

Chapter Thirteen

Transportation

Introduction

The SNHPC region is served by highway, air, and rail transportation modes, with the Interstate and arterial highway systems servicing the majority of passenger and freight traffic. Rail freight services presently provide bulk material transport and State, regional and local officials are currently formulating plans to extend intercity passenger rail service into southern New Hampshire and the SNHPC region. In 2007, the Governor signed legislation creating the New Hampshire Rail Transit Authority (NHRTA), which oversees the development of commuter rail in New Hampshire.

Major highway links within the region include I-93 and the F.E. Everett Turnpike, which are controlled access north-south highways connecting the region to other parts of the state as well as to Massachusetts to the south and the Canadian border to the north. Interstate 293 (I-293) provides an east-west connection between I-93 and the F.E. Everett Turnpike and US 3, NH 3A and NH 28 provide north-south service within the region and southern New Hampshire. NH 101 provides east-west service from the region to the seacoast and the Connecticut River Valley.

In addition to private vehicles, passenger transportation is available through local and inter-city bus, taxi and air. The Manchester Transit Authority (MTA) provides fixed route transit service to approximately 90¹ percent of Manchester residents in addition to demand response services. Intercity bus travel is available through providers such as Concord Coach, Greyhound Transit/Peter Pan Bus Lines and Boston Express, which provides I-93-based commuter services to Boston and Logan Airport. Private limousine services are also available in the region. Manchester-Boston Regional Airport (MBRA) provides regularly scheduled passenger service through six passenger carriers in addition to general aviation and cargo services. Principally because of its location at a junction of the regional interstate system, Manchester is the focus of ground transportation freight movements in the region and state. Despite the current emphasis on road-based ground transportation, local and regional officials are becoming more and more aware of the importance of increased funding for projects that promote a multi-modal system. This will help improve traffic efficiency and safety for commercial and private vehicles, sustain general economic productivity and growth and encourage environmental sustainability.

Transportation Planning Process

Transportation Planning and funding in the SNHPC Region is performed in accordance with Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)², the funding and authorization bill that governs federal surface transportation spending in the United States. SAFETEA-LU requires Metropolitan Planning Organizations (MPOs) to develop and implement the Transportation Improvement Program (TIP) which must be updated at least every two years. The FY 2011-2014 TIP for the SNHPC region includes all regionally significant transportation projects as well as related planning and research, along with

¹ Transit service within one-fourth mile of a residence is generally accepted as a definition of a service corridor. Upon visual inspection of the MTA routes, it was calculated that approximately 90 percent of Manchester's population lies within one-fourth mile of MTA service.

² SAFETEA-LU was extended in September for an additional 6 months ending March 31, 2012

their costs, funding sources, and operating agencies. The SHNPC is the designated MPO for the 13-community region.

In addition to the highway and transit projects listed in the State 10-Year Plan and the FY 2011-2014 TIP for the region, the SNHPC develops and meets the planning priorities for the area as well as the federal requirements of SAFETEA-LU through additional projects contained in the FY 2010-2011 Unified Planning Work Program (UPWP). The UPWP includes regularly scheduled transportation planning activities of the SNHPC such as the roadway inventory and traffic counting programs. The document is also designed to meet more specific needs of the SNHPC member communities through the development of additional planning projects. The FY 2010-2011 Unified Planning Work Program (UPWP) for the SNHPC includes the description of all transportation and transportation-related planning activities between July 1, 2009 and June 30, 2011. The UPWP provides linkage between the federal planning requirements outlined in the Regional Transportation Plan (RTP) designed to improve transportation in the region and specified work tasks.

Projects from the TIP and planning principals and goals expressed in the UPWP are presented in the *Regional Transportation Plan and Transportation Improvement Program FY 2011-2014* (RTP) for the SNHPC Region. This chapter is based on and provides a summary of the RTP, which considers projections for transportation system needs through 2035. The RTP addresses all forms of transportation used in the 13 municipalities and outlines existing and future conditions. It also discusses initiatives to address needs and final prioritized recommendations for each mode of transportation. The plan is intended to establish a master guide for funding transportation projects. In compliance with SAFETEA-LU and other federal mandates, the SNHPC uses projections and data for a diverse array of regional transportation modes utilized for the movement of people and goods to develop information required for the TIP and UPWP. The plan also considers the intermodal nature of the transportation system.

Prioritization of the RTP recommendations results from a screening process that uses seven factors identified and mandated in SAFETEA-LU to assure that impacts associated with health, safety, welfare and the environment are properly weighed in the public interest. Projects included in the RTP have been prioritized based on the following five-step process:

1. Review of previous transportation studies completed in the region over the past 18 years, from which an extensive list of feasible projects was derived.
2. Participation in the State of New Hampshire's Ten-Year Plan process.
3. The application of traditional transportation planning techniques using travel demand forecasting, technical evaluation and analysis and an alternative assessment. This process produced projects for further consideration.
4. Project evaluation considering the eight factors mandated by Federal transportation legislation.
5. Public evaluation and endorsement.

Overall Goal

To assist in the development of a safe, secure, efficient, accessible, and coordinated multi-modal transportation system that provides for cost-effective movement of people and goods within and through the region.

Public Survey Results

The Transportation Survey was developed to measure public input regarding the status of transportation currently facing the SNHPC Region and challenges the region will face in the future. Over 100 respondents replied to the survey, which was made available to Town Planners, Town Managers, Public Works Directors, Board of Selectmen, Planning Boards, and Conservation Commissions within the region. The survey was posted on the SNHPC website between October 1, 2010 and December 1, 2010. Almost every SNHPC region community participated in the survey, with the exception of Chester. It is important to note when reviewing the responses to the transportation questions that opinions varied greatly from town to town. Questions of public transportation, commuter rail and the effects of the I-93 expansion, for instance, all have vastly different meaning and implications on a town-to-town basis.

