could be considered.

The speed zone change in the vicinity of Old Keene Road on NH 12 was discussed. The reduced speed was apparently instigated by a land owner attempting to open a business at this location. The owner felt that the higher speed limit would negatively impact his businesses. Attendees agreed that for northbound direction of travel, this speed limit does not make sense due to the changes in grade at this location.

The intersection of South Street and NH 12 was considered to be very difficult to exit due to both the alignment/sightlines at the intersection, and the speed of traffic. The current configuration also creates a longer pedestrian crossing distance.

Attendees discussed pedestrian crossings in Troy in general. There was a comment that NHDOT would not allow color or texture-differentiated crossings like the ones seen in Keene and other places. In the past, the Town was told this was not an option.

The business sign at the intersection of Water Street and NH 12 was said to have been approved by NHDOT. The attendees offered a few alternatives that have since been incorporated into the recommendations.

The intersection of Quarry Road and NH 12 was not seen to be a serious problem and it was noted that the Town may be working on making changes to how it is aligned to NH 12.

Following the meeting, a Planning Board member spoke with SWRPC staff regarding the potential for a reduced speed zone from Prospect Street to South Main Street to make pedestrian crossings safer and the downtown area more pleasant. A suggested limit was 20 mph. The same member also spoke in favor of a trailhead at the depot to advertise the rail trail.

Town of Fitzwilliam

SWRPC staff gave a PowerPoint presentation to members of the Fitzwilliam Planning Board and Board of Selectmen on September 29, 2014. Fitzwilliam residents were also present. Attendees discussed the existence, treatment options, and issue of invasive plant species. It was acknowledged that the spread of invasive plants is a concern along all of the state highways and that greater attention needs to be given to this problem before it gets worse.

Attendees discussed difficulties with the intersection of NH 12 and NH 119 and discussed traffic calming, better delineation of lines, and the potential for pedestrian crossings. One of the attendees

also mentioned the excessive speed from both approaches to the intersection. The need for a traffic light or a roundabout was discussed by several attendees. SWRPC staff said that there has been some working group meetings between the NHDOT staff and Fitzwilliam members to look at alternative solutions to this intersection. Staff acknowledged that this intersection is one of the more serious concerns within the corridor study, and stated that this report does not get into great detail about potential solutions since the working group was formed to do that.

In addition to the community meeting, a letter was submitted to the Planning Commission from a Fitzwilliam resident and business owner that was unable to attend the meeting. His concerns were that the study did not represent to the full extent the hazardous intersection at NH 12/NH 119. He also was concerned about a fair representation of the Towns' concerns and the responses to the business survey. SWRPC staff contacted him and explained the process of the study and identified the Fitzwilliam members of the NH 12 South Advisory Committee. Information was sent to him regarding the working committee meetings that have been occurring between NHDOT and the town to discuss the issues and potential solutions for the NH 12/119 intersection.

Town of Swanzey

SWRPC staff gave a PowerPoint presentation to members of the Swanzey Planning Board and Board of Selectmen on October 9, 2014. A member of the Zoning Board of Adjustment and Swanzey residents were also present. Attendees discussed the demographical statistics that were presented. The changes that are proposed with the roundabout at the NH 12/Swanzey Factory Road/Lake Street intersection that is scheduled for construction in 2015 and the potential benefits this will bring were also discussed. An attendee raised the question of traffic counts after the construction of the roundabout and the connection of Safford Drive to NH 12. SWRPC staff responded that it will be important to compare the traffic counts that were taken as part of this study to new counts that will need to be taken after the construction has been completed.

SWRPC staff mentioned that the Safford Drive connection may also spur economic development in the industrial park which could increase the number of workers and truck traffic on NH 12. Identification signs may be beneficial as the development of new businesses emerge to direct the deliveries to the industrial park. While this is not an immediate need, it should be considered by the Planning Board as development occurs.

A Planning Board member asked about the need for bicycle lanes along NH 12. He felt there was a large shoulder along the Swanzey portion of the study. Staff agreed that most of the Swanzey portion has a sufficient shoulder, but they are not designated as bike lanes. The group also discussed the prospect of better access management, such as fewer curb cuts and reduced width of curb cuts, and how it would be beneficial for the safety of pedestrians and bicyclists.

Town of Marlborough

SWRPC staff gave a presentation to the Marlborough Planning Board and members of the Board of Selectmen on October 22, 2014. Several residents were also present. Attendees discussed the recommendations made by the NH 12 South Advisory Committee regarding the realignment of Webb Depot Road. They acknowledged that a T-intersection instead of the current Y-intersection would likely improve the safety of motorists. A discussion ensued regarding the business opportunities along the corridor. Staff pointed out that there are several underutilized properties and vacant buildings that

could bring in additional tax revenues and employment if they were occupied. A review of the permitted uses and site development standards could be done to determine if there are some regulatory changes that could be made to make these properties more productive.

One resident discussed the recommendation regarding the increased growth of invasive species along the steep cliffs on the west side of the road. Staff mentioned that the neighboring Town of Troy hires a company to remove invasive plants along many of their roads.

City of Keene

SWRPC staff gave a PowerPoint presentation to members of the Keene Planning, Licensing and Development Committee on November 12, 2014. Several Keene residents were also present. After the presentation, committee members raised questions on the recommendations of the NH 12/32 intersection and the anticipated impact of the proposed changes that will be occurring in the Swanzey section in 2015 (Roundabout at NH12/Swanzey Factory Road/Lake Street and the connection to Safford Drive from NH 12). Staff mentioned that traffic counts have been taken before the improvements have begun. Additional counts will be needed after the construction at both locations have been completed and drivers have adjusted to the alternative routes to get to NH 32 instead of using the current NH12/32 intersection in Keene. The driver frustration may be reduced as more drivers discover it will be easier to enter the highway at the Lake Street location instead of the NH 32 location. A presentation was also given to the Keene Planning Board on January 26, 2015. The Planning Board was interested in the information generated by the study and asked questions regarding the recommendation of a Park & Ride. Staff responded that there is an opportunity to look for locations that a Park & Ride could be located.

NH 12 South Business Survey Summary

Below is a summary of the responses to the NH 12 South Business Survey. Forty-six businesses contributed their time by responding to this survey. This information was used to provide supplemental information beyond the various analysis that is being used in this study. Information gathered by this survey has helped develop a clearer understanding of the current highway needs from a business perspective and will help to plan for the future needs as businesses expand and new economic development occurs.

The first portion of the survey was structured to get more of a business profile including information about the size of the business, commuting, shipping & deliveries, available water, sewer, 3-phase, electricity, and broadband infrastructure, and customer activity. The latter portion of the survey provided the businesses with an opportunity to express their needs and concerns about NH 12, as well as plans for future growth.

