

# ***SOUTHWEST CONNECTS:***

## **Southwest Region Transportation Plan 2014 - 2035**

*Connecting Places \* Connecting People \**

*with Social, Economic & Environmental Policy \**



*Connecting Economies \* Connecting with the*

*Past & Future \* Connecting Transportation*

***Adopted by the Southwest Region Planning Commission Board of Directors on Month, Day, 2014.***

## ACKNOWLEDGEMENTS

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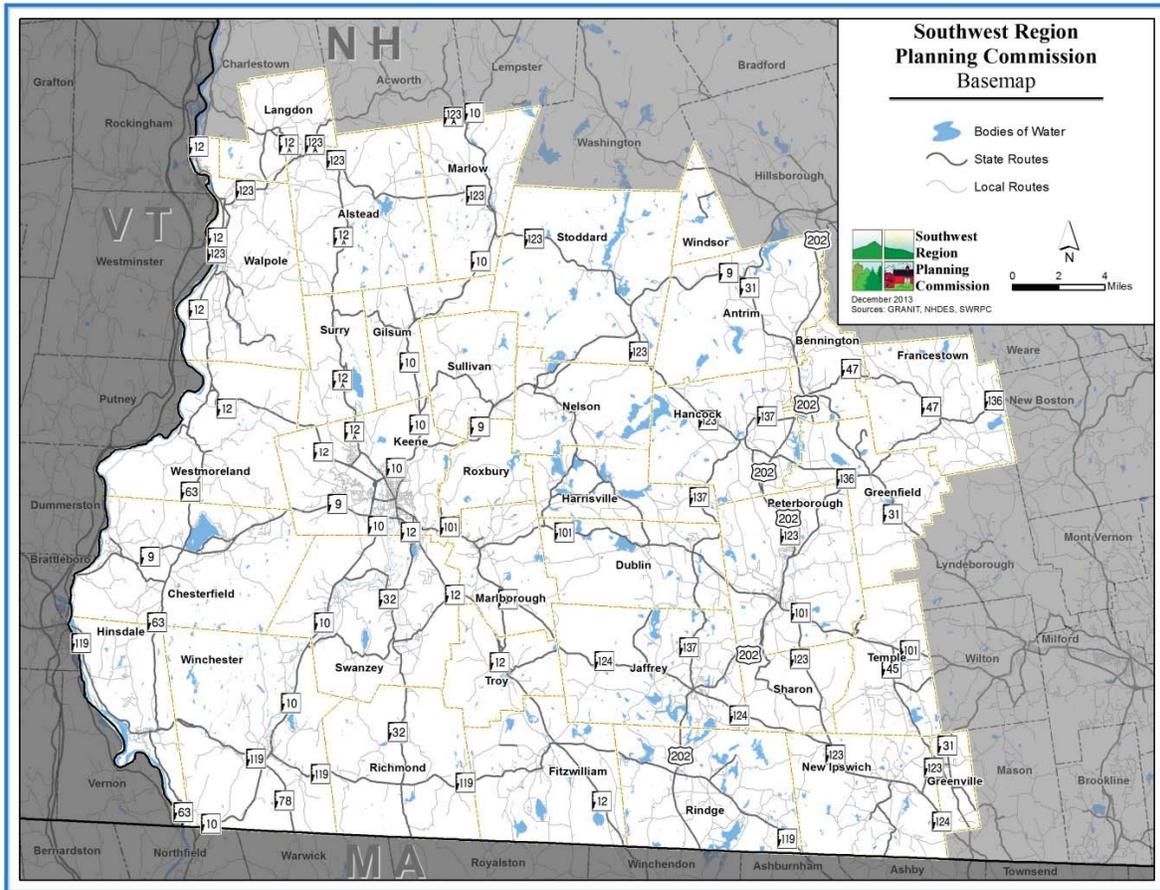
Kurt Blomquist, *City of Keene*  
 Jo Ann Carr, *Town of Jaffrey*  
 Keith Thibault, *Southwestern Community Services*  
 Dave Upton, *Town of Nelson*

\*Other Representatives on MRF Transportation Focus Group

## SWRPC LIST OF MUNICIPALITIES & MAP

The Southwest Region Planning Commission District is composed of municipalities in Cheshire County and parts of Hillsborough and Sullivan County. It includes the following municipalities:

- |              |             |              |              |
|--------------|-------------|--------------|--------------|
| Alstead      | Greenville  | Nelson       | Surry        |
| Antrim       | Hancock     | New Ipswich  | Swanzy       |
| Bennington   | Harrisville | Peterborough | Temple       |
| Chesterfield | Hinsdale    | Richmond     | Troy         |
| Dublin       | Jaffrey     | Rindge       | Walpole      |
| Fitzwilliam  | Langdon     | Roxbury      | Westmoreland |
| Francetown   | Keene       | Sharon       | Winchester   |
| Gilsum       | Marlborough | Stoddard     | Windsor      |
| Greenfield   | Marlow      | Sullivan     |              |



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## HOW TO USE THIS PLAN

SOUTHWEST CONNECTS is not intended to be read cover to cover. Readers should regard the Plan as a resource document to help advance good regional transportation policy. It is also meant to help various transportation stakeholders collaborate on regional transportation issues with the same frame of reference and similar understanding of key challenges and opportunities.

As you are reading through the Plan, note that there are *italicized words* and underlined words. When a word is italicized, that means that a definition of the word is available in the Glossary of Terms section in the back of the Plan. When a word is underlined, that term is hyperlinked to an internet resource that can provide more information about that term. There is also an acronym list at the back of the Plan for your reference.

### If you are representing a community in the Southwest Region

If you are representing a municipality in the Southwest Region it is recommended that you identify the corridor system with which your town is affiliated. There are eight different corridor systems identified in SOUTHWEST CONNECTS so plan to make the **Southwest Region Corridor Systems** section one of your first stops. In some cases, your community may be part of more than one corridor system. This section also has some valuable data that is helpful for understanding transportation-related trends in your corridor area.

You are also encouraged to look at the **Regional Transportation Improvement Program**, which is updated annually in the Plan. This section contains planned capital improvement projects and planning initiatives impacting your community and its neighbors. The lists in this section will give you a sense of today's regional transportation priorities and their potential impact on your community. Ask yourself how these projects will impact your community. What other projects should the region be considering that will be mutually beneficial for other towns in your corridor? You can let SWRPC know your community's ideas for projects or planning initiatives at any time. A good time to do this is each even numbered year in the Fall when SWRPC solicits your community for project ideas for the New Hampshire Ten Year Transportation Improvement Plan (TYP).

Another important reason to consult the plan is to provide a regional perspective to your community's Master Plan. In preparing SOUTHWEST CONNECTS, SWRPC consulted each community Master Plan to build its own content. If you are updating your own Plan, such as your transportation chapter, you are strongly encouraged to examine this Plan's **Vision, Approach, Goals and Objectives** section and make an effort to consider how your community's plans fit with the regional plan. What are similarities and differences of goals and objectives and what kind of strategies are you implementing to further the regional goals and objectives? For example, are there potential partnerships with neighboring communities to establish passenger transportation services in order to improve accessibility and address

Objective 3C? Does your zoning need to be updated to help preserve the regional arterial highway that passes through your community to address Objective 3A? Does your community have a strategy for addressing increased flooding and wash-out events by addressing Objective 4D?

### **If you are a member of a Regional Transportation Committee**

Some people that will use the plan participate in one of several active regional transportation committees in the region. The SWRPC Transportation Advisory Committee (TAC), Monadnock Region Transportation Management Association (MRTMA) and Monadnock Regional Coordinating Council (MRCC) are three transportation advisory groups currently affiliated with the Southwest Region Planning Commission. Each Committee is encouraged to advance the vision, approach, goals and objectives of SOUTHWEST CONNECTS through their own projects and other activities.

The TAC is a longstanding committee representing SWRPC's member communities. SWRPC staff and its Board of Directors consult with TAC to perform official SWRPC transportation-related business. This includes but is not limited to coordination and consultation with NHDOT and Federal Highway Administration (FHWA), regional reviews of transportation grant applications to NHDOT, evaluating SWRPC specific transportation documents such as SOUTHWEST CONNECTS and the Southwest Public Involvement Plan, and a biennial review of Ten Year Transportation Improvement Projects for the Southwest Region.

The MRTMA is an independent coalition of public and private sector groups interested in transportation sustainability in the Monadnock Region. The MRTMA has its own Action Plan, which focuses on diversifying transportation choices and improving land use/transportation coordination in the Monadnock Region in order to meet various economic, social and environmental goals. MRTMA is encouraged to ensure that its own planning initiatives are consistent and help with implementation of the SOUTHWEST CONNECTS Plan. As such, many MRTMA planning initiatives are included in the RTIP's list of Funded Corridor Related Planning Initiatives.

The MRCC is a self-governing body composed of local and regional passenger transportation service providers, funders and consumers who work on ways to improve coordination among service providers and funders in order to enhance community passenger transportation. The MRCC operates using a Coordinated Community Transportation Plan for Southwest New Hampshire, which was consulted when developing SOUTHWEST CONNECTS. Like MRTMA planning initiatives, some MRCC planning initiatives are included in SOUTHWEST CONNECTS RTIP's list of Funded Corridor Related Planning Initiatives.

### **Just an interested reader?**

Everyone is a transportation stakeholder, even if you are not on a transportation committee, involved with your municipality or involved in a transportation related profession. That includes you. We encourage you to read through this document to learn about some of the identified challenges and opportunities for transportation in the Southwest Region. Good planning and communication is a two-

way street, so you are encouraged to share feedback about transportation challenges and opportunities written about in the Plan and share your own ideas. There are a number of ways that you can get involved in the transportation planning process, either by working with your municipality through any number of its municipal boards or committees, or attending any of the regularly scheduled meetings held by the three regional transportation advisory committees listed above. Meetings and other transportation activities are regularly updated on the SWRPC website at [www.swrpc.org](http://www.swrpc.org). If it isn't possible for you to get involved with municipal or regional committees, or attend their meetings as a member of the general public, you can also contact the SWRPC Transportation Program directly using the contact information below. We look forward to hearing from you!

**Southwest Region Planning Commission**  
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## INTRODUCTION

Transportation—defined as a physical system as well as a means to move people and goods from point A to point B—is about making connections. It connects places to one another. It enables people to connect with friends, family, business associates and others. It allows economies to thrive when it is doing a good job of connecting consumers with commodities and services. As such, it has become an essential building block of human settlements and civilization.

Planning for transportation has always been about developing strategies to connect places, people and economies. This continues to be true. Strategies have evolved and adapted according to the unique challenges of history, with each historical period developing and financing a transportation solution to confront the challenges of the day—from the hand-made horse carriages built by pioneers to the tycoon funded railroad system to creation of the interstate and state highway systems paid for by public highway funds.

What are the challenges of today? According to feedback from hundreds of Southwest Region citizens, these challenges include but are not limited to: a lack of funding to maintain existing infrastructure in a cost-effective way, an aging population with changing mobility needs, increases in natural hazard events which significantly reduce the lifespan of infrastructure, limited mobility choices for non-driver populations, limited passenger transportation options to destinations within and outside the region, and the uncertainty of future transportation energy resources.

Southwest Region citizens identified opportunities as well. While there was an undercurrent in public feedback for the need to increase revenue to tackle deteriorating infrastructure and develop more passenger transportation services, this was not seen as an opportunity per se. The larger “opportunity” theme identified through the Plan’s outreach process was education. And with education we return to the theme of connections and connecting—by helping people make connections in their mind about how transportation works and what resources are needed to sustain it.

For instance, despite every person having a daily experience with transportation, how much do we each understand about how transportation is paid for or maintained? Do we all know about existing transportation services or options available to us? Do we understand the social, economic and environmental costs and benefits of transportation decisions? Do we understand the investments that were made for us and have we considered the advantages of making investments for future generations? Do we as voters, and do our selectmen, committee members, and representatives have the information they need to make informed decisions relating to these transportation challenges? If we all had more information, would we be able to better tackle the challenges listed in this Plan?

Therefore, education (i.e. information sharing) is a major focus of SOUTHWEST CONNECTS. In the first section of the Plan, **Vision, Approach, Goals and Objectives**, the Vision sees the Southwest Region surmounting its challenges based on a foundation of a well-informed public that is highly participatory

and knowledgeable about arguments for and against various transportation alternatives. This is followed by the description of a transportation planning Approach that calls for making processes more educational, as well as improving communication, transparency and inclusivity to foster better decision making. The Goals and Objectives are “high level” policy recommendations that encourage flexibility by implementers to gather additional contextual information in order to tailor solutions for future identified transportation issues. The intent here is for us to look at all sides of an issue as we plan for our future. Each part of this section is purposely connected with the State’s Ten Year Transportation Improvement Plan Project Criteria to reinforce the link between transportation planning and implementation.