On a scale of 1-5, 1 being low and 5 being very high, how would you rate the public transportation system (including buses, passenger trains, and airplanes) in the Southern New Hampshire region?

- Of the 87 who responded, 27 gave the public transportation system a score of 1; 24 scored it a 2; 23 awarded it a 3; 12 replied 4 and only 1 respondent gave it a 5.
- Most respondents cited the need for rail links to Boston in the region, as well as expanded bus routes.

Do you think the region will experience increased traffic with the expansion on I-93?

- 83 percent believe that the region will experience increased traffic while 13 percent did not and 4 percent were not sure.

Do you think a commuter passenger rail between Boston and Manchester would be beneficial to our region?

- 78 percent felt that commuter passenger rail between Boston and Manchester would be beneficial to the region while 14 percent did not, and 8 percent were unsure.

Should the SNHPC and municipalities in the region promote transit-oriented development (higher density, mixed-use development surrounding existing/planned multi-modal, transit stops, and parking lots)?

- 67 percent of respondents believed the region should make efforts to promote transit-oriented development while 20 percent did not, and 13 percent did not know.

Should the SNHPC and municipalities in the region create more bike and pedestrian friendly walkways to decrease the number of individual vehicles on the roads?

- 84 percent of those who responded felt that communities should create bike and pedestrian friendly walkways. 15 percent did not agree with this idea and 1 percent was unsure.

- While many were in favor of creating more bike and pedestrian friendly figures, many questioned the widespread applicability of such measures in the SNHPC Region.

On average, how many hours per day do you spend sitting in traffic?

- Of those who responded, 82 said they spent less than 1 hour in traffic while 12 said they spent more than 1 hour.

Do you know of employers in the Southern New Hampshire region that offer commuter tax incentives?

- Only 2 of those who responded, or roughly 2 percent, knew of employers who offer this incentive. 66 percent did not and 30 percent did not know.

Issues and Concerns

The Southern New Hampshire planning region faces a projected influx of thousands of residents over the coming decade (2010-2020).³ With increased population comes increased traffic on roadways that are already at capacity, spurring roadway expansions and construction projects to ease congestion.

These traffic improvements presented in the TIP, UPWP and RTP, which are deemed necessary to meet growing transportation demands, come at a price that municipalities in the region cannot necessarily afford. The state has committed over \$500 million for projects in the SNHPC region over the next ten years, but in some cases important transportation improvements require matching or total funding from municipalities. Towns face the extreme challenge of financing projects on tight budgets as the number of vehicles on the road continues to increase. Table 13.1 displays the funding schedule for the TIP and Ten Year Plan.

**Table 13.1
Fiscal Constraint Summary
FY 2011- FY 2014 TIP and Regional Transportation Plan**

	Total Estimated Costs	Total Estimated Revenues
TIP (2011-2014)		
Highways	\$229,865,000	\$294,544,000
Transit	\$23,746,000	\$30,428,000
Ten Year Plan (2015-2020)*		
Highways	\$294,595,000	\$366,838,500
Transit	\$35,831,000	\$35,831,000

*-remainder of Ten Year Plan Years

Source: SNHPC Regional Transportation Plan 2010

³NH OEP and NH DOT 2005, updated 2010

A significant portion of highway funding allocated to the SNHPC region during the planning horizon of this RTP will be expended on the widening of the Interstate 93 (I-93) corridor. The I-93 Salem to Manchester project involves widening the mainline highway and reconstructing the interchanges on a 19.8 mile section of Interstate 93 between Manchester and Salem. The purpose of the proposed action is to improve transportation efficiency and reduce safety deficiencies associated with this portion of the highway. The project will provide four lanes in each direction northbound and southbound (two additional lanes in each direction) and include improvements to five existing interchanges. The project also includes transit improvements designed to reduce vehicle trips on the highway. The project is currently scheduled for completion in 2020.

Due to the financial challenges of maintaining roadway capacity for the growing population, the Southern New Hampshire Planning Commission, along with planning experts across the nation, are looking towards more sustainable transportation alternatives to mitigate current excessive traffic demands. Among the issues explored in this chapter are Transit Oriented Development, Transportation Demand Management programs (reduction of single-occupancy vehicle commute trips to the workplace), and potential passenger rail for Manchester and points north and south between New Hampshire and Massachusetts.

Existing Conditions

The SNHPC region contains a diverse array of transportation options. This section details the existing conditions of each mode of transportation.

Roads

The majority of SNHPC residents make daily trips to work by car, and this percentage has increased in the past decade. In 2009, 83.6 percent of SNHPC residents drove alone to work, with an average commute time of 29.4 minutes (commute time data is from the 2000 Census) (see Tables 13.2 and 13.3).

In addition to the strong commuter preference of single-occupancy vehicles, a large number of residents in the SNHPC region commute daily out of state (in general to Massachusetts) to their place of employment (see Table 13.4 and Figure 1). This ranges from 33 and 28 percent of residents in Derry and Londonderry, respectively, towns with easy access to Boston via I-93, to six percent for the towns of Weare. Chester and Raymond also have large populations of out of state commuters, making this issue an important concern for the region with economic development implications as well. Because of its role as the economic heart of the SNHPC Region, Manchester had the one of lowest rates of out of state commuters (7 percent) as well as the highest rate of residents that both live and work within its boundaries (52 percent).