The survey respondents were predominantly smaller businesses with few employees. Seventy-two percent said they have less than 10 staff and fifty-four percent have four or less staff members. Of the respondents, fifty-five percent use less than 5,000 sq. ft. of space for their business, with another twenty-nine percent using 5,000 to 10,000 sq. ft.

The predominant means of transportation to work is personal automobile or motorcycle with a response of ninety-eight percent. Fourteen percent said that some of their employees walk or bike to work and only seven percent use a carpool or rideshare method. There are also some who responded that they work from home.

Perhaps one of the most surprising responses in the survey was the question posed for the number of years that the business has been at its current location. Fifty-one percent of the respondents stated that their business had been there for longer than 20 years. The significance of this statistic is that it indicates that this is a profitable and successful corridor for businesses in the southwest region of New Hampshire.

The survey included three questions about business shipments and deliveries. Regarding business shipments (out-going), eighty-four percent of the business indicated that they ship five or less times per week on average. Similarly, eighty percent of the businesses receive five or less deliveries per week on average. Sixty-eight percent use flat-bed/box trucks for deliveries and fifty-nine percent use car or van.

When asked about the busiest season of the year, 59 % responded that their business is affected by the time of year. Of those, 56% do the most business during the summer months and 22% are busiest in the fall months, the second busiest season.

Businesses along the NH 12 South corridor were split on answering questions about the busiest time of day and busiest days of the week. Thirty seven percent responded that the weekends are busiest and thirty-five percent said that weekdays are busier. Twenty-eight percent said that there is no noticeable difference in their business activity for weekday or week-end traffic. They were also split in responding to the busiest time of the day. Fifty-two percent said that the time of day has an effect on their business, while forty-eight percent said the level of activity was not affected by the time of day. Of those who said that the time of day does have an effect on the level of activity, morning and afternoon (44% and 48% respectively) are the busiest with ninety-two percent of their business activity.

Access management plays an important role in the safety and efficiency of roadways, especially in commercial areas. Therefore some questions were asked to provide information about the business access and customer activity, which may not be obtained through other parts of the study.

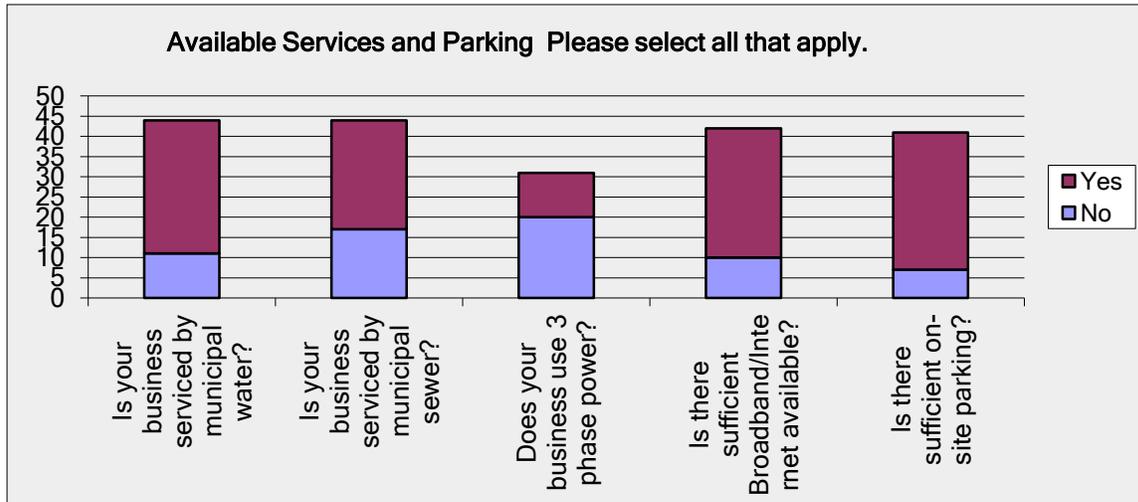
Limiting the number of access points along a highway reduces the number of conflict areas and can greatly increase the level of service of the highway. According to the survey respondents, ninety-six percent of the businesses have one or two driveway entrances. In addition, fifty-two percent indicated that they share a driveway with another business or residential user. This information indicates that the NH 12 South corridor is functioning pretty well regarding access management from a broad perspective. The information that this survey can't provide however, is the distance between driveways, curb cut widths, and other access management considerations.

Another important consideration is the customer flow for the businesses. According to the survey, forty-six percent of the business responses indicated that they have fewer than ten customers per day. Meanwhile, forty-four percent said that they have more than thirty customers per day.

Several questions were posed to provide information that may be beneficial in planning for growth and the increased demand on the highway. Having adequate infrastructure is essential for economic growth. Having available water, sewer, 3-phase power, and broadband are important public sector needs. Adequate parking is an important need for the individual business and is considered an individual or private sector need along the NH 12 South corridor.

Overall, a majority of the businesses responded that they are being served with public water, sewer, and broadband (75%, 61%, and 76% respectively). Eighty-three percent indicated that they have sufficient on-site parking. Some of the respondents were unclear of their use of 3 phase power.

Figure 7: Survey Results Regarding Infrastructure and Parking



The survey asked businesses about growth indicators to help understand recent growth and future expansion plans. This data will help to determine potential future growth and give a better view of increased traffic potential and change in level of service of the highway and intersections.

Approximately one third of the businesses (36%) stated that they have changed the size of their business during the past five years. The majority of changes have been increases in employees, production, floor space, shipments and deliveries, and utility demand. The largest category with a decrease is in the number of employees. Thirty-six percent of businesses stated that they expect to experience some growth in the next five years in the same categories.

The last set of questions was designed to allow respondents' to give their opinions on a series of statements regarding NH 12 South, based on their experiences and observations of the corridor.

Table 18: Business Survey General Results Regarding NH 12

Survey Question	Survey Response
NH 12 is an excellent location for attracting customers.	Majority agree
NH 12 is an excellent location for ensuring timely freight pickups and deliveries.	Majority agree
NH 12 provides my business good access to Southern New England markets.	Majority agree
There are too many driveway and entrance curb cuts on NH 12.	Majority neutral
I am concerned about motorist safety on NH 12.	Majority agree
I am concerned about pedestrian & bicycle safety on NH 12.	Majority agree
NH 12 is often congested.	Majority neutral
NH 12's pavement is in good condition.	Split
There are not enough passing opportunities on NH 12.	Split
I am concerned how growth over time will affect congestion on NH 12.	Slight majority agree
I am concerned about the safety of entering/exiting NH 12 businesses in N. Swanzey/Lower Main Street area in Keene	Majority agree
The intersection of NH 12 and Martell Ct. in Keene is a problem that should be fixed.	Majority agree
The intersections of NH 12 and 32 is a problem that should be fixed.	Majority agree
The intersection of NH 12 and 119 is a problem that should be fixed.	Majority agree

Future Conditions

Development

To address the capacity for development along the corridor, a model was developed to quantify the total *potential* holding capacity of the area within and in some cases adjacent to the corridor study area. The numeric build-out provides an estimated building capacity (in numbers) for each area based on permitted or planned density rules like minimum lot size, and other factors, like severe environmental constraints. The model did not account for existing structures and the calculations should not be interpreted as a prediction of future land use, but a relative measure by which a community may review their overall capacity development under current zoning regulations. Severe environmental constraints, which were not considered buildable space by the study, included land that had slopes steeper than 25%, surface waters, Special Flood Hazard Area (100-yr. floodplain), and hydric soils. Minimum lot size and zoning data were obtained from the SWRPC GIS and local ordinances to determine the extent of currently permitted development within the study area.