The next section of SOUTHWEST CONNECTS is the **Regional Transportation Improvement Program (RTIP)**. This section, and its position toward the front of the Plan, is meant to clearly profile existing transportation projects so that transportation stakeholders are well-informed about the decisions and planning initiatives that have been designed to meet regional transportation challenges. In order to keep this section relevant, it is scheduled to be updated annually to reflect any changes in projects or planning initiatives.

Following the RTIP is the **Transportation Context and Concepts** section, which is educational in nature. It introduces the reader to transportation basics, how the transportation system is operated and funded in the Southwest Region and New Hampshire, and offers “best practices” perspectives on how to assess transportation challenges, transportation impacts and transportation-related trends.

The next section, **Southwest Region Corridor Systems**, provides a summary profile of all eight corridors in the Southwest Region. Summary data and information is provided for each corridor. Information and data include an identification of each Corridor’s geographical area, their transportation infrastructure attributes, population information, travel and vehicle trends, commuting and economic data, housing and land use data and performance measure data. Each corridor profile also comes with a corridor map, a map showing multimodal assets, a map showing geographical aspects of major challenges that the corridor faces or will face, and a map showing the corridor’s use as a regional travel corridor, including how it connects to neighboring regions. People looking for help interpreting this data can go back to the Transportation Context and Concepts section for assistance.

Finally, this Plan offers a **Glossary of Terms** and a **List of Acronyms**. The transportation planning world is littered with technical vocabulary and an alphabet soup of programs, organizations, and governmental agencies. These sections are here to improve your reading experience.

From SWRPC staff, it is our sincere hope that the content of SOUTHWEST CONNECTS will help you “make connections” and learn something new about transportation in the Southwest Region which will enable the best transportation decision making possible. In addition, we hope you can help us identify which places need better connections, which segments of the population need better ways of connecting with the community, and how we can sustain and enhance our local and regional economies by improving connectivity with the outside world.

# **VISION, APPROACH, GOALS AND OBJECTIVES**

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## **Transportation Vision for Southwest Region:**

In the future, the Southwest Region's network of major highways, rail rights of way, airports and other transportation features will look much the same as they do today. New infrastructure will not displace or disturb the special places, cultural resources, and natural features that comprise our rural landscape. Changes will happen in the context of our existing infrastructure and rights of way. New modes of transport will utilize the regional transportation network and public rights of way to make room for passenger transportation services, broadband fiber-optic cable, safe bike routes and the reintroduction of some rail. Technological and travel demand management solutions will use our existing infrastructure more efficiently as well as reduce energy demands, curb greenhouse gas emissions and save households and government money. All transportation will have stable and reliable revenue sources and will provide individuals of all ages and abilities affordable access to basic needs such as health care, employment, shopping and community interaction. Infrastructure will be sufficiently managed to avoid costly repairs or upgrades due to poor asset management, nearsighted land use decisions or climate-induced severe storm events. Villages and downtowns will serve as intermodal transportation hubs helping to connect and move people and goods between places both local and far away. Transportation decision making will rely on an active, participatory and well-informed public that weighs in on transportation alternatives thoughtfully and carefully by accounting for long term as well as short term costs and benefits.

## **Transportation Planning Approach:**

Southwest Region Planning Commission, as the keeper of the SOUTHWEST CONNECTS Plan, will encourage planning, policymaking and other decision making affecting the Southwest Transport System to be:

- **Educational:** Transport challenges are often complex and require a good grasp of data, concepts, analysis and understanding of different perspectives. Complex challenges and solutions need to be made understandable to people with varying degrees of awareness or comprehension.
- **Communicative and Collaborative:** Transport challenges are assessed and solutions are implemented by multiple entities that are sometimes not accustomed to communicating with each other. It is imperative that decision making entities share information to foster more informed and consensual decision making.
- **Inclusive and Transparent:** Transport decisions affect everyone. People of all ages and abilities should have a reasonable opportunity to be exposed to decision making processes as well as participate in transport decision making.

- Creative: “This is the way we always have done it” is not an acceptable reason on its own for rejecting new ideas or approaches to transport challenges. Thoughtful new ideas and experimentation are encouraged in cases where there is reasonable support behind new ideas.
- Holistic and Integrative: Transport decisions more often than not have economic, social and environmental ramifications. It is important to understand and evaluate all costs and benefits of decisions, based on the best assessment tools available.
- Adaptive and Malleable: Transport solutions are hardly ever one size fits all. Flexibility in transportation solution design can help transportation adapt to potential future challenges or opportunities.
- Strategic and Proactive: Transportation decision making is limited by scarce resources and should be calculated and implemented to obtain the best outcome based on guiding goals and objectives.

***These approaches address the following Ten Year Plan Project Criteria: Feasibility, Progress to Date, Facility Importance, Traffic Volume, Local Support, Regional Support and State Support.***

## Goals and Objectives:

**Goal 1: The transport system will be managed to support and enhance the regional economy.**

Objective 1A: It will be managed to foster a reliable business climate for existing and new businesses.

Objective 1B: It will be managed to leverage, attract and stimulate new investment.

Objective 1C: It will be managed to nurture and support regional economic diversity.

Objective 1D: It will provide transportation efficiency solutions for households, businesses, and taxpayers and free up scarce resources for personal, business and community investments.

***Goal 1 addresses the following Ten Year Plan Project Criteria: Improve Economic Conditions, Enhance Access to Businesses, Freight Mobility and Extend Service Life. It also addresses the Balanced Scorecard’s performance measures to improve asset conditions and increase mobility.***

**Goal 2: The transport system will be managed to help preserve and enhance natural, cultural and historic resources.**

Objective 2A: It will be managed to ensure high quality water, soil and air.

Objective 2B: It will be managed to reduce greenhouse gases from transportation emissions.

Objective 2C: It will be managed to support existing flora and fauna and their habitat.

Objective 2D: It will be managed to preserve the sense of place of its villages, downtowns, parks and other unique cultural and historic destinations.

Objective 2E: It will work to preserve elements of the Region’s transportation history including its historic bridges, trestle bridges, railroad depots, rail rights of way and other resources.

***Goal 2 addresses the following Ten Year Plan Project Criteria: Greenhouse Gas Emissions Impacts, Impacts to Natural Environment, and Impacts to Historical/Cultural Resources. It also addresses the Balanced Scorecard’s performance measures to improve asset conditions.***

**Goal 3: The transport system will provide people of all ages and abilities timely access to goods, services, recreation, entertainment and companionship.**

Objective 3A: It will preserve mobility on all backbone arterial highways identified in all 8 corridors of the *SOUTHWEST CONNECTS* Plan.

Objective 3B: It will maintain public access of existing public infrastructure that currently causes or is expected to cause unreasonable detours.

Objective 3C: It will improve mode of transport choices as well as the quality of existing alternative choices inside the region and with outside destinations.

Objective 3D: It will support and encourage local efforts to improve street, sidewalk, bicycle path and virtual connectivity as well as land use practices that reduce overreliance on building transportation capacity or requirements for long-distance transportation solutions.

***Goal 3 addresses the following Ten Year Plan Project Criteria: Alternative Modes, Congestion, Freight Mobility, Availability of Alternative Routes, Facility Importance and Traffic Volume. It also addresses the Balanced Scorecard’s performance measures to increase mobility.***

**Goal 4: The transport system will be designed and managed to eliminate fatalities and injuries as well as provide reassurance to the traveling public that they are safe.**

Objective 4A: It will be designed and managed to address the unique safety challenges of special populations including but not limited to senior citizens, the disabled and the youth.

Objective 4B: It will eliminate safety risks associated with poor transportation asset conditions.

Objective 4C: It will address safety concerns of “incomplete streets” and its effect on the traveling public’s comfort level while walking, biking or using transit.

Objective 4D: It will proactively mitigate potential dangers associated from severe storm events and other causes of potential hazards.

***Goal 4 addresses the following Ten Year Plan Project Criteria: Safety Measures, Safety Performance, and Current Asset Condition. It also addresses the NHDOT Balanced Scorecard performance measure to improve system safety.***

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# **REGIONAL TRANSPORTATION IMPROVEMENT PROGRAM**

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The Regional Transportation Improvement Program (RTIP) documents regional projects and initiatives that advance the SOUTHWEST CONNECTS Vision and are guided by the SOUTHWEST CONNECTS Approach, Goals and Objectives. Projects and initiatives are described with information where available on costs, implementation schedule, and their location. Each project and initiative is coded according to the Corridor System where the project exists, allowing the reader to more easily understand where strategic investments are taking place to enhance regional transportation in the Southwest Region. This chapter of the Plan is updated every year.

The section entitled **PROGRAMMED REGIONAL SURFACE TRANSPORTION CAPITAL PROJECTS** lists regional-oriented “brick and mortar” capital projects, services and planning initiatives occurring in the Southwest Region. Capital projects are updated based on the recommendations of SWRPC and the resultant list of projects adopted as law by the Governor and Legislature as the biennial New Hampshire’s Ten Year Transportation Improvement Plan (TYP). SWRPC recommendations are based on town project nominations and project assessments performed by the SWRPC Transportation Advisory Committee. Cost, schedule and other project description information is based on the TYP and the State Transportation Improvement Program (STIP).

This list is not an exhaustive list of all projects occurring in the region, but it does include all of the projects in which the Regional Planning Commission is asked to weigh in by NHDOT. Certain categories of projects that are not included in this list include maintenance projects (e.g. repaving projects, guardrail replacement, bridge inspection, etc.), locally administered municipal projects using state or federal monies, transit, aeronautic and rail projects. The list of projects are financially constrained according to the projected amount of funds that the State of New Hampshire has available to invest in the transportation system. The Southwest Region, along with the other eight regional planning districts in the State work with a budget that is based on the Region’s proportion of the State’s population as well as its proportion of road lane miles eligible through various funding sources.

Whereas PROGRAMMED REGIONAL SURFACE TRANSPORTATION CAPITAL PROJECTS lists projects that SWRPC is asked to weigh in on, **OTHER PROGRAMMED REGIONAL PROJECTS** lists projects that, because of their funding source, are not expressly evaluated by SWRPC as part of its biennial evaluation of TYP projects. However, they are included in list form because they are expected to have substantial regional impact as well as promote the SOUTHWEST CONNECTS Vision, Approach, Goals and Objectives.

**UNFUNDED REGIONAL PROJECTS** is a third list in the RTIP, which describes projects that are seen as transportation needs in the Region, but due to scarce funding resources are unfunded at this time. This list was created to help readers understand the full range of known transportation needs in the Region.

Finally, the **FUNDED CORRIDOR RELATED PLANNING INITIATIVES** list identifies planning initiatives of SWRPC, MRTMA and MRCC that are expected to help improve challenges faced by the eight corridors identified in SOUTHWEST CONNECTS. These initiatives often involve gathering data, performing analysis and working with stakeholders to establish consensus and support for corridor goals or project purpose and need statements or other planning guidance.

## PROGRAMMED REGIONAL SURFACE TRANSPORTION CAPITAL PROJECTS

Project #	Project Description	Phase	Timeframe	Cost (M)	Corridor(s)
20817	Alstead, NH 123A: Replace Single Span Bridge Over Warren Brook - 073/163 {Red List}	Preliminary Engineering	2015-2017	0.105	NH 9 East
		Right of Way Acquisition	2015-2016	0.021	
		Construction	2020-2021	2.420	
13597	Chesterfield, NH 63: Reconstruct to improve safety adjacent to Spofford Lake in the area of the "S-curves" from North Shore Road southerly to approximately .5 miles {STP-Safety}	Right of Way Acquisition	2013	0.055	NH 9 West
		Construction	2013	0.440	
12210	Hinsdale and Brattleboro, VT, NH 119: Replace 2 bridges over Connecticut River - 041/040 & 042/044, by constructing a new bridge 043/044 just downstream [Section 1602 - Designated Project; Demo Id NH018 & NH021] [Parent = 12110#]	Preliminary Engineering	2016-2018	44.184	NH 9 West
		Right of Way Acquisition	2016	1.202	
		Construction	2021-2022	0.297	
16307	Jaffrey, US 202/NH 124: Reconfigure 'dog-leg' @ intersection of NH 124	Preliminary Engineering	2015-2017	0.529	US 202 South
		Right of Way Acquisition	2018	0.312	
		Construction	2020	8.239	
16152	Keene, NH 9/10: Bridge Rehabilitation - 129/099 {Red List}	Construction	2021	2.057	NH 9 East
14465	New Ipswich, NH 123/123: Replace bridge over Souhegan River - 157/093 {Red List}	Preliminary Engineering	2013-2014	0.445	NH 101 East
		Right of Way Acquisition	2013	0.270	
		Construction	2014-2015	2.871	
14772 A	Peterborough, US 202: Reconstruction 1000' at Main Street intersection. Also reconstruct granite block wall along US 202 that connects to Main Street Bridge abutment (Town-Owned)	Construction	2016	2.130	US 202 North

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**PROGRAMMED REGIONAL SURFACE TRANSPORTION CAPITAL PROJECTS (continued)**