**Table 13.2
Commuting Methods for the SNHPC Region**

Town	Mode of Travel										
	Total Workers 16 and Over	Drove Alone	Percent Drove Alone	Carpool	Percent Car-pooled	Total Using Public Transportation	Percent Using Public Transportation	Total Bicycle/Walked	Percent Bicycle/Walked	*Other	Percent Other
Auburn	2,902	2,502	86.3	226	7.8	0	0	61	2.1	113	3.9
Bedford	10,401	9,070	87.2	437	4.2	104	1	73	0.7	697	6.7
Candia	2,459	2,115	86	160	6.5	0	0	34	1.4	150	6.1
Chester	2,415	1,892	78.3	290	12	0	0	0	0	233	9.6
Deerfield	2,313	1,897	82	134	5.8	0	0	12	0.5	171	7.4
Derry	18,053	15,507	85.9	1,444	8	72	0.4	289	1.6	758	4.2
Goffstown	9,415	7,428	78.9	677	7.2	94	0.1	517	5.5	781	8.3
Hooksett	7,572	6,118	80.8	598	7.9	8	0.1	401	5.3	432	5.7
Londonderry	13,459	11,427	84.9	1,036	7.7	135	1	162	1.2	699	5.2
Manchester	56,424	46,832	83	5,699	10.1	339	0.6	1,862	3.3	1,692	3
New Boston	2,743	2,315	84.4	173	6.3	0	0	8	0.3	247	9
Raymond	5,000	4,275	85.5	535	10.7	40	0.8	45	0.9	90	1.8
Weare	5,397	4,485	83.1	453	8.4	0	0	157	2.9	302	5.6
Region	133,156	115,863	83.6%	11,862	7.9%	792	0.33%	3,464	1.9%	6,063	5.9%

*Motorcycle, worked from home or other means

Source: ACS 2005-2009

**Table 13.3
Historic Commuting Methods for the SNHPC Region**

Municipality	Drove Alone			Carpooled			Public Transportation (Including Taxi)			Bicycled or Walked			Motorcycle or other means		Mean Travel Time to Work		
	1990	2000	2009	1990	2000	2009	1990	2000	2009	1990	2000	2009	1990	2000	1990	2000	
	Auburn	79.3	87.9	86.3	15.4	6.8	7.8	0.5	0.4	0	1.5	0.3	2.1	0.4	1.3	3.9	25.6
Bedford	85.5	86	87.2	7.5	5.4	4.2	0.4	0.3	1	1.2	0.5	0.7	0.5	1.5	6.7	21.4	27.2
Candia	79.6	86.5	86	12.1	9.4	6.5	1.1	0.5	0	2.1	0.5	1.4	0.8	0	6.1	25.8	28.3
Chester	79.9	84.2	78.3	10.4	6.8	12	0.6	1.2	0	2.4	0.6	0	1	0	9.6	32.3	32.2
Deerfield	82.6	86.6	82	9.7	7.8	5.8	0.3	0	0	1.4	1	0.5	1	0.3	7.4	33.6	33.9
Derry	83.3	84.9	85.9	12.1	9.7	8	0.6	0.8	0.4	1.3	1.4	1.6	0.5	0.6	4.2	29.6	31.1
Goffstown	78	81.7	78.9	11.5	8.5	7.2	0.1	0.1	0.1	6	5.1	5.5	0.5	1	8.3	22.6	26.1
Hooksett	87.8	82	80.8	6.9	8.8	7.9	0.5	1.6	0.1	1.6	3.6	5.3	0.2	0.4	5.7	20.7	25.7
Londonderry	82.8	86.3	84.9	12.1	7.9	7.7	0.8	1.3	1	1.7	0.7	1.2	0.5	0.6	5.2	28.3	29.7
Manchester	76.9	81	83	14.2	11.9	10.1	1.5	1.4	0.6	4.8	3.1	3.3	0.6	0.4	3	18.8	21.3
New Boston	79.1	82.4	84.4	14.1	10.5	6.3	0	0.5	0	3	1.3	0.3	0.5	0.6	9	29.3	32.7
Raymond	81.2	83.7	85.5	14.4	12.3	10.7	0.6	0.2	0.8	1.3	1.5	0.9	0.5	0.2	1.8	31.2	31.6
Wear	82.4	81.6	83.1	13	11.5	8.4	0	0.4	0	0.4	2.1	2.9	0.6	0.4	5.6	31	35.1
SNHPC Region	80	83	83.6	12.7	10	7.9	0.9	1	0.3	3.3	2.3	1.9	0.5	0.6	5.9	26.94	29.35
State of NH	78.2	81.8	N/A	12.3	9.8	N/A	0.7	0.7	N/A	4.4	3.1	N/A	0.8	0.6	N/A	21.9	25.3