Market factors, zoning changes, the potential to overcome severe environmental constraints, and specific land uses were not addressed in the model. The results, also available in the appendix, include the following findings:

- Keene had the lowest proportions of environmental constraints on land in the study area (6% and 3%, respectively). However, these areas were also the most densely developed, compared to other corridor communities. The Low Density District also accounted for more land area than all of the other zoning districts in Keene.
- In Swanzey, the Business District was the largest portion of the corridor study area, and it also showed the highest capacity for new development. About 30% of this area was constrained by one or more environmental constraints, whereas in the Rural/Agricultural and Industrial Districts, over half of land was found to be affected by at least one environmental constraint.
- Marlborough's land area, the smallest in size compared to other communities, was also the most likely to have development restrictions due to environmental constraints. Of the total land area in Marlborough, 77% of all land area was found to be affected by one or more environmental constraints.
- In Troy, about 59% of total land area was encumbered to potential development by at least one environmental constraint. The Highway Business District, the largest area of any district within the corridor study area, was found to be about 50% constrained, leaving a total of approximately 103 acres for existing and potential development.
- In Fitzwilliam, about 57% of land was found to have at least one development constraint.

For more detailed statistics, see the Appendix section "Land Use, Zoning, and Development Potential".

Population Projections

In order to estimate what the potential needs will be for public infrastructure, housing, and community services, population projections are used.

The NH Office of Energy and Planning (NH OEP) prepares population projections for every community and county in New Hampshire. The projections for communities within the study area are presented in Table 16 in five-year intervals up to the year 2040, beginning with the census count from the year 2010.

Table 16: Population Projections 2010 - 2040

	2010	2015	2020	2025	2030	2035	2040	% Change 2010-2040
Keene	23,409	23,332	23,531	23,842	24,076	24,233	24,260	3.6%
Swanzey	7,230	7,294	7,446	7,545	7,619	7,668	7,677	6.2%
Marlborough	2,063	2,045	2,052	2,079	2,100	2,113	2,116	2.6%
Troy	2,145	2,193	2,268	2,298	2,320	2,335	2,338	9.0%
Fitzwilliam	2,396	2,476	2,587	2,621	2,646	2,664	2,667	11.3%

Source: NH Office of Energy & Planning (Fall 2013)

By using this method of projection, all of the corridor communities are expected to experience a small but steady growth in population between 2010 and 2040. The projections do show a short-lived decline in the Keene projection between 2010 to 2015, however the 2020 population is expected to increase and continue to increase in each of the remaining years. Fitzwilliam and Troy show the greatest projected population growth with 11.3% and 9% respectively, while Marlborough shows the least projected population growth with 2.6% by 2040.

Regional Population Projections in Massachusetts and Vermont

This study also considered the population projections of the near-by regions/counties to provide a broader vision of the future needs of the corridor.

Central Region (Massachusetts): According to the University of Massachusetts Report titled: Long-term Population Projections for Massachusetts Regions and Municipalities, November 2013, the population projection for the Central Region of Massachusetts is expected to increase from 693,813 in 2010 to approximately 760,000 people by 2030, nearly a 9.5% increase.

Berkshire/Franklin Region (Massachusetts): The same report predicts that there will be an in-migration from retiring baby boomers and that the population in the Berkshire/Franklin County region will peak in 2025 with approximately 238,000 residents, followed by a decline in 2030 to 236,970. That figure represents a projected growth of approximately .4% between 2010 and 2030.

Windham County, VT: The State of Vermont has prepared projections using two different migration rates and have published results using both scenarios. According to a report entitled Vermont Population Projections (August 2013) prepared by Ken Jones, Windham County Vermont is expected to see a 4.4% increase in population by 2020 and a 6.6% increase by 2030 (over the 2010 census population figures) using a migration rate similar to trends between 2000 and 2010. However, if the trend is similar to the migration rate experienced between 1990 and 2000, the population projection for Windham County is a -0.2% change between 2010 to 2020 and -2.0% change between 2010 to 2030.

Recommendations

Advisory Committee Recommendations

Through a series of meetings with the NH12 South Advisory Committee, the following Recommendations were developed:

	Keene	Swanzy	Marlborough	Troy	Fitzwilliam
Highway Construction	•	•	•	•	•
Access Management	•	•		•	•
Pedestrian Improvements	•	•		•	•
Bicycle Safety	•	•	•	•	•
Invasive Species			•	•	•
Trail Improvements	•	•	•	•	•
Stormwater Management		•		•	•
Engineering Study	•			•	•
Opportunity	•	•	•	•	•

Keene	
Access Management	<p>Issue: Motorist safety is a concern. <u>Contributing Factors:</u> Numerous curb cuts and wide curb cuts create more points of potential vehicle conflict and increase the opportunity for accidents. <u>Goal:</u> Improve vehicular safety <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Prepare an Access Management Plan for the area between the NH 101/12 intersection to the Keene/Swanzy Town Line; b. Work with NHDOT to have an Access Management Memorandum of Understanding (MOU) to coordinate driveway permitting with Site Plan and Subdivision reviews.
Pedestrian Safety Bicycle Safety	<p>Issue: Pedestrian and bicyclist safety is a concern. <u>Contributing Factors:</u> High volume of traffic, speed, sidewalk conditions, curb cut width, numerous curb cuts, lack of sufficient bike lane or shoulder, and lack of sufficient crosswalks. <u>Goal:</u> Improve the safety of pedestrians and bicyclists. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Implement Complete Streets principles from intersection of NH 101 to Keene / Swanzy Town Line. <ol style="list-style-type: none"> i. Improve sidewalks on South Main Street in Keene/add sidewalks; ii. Examine crosswalk opportunities on South Main Street in Keene. Evaluate the need for additional crosswalk improvements at the NH 101/12 South intersection; iii. Make curb cut reductions immediately south of the signalized intersection; iv. Install street trees/ benches/other pedestrian amenities; v. Add bike racks; b. Implement signage that alerts drivers to the presence of cyclists in the roadway; c. Implement signage that alerts drivers to the safe passing distance per RSA 265:143a; d. Conduct a walkability and bikeability assessment¹; e. Prioritize pedestrian signal timing at the NH 12/101 signalized intersection.