Project #	Project Description	Phase	Timeframe	Cost (\$M)	Corridor(s)
24500	Peterborough, NH 136: Bridge replacement - 110/115 {Red list Bridge}	Construction	2020	1.329	US 202 North
10439	Roxbury and Sullivan, NH 9: Reconstruct shoulders & widen from East Sullivan, South 2.04 mi, including bridge replacement - 093/061 (Red List)	Preliminary Engineering	2015-2017	0.747	NH 9 East
		Right of Way Acquisition	2015	0.284	
		Construction	2017	6.045	
27692	Swanzey, NH 32: Bridge replacement, over Martin Brook Br #149/072. (Red List)	Construction	2023	1.726	NH 12 South
14747	Walpole and Charlestown, NH 12: Reconstruction from Main Street in Walpole to NH 12A in Charlestown, remove concrete base, add shoulders and improve drainage.	Construction	2016-2017	13.981	NH 12 North
12906	Winchester, NH 10: Bridge replacement over Ashuelot River - 152/181 {Red List}	Construction	2013-2014	5.947	NH 10 South
20819	Winchester, NH 10: Rehabilitation or replacement of 12' concrete box over Forest Lake outlet - 137/121 (RED LIST)	Preliminary Engineering	2015-2016	0.063	NH 10 South
		Right of Way Acquisition	2015-2021	0.018	
		Construction	2021	1.158	
				11.679	NH 9 East
				46.178	NH 9 West
				7.186	NH 10 South
				13.981	NH 12 North
				1.726	NH 12 South
				3.586	NH 101 East
				3.459	US 202 North
				9.080	US 202 South
				96.875	All Corridors

OTHER PROGRAMMED TRANSPORTION CAPITAL PROJECTS

Project #	Project Description	Phase	Timeframe	Cost (\$M)	Corridor(s)
16030	Bennington, Village Area: Pedestrian Improvements in Village Area [09-02TE]	Preliminary Engineering	2013	0.076	US 202 North
		Right of Way Acquisition	2014	0.021	
		Construction	2014	0.516	
16047	Dublin, NH 101: Pedestrian Improvements in Village Area [09-12TE]	Preliminary Engineering	2013	0.029	NH 101 East
		Right of Way Acquisition	2013	0.01	
		Construction	2014	0.666	
10309 B	Keene, Winchester Street: Reconstruction from NH 101 roundabout north to Pearl Street/Island Street including intersection at Key Road [MUPCA*450] {Municipal Urban Projects}	Construction	2021	2.743	NH 10 South
27790	Keene, Gilbo Ave: Multiuse Path Along Gilbo Ave and Colony Mill Marketplace [TE]	Preliminary Engineering	2014	0.700	NH 9 West
		Right of Way Acquisition	2014	0.005	
		Construction	2015	0.701	
16034	Winchester, NH 10 (Main Street and Warwick Road: Pedestrian Improvements in Village Area	Preliminary Engineering	2013	0.021	NH 10 South
		Construction	2013	0.300	
				0.000	NH 9 East
				1.406	NH 9 West
				3.064	NH 10 South
				0.000	NH 12 North
				0.000	NH 12 South
				0.705	NH 101 East
				0.613	US 202 North
				0.000	US 202 South
				5.788	All Corridors

**UNFUNDED REGIONAL TRANSPORTATION PROJECTS**

Project #	Project Description	Timeframe	Cost (\$M)	Corridor(s)
11999A	Chesterfield, off road: Bridge rehabilitation, deck replacement and superstructure repairs recommended by Bridge Design -	N/A	3.000	NH 9 West
N/A	Dublin, NH 101: Reconstruct NH 101 from Marlborough TL to Dublin Lake, Remove concrete and reconstruct, 3.851 Miles	N/A	11.550	NH 101 East
N/A	Gilsum, NH 10: Rehab/reconstruction to address pavement transverse/tent cracking and heaving in the winter, from northerly intersection of Riverside Rd to the northerly intersection of Old Marlow Road, 2.4 miles.	N/A	7.200	NH 9 East
10309 J	Keene, NH 9/10/12/101 intersection: Add additional turning lanes and adjust medians.	N/A	2.200	NH 9 West NH 12 North NH 101 East
10309 L	Keene, NH 12/101: Widen existing two lane segment of highway between intersection with Main Street and Winchester Street to four lanes.	N/A	5.260	NH 101 East
N/A	Peterborough, US 202/NH 123: Bridge Replacement - 108/116 {Red List}	NHDOT Recommendation 2019	5.000	US 202 North
16073	Stoddard, Antrim and Hillsborough, Capacity, safety improvements and acquire controlled access ROW	N/A	2.050	NH 9 East
N/A	Temple, NH 101: Remove concrete pavement and reconstruct from Peterborough TL easterly to Wilton TL, 3.411 MI.	N/A	10.230	NH 101 East
12905	Walpole and Rockingham, VT, Bridge Street: Historic bridge rehabilitation - replace deck & floor system, rehab abutments & pier - 062/052 {Red List}	NHDOT Recommendation 2024	6.500	NH 12 North

Continued on next page...

Continued from previous page...

**UNFUNDED REGIONAL TRANSPORTATION PROJECTS (continued)**

Project #	Project Description	Timeframe	Cost (\$M)	Corridor(s)
N/A	Westmoreland, NH 12: Bridge Replacement or Rehabilitation (heavy spalling and exposed rebar in invert) - 113/163 {Red List}	NHDOT Recommendation 2022	0.800	NH 12 North
N/A	Westmoreland, NH 63: Repair erosion at SW wing and northern abutment - 109/124 {Red List}	NH DOT Recommendation 2022	0.200	NH 12 North
8070	Keene-Swanzey, Dillant-Hopkins Airport: Expansion - apron & hangar improvements	NHDOT Recommendation 2020-2024	2.020	NH 12 South
8071	Keene-Swanzey, Dillant-Hopkins Airport: Modernization - taxiway improvements	NHDOT Recommendation 2022-2024	4.234	NH 12 South
8072	Keene-Swanzey, Dillant-Hopkins Airport: Preservation - runway reconstruction and hazard beacon rehabilitation, master planning, SRE purchase.	NHDOT Recommendation 2015-2018	2.881	NH 12 South
			<b>7.200</b>	<b>NH 9 East</b>
			<b>3.733</b>	<b>NH 9 West</b>
			<b>0.000</b>	<b>NH 10 South</b>
			<b>8.233</b>	<b>NH 12 North</b>
			<b>9.135</b>	<b>NH 12 South</b>
			<b>27.773</b>	<b>NH 101 East</b>
			<b>5.000</b>	<b>US 202 North</b>
			<b>0.000</b>	<b>US 202 South</b>
			<b>63.125</b>	<b>All Corridors</b>

FUNDED CORRIDOR RELATED PLANNING INITIATIVES

ID #	Project Description	Time-line	Corridor(s)		
			NH 101 West	Other Target Corridor To Be Decided	Other Target Corridor To Be Decided
UPWP Task 211	Livability Charrettes - Project will implement plans for transportation assets and enhancements in 3 town centers based on the inventory, data analysis, and community visioning workshops.	2013-2015	NH 101 West	Other Target Corridor To Be Decided	Other Target Corridor To Be Decided
UPWP Task 212	SW Region Preliminary Rail Asset Feasibility Study - Project gathers data, community and local business input and freight expert input to assess the feasibility of reviving three rail facilities in the Southwest Region that have benefited by rail improvement projects. This includes two underutilized sections and one temporarily defunct section of rail in the Southwest Region: 1) the Hinsdale Fort Hill Branch railroad line; 2) the North Walpole portion of the New England Central Railroad; and 3) the Greenfield, Bennington and Antrim sections of the Hillsboro branch. This project will provide important decision making information for the state, communities and businesses to better understand the potential role of the assets to promote rail freight as part of the State’s larger freight planning process.	2013-2015	NH 9 West	NH 12 North	US 202 North
UPWP Task 213	Hinsdale Island and Surroundings Planning - Project develops a vision and preliminary land use and transportation plan for the use of Hinsdale Island based on the anticipated implementation of Project #12210, which will keep existing bridges to the island in place for pedestrian, bicycle and emergency vehicle use.	2013-2015	NH 9 West		
UPWP Task 214	NH 12 Corridor Study - The project will work with the State, the communities of Keene, Swanzey, Marlborough, Troy and Fitzwilliam to develop a consensual vision for the NH 12 South Corridor that is compatible with regional mobility and each community's vision.	2013-2015	NH 12 South		
UPWP Task 215	Regional Rail Trail Planning - This project will gather baseline data to enable the State, region and communities to appropriately manage rail trail assets present in each Corridor and examine opportunities for improving community livability or bolstering the Monadnock tourism economy.	2013-2015	All Corridors Have Regional Rail Trails That Will Benefit From this Project		

# **TRANSPORTATION CONTEXT AND CONCEPTS**

**DRAFT**

This section of the Plan defines major transportation concepts and affirms some of the current thinking that led to the formation of the preceding section on Vision, Approach, Goals, Objectives, the section on Regional Transportation Improvement Program and Initiatives and the following section on Southwest Region's Corridors.

## What Transportation Is

Transportation is almost invisible, yet it is everywhere we look. It tends to blend in with the scenery and is connected to almost everything we do as a society. We often take for granted the pervasive impact it has on all of us. The core purpose of transportation has always been to overcome space (across land, water, air) by taking on human and physical constraints such as distance, time, topography and administrative jurisdiction policies.<sup>1</sup> It always involves helping people, freight and information move through space. Two key goals of transportation are *mobility* and *accessibility* where mobility describes the efficiency of physical movement and accessibility describes the ability to reach desired services and activities.<sup>2</sup> The context of how it maneuvers through these constraints depends on four key transportation ingredients which can differ from place to place and over time. The four key ingredients include 1) infrastructure (railroads, bridges, highways, airports, utility lines, pipelines), 2) the technology that provides mobility (steam engine, internal combustion engine, internet), 3) the energy sources that move people, freight and information over the infrastructure (petroleum, electricity) and 4) the variable demands that cause people, freight and information to move in the first place.

While transportation effectively moves people, freight or information, it physically moves only people or things. The movement of people, in this Plan, is categorized into *personal transportation* and *passenger transportation* where "personal" represents user-based transportation and "passenger" represents services provided by an outside party. The movement of things can involve the movement of commodities, documents, or in the case of telecommunications, electrons and electromagnetic waves. *Freight transportation* includes moving commodities over distance such as television sets or tomatoes, or moving information or other forms of communication represented in physical form such as postal mail or document deliveries by companies such as Fed Ex or UPS. *Virtual transportation* refers to the idea of transporting people and their ideas virtually, through telecommunications technologies.

Figure a: Transportation is invisible, yet everywhere we look.



If you look at this picture and are asked to describe it, you might call it a "downtown". But notice the bikes, bus, cars, and pedestrian. Transportation is everywhere yet it is invisible.

Photo credit: SWRPC

<sup>1</sup> Rodrigue, Dr. Jean-Paul, The Geography of Transport Systems, Chapter 1.

<sup>2</sup> Litman, Todd, TDM Encyclopedia, "Measuring Transport," Victoria Transport Policy Institute.

## Definition and Role of Regional Transportation

Transportation can be local, regional or even global in scope. Somewhere in the middle, between local and global, is regional transportation. Regional transportation itself can encompass many different scales of territory depending on the context. It can range from entire hemispheres to groups of states or provinces to groups of municipalities. **For the purposes of planning for the Southwest NH Region area, the definition of regional transportation used in this plan is transportation between two or more municipalities in the Southwest Region as well as transportation linking the Southwest Region to neighboring regions (as defined by regional planning districts) in New Hampshire, Massachusetts and Vermont.** This definition allows the scope of the plan to examine *intra* and *inter-regional* transportation issues, without extending its focus to territories that are less connected and codependent with the Southwest Region.

Figure b: Example of how many Southwest Region trips tend to be regional rather than local.



Most transportation tends to be regional as described in the definition above. Consider NH Route 9 which connects eight municipalities in the Southwest Region to each other as well as to Interstate Route 91 and Interstate Route 89 and beyond. Although NH Route 9 hosts local and interstate traffic, work commuting, shopping trips, service related trips, and freight movements demonstrate that traffic on the facility is overwhelmingly regional. So even though communities on NH Route 9 are a string of unique places in their own right, and the State of New Hampshire is responsible for maintaining the facility and ensuring connectivity with the national highway system, paying attention to the regional value of the

facility is extremely important. Not all regional travel patterns are within the Southwest Region, however. Preserving inter-regional transportation connections with neighboring regions in New Hampshire, Vermont and Massachusetts are particularly important to the Southwest Region economy. People living and doing business from inside the region rely on long distance mobility transportation assets located in neighboring regions such as interstate highways I-89, I-91 and I-93, railroads like the New England Central Railroad and major airports in Manchester, Boston, MA and Hartford, CT.

## Transportation Modes

The principal *modes of transportation* that are in use today have their own basic requirements for infrastructure, the technology they use for propulsion/movement, their fuel source, and how they are used (nature of demand). Modes are not limited to transportation on wheels or with wings. The modern definition now includes everything from walking to pipelines to telecommunications.