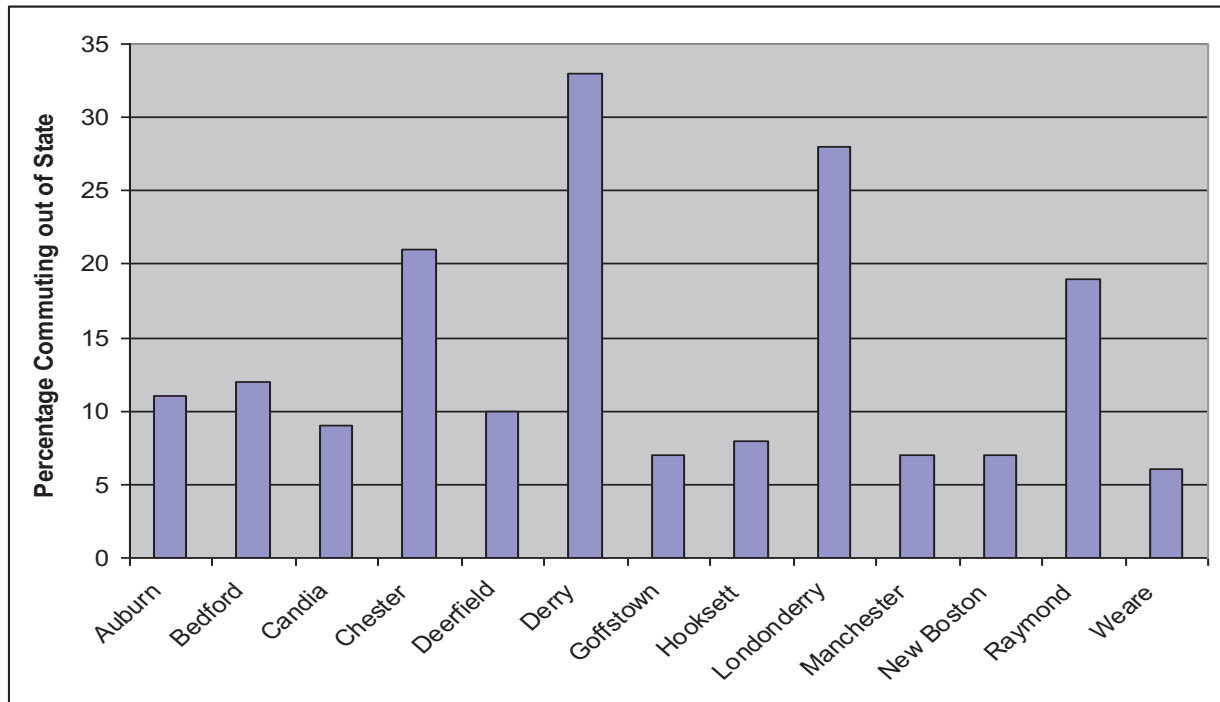
Source: 2000 U.S. Census, ACS 2005-2009

**Table 13.4
Commuting Times and Locations**

Municipality	Mean Travel Time to Work (Minutes)	Percentage of Residents:		
		Working in Community of Residence	Commuting to Another NH Community	Commuting Out-of-State
Auburn	26.7	13%	77%	11%
Bedford	27.2	26%	62%	12%
Candia	28.3	11%	80%	9%
Chester	32.2	16%	63%	21%
Deerfield	33.9	16%	74%	10%
Derry	31.1	20%	47%	33%
Goffstown	26.1	22%	71%	7%
Hooksett	25.7	21%	71%	8%
Londonderry	29.7	22%	50%	28%
Manchester	21.3	52%	41%	7%
New Boston	32.7	16%	78%	7%
Raymond	31.6	18%	64%	19%
Ware	35.1	15%	80%	6%
Average	29.4	20.6%	66%	13.7%

Source: 2000 U.S. Census

**Figure 13.1
Percentage of Residents Working Out of State by Community**



Source: 2003 New Hampshire Employment and Labor Market Information Community Profiles

Major freeways, such as Interstate 93 and the F.E. Everett Turnpike, primarily carry through traffic while arterial roads, such as NH 101, NH 28, and US 3 carry a combination of local and through traffic. The region's road network system conforms to a functional classification of streets and highways as defined by NHDOT. Daily traffic on the major roadways in the SNHPC region is continually monitored by both the commission and the New Hampshire Department of Transportation.

“Highway capacity,” is the maximum number of vehicles that can be expected to be able to traverse a section of roadway under certain prevailing traffic, roadway and control conditions. This term, usually expressed in vehicles per hour, refers to a rate of flow and not a total daily volume. Several roadways were identified as operating at or over capacity during peak hour periods in the Regional Transportation Plan. These roads include NH 101 (Bedford); I-93 and I-293 in Londonderry and Manchester; NH 114A in Goffstown; NH 102 in Londonderry; and US 3/NH 28 in Hooksett. The RTP forecasts that by 2035 this list would expand to include NH 101 in Auburn and Bedford; NH 102 in Chester and Raymond; and F.E. Everett Turnpike in Manchester and Bedford.

Traffic congestion in New Hampshire is measured in terms of Level of Service (LOS) A through F, with A being free flowing and F being heavily congested. In 2008, out of 4,559 miles of major state highways including state maintained and numbered routes, 305 miles were congested at LOS E and F and 1,235 miles were moderately congested at LOS C and D.⁴

Traffic congestion is a result of roads exceeding their intended capacity. It is caused in large part by sprawling development patterns and people living farther and farther away from where they work. Traffic congestion is not only costly in terms of pollution, lost economic opportunity and driver frustration, but it is also a completely unsustainable practice. As the population of the SNHPC Region continues to grow, it is important to actively promote a more sustainable transportation network. A large part of this includes reducing the number of single occupancy vehicle trips, which can be achieved



A school bus on Bog Road in Goffstown.

by providing and promoting alternative means of travel such as:

- Improved transit services in the SNHPC Region;
- The creation of commuter rail services along the Capitol Corridor from Boston to Concord;⁵
- Improved and expanded Park and Ride facilities;⁶
- The provision of bike and pedestrian infrastructure;
- The promotion of Transit Oriented Development (TOD) near park and ride, commuter rail and transit facilities.

⁴ NH DOT 2011-2020 Ten Year Plan

⁵ NHRRA, <http://www.nhrra.org/capitol.php>

⁶ NH DOT Rideshare, <http://www.nh.gov/dot/nhrideshare/parkandride.htm>

Significant traffic flow volumes are found near and between the locations of major traffic generators. Generators include concentrations of facilities associated with business, commercial enterprises, industrial/manufacturing firms, airport-related functions and businesses and large residential developments such as apartment and condominium living areas. In the SNHPC region, major generators include:

- Manchester Boston Regional Airport/South Willow Street area (manufacturing, wholesale distributors, retail sales and services);
- Downtown Manchester central business district (offices, retail sales, entertainment, and services);
- NH 102, Londonderry and Derry (retail sales);
- NH 28 and Crystal Avenue, Derry, (retail sales, manufacturing);
- US 3, Hooksett (retail sales and service companies, manufacturing);
- US 3, Bedford (office, retail sales).

Other activity centers include the small village centers in municipalities surrounding the Manchester area.