¹ <http://www.healnh.org/images/pdffiles/ActiveTransportation/workshop2/Walk-Bike-Assessment2014.pdf>

Highway Construction	Engineering Study	<p>Issue: Intersection at NH 12/NH32 has an accident history and has difficult turning movements. <u>Contributing Factors:</u> High volume of traffic on NH 12, long car platoons with short gaps for entering traffic especially during peak hour times, a 50 to 55 degree angle intersection, limited sight distance. <u>Observation:</u> Proposed projects in the Swanzezy section of NH 12 South were designed with a goal, in part, to alleviate the amount of traffic at this intersection. Namely, the roundabout at the intersection of NH 12/Lake Street/Swanzezy Factory Road is scheduled to be completed in 2015. In addition to that project, the extension of Safford Drive is also scheduled to be completed in 2015. Both projects involve an improvement that will connect NH 12 South to NH 32 and will likely absorb most of the northbound traffic that intend to turn onto NH 32. Therefore traffic patterns at this location should be assessed after the NH 12/Lake Street/Swanzezy Factory Road roundabout and the construction of Safford Drive are completed. <u>Goal:</u> Reduce the number of accidents and improve turning movements. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Realign NH 32 to make as close as possible to a 90 degree T-intersection with NH 12; b. Physically narrow NH 32 to avoid problem of right hand turning vehicles blocking left turning vehicle's sight line; c. Paint and maintain crosswalk across NH 32; d. Improve safety of pedestrians by delineating a crossing area and adding signage that indicates turning vehicles must yield to crossing pedestrians (MUTCD R10-15); e. Assess traffic patterns at this location after the NH 12/Lake Street/Swanzezy Factory Road roundabout and the construction of Safford Drive are completed; f. Examine stop sign locations for Greenwood/Lynwood Avenue area in order to discourage the use of neighborhood streets as a detour for NH 32 traffic. <p>Issue: Increased traffic flow at the NH 101/12 intersection during peak hour makes it difficult to exit Martell Court. <u>Contributing Factors:</u> There are limited detour options to reach jobs and services in Keene from areas south of Martell Court. <u>Goal:</u> Reduce the number of vehicles using this stretch of NH 12 South that are only using it for travelling to and from work. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Consider the Keene/Swanzezy Bypass to connect Optical Ave. (Keene) to NH 12; b. Prepare an Access Management Plan for area between NH 101 and Swanzezy Town Line; c. Support and work with Monadnock Region Transportation Management Association to initiate and promote carpooling and vanpooling programs that target NH 12 commuters; d. Revisit former Ten Year Plan recommendation to improve the intersection with a roundabout or other configuration that eliminates issues associated with Martell Court. This should include considerations for increasing the flow of Beaver Brook to alleviate stormwater from backing up and causing flooding to the area.
Trail Improvements	<p>Issue: The Cheshire Rail Trail, which runs parallel to NH 12, is unimproved, making it unsuitable for some cyclists, pedestrians, and other users. <u>Contributing Factors:</u> Access points to the trail are unmarked, and there has been no routine maintenance. <u>Goal:</u> Improve the condition of the trail system for non-motorized users (with the exception of permitted snowmobile travel in winter). <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Improve wayfinding and permitted use signage; b. Improve path/roadway crossings including the crossing over NH 101 from Marlboro Street to the Stone Arch Bridge; c. Apply to the Transportation Alternatives Program through NHDOT and the Recreational Trails Program through NH DRED to compete for grants that offer an 80% federal match on rail trail improvements; d. Enforce motorized vehicle restrictions to keep the trail safe for its users and in good condition, including constructing ballasts or gates at points of entry; e. Support and work with Monadnock Region Transportation Management Association to initiate and promote a Cheshire Rail Trail Coalition to coordinate and collaborate on regional trail improvements; f. Encourage trailhead signs and parking for trail users. 	

Opportunity: Dillant-Hopkins Airport has capacity to accommodate additional air traffic and promote more regional economic development activity.

Contributing Factors: The airport has the third longest runway in New Hampshire. With its 6,200 foot runway, the facility has the ability to handle aircraft from single engine personal aircraft to large corporate jets and includes a terminal, hangar buildings and a variety of services.

Goal: Increase the number of high quality jobs and economic growth by leveraging the airport to attract new high quality employers.

Option to Consider:

- a. Promote the economic opportunities of the airport as a means of transporting people and goods. Involve regional stakeholders such as the Greater Keene Chamber of Commerce.

Opportunity: Develop Park and Ride near the north end of corridor area to serve NH 12 drivers heading south to MA 2, Boston, etc. as well as users of NH 9, NH 101 and NH 10.

Contributing Factors: Many commuters use this highway daily with no current Park and Ride options, thereby adding to the average daily traffic count on NH 12 South.

Goal: To provide transportation choices and promote multi-modal options to reduce the number of single occupancy vehicles on the highway.

Option to Consider:

- a. Consider potential locations for a suitable Park and Ride parking lot and work with NHDOT to implement.

Opportunity: Expand the ability to access and fully utilize a reliable, affordable, and sustainable broadband network.

Goal: Increase the availability of high-capacity broadband infrastructure and technology along the corridor.

Options to Consider:

- a. Encourage policies that promote the installation of broadband conduit when construction occurs in roadway rights of way.
- b. Improve the permitting & approval process to secure pole attachments, access ROW, & make modifications to & site wireless facilities.
- c. Establish and encourage high capacity broadband connection centers &/or public Wi-Fi networks in appropriate locations such as village centers & community institutions.
- d. Expand utilization of open access fiber networks & facilities such as NH FastRoads. Promote opportunities for connecting fiber technology or other fixed infrastructure to wireless infrastructure.
- e. Promote the inclusion of broadband infrastructure development & maintenance in public works projects.

Opportunity: Coordinate with public utilities, NHDOT and towns to repair, rehabilitate or expand underground infrastructure during highway projects.

Contributing Factors: The cost and driver inconvenience to install underground infrastructure for stand-alone projects can be prohibitive.

Goal: Expand infrastructure such as water, sewer, and underground utilities.

Option to Consider:

- a. Coordinate infrastructure projects with NHDOT projects during the planning phase.