**Table 1: Basic Characteristics of Common Modes of Transportation in Use Today**

Transportation mode	Basic infrastructure requirements	Predominant technology	Energy/ fuel source	Nature of Demand
Pedestrian	Sometimes sidewalks or multi-use paths	No technology required	Human power	Personal travel
Bicycle	Sometimes highway shoulders, bike lanes or multi-use paths	Bicycle	Human power	Personal travel
Motor Vehicles and Trucks	Highways; parking; fueling stations	Internal combustion engine, electric motor	Petroleum, electricity, natural gas	Personal travel and freight for trucks designed for cargo
Bus Transit	Highways; parking; fueling stations	Internal combustion engine	Petroleum	Passenger travel and light freight
Locomotive	Railroads with fueling stations or electric rail; depots; sidings;	Internal combustion engine, induction motor	Petroleum, electric	Freight and passenger travel
Ships	Ports with fueling	Internal combustion engine	Petroleum	Freight
Airplane	Airports with fueling	Internal (continuous) combustion engine	Petroleum	Passenger travel and freight
Pipeline	Pipeline	Pumping systems	Petroleum	Freight
Telecommunications	Satellites; utility line infrastructure with broadband	Internet based technologies	Electricity	Personal (virtual) travel

Source: SWRPC

Table 2: Transportation Infrastructure in SW Region, 2014

Infrastructure	Quantity
Sidewalks	103 miles
Hardpack or Paved Multiuse Paths	45.4 miles
4 foot shoulders for Biking*	193.6
Bike Lanes	1.1 miles
Highways (Class I – V)*	1,862 miles
Bridges	487
Fuel Stations	73
Local Bus Transit Routes*	17.6 miles
Intercity Bus Transit Routes	37 miles
Active Rail Line	11 miles
Rail Sidings	3.6 miles
Abandoned Rail ROW	36 miles
Marine Ports	0
Airports	2
Pipeline	0

Source: SWRPC & NHDOT

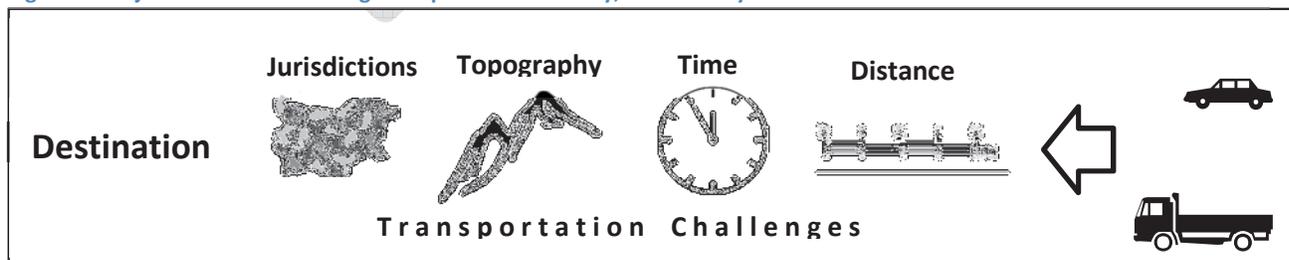
\*Based on road distance not road lane distance. All information are estimates based on best available data.

If either the transportation mode’s infrastructure, technology, energy source or demand are not in place or are impractical to develop, that mode can fail. Consider Southwest New Hampshire as an example. The Region’s infrastructure is strong in highways, spotty in pedestrian, bicycle, rail, airports and broadband infrastructure and marine infrastructure and pipelines are non-existent. Consequently, modes that depend on highways are in a stronger position to accommodate demand than the other modes of transportation. However, buses, which are supported by highway infrastructure are not strong in the Southwest Region. In the case of bus transit, demand (passengers and political will to subsidize transit) for passenger travel has been relatively insignificant for several decades. At present, there are no technology or energy challenges facing the Southwest Region, but for future planning purposes, technological efficiency and energy sources may become more important factors for determining mode development in the Region.

### Transportation Challenges

In an ideal world, transportation would provide access to everywhere, instantaneously, for free. However, there are several basic factors that constrain what our transportation system provides in terms of accessibility and mobility. As mentioned earlier, some of these major factors include distance, time, topography, and administrative jurisdiction policies. Although these are fairly mundane concepts, their impact on transportation is very significant.

Figure c: Major Factors Constraining Transportation Mobility, Accessibility and Cost



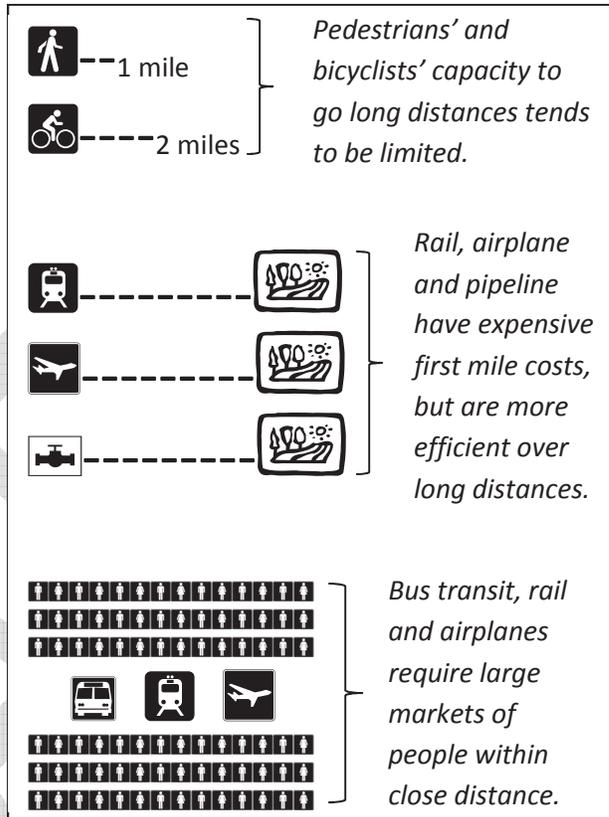
Source: *The Geography of Transport Systems*, Third Edition by Jean-Paul Rodrigue, Claude Comtois & Brian Slack, 2013.

### Distance and Time

Distance and time are key factors when we think about transportation. How far away is the destination? How much time will it take? Increasingly, the distinction between distance and time has blurred due to advances in transportation infrastructure, technology and affordable energy such that the questions “how far” and “how much time” can mean the same thing.

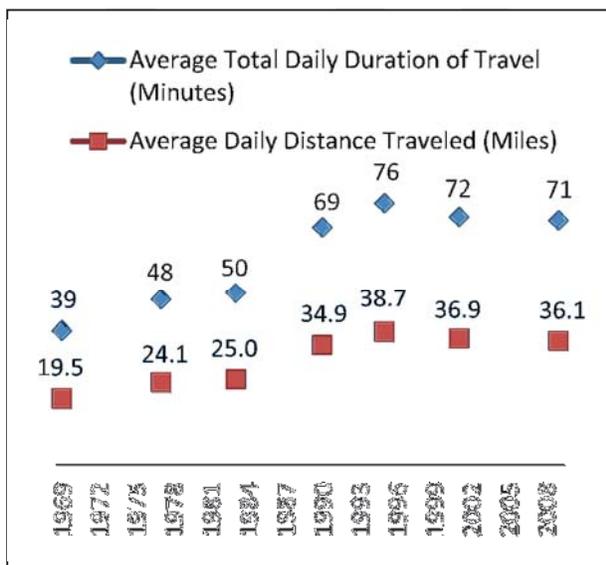
Still, distance remains an important factor for shaping transportation and determining what modes best meet transportation needs. Some modes of transportation, for all practical purposes, are limited by distance such as pedestrian and bicycle modes. Some modes are more efficient (less costly) moving people, freight or information over long distances instead of short distances such as rail, airplanes or pipeline. Other modes rely on market density, which is the same as the number of people or goods within a specific distance from each other and the transportation mode (bus transit, rail, airplanes).

Figure d: Transportation and Distance Concepts



Source: SWRPC

Figure e: American Travel Distance and Time, 1969-2009



Source: National Household Transportation Survey, 2009

Transportation technological advances and affordable energy have enabled people to increase their access to places where they want to live, work and play, making distance less of a factor in their daily lives. In New Hampshire, individual demand for land ownership combined with population growth has resulted in more dispersed settlement patterns. Decreased land use density translates into longer trip distances for Granite Staters. In context of the global economy, as transportation technology and affordable energy has made distance less relevant, the world economy continues to expand. Businesses are taking advantage of economic advantages in once

distant geographical locations in order to access raw materials or more affordable labor.

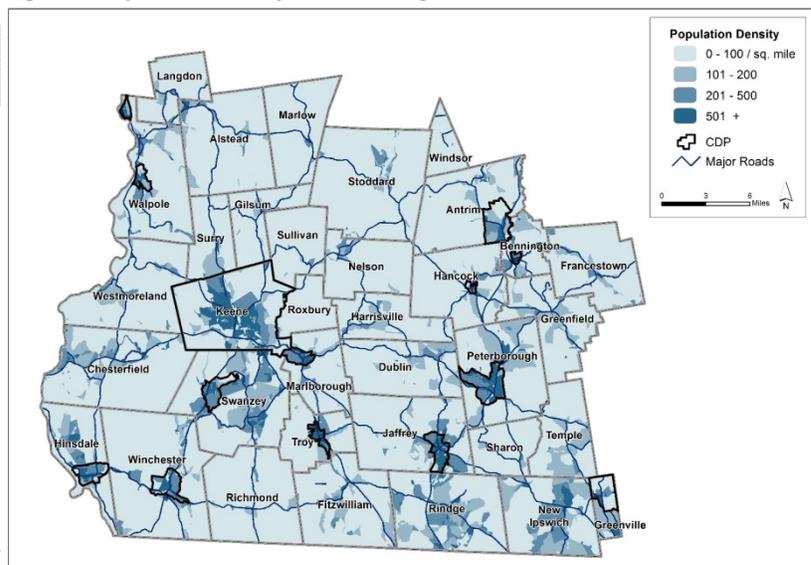
Since 1969, the distance that Americans travel daily has increased about 85%. Interestingly, time spent traveling has increased at roughly the same rate, meaning that the average American's mobility has kept pace with growth. In 1969, American's average distance traveled was 19.5 miles and took up to 39 minutes of their day on average. Distances and travel time increased steadily through 1980s, grew sharply in the 1990s and plateaued around the early 2000s. Today, the average American is estimated to travel about 36 miles daily, spending 71 minutes per day traveling to various destinations whether the trip purpose is to get to work, shopping, or for leisure purposes.

Despite the fact that transportation demands more time out of an average American's day, many changes to technology and management strategies have evolved to address time constraints. Improvements in intelligent transportation systems (ITS), such as geographic positioning systems and smart message board signs, allow modes of transportation to navigate through time constraints such as congested roads by providing information on alternative routes or less congested times of day. Other ITS technologies save people time by tracking real time movements of modes of transportation such as bus, transit or airplanes through global positioning systems connected to smart phones. New generations of workplaces are increasingly replacing the former 9 to 5 schedule with schedules that allow them to use transportation less frequently through flextime arrangements or eliminate transportation completely through work at home arrangements. In the world of freight transportation, time is also relevant. The term "just in time" describes a contemporary production management strategy designed to eliminate costs associated with time, in particular warehousing, so that commodities are transported directly from a supplier to a consumer on demand. Delivery companies such as UPS and Fed Ex provide consumers access to distance and time logs which track package deliveries and estimated delivery times for parcels traveling global distances.

The Southwest Region has its own unique relationship with distance and time constraints. The Region itself is a contiguous block of 35 towns in Southwest New Hampshire covering 1,007 square miles. At its widest points, the region is approximately 36 miles from east to west and 33 miles from north to south.

With the exception of the City of Keene, and several other small downtowns and village centers, the population is mostly dispersed. The Region has a mostly dispersed population with concentrated pockets of high population density, which correspond roughly with the the *Census Designated Place* (CDP) boundaries outlined in black on Figure f. The region is located approximately 80 miles from Boston, which is the largest

Figure f: Population density in the SW Region



transportation hub in New England and close to other important destinations, making the region rural, but not remote.

As a whole, 65% of the working population (23,267 people) lives and works in the Region. Almost half of all commuters travel less than 10 miles from home to work, but there are approximately 4,000 workers that travel greater than 50 miles on a regular basis.

**Table 3: SWRPC Resident Commute Distance, 2011**

	Count	Share
Total Primary Jobs	48,075	100.0%
Less than 10 miles	17,816	37.0%
10 to 24 miles	11,342	23.6%
25 to 50 miles	6,763	14.1%
Greater than 50 miles	5,507	11.5%
To Massachusetts (distance unknown)	6,647	13.9%

Source: US Bureau of Census Longitudinal Employer-Household Dynamics, 2011

The majority of trips that Southwest Region residents make for shopping, services or medical appointments are local or regional in nature depending on the town of residence. Major supermarkets are distributed around the Region in Walpole, Keene, Swanzey, Hinsdale, Peterborough and Rindge, and just outside of the Region in places like Hillsborough and Brattleboro, VT, although there are several smaller business food stores distributed throughout the Region. Small clothing stores are distributed throughout the Region, with the only larger stores located in Keene, Rindge and Hinsdale. In the Southwest Region there are two medical hospitals in Keene and Peterborough, as well as a hospital in Brattleboro, VT, all of which provide medical services including some medical specialization services. Access to basic services depends on each town’s geographical location, but most services are within a 20 mile drive.