Transit

The current MTA fixed-route system, shown in Figure 3, consists of eleven (11) routes providing scheduled service Monday through Friday in Manchester, which, according to SNHPC estimates, has a current population of approximately 112,440. Saturday service is provided on nine (9) of these routes while no Sunday service is provided. Hours of operation on weekdays are 5:30 AM to 6:30 PM while on Saturdays service is provided on a reduced schedule between 8:00 AM and 6:30 PM. The regular fare for a one-way trip is \$1.50. Regular fares are discounted at a rate of 50 percent of the regular fare for senior citizens and handicapped passengers. Ten-ride tickets are \$14.00 for adults, \$11.00 for students and \$7.00 for senior citizens and disabled passengers.

Comprehensive service is provided to Manchester's central business district, and routes extend outward to serve most areas of the City. The fixed-route system is limited to the boundaries of the City of Manchester, with the exception of four routes that extend into small portions of Bedford, Goffstown, Hooksett and Londonderry. Frequency of service (headway) on all routes is one hour. Round trip running times on seven routes are fifty-five minutes and vary from forty minutes to an hour and ten minutes on the remaining four routes. The one hour headway is operated all day weekdays and Saturdays, with 11 buses in operation all day weekdays and 9 buses all day Saturday.

Ridership on the MTA generally decreased throughout the 1980's and 1990's due to route reductions and fare increases. Multiple fare increases in the late 1980's and early 1990's likely accounted for the declining ridership, and reductions in service continuing through the 1990's extended this decrease through the past decade. Minor changes were made to bus routes in 2000, including increases in service to local colleges and universities. Further changes occurred in September 2003 with additional round trip service to Manchester-Boston Regional Airport. Statistics for 1988 through the fiscal year 2002 indicate a stabilization of ridership, yet substantial drops of ridership in 2002 interrupted this pattern. However, since 2005 ridership in the system has been generally rising (see Table 13.5).

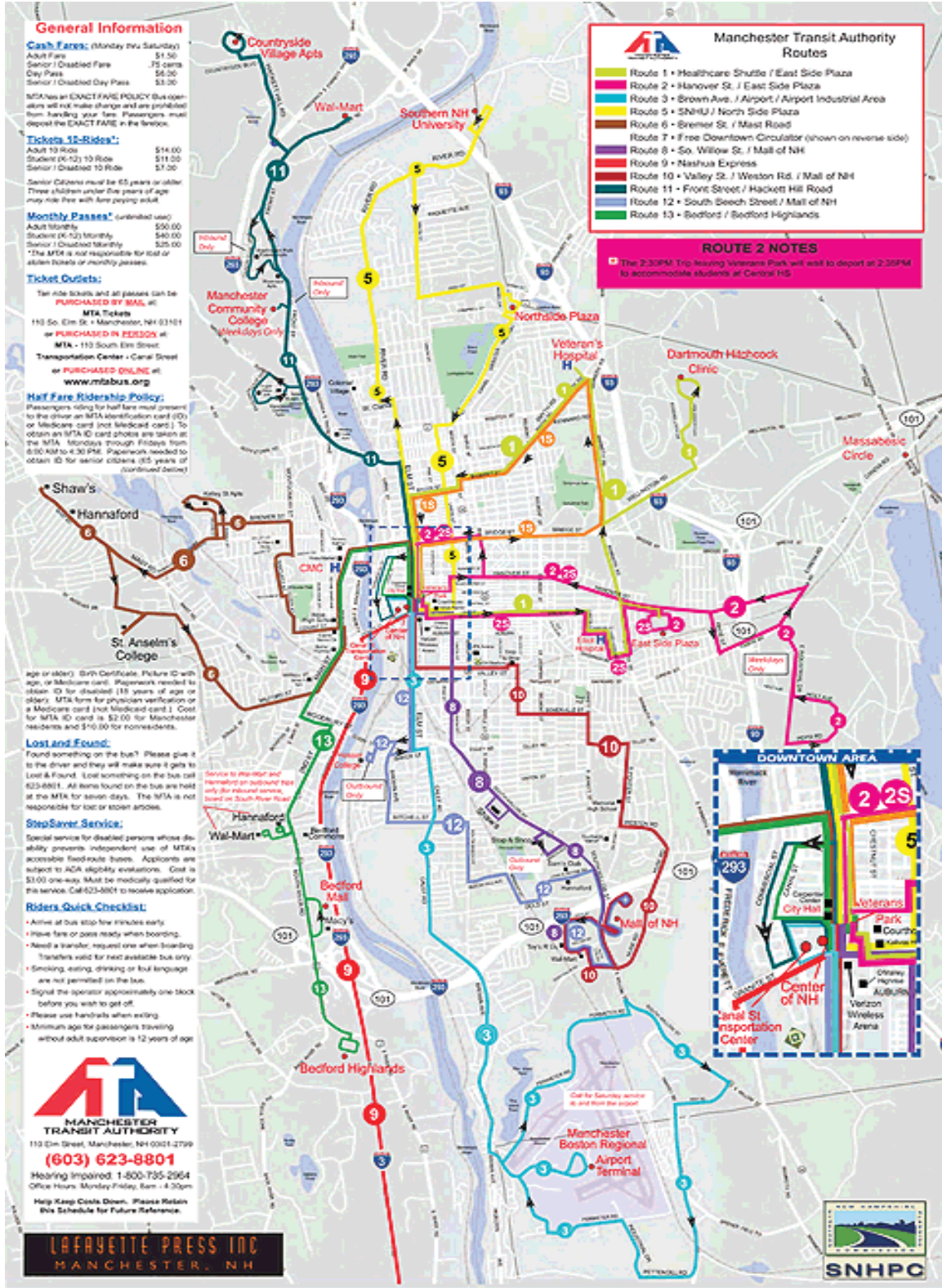
Table 13.5
MTA Annual Ridership, 1990-2009