Swanzey

Highway Construction	<p>Issue: Making a left turn onto Flat Roof Mill Road (from north bound lane of NH 12) can be difficult. It is difficult to see the entrance to the road creating a potential to overshoot the entrance.</p> <p><u>Contributing Factors:</u> The curve and slope of NH 12, banked curve of NH 12, speed of northbound vehicles, elevation change between NH 12 and Flat Roof Mill Road, NH 12 narrows, no street lighting.</p> <p><u>Goal:</u> Improve the safety and visibility at this intersection.</p> <p><u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Increase the length of the left turn lane to provide greater queuing time, including signage and pavement markings; b. Reduce the angle of the banked curve; c. Add street lights to improve night time visibility. <p>Issue: Difficulty entering NH 12 from Senior Living Complex access across from Mt. Huggins Road.</p> <p><u>Contributing Factor:</u> Marginal sightline to the right when exiting the complex (especially in smaller cars that are lower) due in part to some young tree growth approximately 10' behind the guard rail.</p> <p><u>Goal:</u> Increase visibility for cars entering onto NH 12.</p> <p><u>Option to Consider:</u></p> <ol style="list-style-type: none"> a. Trim tree growth near the guard rail. 	
Pedestrian Safety	Bicycle Safety	<p>Issue: Pedestrian and bicyclist safety is a concern.</p> <p><u>Contributing Factors:</u> High volume of traffic, sidewalk conditions, curb cut width, numerous curb cuts, and lack of sufficient bike lane.</p> <p><u>Goal:</u> Improve the safety of pedestrians and bicyclists.</p> <p><u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Implement Complete Streets principles from the Keene / Swanzey Town Line to Cheshire County Fairgrounds; <ol style="list-style-type: none"> i. Add or improve sidewalks where needed. Papagallos and Waste Management are the only two businesses that discontinue the sidewalk from Keene all the way through Rountree Ford. The Town could consider this as part of their site plan review or apply to TAP; ii. Make curb cuts reductions at various locations; iii. Add street trees, benches, and other pedestrian amenities; iv. Add bike racks; b. Conduct a walkability and bikeability assessment².
Access Management	<p>Issue: Motorist safety is a concern.</p> <p><u>Contributing Factors:</u> Numerous curb cuts and wide curb cuts create more points of potential vehicle conflict and increase the opportunity for accidents.</p> <p><u>Goal:</u> Improve vehicular safety.</p> <p><u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Prepare an Access Management Plan for the area between the Keene/Swanzey Town Line to the NH 12/Flat Roof Mill Road intersection; b. Work with NHDOT to have an Access Management Memorandum of Understanding (MOU) to coordinate driveway permitting with Site Plan and Subdivision reviews; <p>Issue: Parking area at the former Swanzey Diner has unsafe ingress and egress creating a potential for accidents along this stretch.</p> <p><u>Contributing Factor:</u> There is no curbing to designate the access points which create numerous points of conflict.</p> <p><u>Goal:</u> Eliminate vehicles from backing onto NH 12; reduce access width.</p> <p><u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Curbing should be installed to provide better controlled access points and eliminate parking/ cars backing onto NH 12; b. Work with NHDOT on access management solution in preparation for next site plan review. 	

² <http://www.healnh.org/images/pdffiles/ActiveTransportation/workshop2/Walk-Bike-Assessment2014.pdf>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Trail Improvements</p>	<p>Issue: The Cheshire Rail Trail, which runs parallel to NH 12, is unimproved, making it unsuitable for some cyclists, pedestrians, and other users. <u>Contributing Factors:</u> Access points to the trail are unmarked, and there has been no routine maintenance. <u>Goal:</u> Improve the condition of the trail system for non-motorized users (with the exception of permitted snowmobile travel in winter). <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Improve wayfinding and permitted use signage; b. Improve path/roadway crossings; c. Apply to the Transportation Alternatives Program through NHDOT and the Recreational Trails Program through NH DRED to receive an 80% match on rail trail improvements; d. Enforce motorized vehicle restrictions to keep the trail safe for its users and in good condition, including constructing ballasts or gates at points of entry; e. Support and work with Monadnock Region Transportation Management Association to initiate and promote a Cheshire Rail Trail Coalition to coordinate and collaborate on regional trail improvements; f. Encourage trailhead signs and parking for trail users.
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Stormwater Management</p>	<p>Issue: Increase in severe storm events results in erosion along shoulders and banks. <u>Contributing Factors:</u> Insufficient stormwater management to handle extreme weather events can cause severe erosion which can result in: the degradation of water quality of nearby waterbodies; and can cause road washouts if erosion undermines the edge of pavement. <u>Goal:</u> Improve the capacity of stormwater management to include extreme weather events. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Inventory road-stream relationship to determine areas of erosion/contaminants entering the waterbody; Involve local Conservation Commission, Lake Association, or River Advisory Committee when possible; b. Repair erosion areas with plantings. Use temporary sedimentation barriers until vegetation is established; c. Adopt ordinance/ design standard that requires a vegetative buffer to be maintained between the waterbody and road; <p>Maintain ditches to increase capacity. Add rip-rap, check dams and other methods where appropriate.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Opportunity</p>	<p>Opportunity: The Town of Swanzeey is extending Safford Drive from NH 32 to connect to NH 12 South near the Cheshire County Fairgrounds with construction to be completed by 2015. They are also designating the area as an Industrial Park Zone. <u>Goal:</u> Provide a connection between NH 12 and NH 32 to alleviate traffic on other east-west connectors such as Lake Street and Flat Roof Mill Road, and provide access to undeveloped industrial land. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Provide appropriate signage for the Industrial Park to direct deliveries and tractor trailers; b. Install a “To NH 32” sign for northbound and southbound drivers on NH 12 at the approach to Safford Drive after it is completed. <p>Opportunity: Expand the ability to access and fully utilize a reliable, affordable, and sustainable broadband network. <u>Goal:</u> Increase the availability of high-capacity broadband infrastructure and technology along the corridor. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Encourage policies that promote the installation of broadband conduit when construction occurs in roadway rights of way. b. Improve the permitting & approval process to secure pole attachments, access ROW, & make modifications to & site wireless facilities. c. Establish and encourage high capacity broadband connection centers &/or public Wi-Fi networks in appropriate locations such as village centers & community institutions. d. Expand utilization of open access fiber networks & facilities such as NH FastRoads. Promote opportunities for connecting fiber technology or other fixed infrastructure to wireless infrastructure. e. Promote the inclusion of broadband infrastructure development & maintenance in public works projects. <p>Opportunity: Coordinate with public utilities, NHDOT and towns to repair, rehabilitate or expand underground infrastructure during highway projects. <u>Contributing Factors:</u> The cost and driver inconvenience to install underground infrastructure for stand-alone projects can be prohibitive. <u>Goal:</u> Expand infrastructure such as water, sewer, and underground utilities. <u>Option to Consider:</u></p> <ol style="list-style-type: none"> a. Coordinate infrastructure projects with NHDOT projects during the planning phase.