**Table 4: Road Mileage Distances and Times from Center of SW Region**

Interstate 91 (Brattleboro, VT)	32 miles (50 minutes)
Interstate 89 (Hopkinton, NH)	38 miles (58 minutes)
Interstate 93 (Bow, NH)	48 miles (60 minutes)
Manchester Boston Regional Airport	47 miles (1 hour, 12 minutes)
Dartmouth-Hitchcock Medical Center, Lebanon, NH	77 miles (1 hour, 34 minutes)
Boston, MA	82 miles (1 hour, 46 minutes)
Bradley Airport, CT	102 miles (1 hour, 59 minutes)

Source: Google Maps from Origin Point of Harrisville, NH which is positioned in the Center of the SW Region

Distance to significant personal transportation destinations outside of the Region can range to about 100 miles (or 2 hours), but most important personal travel destinations (for niche shopping needs or specialized services) are within a much shorter distance.

Freight transportation distances tend to be longer than personal or passenger transportation distances. Approximately 60% of all trips are over 250 miles. Unfortunately, there is no freight data specifically for the Southwest Region. However, for New Hampshire we know that by ton per mile, only about 15% of freight traffic is probably occurring in a range of 50 miles. For some virtual transportation trips, telecommunications has made distance and time largely irrelevant. Though not traditionally considered the nuts and bolts of transportation, telecommunications has become increasingly relevant to transportation planning. Just as we have an interstate highway, we have an information highway, both

of which can connect people and services. Telecommunications technologies make it possible to replace trips to work or to stores. However, recent broadband mapping and planning efforts by Southwest Region Planning Commission suggest that the Southwest Region’s telecommunication infrastructure (broadband) remains spotty, therefore making distance an ongoing challenge.

**Table 5: NH Distance of Freight Originating in NH by Ton-Mile, 2007**

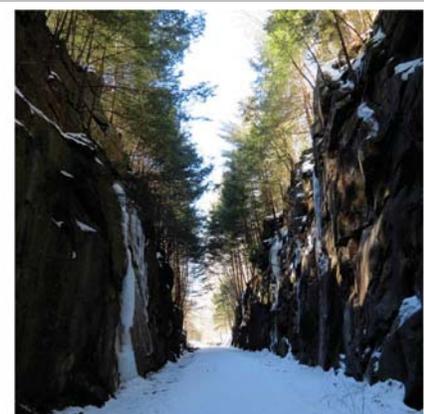
Distance from Southwest NH Region	Ton-Miles	Mileage is as close as...	and as far as...	Notable Destinations within range include...
Less than 50 miles	15.5%	Local Trip	Worcester, MA	Nashua, NH; Northampton, MA
50-99 miles	10.8%	Northampton, MA	Hartford, CT	Boston, MA
100-249 miles	14.5%	Hartford, CT	New Brunswick, NJ	New York, NY; Montreal, QB
250-999 miles	25.2%	Syracuse, NY	Chicago, IL	Charlotte, NC; Detroit, MI;
1,000 or more miles	34.1%	Chicago, IL	Shanghai, China	Singapore, Malaysia, Rotterdam, Netherlands

Source: US Department of Transportation, Bureau of Transportation Statistics

### Topography

Topography, the natural and physical features shaping our Region, has had and will continue to have a strong impact on transportation. Steep slopes, wetlands, rivers and other characteristics of the natural physical environment place constraints on where we can build and expand transportation infrastructure, but also limits new development and expansions of homes, commercial buildings and parking lots that are connected with each other by our transportation system. Topography's influence can be seen at the local level, imposing restrictions today on where we build new roads or add additional lanes to highways because of wetlands or steep slopes, and it impacts us at a larger regional level. For example, some policy makers in northern New England States aspire to one day have an east-west limited access highway to promote trade and travel with the American Midwest and Canada, but the Appalachian Mountains are a massive obstacle to that dream. Traversing complicated topography is difficult due to environmental protections in place for resources such as wetlands, streams and rivers, but also because it is expensive.

**Figure d: Granite in the Granite State**



*Hillsides of granite along the Cheshire Rail Trail are one of the SW Region’s special challenges with topography.*

Photo credit: [nhgardensolutions.wordpress.com](http://nhgardensolutions.wordpress.com)

In the Southwest Region's recent past, many topographical features were overcome when, relative to today, there was more capital to build infrastructure, and few or no environmental regulations were in place. The highways and rail right of ways that traverse through the Region were engineered to be as close as possible to no more than 3% slope and as close to a straight line between important origins and destinations. To accomplish this feat, planners and engineers had to traverse through mountains, hills, and chasms by conducting major dynamite blasting operations and relocating rock and soil to develop massive causeways between valleys with teams of men, horses and later machines. Today, there are 275 municipal bridges, 221 state bridges, 3 bridges belonging to the Army Corps of Engineers, and 2 that are considered Railroad bridges. There are also countless culverts crossing the many rivers, wetlands and streams that snake through all parts of the Southwest Region. Although the Region's topography has made it such that there are times when it is more convenient to travel south to go longer distances east or west, this infrastructure has made it possible to access almost every corner of the Region with relative ease if you are able to drive a vehicle.

Figure e: Washout at Belvedere Rd in Keene, NH (2012)



Photo credit: Keene Sentinel

Despite overcoming many topographical challenges in the past, topography challenges remain today. With infrastructure placed over or near riparian areas, hills and mountains, maintenance can be challenging. Bridges are expensive to maintain, and even more expensive to rebuild. Today there are 94 bridges on the State Department of Transportation's *red list* in the Southwest Region, a state watch list that has bridge inspections at least twice a year instead of the normal inspection schedule of one time every two years.<sup>3</sup> Nearly 20% of the 487 bridges in the Region are red listed. Since 2008, the number of bridges have remained consistently high partly due to limited financial resources at the state

level. A more recent topographical related phenomenon impacting the region has been a spate of extreme weather events in which unprecedented heavy rainfalls have washed out highways and blocked culverts. The strongest impact has been felt in parts of the Region where water is less likely to get absorbed and thus washes down hills. Since the December 2008 Ice Storm, over 280 roads and highways have been closed in the Southwest Region due to natural disasters.<sup>4</sup> The SWRPC Natural Resource Plan suggests that more heavy precipitation events are likely to come our way, potentially with more frequency.

Topography will remain a challenge to maintaining infrastructure, but also in regards to building new infrastructure. Most of the land that is easiest to build on has already been built on. As the Region

<sup>3</sup> The red list identifies bridges for which at least one of its main components--the bridge deck, superstructure or substructure, is rated as "poor."

<sup>4</sup> Road closure incidents reported by New Hampshire Department of Safety, Homeland Security and Emergency Management from December 2008 Ice Storm to July 2013 Floods.

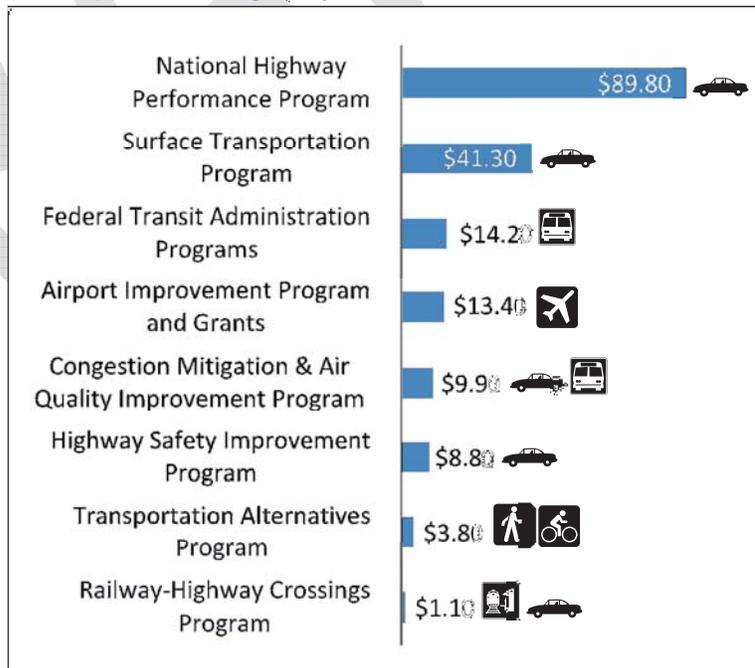
grows, and if trip distances remain largely irrelevant, more capacity and mobility preservation techniques will be required for our transportation infrastructure. One way of ensuring that regional mobility remains strong is the creation of a network of streets to connect to local destinations, providing relief to our regional highways by separating local from regional traffic. Topography will continue to challenge us in constructing new streets. Furthermore, environmental regulations designed to protect special environmental resources will require that we maintain and protect what we have for regional infrastructure, before building new.

### Administrative Jurisdiction Challenges

Another factor shaping transportation mobility and accessibility are the administrative jurisdictions that manage or regulate the transportation system. Different levels of government make policy decisions whether it is financing transportation improvements or services, regulating transportation in context of land use and environmental resources, or other policies shaping how our transportation system should be used or designed. In addition to the 35 towns that make up the Southwest Region transportation system, several other administrative jurisdictions including neighboring towns, the State of New Hampshire, Vermont and Massachusetts and the federal government can and do impact the Region’s mobility and accessibility. Private sector entities, such as railroads, also affect transportation mobility and accessibility.

Funding policies are one of the most obvious ways that administrative jurisdictions impact transportation. General examples of fiscal policies include taxes, fees, subsidies or revenue apportionment (how money is invested) policies. Fiscal policies will dictate how much revenue is available to sustain or develop the transport system, and shape decisions about investments in *asset management, maintenance, operations, modernization, capacity expansion, multimodal development* and other transport management themes. Other kinds of policies affecting transportation can have impact on transportation such as design standards, policies to serve marginalized user groups, management policies designed to protect transportation investments or policies to protect historical, cultural or environmental resources.

Figure g: Federal Transportation Funding in New Hampshire in FY 2013 (Millions) and Benefitting Transportation Modes



Source: FHWA, FTA, FAA

The federal government continues to have a major role in funding and thus shaping the transportation system in New Hampshire. In the State’s draft *10 Year Transportation Improvement Plan* for FY2015-

Figure f: Noteworthy Federal Transportation Policies

**ADA** – The Americans with Disabilities Act (ADA) is a law that prohibits the discrimination of people based on disability. In the realm of transportation, it ensures public transportation and other transportation facilities such as sidewalks, walkways, bike paths, etc accommodate people with disabilities.

**NEPA** – The National Environmental Policy Act (NEPA) requires transportation projects to integrate environmental values into the decision making processes by considering environmental, historical, archaeological and other impacts. The policy is designed to prevent or mitigate any harmful impacts resulting from transportation projects.

**Interstate Weight** – Title 23 of the U.S. Code states that vehicles are not allowed to travel on interstate highways that carry more than 20,000 lbs on any one axle, or with a tandem axle weight of 34,000 lbs, or a gross weight of 60,000 lbs for a vehicle with five or more axles. This policy requires heavier loads to use state and local road highways, which can impact highway maintenance costs.

**Clean Air Act** – The Clean Air Act is a federal policy aimed at having the Environmental Protection Agency (EPA) protect the public from air pollution that can harm human health. It requires air quality mitigation for areas of the country that are not attaining federally set air quality standards. This policy is meant to shift investments in transportation that reduce air pollution such as public transit, park and ride lots, etc.

**Title VI** – Part of the Civil Rights Act of 1964, which prohibits the discrimination of people on the basis of race, color, national origin in programs receiving federal financial assistance. The policy prohibits discriminatory transportation decision making or projects.

**Rail deregulation** – Term referring to policies including the Railroad Revitalization and Regulatory Reform Act of 1976 and the Staggers Act of 1980 which eased federal regulation of railroads and allowed private enterprises to pursue ownership of rails and encourage freight business and shift freight to rail away from highway.

Sources: See weblinks above.

2024, 71% of the entire funding of that Plan is paid with federal transportation dollars, with 29% of the cost paid for with state or other dollars.<sup>5</sup> These funds are eligible for everything from highways and bridges, to aviation improvements, to bicycle and pedestrian improvements.