Year	Ridership	Percentage Change
1990	648,275	-2.9
1991	588,848	-9.1
1992	581,154	-1.3
1993	567,071	-2.4
1994	620,018	9.3
1995	551,313	-11.0
1996	476,883	-13.5
1997	462,720	-2.9
1998	447,325	-3.3
1999	432,635	-3.2
2000	454,612	5.0
2001	395,365	-12.9
2002	341,503	-13.7
2003	395,365	15.7
2004	382,979	-3.1
2005	409,216	6.8
2006	439,625	7.4
2007	411,728	-6.3
2008	475,210	15.4
2009	531,961	11.9

Source: MTA, 2010

In addition to the MTA, The Cooperative Alliance for Regional Transportation (CART) is a public transit service developed to expand access to transportation in a seven town Greater Derry-Salem service area that includes the towns of Chester, Derry and Londonderry in the SNHPC region. The two key elements of the service include: 1) coordinating the efforts of a range of existing agencies providing van service to senior citizens, people with disabilities, and others in need of transportation in the region; and 2) expanding service available by leveraging federal transit funds available to the region which have not been tapped previously. CART has been in operation since October of 2006. During Fiscal Year 2010 (October 2009-September 2010) CART provided 12,902 trips. That figure for the start of Fiscal Year 2010 (October-December 2010) stood at 2,883 for the three month period. The majority of these trip destinations were for medical appointments to the communities of Derry, Londonderry and Salem.

Figure 13.2
MTA Routes



Source: Manchester Transit Authority, 2010

Transit is a more cost effective and sustainable mode of travel, as it reduces the number of single occupancy vehicles on the road and their associated emissions and pollutants. The SNHPC along with the MTA is currently studying the feasibility of a regional transit system/authority that would provide transit access to a far greater number of the Region’s residents (the MTA only serves Manchester and some very small areas of four surrounding communities).

In addition to the MTA and CART, several carriers operate inter-city bus service with stops in the SNHPC Region. Concord Coach/Boston Express provides service between Concord, New Hampshire and Boston, Massachusetts, making multiple (up to 20 per day) stops in Manchester and Londonderry throughout the week. Greyhound Lines, which formerly operated as Vermont Transit Lines in the SNHPC Region, makes stops at the Manchester-Boston Regional Airport from various locations in New Hampshire, Vermont, Massachusetts and Montreal, Canada. Peter Pan Trailways offers limited service between Concord and Connecticut that includes a stop in Manchester.

A vital future need for the region is consideration of the development of an east-west bus service from Manchester to Portsmouth along the Route 101 corridor. Today, to get to Portsmouth or to go north to Maine a Manchester area inter-city bus rider has to first go to Boston to connect with a northbound service. This is clearly inefficient and not attractive to riders. An east-west connection between Manchester and Portsmouth would connect a sizable population along the Route 101 corridor.

Freight

Truck transportation represents the primary mode of freight transportation in the United States, New Hampshire and the SNHPC Region. Table 13.6 presents 2002 data showing the importance that trucking plays in the movement of freight shipments in the State. The FHWA Office of Freight Management and Operations estimated that these freight movements in New Hampshire represented slightly over 4 billion ton-miles of truck shipments per year. Historically, they included products such as electrical equipment, machinery, foodstuffs and fabricated metal products. In 2002, approximately 82 percent of all freight shipments in the State were moved by truck.

**Table 13.6
New Hampshire Freight Shipments by Truck and Rail (2002) Total Tonnage (millions) and Percent of Total Shipments**

Categories	Total Tons	Truck	Rail
Within State	31.1	92.6%	<1%
From State	20.6	74.8%	4.4%
To State	24.7	74.5%	8.5%
Total State	76.4	81.9%	4.1%
Percent of Total	100%	81.9%	4.1%

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations.

SNHPC Regional Transportation Plan, 2010

Air Travel

Manchester-Boston Regional Airport (MBRA), New Hampshire's largest commercial air traffic facility, offers the region modern airport amenities. Six major and three regional airlines provide domestic passenger service to MBRA. Southwest Airlines and U.S. Airways are the two largest airlines serving MBRA, accounting for 62 percent (34 percent and 28 percent, respectively) of the passengers at the facility. Of the five all-cargo airlines that serve MBRA, United Parcel Service accounts for the largest share of total freight, followed by Federal Express. Additionally, Air Canada provides several daily flights to Toronto, Canada. The economic impact of the facility, which was estimated in 2008 at approximately \$1.24 billion, has doubled over the past five years. According to an economic impact study completed for the City of Manchester, MBRA accounts for 3,820 jobs with an annual payroll of \$153 million and direct spending by on-airport businesses and organizations totaled \$242 million. Table 13.7 shows historic passenger and cargo data for MBRA.

Table 13.7
Historic Passenger and Cargo Activity at MBRA

YEAR	PASSENGER ENPLANEMENTS	PASSENGER DEPLANEMENTS	TOTAL PASSENGERS	CARGO (IN POUNDS)
1990	390,556	386,702	777,258	45,856,698
1991	410,787	414,800	825,587	51,868,258
1992	422,600	417,761	840,361	80,295,756
1993	400,564	393,570	794,134	89,384,571
1994	463,431	456,483	919,914	101,673,996
1995	451,138	442,188	893,326	108,602,197
1996	500,322	483,808	984,130	117,877,136
1997	559,741	548,475	1,108,216	123,000,560
1998	971,821	966,356	1,938,177	133,927,872
1999	1,412,769	1,396,320	2,809,089	159,825,171
2000	1,588,320	1,580,981	3,169,301	166,936,519
2001	1,631,331	1,602,224	3,233,555	166,519,494
2002	1,687,733	1,675,510	3,363,243	181,342,300
2003	1,802,299	1,799,121	3,601,420	161,093,039
2004	2,004,122	1,999,185	4,003,307	162,080,948
2005	2,166,623	2,162,855	4,329,478	155,640,131
2006	1,952,277	1,944,255	3,896,532	176,382,468
2007	1,948,313	1,944,317	3,892,630	193,487,647
2008	1,861,695	1,854,698	3,716,393	178,155,941
2009	1,595,477	1,585,772	3,181,249	161,670,797