Marlborough

Highway Construction	<p>Issue: Unsafe entrance onto NH 12 from Webb Depot Road. <u>Contributing Factor:</u> Webb Depot Road meets NH 12 as a Y-intersection making it difficult to see northbound traffic when entering onto NH 12. <u>Goal:</u> Improve safety at intersection of NH 12 and Webb Depot Road. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> Consider aligning the approach to a T- intersection; Investigate other options for safety improvements.
Bicycle Safety	<p>Issue: Safety of bicyclists is a concern. <u>Contributing Factors:</u> Speed and volume of vehicles create unsafe conditions for bicyclists. <u>Goal:</u> Improve safety for bicyclists. <u>Option to consider:</u></p> <ol style="list-style-type: none"> Create or improve designated bike lanes/shoulders on NH 12.
Invasive Species	<p>Issue: Invasive species, including Japanese Knotweed, encroaching on roadway. <u>Goal:</u> Maintain safe sightlines, travel lanes, and shoulders along NH 12 by removing or avoiding the spread of invasive plants. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> Utilize methods in New Hampshire Department of Transportation Best Management Practices for Roadside Invasive Plants (2008)³; Contact the Department of Agriculture, Markets & Food to educate the general public, conservation commissions, municipal and state highway departments, town officials, and others about invasive plant species in New Hampshire.
Trail Improvements	<p>Issue: The Cheshire Rail Trail, which runs parallel to NH 12, is unimproved, making it unsuitable for cyclists, pedestrians, and other users. <u>Contributing Factors:</u> Access points to the trail are unmarked, and there has been no routine maintenance. <u>Goal:</u> Improve the condition of the trail system for non-motorized users (with the exception of permitted snowmobile travel in winter). <u>Options to Consider:</u></p> <ol style="list-style-type: none"> Improve wayfinding and permitted use signage; Improve path/roadway crossings; Apply to the Transportation Alternatives Program through NHDOT and the Recreational Trails Program through NH DRED to receive an 80% match on rail trail improvements; Enforce motorized vehicle restrictions to keep the trail safe for its users and in good condition, including constructing ballasts or gates at points of entry; Support and work with Monadnock Region Transportation Management Association to initiate and promote a Cheshire Rail Trail Coalition to coordinate and collaborate on regional trail improvements; Encourage trailhead signs for users of the trail and adjacent river; Improve and designate a parking area and trailhead at the existing access point immediately north of 082/128 bridge (mile marker 11.6) at the Marlborough-Troy town line or create access to the railbed across from the existing parking area immediately north of 077/065 bridge (mile marker 12.0).

³ <https://t2.unh.edu/sites/t2.unh.edu/files/documents/publications/BMPsforRoadsideInvasivePlants.pdf>

Opportunity	<p>Opportunity: Expand the ability to access and fully utilize a reliable, affordable, and sustainable broadband network.</p> <p>Goal: Increase the availability of high-capacity broadband infrastructure and technology along the corridor.</p> <p><u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Encourage policies that promote the installation of broadband conduit when construction occurs in roadway rights of way. b. Improve the permitting & approval process to secure pole attachments, access ROW, & make modifications to & site wireless facilities. c. Establish and encourage high capacity broadband connection centers &/or public Wi-Fi networks in appropriate locations such as village centers & community institutions. d. Expand utilization of open access fiber networks & facilities such as NH FastRoads. Promote opportunities for connecting fiber technology or other fixed infrastructure to wireless infrastructure. e. Promote the inclusion of broadband infrastructure development & maintenance in public works projects.
	<p>Opportunity: Coordinate with public utilities, NHDOT and towns to repair, rehabilitate or expand underground infrastructure during highway projects.</p> <p><u>Contributing Factors:</u> The cost and driver inconvenience to install underground infrastructure for stand-alone projects can be prohibitive.</p> <p><u>Goal:</u> Expand infrastructure such as water, sewer, and underground utilities.</p> <p><u>Option to Consider:</u></p> <ol style="list-style-type: none"> a. Coordinate infrastructure projects with NHDOT projects during the planning phase.

Troy	
Access Management	<p>Issue: Unsafe access to enter/exit businesses between Old Keene Road and Marlborough.</p> <p><u>Contributing Factors:</u> Numerous curb cuts and wide curb cuts create more points of potential vehicle conflict and increase the opportunity for accidents.</p> <p><u>Goal:</u> Improve safety for motorists entering and exiting businesses between Old Keene Road and Marlborough Road.</p> <p><u>Option to consider:</u></p> <ol style="list-style-type: none"> a. Implement access management strategies to reduce the number and width of curb cuts. There are an excessive number of curb cuts and curb cut widths in many locations along this stretch of the corridor. Reducing the width and number of curb cuts will not only increase safety for pedestrians, bicyclists, and motorists, it will add to the usable parking area for the business and create landscape opportunities for added value and appeal.
Engineering Study	<p>Issue: Speed limit is perceived to be too slow for the north bound lane beyond Marlborough Road and up the hill towards Marlborough.</p> <p><u>Contributing Factor:</u></p> <p><u>Goal:</u> Maintain appropriate speed to move traffic through the corridor in a safe and efficient manner to accommodate vehicular, bicycle, and pedestrian traffic.</p> <p><u>Option to consider:</u></p> <ol style="list-style-type: none"> a. Request a speed study for the north bound lane just beyond Marlborough Road up the hill towards Marlborough and work with NHDOT to determine if a speed limit increase is warranted. <p>Issue: Difficult intersection at Marlborough Road and NH 12</p> <p><u>Contributing Factor:</u> Intersection alignment, excessive speed, and narrow gaps in traffic can make it difficult to enter onto NH 12, especially during peak hours.</p> <p><u>Goal:</u> Improve visibility for vehicles entering NH 12 from Marlborough Road.</p> <p><u>Option to consider:</u></p> <p>Request an engineering study to explore options to improve intersection safety and turning movements.</p>