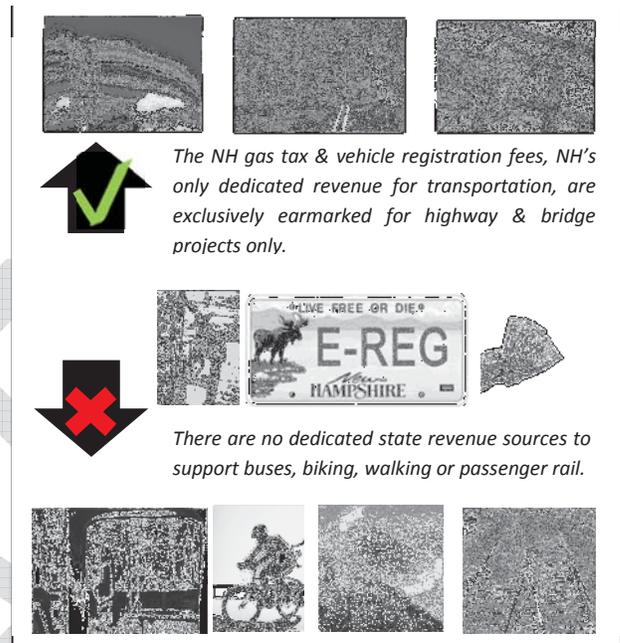
Local funding match is required more often than not. Some categories of this funding can be used flexibly across modes or for different categories of infrastructure, but most of the funding is for a specific type of transportation. With such an enormous contribution to the State’s transportation system, the federal government’s fiscal policies on what transportation assets to spend money on have a major impact on the state and regional transportation systems. These funds provide great opportunities to maintain and upgrade the transportation system, but provide some restrictions on how money can be spent.

Although the federal government’s influence on the transportation system is largely fiscal in nature, there are a number of design and land use related policies attached to federal funding. Some notable policies include the restriction of access points (exits, driveways or entrances) on interstate highways, the limitation of heavy trucks on interstate highways, the design related access requirements for people with disabilities stemming from the Americans with Disabilities Act of 1990 (ADA), and the National Environmental Policy Act of 1970 (NEPA), which regulates use of federal money that may impact environmental, cultural or historical resources.

<sup>5</sup> NH Department of Transportation, 2015-2024 Ten Year Transportation Plan Governor’s Advisory Commission on Intermodal Transportation Public Hearing Presentation, September-October 2013.

The State of New Hampshire also has fiscal policies and other policies that shape the regional transportation system. State funding is restricted by statute to four highway and bridge programs: *State Aid Highway Block Grant Aid*, *State Aid Highway Program*, *State Aid Bridge Program* and the *Betterment Program*.<sup>6</sup> These programs are derived from [Article 6A in the Constitution of New Hampshire](#), which stipulates taxes and fees relating to motor vehicles (the sole dedicated revenue source for transportation of any kind in New Hampshire today) are restricted to the purpose of funding construction, reconstruction and maintenance of public highways in the State. Therefore, motor vehicle taxes and fees cannot be used to finance other modes of transportation. For example, transit in New Hampshire relies primarily on federal and local funding with minimal contribution from the State. Any state funding that is available has come from bonding or general fund financing to pay for capital expenses associated with transit (buses, equipment). In 2011, a study showed that NH was tied for fourth place among the States with the lowest state funding for transit in the nation at \$.32 per capita.<sup>7</sup> State funding for walking, biking and rail does not exist and these are traditionally paid for with federal and local funding. The state does contribute to aeronautics development through airplane registration fees and general fund revenue grant and loan programs.

Figure h: State Transportation Funding in New Hampshire



Source: SWRPC

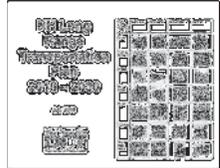
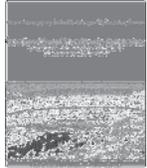
Other significant state policies that impact transportation mobility and accessibility include the state’s road classification system law, which determines ownership and maintenance responsibilities as well as design standards for different types of roads within the State including municipal roads. It also has authority to regulate access to and from state highways which can affect the overall mobility and accessibility of those roads.<sup>8</sup> The State exercises this authority by issuing permits for driveways and entrances, and planning signalization, medians and other design considerations for new developments that are expected to have high traffic generation. This is the extent of the State’s involvement in land use and transportation connection issues. There are other state policies relating to transportation, such as those in the State Transportation Long Range Plan or the NH Climate Action Plan. These plans are important guidance documents, and they are advisory rather than regulatory in nature. More information on these state transportation policies are available in Figure i.

<sup>6</sup> State Highway Block Grant Aid, State Aid Highway, State Aid Bridge and Betterment Programs can be found under the following statutes respectively: RSA 235:23 & 25; RSA 235:10-:21; RSA 234; and RSA Section 235:23a.

<sup>7</sup> Survey of State Funding for Public Transportation: Final Report 2013. American Association of State Transportation Officials and the American Public Transit Association.

<sup>8</sup> The State Road Classification law is under NH RSA 229 and State Access Management law is under NH RSA 230 and NH RSA 236:13.

Figure i: Noteworthy State Transportation Policies

	<p>NH Law splits maintenance responsibilities for roads (<a href="#">NH RSA 229</a>) and bridges (<a href="#">NH RSA 234</a>) between the State and municipalities. The road system is set up in a hierarchy of seven classes of road from Class 1 (high mobility) roads to Class VI (abandoned) roads. NH has a policy for the permitting of driveways and other accesses to state highways derived from <a href="#">NH RSA 236:13</a>. For some portions of roads, the state has purchased the right-of-way to control access points or limit access points to interchanges only.</p>
	<p>The <a href="#">NH Long Range Transportation Plan</a> is a policy advisory document for NHDOT that identifies transportation issues and trends influencing the performance of the system, future opportunities, and articulates the State’s transportation vision and goals. Goals in the document include transportation-land use integration, mobility and modal choice, safety, security, environment and public health, system preservation and maintenance, collaboration and coordination, and stewardship of the transportation system.</p>
	<p>The <a href="#">NH Climate Action Plan</a> recommends NH achieve a long-term reduction in greenhouse gas (GHG) emissions of 80 % below 1990 levels by 2050. The Plan contains a number of objectives and strategies to reduce GHG emissions by reducing vehicle miles traveled (VMT). This includes encouraging appropriate land use patterns as well as creating an integrated multimodal transportation system.</p>

Sources: See weblinks; Photo credit of State Capitol building: [www.gencourt.state.nh.us/](http://www.gencourt.state.nh.us/)

In the same way that federal and state investments affect transportation mobility and accessibility, so do local investments. Decisions on transportation financing at the local level typically come through a local highway department budget on maintenance-related items and through capital improvement plans or warrant articles for larger or discrete transportation improvement projects. Unlike federal or state investments, however, local transportation investments tend to be less the result of an ongoing policy, and more based on case by case comparative assessment of town needs by the town legislative body’s (city council or town meeting voters) on an annual basis.

Figure j: State & Local Road Mileage & Bridges in the SW Region

	Miles of Road	% Miles of Road	Bridges	% of Bridges
State	513	28%	221	45%
Local	1,349	72%	275	55%

Source: NHDOT

Compared with the federal and state government, local government in New Hampshire has the responsibility for the most road and bridge miles. Moreover, it is local government’s responsibility to maintain other transportation modes in its community including sidewalks, bike paths, local bus transit or airports. While the federal government and state government do contribute capital funding to other modes, the presence of different modes of transportation depends mostly on local communities in New Hampshire by virtue of local ongoing maintenance responsibilities and federal and state local match policies. The financing tools that local government has to fund transportation may come through property taxes (general, central business service district, tax increment financing district, village district),

bonding, or special revenue funding through user fees such as vehicle registration fees, parking fees, airport fees or solid waste fees.<sup>9</sup>

In addition to transportation financing, local governments have the authority to create other policies that can have a tremendous impact on transportation mobility and accessibility. Noteworthy examples include local road layout powers and local land use authority such as zoning, subdivision and site plan review. Road layout powers under NH RSA 231:8 provide a community the authority to create a new road, or to make a public highway out of a private road. With that power, the town may enact design standards or determine that road's level of connectivity with the surrounding street network. Zoning powers under NH RSA 674:16 allow local government to regulate and restrict building dimensions, sizes and heights, lot sizes, the density of population, and the location and use of buildings, structures and

Figure k: Local Policies that Impact Walking, Biking, Transit

There are numerous ways that municipalities can improve walking, biking and transit conditions in their community:

- Planning Boards can ensure that land use and transportation goals and objectives are integrated in their **Master Plans**. The Master Plan can identify areas where more walking, biking or transit are envisioned for certain sections of a community.
- **Zoning, site plan and subdivision regulations** are policy documents that can aid a Planning Board in helping new development or *changes in use* be more accessible to walkers, bikers and transit riders. Some planning board strategies that can be used to advance this goal include maximum parking requirements, shared parking, street connectivity requirements, sidewalk connectivity requirements, and bike rack, bus stop or turning radius requirements for buses.
- A municipality's governing body can improve walking, biking and transit conditions by purposefully and methodically tying its **Capital Improvement Program** to its Master Plan.
- More communities are adopting "**Complete Streets**" policies to improve walking, biking and transit conditions as part of new capital improvement projects or even road maintenance activities such as applying road paint. A Complete Streets policy can be a document ratified by the municipality's governing body, that provides the framework for ensuring planners and engineers consistently design and operate the entire roadway with all users in mind – including bicyclists, public transportation vehicles, riders, and pedestrians of all ages and abilities.
- Although there are some federal grant programs that provide assistance for supporting walking, biking and transit, it is mostly a local responsibility. While the general fund can be a source for these investments, the danger is that support for walking, biking and transit competes each year with other needs. If these kinds of investments are viewed by the community as basic infrastructure, then there are tax district tools at a community's disposal. Many NH communities are using **NH RSA 261:153 VI**, a \$5 vehicle registration fee, as a revenue source for supporting transit in their communities.

Source: SWRPC

land used for business, industrial, residential or other purposes. In effect, zoning can determine the types of transportation modes used in a community by virtue of its community design and density requirements. Likewise, zoning can determine where low or high traffic generation land uses are positioned in a community. Subdivision and site plan authority, under NH RSA 674:36 and 674:44 respectively, provide town planning boards the authority to determine site connectivity with

<sup>9</sup> Slack, Susan. A Hard Road to Travel: New Hampshire Law of Local Highways, Streets and Trails, Local Government Center, p. 187-188.

neighboring land uses, decide whether land accommodates multiple modes of transportation on site, and control the location and design of how the land interfaces with the transportation system.

## Understanding and Addressing Transportation Impacts

The preceding section of this chapter demonstrated that distance, time, topography and administrative jurisdiction policies can all impact transportation. But transportation also has its own impacts. These impacts can be positive or negative, *direct* or *indirect*, *internal* or *external*, short or long-term, affecting individuals, society, the economy or environment. Traditionally, transportation impact has been measured by its ability to provide mobility and has been often measured in terms of vehicles. Mobility concepts such as *congestion*, *capacity* and *speed* continue to be used to understand how efficiently vehicles are moving on a stretch of highway. While this is a good way to understand the impact of making design changes to the highway system, it can give the impression that these are the only impacts worth paying attention to. Yet our nation’s experience with transportation suggests that transportation impacts are much broader than on mobility alone.

### Sustainability and Livability

There are volumes of literature that describe the broader impact of transportation, based on *sustainability* principles. These impacts are often categorized as social impact, economic impact or environmental impact. When transportation impact is understood and accepted as wide ranging, diverse, and interrelated with other aspects of our world, it is easier to understand how transportation planning affects broader community goals. An important message from sustainability is that the transportation decisions we make should therefore create impacts that support, not detract from the larger goal to improve the quality of life. Sustainable planning is about accruing *win-wins* and minimizing tradeoffs.

**Table 6: Social, Economic and Environmental Transportation Impacts**

Social Impacts	Economic Impacts	Environmental Impacts
Level of Equity	Level of Congestion	Air Quality
Mobility	Mobility for Economic Purposes	Climate
Human Health	Costs Associated with Safety Performance	Habitat Quality
Community Cohesion	Transportation Facility Costs	Water Quality
Community Livability	Consumer Transportation Costs	Hydrologic Impacts
Aesthetics	Supply of Non-Renewable Energy Resources	Noise Levels

Source: Adapted from Victoria Transport Policy Institute: *Sustainable Transportation and Travel Demand Management: Planning that Balances Economic, Social and Ecological Objectives*, 2013.

Using examples of impacts in the table above, transportation system changes should ordinarily strive to allow individuals of various ages, abilities and income in our community to have the ability and choice to reach desired goods, services, activities and destinations (level of equity and mobility). They should also be affordable (transportation facility costs and consumer transportation costs), and should not pollute our environment (air quality, water quality). Alternatively, whenever possible transportation system changes should avoid enabling a sedentary lifestyle (human health), limiting modes of transportation that connect to workplaces (mobility for economic purposes) or building roads that fragment significant wildlife habitat (habitat quality). With the idea that informed decisions are better decisions, this way of thinking is designed to optimize decision making using the best information available.