Source: MHT, 2010

Intermodal/Multimodal Facilities

The Manchester Transportation Center, which was renovated in late 2009, is a multi-modal bus facility located in the central portion of the city at 119 Canal Street. Boston Express and Concord Coach offer inter-city bus services to destinations such as South Station and Logan International Airport in Boston from the facility, which is also served by Greyhound and Peter Pan Bus Lines. MTA also serves the facility via Route 2 (Hanover/Massachusetts Traffic Circle), Route 4 (Elliot Hospital/East side Plaza/East Industrial Drive), Route 11 (Front Street/Hackett Hill Road) and Route 13 (Bedford/Bedford Highlands).

Additionally, the current New Hampshire Ten Year Transportation Improvement Plan contains approximately \$9.4 million dollars for the construction of a Manchester Multi-Modal Transportation Center including a 600-space parking garage and park n' ride facility. The proposed site for the facility is immediately south of Manchester's downtown core. It is anticipated that this facility would also serve as the downtown Manchester station for a proposed extension of passenger rail services into the SNHPC region.



Entrance to Manchester Airport

MBRA and the Manchester Transportation Center serve as key links between several modes of transportation. Manchester Airport serves as a junction of trucks, passenger vehicles, buses, bicycles, and planes; Manchester Transportation Center serves as a junction of buses, passenger vehicles, bicycles, pedestrians, and perhaps future passenger rail. In addition, several warehousing areas throughout the region connect trucks, passenger vehicles, and rail cars.

Pedestrian and Bicycle Travel

The SNHPC is committed to facilitating and encouraging bicycling and walking as convenient, safe, sustainable and practical forms of transportation throughout the region. This work is generally supported by objectives that emphasize the regional network, safety, appropriate design, education, planning and maintenance of the system and include:

- Establishing a continuous and coordinated regional bikeway and pedestrian walkway system, ensuring that this regional system is well linked with local municipal systems and adjacent systems in adjacent towns and regions;
- Making biking and walking safer;
- Creating a traveling environment that provides an inviting, viable alternative to motorized travel;
- Promoting public awareness and acceptance of bicycling and walking as attractive, viable and sustainable transportation and recreation modes;
- Participating in and promoting Safe Routes To School (SRTS) activities among the SNHPC region;
- Fully and meaningfully integrating bicycling and pedestrian needs into the land use planning, transportation planning, highway design, and highway maintenance processes.
- Continue to expand and coordinate a trail system in the region through SNHPC Regional Trails Coordination Council.

The mission of the Regional Trails Coordination Council is to develop and assist in the implementation of a comprehensive trail plan. The Regional Trails Coordination Council will:

- 1) Provide a forum for cooperation and collaboration among both governmental and non-governmental organizations;
- 2) Develop consensus on priorities for regional trails development;
- 3) Act as an information clearing house for regional trails stakeholders;
- 4) Identify and pursue sources of funding;
- 5) Promote awareness of existing and developing trails.

While bicycling and walking have numerous health and environmental benefits and take automobiles off of our increasingly congested roads, current land use patterns in the region often do not support development of facilities and planning for pedestrian and bicycle travel. Additionally, existing facilities often do not allow for safe and comfortable travel by these modes. The extent to which planning for pedestrian and bicycle facilities can practically occur at the local level often varies greatly. As a result, SNHPC proposes that project level actions be taken to change practices, policies and regulations pertaining to pedestrian and bicycle facilities in the following areas:

- Land use, by making development more compact and reducing distances between origin and destination points;
- Engineering practice, by supplying adequate facilities and seriously considering bicycle and pedestrian needs at every stage of the planning and development process;
- Education concerning automobile, pedestrian and bicycle safety, including the concept of “complete streets⁷”;
- Encouragement, by building community support and awareness, and by assisting private and public sector businesses to increase employee levels of biking and walking; and
- Enforcement, by more strictly implementing existing laws to strengthen the education element.

Rail

There are approximately 459 miles of active railroad track in use in New Hampshire that are owned and operated by 17 different entities including the State of New Hampshire, which owns approximately 200 miles. The rail system in New Hampshire was reduced by approximately 75 miles during the ten year period between 1993 and 2003 and a significant portion of this reduction was the result of the abandonment of previously active rail lines. The State has purchased a substantial portion of this property to maintain and encourage rail freight service and for preservation for use as recreational trails. A specific goal of the New Hampshire State Rail Plan is to preserve abandoned railroad corridors having potential for future transportation or public uses. All railroads are rated according to the standards of the Federal Railroad Administration.

The principal rail line in the SNHPC region is the New Hampshire Main Line that runs north-south along the Merrimack River through Bedford, Manchester and Hooksett. This line is owned by the Boston and Maine Corporation, a subsidiary of Pan Am Railroad. As population and traffic congestion levels in southern New Hampshire increase, interest in passenger rail as a transportation alternative has grown as well. Through the efforts of a wide range of stakeholders including SNHPC, numerous initiatives to bring passenger rail service into southern New Hampshire are currently underway. To date, they have included evaluation of potential services along the New Hampshire Main Line, the Manchester & Lawrence (M&L) Branch and a proposed rail corridor within the right-of way of I-93. Figure 4 shows the existing New Hampshire rail network.

⁷ Complete Streets often referred to as (livable streets) are roadways designed and operated to enable safe, attractive, and comfortable access and travel for all users, including pedestrians, bicyclists, motorists and public transport users of all ages and abilities. The American Planning Association has endorsed the concept of “complete streets” and offers the following additional information which can be found at: <http://www.planning.org/research/streets/index.htm>.