Invasive Species	<p>Issue: Invasive species, including Japanese Knotweed, encroaching on roadway. <u>Goal:</u> Maintain safe sightlines, travel lanes, and shoulders along NH 12 by removing or avoiding the spread of invasive plants. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Utilize methods in New Hampshire Department of Transportation Best Management Practices for Roadside Invasive Plants (2008)⁴; b. Contact the Department of Agriculture, Markets & Food to educate the general public, conservation commissions, municipal and state highway departments, town officials, and others about invasive plant species in New Hampshire.
Highway Construction	<p>Issue: Limited visibility for vehicles entering NH 12 from Water Street. <u>Contributing Factor:</u> Sight line is limited when entering NH 12 from Water Street due to a business sign. <u>Goal:</u> Improve sight line at intersection of NH 12 and Water Street. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Inform sign owner of the issue and request that it be relocated; b. Check zoning ordinance regarding signs to determine compliance. Require compliance if it is found to violate ordinances or codes; c. Restrict turning movement to a right turn only when entering onto NH 12 from Water Street; d. Restrict Water Street to a one-way street (enter from NH 12). <p>Issue: Difficult intersection at Quarry Road and NH 12. <u>Contributing Factor:</u> Quarry Road meets NH 12 at a Y-intersection making it difficult for drivers to enter onto NH 12 due to the angle needed to check for on-coming traffic. <u>Goal:</u> Improve safety at the intersection of Quarry Road and NH 12. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Explore making this a T- intersection instead of the current Y-intersection. <p>Issue: Pedestrian safety is a concern for crossing South Street at intersection with NH 12. <u>Contributing Factor:</u> Intersection alignment and long pedestrian crossing at intersection of NH 12 and South Street. <u>Goal:</u> Improve driver visibility and pedestrian safety at the intersection. <u>Option to Consider:</u></p> <ol style="list-style-type: none"> a. Realign intersection to meet NH 12 at a right angle thereby reducing the length of the pedestrian crossing. <p><u>Goal:</u> Further improve pedestrian safety for crossing South Street (beyond recent improvements). <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Textured crosswalk (similar to Keene Main Street crosswalks) or colored pavement. This provides greater visibility for travelers and maintains high visibility longer than painted lines. It creates a visual diversion for motorists compared to white lines; b. The northern curb entering onto South Street should be extended to reduce the length of the pedestrian crosswalk (and amount of time pedestrians are in the roadway), and to reduce speed of southbound vehicles turning right entering South Street; c. Improve safety of pedestrians by delineating a crossing area and adding signage that indicates turning vehicles must yield to crossing pedestrians (MUTCD R10-15). <p>Issue: West Hill Road has only one means of access which could delay response time in the event of an emergency if the road is obstructed. <u>Contributing Factor:</u> The property between the end of West Hill Road and NH 12 is in the Town of Marlborough. Maintenance and snow removal agreements would need to be established. <u>Goal:</u> Improve accessibility to residents in the event of an emergency. <u>Option to Consider:</u></p> <ol style="list-style-type: none"> a. Work with the Town of Marlborough to provide a second means of access to the West Hill Road residents by extending the road through Marlborough and connecting to NH 12.

⁴ <https://t2.unh.edu/sites/t2.unh.edu/files/documents/publications/BMPsforRoadsideInvasivePlants.pdf>

Bicycle Safety	<p>Issue: Volume of vehicles, lack of suitable shoulder in some areas, and other infrastructure deficiencies create unsafe conditions for bicyclists. <u>Goal:</u> Improve safety for bicyclists. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Create or improve designated bike lanes/shoulders on NH 12. b. Consider bicycle-friendly infrastructure improvements including new storm drain grates and signage. <p>Issue: Pedestrian and bicyclist safety is a concern. <u>Contributing Factors:</u> High volume of traffic, sidewalk conditions, curb cut width, numerous curb cuts, and lack of sufficient bike lane. <u>Goal:</u> Improve the safety of pedestrians and bicyclists. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Implement Complete Streets principles between Mountain View Cemetery and Quarry Road. b. Add or improve sidewalks where needed. The Town could consider this as part of their site plan review or apply to TAP; <ol style="list-style-type: none"> i. Make curb cuts reductions at various locations; ii. Add street trees, benches, and other pedestrian amenities; iii. Add bike racks.
Trail Improvements	<p>Issue: The Cheshire Rail Trail, which runs parallel to NH 12, is unimproved, making it unsuitable for some cyclists, pedestrians, and other users. <u>Contributing Factors:</u> Access points to the trail are unmarked, and there has been no routine maintenance. <u>Goal:</u> Improve the condition of the trail system for non-motorized users (with the exception of permitted snowmobile travel in winter). <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Improve wayfinding and permitted use signage (ex. a weather protected bicycle map near the depot trailhead); b. Improve path/roadway crossings; c. Apply to the Transportation Alternatives Program through NHDOT and the Recreational Trails Program through NH DRED to receive an 80% match on rail trail improvements; d. Enforce motorized vehicle restrictions to keep the trail safe for its users and in good condition, including constructing ballasts or gates at points of entry; e. Support and work with Monadnock Region Transportation Management Association to initiate and promote a Cheshire Rail Trail Coalition to coordinate and collaborate on regional trail improvements; f. Encourage trailhead signs for trail users; g. Improve and designate a parking area and trailhead at the railway depot property (corner of Depot Street and High Street).
Stormwater Management	<p>Issue: Increase in severe storm events results in erosion along shoulders and banks. <u>Contributing Factors:</u> Insufficient stormwater management to handle extreme weather events can cause severe erosion which can result in: the degradation of water quality of nearby waterbodies; and can cause road washouts if erosion undermines the edge of pavement. <u>Goal:</u> Improve the capacity of stormwater management to include extreme weather events. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Inventory road-stream relationship to determine areas of erosion/contaminants entering the waterbody. Involve local Conservation Commission, Lake Association, or River Advisory Committee when possible; b. Repair erosion areas with plantings. Use temporary sedimentation barriers until vegetation has been established; c. Adopt ordinance/ design standard that requires a vegetative buffer to be maintained between the waterbody and road; d. Maintain ditches and retention areas to increase capacity. Add rip-rap, check dams and other methods where appropriate.

Opportunity

Opportunity: Expand the ability to access and fully utilize a reliable, affordable, and sustainable broadband network.

Goal: Increase the availability of high-capacity broadband infrastructure and technology along the corridor.

Options to Consider:

- a. Encourage policies that promote the installation of broadband conduit when construction occurs in roadway rights of way.
- b. Improve the permitting & approval process to secure pole attachments, access ROW, & make modifications to & site wireless facilities.
- c. Establish and encourage high capacity broadband connection centers &/or public Wi-Fi networks in appropriate locations such as village centers & community institutions.
- d. Expand utilization of open access fiber networks & facilities such as NH FastRoads. Promote opportunities for connecting fiber technology or other fixed infrastructure to wireless infrastructure.
- e. Promote the inclusion of broadband infrastructure development & maintenance in public works projects.

Opportunity: Coordinate with public utilities, NHDOT and towns to repair, rehabilitate or expand underground infrastructure during highway projects.

Contributing Factors: The cost and driver inconvenience to install underground infrastructure for stand-alone projects can be prohibitive.

Goal: Expand infrastructure such as water, sewer, and underground utilities.

Option to Consider:

- a. Coordinate infrastructure projects with NHDOT projects during the planning phase.