Along with its recognition of transportation's diverse impacts, sustainability recognizes that impacts can change or build up over time. Therefore, sustainability involves implementing transportation solutions that meet the needs of today's generations without compromising the needs of future generations. It also may involve heeding decisions made by earlier generations. The rail trails in Southwest New Hampshire are a good example of the State looking forward and backward by purchasing former railroad rights of way for future potential rail use. Today, the rail trails are meeting the needs of today's generation by serving as recreational trails, but they are being reserved for future generation use, possibly for rail again. At the same time they are recognizing the hard work and planning that went into the development of these facilities in the late 1800s.

Related to sustainability is *livability*. Livability is a subset of sustainability in that it comprises sustainability themes that directly affect people in a community. The US Department of Transportation (US DOT), along with the Department of Housing and Urban Development

Figure I: Livability Principles & Transportation

- **Provide more transportation choices:** Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.
- **Promote equitable, affordable housing:** Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- **Enhance economic competitiveness:** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services, and other basic needs by workers, as well as expanded business access to markets.
- **Support existing communities:** Target funding toward existing communities—through strategies like transit oriented, mixed-use development, and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.
- **Coordinate policies and leverage investment:** Align policies and funding to remove barriers to collaboration, leverage funding, and increase accountability and effectiveness of all levels of government to plan for future growth.
- **Value communities and neighborhoods:** Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.

Source: Adapted from the *Livability in Transportation Guidebook*, US DOT.

and the Environmental Protection Agency introduced six livability principles, which they are using as a foundation for their own interagency coordination. While these principles apply to those federal agencies, the policy framework also has real impact on regional transportation planning by providing new guidelines around how federal transportation funding can be used.

## Performance Measures & Trends

In the following **Southwest Region Corridor Systems** section, SOUTHWEST CONNECTS dissects the Southwest Region into eight corridor systems. Profiles are provided on each of these corridor systems based on performance measure and trend data. This section is designed to explain some of the key performance measures and trends used in that Section and is intended to help users of the Plan to interpret data to foster additional questions, draw conclusions or develop solutions to address corridor challenges and opportunities.

Transportation impacts are easier to understand when there is data and information available to show how those impacts stand today and how they change over time. Performance measures are meant to help paint a picture of what is happening. Measurement data also helps a plan set goals by aiming for the metric showing a positive outcome. Although more guidance is coming out all the time on how to measure transportation sustainability and livability, some data resources are still hard to find. Often performance indicators require primary data collection, particularly at a local or regional level.

Performance measures have grown as a popular way to monitor the transportation system. [Moving Ahead for Progress in the 21<sup>st</sup> Century](#) (MAP-21), the current federal transportation law, requires USDOT and States to develop performance measures tied to federal transportation funding. NHDOT, by its own volition, has also taken an interest in performance measures and has adopted what it calls a “[Balanced Scorecard](#).” The Balanced Scorecard measures and tracks customer satisfaction, transportation system performance, resource management, and employee development over time. An important component of the program is that it is measured against metric goals that it

Table 7: NHDOT Balanced Scorecard Performance Measures Applicable to Regional Transportation System

Objective	Measure	Units
Improve Asset Conditions	State Highway Pavement in Good or Fair Condition	Miles
	Red listed bridges	Number
	Rail lines capable of speeds of 40 mph	Miles
	Airport runway surface conditions	Average condition
	Remaining useful life of transit buses	% of vehicle life remaining
Increase Mobility	Transit ridership	# of total riders
	Average level of service on selected highway segments	Level of service
	Population with Access to Multimodal Transportation	Percent
Improve System Safety and Security	Highway Fatalities - Five Year Moving Avg.	Number

Source: NHDOT

Figure m: Performance-based Criteria for Projects Evaluated in the Ten Year Transportation Improvement Plan

Mobility & Accessibility	Potential for Success	Safety	Economic Development	Network Significance	Environment	State of Repair	Support
Reduce Congestion	Feasibility	Improve Safety	Enhance Access to Businesses	Traffic Volume	Natural Environment	Extend Service Life	Local Support
Freight Mobility	Progress to Date	Crash Rate	Economic Conditions	Facility Importance	Historical/Cultural Environment	Current Asset Condition	Regional Support
Alternative Modes				Availability of Alternative Routes	Greenhouse Gases		State Support

Source: NH DOT

sets for itself. Although the document is designed to be a scorecard for NHDOT as an agency, there are a number of performance measures that are useful for measuring the regional performance of the transportation system. The NHDOT Balanced Scorecard performance measures applicable to regional transportation system are shown above in Table 7.

In a partnership effort with the nine New Hampshire Regional Planning Commissions, NHDOT has set the stage for additional performance measurement at the transportation project level for projects being considered for the New Hampshire State Transportation Improvement Plan. In 2012, NHDOT and the nine Regional Planning Commissions agreed on a set of eight criteria and twenty sub criteria to evaluate transportation projects. Though the performance measurements are a work in progress, they are designed to objectively measure the projects and compare projects to each other using the same criteria.

A third set of more regional-specific performance measures are being tracked by the [Monadnock Region Transportation Management Association](#), a coalition of public and private sector institutions, as well as organizations and interest groups with the goal of increasing the use and availability of local and regional transportation options in the Southwest Region. The MRTMA 2012-2020 Action Plan has outcome measures aligned to seven objectives that focus on the development of various transportation

Figure k: MRTMA Action Plan Goals and Objectives

Goal and Objectives	
Goal	Increase use and availability of local and regional transportation options in the Monadnock Region.
1	Expand use and availability of sidewalks and walkways
2	Increase use and availability of bicycle infrastructure
3	Increase use and availability of public transportation
4	Increase use and availability of ridesharing and car sharing
5	Increase use and availability of intercity bus services
6	Implement non-modal strategies to replace vehicle trips
7	Increase location efficient siting of housing, workplaces & shopping

Source: MRTMA Action Plan, 2012.

modes and land use planning. Like the Balanced Scorecard, the Plan has targets using census travel trend data and primary data collected by SWRPC to assess the impact of MRTMA strategies aimed at promoting the MRTMA Plan’s goal and objectives. Since the plan represents the collective thinking of a diverse group of stakeholders in the regional community, the objectives and performance measurements are well aligned with other region-specific plans such as the plan monitored by the Healthy Monadnock 2020 initiative. All of the performance measures from the Balanced Scorecard, Ten Year Plan and MRTMA discussed in this section are considered in the next section of SOUTHWEST CONNECTS.

DRAFT

# **SOUTHWEST REGION CORRIDOR SYSTEMS**

**DRAFT**

## Introduction

In the past, the SWRPC Regional Transportation Plan examined transportation needs based on a system-wide transportation analysis. This involved looking at transportation through a lens of 35 communities in Southwest New Hampshire. While there are some similarities between Windsor and Walpole, Hinsdale and Greenville, it is difficult to provide strategic transportation planning guidance at that scale. This Plan examines the Region from a corridor perspective. A corridor analysis approach has a number of benefits over system-wide transportation analyses, which are described below in Figure I.

**Figure I: Benefits of Corridor Planning Approach Versus System-Wide Planning Approach**

- Corridors provide a more direct connection between the movement of people, goods and information and regionally significant economic activity.
- Corridors provide regional stakeholders an ability to more closely examine the trade-offs among different modes of transportation for people and goods movement.
- Corridors provide an opportunity for higher precision in monitoring the performance of transportation facilities and services.
- Corridor-level analysis encourages a more complete investigation of non-transportation strategies, such as land use planning and zoning, for addressing transportation challenges.
- Corridors, especially trade corridors, handle significant amounts of through trips in many states and thereby provide a better focus for multi-state efforts at improving transportation capabilities across state boundaries.
- Corridor planning is already familiar to SWRPC towns, NHDOT and neighboring regional planning commissions in New Hampshire and Vermont. SWRPC has a body of corridor analysis to draw from including the NH 9, NH 101 and US 202 studies as well as the NH 10 Job Access Reverse Commute, NH 119 Transit Feasibility, NH 12 North Transit Feasibility and the East-West Corridor Study. These studies included the participation and involvement of municipal, state, regional planning commission and other stakeholders.
- Because corridor studies provide more focus on localized problems, a corridor-level analysis can better promote the active engagement of local officials and stakeholders and a greater opportunity for addressing local issues, needs, plans, actions, and impacts.

Source: Adapted from *A Guidebook for Corridor-Based Statewide Planning*, National Cooperative Highway Research Program, 2010.

The Plan's corridor analysis approach is based on an examination of former, existing, future anticipated, and strategic planned travel patterns that are expected to benefit the Southwest Region and its neighbors. The corridors are based on their north, south, east or west orientation. Travel patterns are identified based on trip purposes, major trip origins and destinations. The analysis is multimodal and intermodal, meaning that various modes of transportation and their existing or potential connections are considered in the corridor analysis. This includes highways, rail trails, transit routes, intercity bus routes, rail, intermodal stations, park and ride lots and other transportation facilities aligned with corridors. Since motor vehicle travel is the dominant mode of transportation today, corridors in SOUTHWEST CONNECTS tend to be identified by the major highways that provide its backbone infrastructure. The Federal Highway Administration functional highway classification system is used to

describe how different parts of corridors are connected to each other by the road system. This hierarchy identifies roads as arterials, collectors and local roads with arterials designed and used for high mobility purposes with a low degree of access, local roads designed less for mobility and more for access, and collector roads balancing mobility and accessibility.

Figure m: Highway Functional Classification (Urban/Rural combined and simplified)

- Principal Arterial-Interstate: high volume roadway serving statewide and interstate travel
- Principal Arterial: travel between cities and towns
- Minor Arterial: alternative links between cities and towns
- Major Collector: access between local centers, serving as traffic generators to institutional commercial and residential uses
- Minor Collector: alternative routes to major collectors and access to individual properties
- Local: access to individual residential and commercial uses

Source: US DOT

Transportation is about connecting places where people live—where they sleep, relax, eat, shop, work and play. It does not exist without trip origins and destinations, which can be major like a job center or minor like a country store at a crossroads. The places between origins and destinations are also worth paying attention to since land uses along the way often bring challenges or opportunities to the transportation system or vice versa. Project for Public Spaces, Inc., a national leader on land use and transportation issues, recognizes several attributes that describe a successful corridor. First, the corridor should promote the long-term goals and vision of each community in the corridor. Second, the corridor should host diverse land uses which are helpful in meeting each other’s community goals and needs such as access to housing, employment, shopping or other destinations. Third, the corridor should be as multimodal as possible so as to provide transportation choice and so as not to overtax any single part of the transportation system. All of the communities in the Southwest Region are identified with one or more corridor(s) in the Plan. In addition, there are fourteen nodes within the Southwest Region that are examined as part of the corridor analysis.

Figure n: Corridor and Place as described by Project for Public Spaces

*“A corridor is a multi-modal transportation network, knit together around a major transportation facility, such as a road or rail line. It encompasses all the surrounding land uses. A corridor links places together like pearls on a necklace. These places, or “nodes,” are comprised of existing destinations in the community.... In successful corridors, the transportation system unites adjacent communities. It fits into the context of each community and is accessible to drivers and non-drivers alike. In a failing corridor, transportation facilities divide communities, spawn debilitating congestion and create visual blight.”*

Source: Great Corridors, Great Communities, Project for Public Spaces, Inc., 2008, p.6.

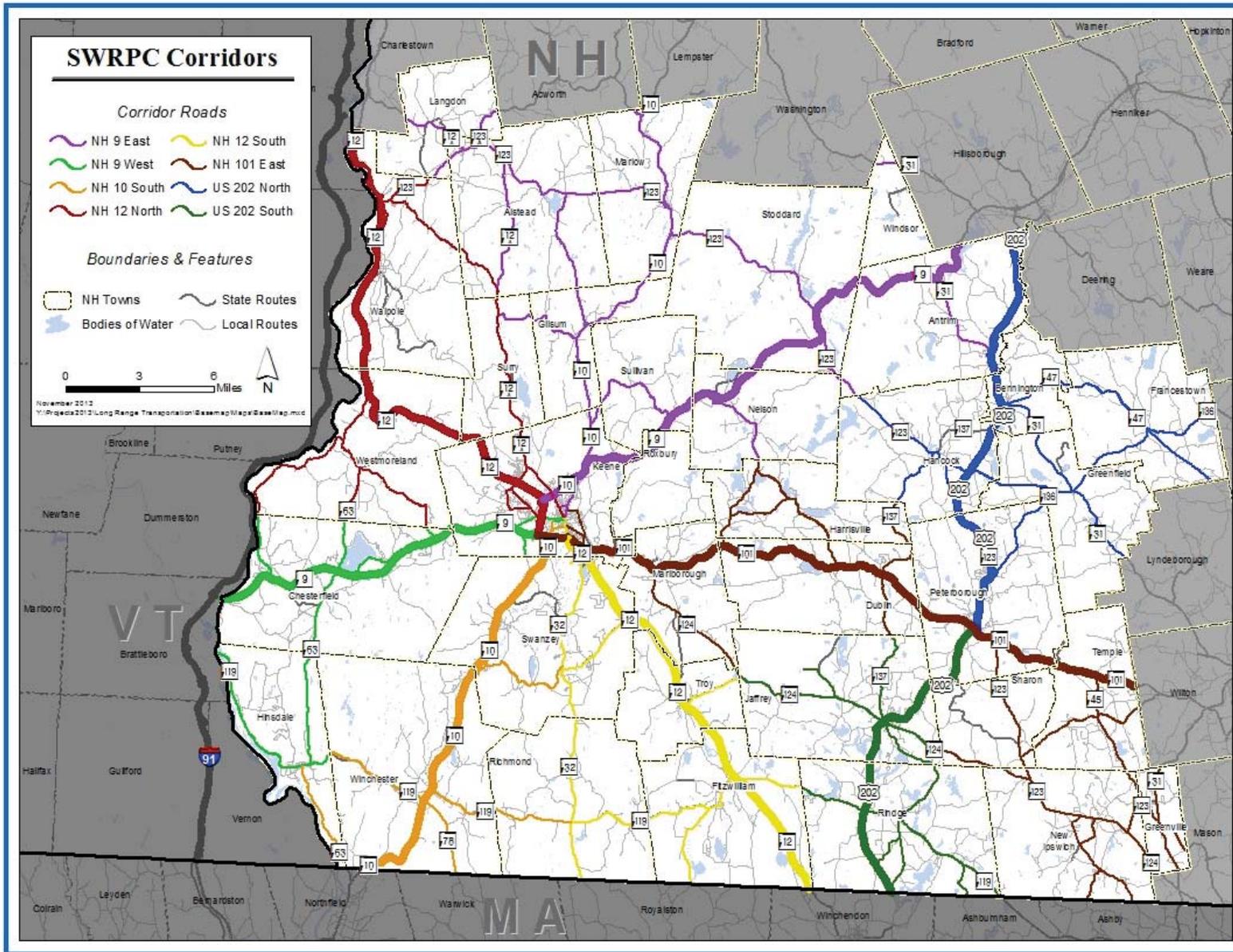
These nodes are defined as Census Designated Places by the US Bureau of Census and include the village or downtown areas of Antrim, Bennington, Greenville, Hancock, Hinsdale, Jaffrey, Keene, Marlborough, North Walpole, Peterborough, Troy, Walpole, West Swanzey and Winchester.

For each corridor system, an arterial highway was identified as the main regional thoroughfare, or “backbone,” driving travel trends in that system. The Plan also identifies supporting minor or urban arterials and collectors. In cases where there is other transportation infrastructure that exists on the Corridor, those modes of transportation are identified as part of the corridor system as well. For example, the Cheshire Rail Trail, the New England Central Railroad, and the sidewalk systems in Alstead, Keene, the Village of Walpole and the Village of North Walpole are all considered part of the NH 12 North Corridor’s infrastructure. Transportation services such as the Greyhound Intercity bus service and transit services in Keene and Walpole are also identified services playing an important role on the NH 12 North Corridor System.

In total there are eight corridors identified in the Plan. On the map on the facing page, it is clear that many of the corridors converge at certain towns. Keene, for example, is a part of 6 of the 8 corridor systems identified. Peterborough is a part of three corridor systems. The remaining 33 towns in the Southwest Region are identified with one or two corridor systems. These corridors include:

- The NH 9 East Corridor (Alstead, Antrim, Gilsum, Keene, Langdon, Marlow, Nelson, Roxbury, Stoddard, Surry and Windsor);
- The NH 9 West Corridor (Chesterfield, Hinsdale and Keene);
- The NH 10 South Corridor (Hinsdale, Keene, Richmond, Swanzey and Winchester);
- The NH 12 North Corridor (includes Alstead, Keene, Surry, Walpole and Westmoreland);
- The NH 12 South Corridor (Fitzwilliam, Keene, Richmond, Swanzey and Troy);
- The NH 101 East Corridor (Dublin, Greenville, Harrisville, Keene, Marlborough, New Ipswich, Sharon and Temple);
- The US 202 North Corridor (Antrim, Bennington, Frankestown, Greenfield, Hancock and Peterborough); and
- The US 202 South Corridor (Jaffrey, Peterborough and Rindge).

A map of the arterials and collectors forming the skeletal structure of each corridor system is shown on the opposite page.



## Using and Interpreting Information in the Corridor System Profiles

Each corridor profile in this section of SOUTHWEST CONNECTS was designed to contain similar sets of information. This allows the reader to look up data quickly and compare corridor systems with each other if desired. This section walks through the contents of each corridor system profile. Background information and hints on how to use and interpret information are provided, along with some discussion about the limitations of some of the data.

### Corridor Summary

Each corridor system profile begins with a summary that describes important characteristics of each corridor. These descriptions pull observations from data sources referenced later in the corridor's profile. In an effort to paint a fuller picture of the corridor system, information is often pulled about housing, jobs and land use in addition to transportation. After each corridor description, each corridor summary contains a list of bullet points containing some of the corridor system's priority challenges and opportunities.

### Maps

Following each summary is a set of four maps depicting the corridor system. The first map is a base map showing the corridor system and its relationships to other corridor systems. Each corridor system is represented by a color. Note the "nodes" depicted in the map. These are somewhat defined places where there is recognized denser population, often with a mix of residential, civic and commercial buildings. One can think of these nodes as logical places to have intermodal connectivity as well as a place where regional travel on the corridor system tends to transition to a more localized travel and vice versa.

A second map expands beyond the identification of challenges and opportunities noted in the corridor summary with additional detail and geographical information about where these challenges or opportunities exist on the corridor system. This map can be useful in explaining the current understanding of issues and opportunities facing the corridor system. These items may compel the implementation of studies or projects in the Regional Transportation Improvement Program of SOUTHWEST CONNECTS.

The third map for each corridor system depicts how traffic tends to move in the corridor system. Towns identified in the map constitute community origins or destinations that are likely to use the corridor system heavily for regional travel needs. These maps also show relationships with towns in adjoining regional planning districts. All of this information is based on an analysis of commuter trends, travel time analysis, and analysis of likely travel routes to major destinations outside of the Southwest Region.

The final map depicts transportation infrastructure and services as it relates to the corridor. Here you will find information about existing sidewalks, rail, airports, bus service, bike paths, park and ride lots and intermodal centers.

## Features and Location

The “Features and Location” page contains basic information about the corridor system’s geography and its transportation system. Here you will learn which towns are associated with the corridor system, the nodal centers identified on the corridor and a description of the main backbone of the corridor system. A table documents the functional classification of each member road of the corridor system along with the town in which the road is located. Finally, information about where other transportation systems exist are listed, along with whether they are present in towns or nodal centers

## Population

When evaluating transportation needs, it can be useful to examine how population has changed over time and how it is predicted to change. These changes can help explain how traffic levels change or if there are needs to examine *travel demand management* strategies or increase transportation capacity. Therefore, past, present and projected future population datasets are presented for each town in the corridor and the corridor system combined.

Another important population dataset to consider are *socioeconomic* trends. These trends paint a picture of the people that make up the regional community and how community members interact with the economy. Population characteristics provide a wealth of information on how to plan for the transportation system. Data that documents the number and proportion of people by age, income, disability, race, or the density of

**Table 8: Transportation Considerations for Segments of the SWRPC Population, 2010**

Population or Household Categories	Transportation Considerations	Population or Households Estimates	% of Total Population or Households
Youth Population, Age 1-15	Non-drivers	20,941	20.5%
Young Adult Population, Age 18-34	Generation less attached to cars	22,685	22.2%
Middle Age Population, Age 35-64	Often demand high mobility and flexibility	43,592	42.6%
Senior Population, Age 65+	1 out of 5 non-drivers; tend to drive less	15,095	14.8%
Low Income Population	Sensitive to transportation expenses	16,680	16.3%
Disabled Population	Often non-drivers or need door to door service	30,221	29.5%
Single Parent Households	Need for flexibility to deal with time constraints	7,260	28.0%
Minority Race Population	History of transport disadvantages in the US	3,587	3.5%
Rural Population	Motorized transportation requirements	72,078	70.4%
Urban Population	Less need for motorized transportation	30,235	29.6%

Sources: US Census Bureau, National Household Travel Survey, SWRPC.

the community that they live in can provide insight on what mix of transportation might best serve the population. For example, if there are a number of youth in a community and we know that they cannot drive but their school is located in a walkable or bikeable distance, we can make assumptions that a sidewalk or bicycle safe path or shoulder may be warranted to facilitate their travel. Socioeconomic population data is also useful in addressing *environmental justice* concerns which examine the issue of fairness in transportation planning and the transportation system. Special population data is provided on the “Population” page for each Corridor. Geographic areas with above average proportions of special populations are identified in this section as well.

### Travel and Vehicle Trends

While the performance measures provide a good way to monitor transportation system, there are a number of other system indicators that can provide more context about the transportation system. Some of these datasets are presented on the “Travel & Vehicle Trends” page for each corridor system. One dataset, “Traffic Volume Changes 500 or Greater,” shows the most significant recent traffic volume increases and decreases over a 3 to 6 year period. This data can be instructive in helping describe how local economic, land use or transportation system changes can dramatically impact traffic flows, or it can signal areas on the Corridor that deserve more study.

Another useful dataset provides information on the proportion of medium duty to heavy duty truck data based on available count information for that corridor. This data can be used in several different ways. It can help a reader get a sense of the quantity and proportion of transportation related freight traffic occurring on the corridor and it can also provide clues on the additional heavy vehicle stresses that roads or bridges in the area might experience. Readers should be advised that the data can change significantly from location to location, but it provides a general barometer of how much truck traffic that corridor is experiencing.

Other vehicle datasets that are documented in “Travel and Vehicle Trends” are information on ridesharing and the kinds of vehicles registered locally on the Corridor. A strategy of ridesharing is to encourage it when there are the most people making similar origin-destination trips. This typically happens during the peak hour. “Peak Hour Ridesharing” provides a glimpse of the true amount of ridesharing occurring based on the combined am and pm peak hours of unique traffic locations. The results are somewhat surprising when comparing it to US Census carpool data. This data, which includes all types of trips, not just commute to work trips, show significantly higher proportions of people sharing rides throughout the Region. The final data set provides a baseline of the kinds of vehicles registered on the Corridor. An interesting figure in this data set are the ratio of vehicles to population data as well as the number of passenger vehicles that are hybrid or electric.

If available, bicycle counts are also provided to document use of multi-use trails that are part of corridor systems.

## Commuting and Economy

Information about commuting patterns is provided on the next sheet of each corridor system. Here readers can learn about how towns in a corridor system cross commute from one community to another, as well as how many people work and reside in the same community.

The second table shows communities that draw 50 or more residents from another individual community and are likely to use the corridor system as part of their commute. This table is instructive in showing a fairly large number of employees that might be making similar daily trips, and also shows possible opportunities for carpooling or other transportation sharing arrangements.

The final tables provide basic information about jobs. Job and institution numbers can give a sense of how many people the community might be attracting on a daily basis and from how many different locations in the community. The unemployment rate is also provided to understand the relative economic health of the community. In some cases, information is available about large employers. Here information is provided on known employers employing more than 50 people and located within the corridor system.

## Housing and Land Use

Each corridor system's "Housing and Land Use" objective is to provide the reader with some data to understand how housing, land use and transportation are related on the corridor. The first table provides a great deal of information. Permit information can show how fast the community is growing, owner-rental household ratio gives a sense of the permanence of households living in the community, and then there are several measures that provide a sense of the cost of housing. These measures are important to look at, since housing is often the only household budget category more expensive than transportation. The final measure, median monthly budget needed for transportation, is derived from an index that examines housing costs, average trip distance, average number of trips per household, and the cost of owning a vehicle to determine a monthly budget required to support the household's driving expenses. In some communities, this transportation budget is estimated to be higher than the housing budget. For each data set, the tables compare the average of all towns in the corridor system to each town, so that readers can quickly identify where community averages are higher or lower than the corridor average.

Housing to jobs ratio is a second table that is provided. This gives the reader a sense of whether the community is a "bedroom" community. In some cases, this may indicate a community's reliance on traveling longer regional distances to work. Few communities in the region have a similar number of jobs and housing units. Job-Housing balance, coupled with housing and transportation cost information, can be instructive in predicting growth and pressure on the corridor system. For example, a community with very few jobs and high transportation costs and high housing costs is unlikely to experience a great deal of pressure for new housing, and thus traffic growth on that portion of the corridor.

The final dataset provided on the "Housing and Land Use" page shows the level of regulation of curb cuts that New Hampshire Department of Transportation has for each backbone corridor. The Southwest

Region does not have interstate highways within its district to quickly move through the Region. Consequently, the number of curb cuts and traffic generating land uses on corridors can have a debilitating effect on traffic flow and mobility over time if not carefully regulated to ensure safety and mobility. This table provides the mileage and level of regulation of curb cuts (access management) for each corridor backbone along with mileage level of regulation by town. Limited access is the strongest form of regulation, which ensures that no new curb cuts will be established for that section of highway. Controlled access refers to predetermined access points for undeveloped parcels along the corridor. Regular access refers to the traditional driveway and permit review process managed by NH DOT's District IV office.

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