Fitzwilliam

Highway Construction

Engineering Study

Issue: Dangerous intersection at NH 12 and NH 119.

Contributing Factors: This is a busy intersection and has a history of accidents or near misses. The pavement is wide and traffic is fast.

Goal: Improve turning movement safety.

Options to Consider:

- a. Explore options for intersection safety improvements at the intersection of NH 12 and NH 119. This should examine existing suggestions resulting from 2009 Road Safety Audit (http://www.swrpc.org/files/data/trans/Fitzwilliam%20RSA-083109_0.pdf) and subsequent engineering drawings produced by NHDOT that examined ideas such as:
 - i. A road diet to reduce the amount of pavement and speed;
 - ii. Install traffic islands or raised pavement and pavement markings as well as other traffic calming methods including call out lane, turning arrow, and edge line markings;
 - iii. Traffic calming for the southbound approach to the intersection (rumble strips similar to approach of the roundabout in Peterborough if determined that sound would not impact neighboring residences);
 - iv. Left turn in north and southbound lanes of NH 12;
 - v. Left turn from NH 119 to northbound lane of NH 12 (toward Troy). Need a Stop Bar;
 - vi. Left turn from NH 119 to southbound lane of NH 12 (toward MA state line). Need a Stop Bar;
 - vii. Pedestrian/ bicycle safety improvements- crosswalks, sidewalks, bike lanes, and Complete Street strategies; – At 12/119, call out lane, turning arrow, and edge line markings specifically
- b. Install flashing sign to alert residents of “congested intersection” north of this intersection at top of hill. Consider other sign options (overhead, roadside) for 12/119 lane designations.

Pedestrian	Bicycle Safety	<p>Issue: Unsafe crossing areas for pedestrians and cyclists at the intersection of NH 12 and NH 119. <u>Contributing Factors:</u> This is an area with several businesses that are heavily used. Currently there are no safe crossing areas and no crosswalks. This intersection has a wide stretch of pavement for pedestrians to cross. <u>Goal:</u> Improve pedestrian and bicyclist safety at this intersection. <u>Option to consider:</u> a. Textured and colored crosswalks will provide higher visibility and increase awareness of potential pedestrians.</p>
Invasive Species		<p>Issue: Invasive species, including Japanese Knotweed, encroaching on roadway. <u>Goal:</u> Maintain safe sightlines, travel lanes, and shoulders along NH 12 by removing or avoiding the spread of invasive plants. <u>Options to Consider:</u> a. Utilize methods in New Hampshire Department of Transportation Best Management Practices for Roadside Invasive Plants (2008)⁵; b. Contact the Department of Agriculture, Markets & Food to educate the general public, conservation commissions, municipal and state highway departments, town officials, and others about invasive plant species in New Hampshire.</p>
Trail Improvements		<p>Issue: The nearby Cheshire Rail Trail, is unimproved, making it unsuitable for some cyclists, pedestrians, and other users. <u>Contributing Factors:</u> Access points to the trail are unmarked, and there has been no routine maintenance. <u>Goal:</u> Improve the condition of the trail system for non-motorized users (with the exception of permitted snowmobile travel in winter). <u>Options to Consider:</u> a. Improve wayfinding and permitted use signage; b. Improve path/roadway crossings; c. Apply to the Transportation Alternatives Program through NHDOT and the Recreational Trails Program through NH DRED to receive an 80% match on rail trail improvements; d. Enforce motorized vehicle restrictions to keep the trail safe for its users and in good condition, including constructing ballasts or gates at points of entry; e. Support and work with Monadnock Region Transportation Management Association to initiate and promote a Cheshire Rail Trail Coalition to coordinate and collaborate on regional trail improvements; f. Encourage trailhead signs and parking areas for trail users; g. Coordinate with the Montachusett Regional Planning Commission and Massachusetts DOT to connect trail systems across the state line.</p>
Stormwater Management		<p>Issue: Increase in severe storm events results in erosion along shoulders and banks. <u>Contributing Factors:</u> Insufficient stormwater management to handle extreme weather events can cause severe erosion which can result in: the degradation of water quality of nearby waterbodies; and can cause road washouts if erosion undermines the edge of pavement. <u>Goal:</u> Improve the capacity of stormwater management to include extreme weather events. <u>Options to Consider:</u> a. Inventory road-stream relationship to determine areas of erosion/contaminants entering the waterbody; Involve local Conservation Commission, Lake Association, or River Advisory Committee when possible; b. Repair erosion areas with plantings. Use temporary sedimentation barriers until vegetation has been established; c. Adopt ordinance/ design standard that requires a vegetative buffer to be maintained between the waterbody and road; d. Maintain ditches and retention areas to increase capacity. Add rip-rap, check dams and other methods where appropriate; e. Create an inventory: monitor stream crossings, culverts, catch basins, and other infrastructure.</p>

⁵ <https://t2.unh.edu/sites/t2.unh.edu/files/documents/publications/BMPsforRoadsideInvasivePlants.pdf>

Opportunity	Access Management	<p>Opportunity: Development potential exists along the Fitzwilliam portion of the corridor study. <u>Goal:</u> Establish safe access to accommodate potential future needs of the area. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Access management strategies should be a priority for new curb cuts. Internal accessways and designated right-of-ways should be included in site plans where potential future development may occur. The Fitzwilliam Site Plan Regulations should be amended to include this standard; b. Prepare an Access Management Plan for the Fitzwilliam portion of the study area.
Opportunity		<p>Opportunity: Expand the ability to access and fully utilize a reliable, affordable, and sustainable broadband network. <u>Goal:</u> Increase the availability of high-capacity broadband infrastructure and technology along the corridor. <u>Options to Consider:</u></p> <ol style="list-style-type: none"> a. Encourage policies that promote the installation of broadband conduit when construction occurs in roadway rights of way. b. Improve the permitting & approval process to secure pole attachments, access ROW, & make modifications to & site wireless facilities. c. Establish and encourage high capacity broadband connection centers &/or public Wi-Fi networks in appropriate locations such as village centers & community institutions. d. Expand utilization of open access fiber networks & facilities such as NH FastRoads. Promote opportunities for connecting fiber technology or other fixed infrastructure to wireless infrastructure. e. Promote the inclusion of broadband infrastructure development & maintenance in public works projects. <p>Opportunity: Coordinate with public utilities, NHDOT and towns to repair, rehabilitate or expand underground infrastructure during highway projects. <u>Contributing Factors:</u> The cost and driver inconvenience to install underground infrastructure for stand-alone projects can be prohibitive. <u>Goal:</u> Expand infrastructure such as water, sewer, and underground utilities. <u>Option to Consider:</u></p> <ol style="list-style-type: none"> a. Coordinate infrastructure projects with NHDOT projects during the planning phase.