Passenger rail service from Manchester to Boston would allow the highly skilled southern New Hampshire labor market better access to the Greater Boston labor market and vice versa, potentially increasing competitiveness and productivity and, by doing so, expanding output and employment opportunities in both areas. This would help the SNHPC Region by giving employers more freedom in their site selection process. With the state's business-friendly climate and new rail link, southern New Hampshire would become a very attractive start up and relocation spot for companies.

Figure 13.3
New Hampshire Railroad Network



Source: New Hampshire DOT

Future Conditions

To look towards a sustainable transportation modal, the SNHPC adopted the FHWA's definition of sustainable transportation, which is to "provide exceptional mobility and access in a manner that meets development needs without compromising the quality of life of future generations. A sustainable transportation system is safe, healthy, affordable, renewable, operates fairly and limits emissions and the use of new and renewable resources."

To assess the region's existing highway facilities and plan for future changes, the SNHPC maintains a regional transportation model. The model, which is described in much greater technical detail in the SNHPC Regional Transportation Plan, utilizes the TP+/VIPER commercial travel demand modeling software package and the Commission's socio-economic database. The region's principle street system is divided into links and nodes. Each link in the network has specified length, average speed, number of lanes, capacity, and use with one-way or two-way traffic. Within the model network of links and nodes, the region's thirteen communities are represented by 290 internal "Traffic Analysis Zones" (TAZ) and 67 "external stations" on the boundary of the SNHPC Region. The traffic forecasting procedure follows a standard four-step process:

1. **Trip Generation** - Determine the quantity of trips generated at each traffic zone.
2. **Trip Distribution** - Determines the origin and destination patterns of trips generated at each TAZ.
3. **Modal Split** - Determines what modes the trips are going to use to travel to their destination.⁸
4. **Traffic Assignment** - Determines which routes the trips are going to take to their destination.

The traffic assignment portion of the model uses an algorithm that reflects the way traffic gradually diverts away from roadways as they become congested. The assignment portion also includes movement counts and timing data from all signaled intersections in the SNHPC region to account for vehicle delays at these intersections. Finally, the model factors in capacity of roadways and delay at the signals. Traffic assignments were prepared for 2012, 2017, 2026 and 2035 to coincide with the requirements for air quality conformity determination.

The regional transportation model has undergone a validation process to ensure that it reasonably estimates base year (2005) travel activity in the region. This validation process has a degree of built-in error and is considered to make reasonable travel estimations given reasonable future year input. The RTP assumes "Build" and "No-Build" scenarios to compare the potential impacts of projects and improvements. The Build scenario assumes that all proposed projects and improvements included in the Regional Transportation Plan are completed while the No-Build scenario assumes that no changes to the existing roadway network will be made.

Regional Traffic Volumes

Travel patterns and volumes on the region's highway system will change as a result of the implementation of the projects and improvements specified in the RTP. A comparison of year

⁸ No modal split analysis has been applied to the data because transit ridership is an insignificant percentage of total travel activity.

2035 No-Build and Build traffic assignments shows that, as a result of the Build projects, traffic decreases such as those on I-293 between Brown Avenue and the F.E. Everett Turnpike, on portions of South Willow Street in Manchester and on Crystal Avenue in Derry, will occur. Other areas, such as those in the vicinity of the I-93 widening project and the Airport Access Road, will experience increases in traffic as a result of the projects included in the Build scenario. Traffic volumes produced by the regional travel demand model are expressed in Annual Average Daily Traffic (AADT).

A comparison of overall regional Vehicle-Miles Traveled (VMT, a measure of the overall daily use of a region's highway system) for year 2035 indicates that the 9,594,837 No-Build region-wide VMT figure will be reduced to 9,547,669 as a result of the Build scenario projects. This represents a decrease of about one percent with the Build network in place. Regional VMT are decreased as a result of new highway facilities that reduce trip lengths for some origin-destination paths by providing a more direct route. In some instances, trip lengths between other origin-destination paths will be increased where travel is directed to a longer but faster and more efficient route.

In the regional travel demand model, vehicle-hours traveled (VHT) accounts both for travel speed and traffic volumes on a region-wide basis. The results of the regional travel demand modeling process indicates that, as a result of the Build network, total year 2035 VHT will decrease VHT by 18.6 percent compared with the year 2035 No-Build scenario.

SNHPC Region Transportation in the Future

The popularity of transit facilities is expected to increase by 2035 due to population growth and development, marketing efforts by the MTA, increased costs of personal vehicle travel, concerns for congestion and safety, and improved transit schedules and coach comfort. SNHPC is actively involved in the development of public transit in the region, from collaborating with the Manchester Transit Authority in the provision of fixed-route transit services, participating in the design and management of new transit services (CART in the greater Derry-Salem area), and participating with NHDOT and the New Hampshire Department of Health and Human Services in a project to coordinate community transportation services on a Statewide basis. The SNHPC is also involved with other transit initiatives, such as the pursuit of a fully regional transit system and expansion of passenger rail services into southern New Hampshire, and proposals for new transit services. One element that all of existing and future services have in common is their need for new dedicated sources of funding for operations and capital replacement. Because the transit funding projections included in the RTP and TIP are sufficient only for maintaining the current service levels and replacement of capital, additional funding will be required for growth and expansion of transit in the region. It appears evident that, in order to expand transit in the SNHPC region, sources of dedicated transit revenue must be identified. This will be an ongoing issue in the future, especially in light of the projected increase in transit popularity moving into the future.

The high cost of regional transportation projects will only be partially covered by state and federal funds. As transportation is clearly a pressing need of the region and municipal budgets cannot afford the prohibitive costs of these improvements, the region must explore creative funding methods. Table 13.8 lists a variety of innovative funding methods for transportation projects along with some benefits and drawbacks. Alternative taxation and fee methods can have

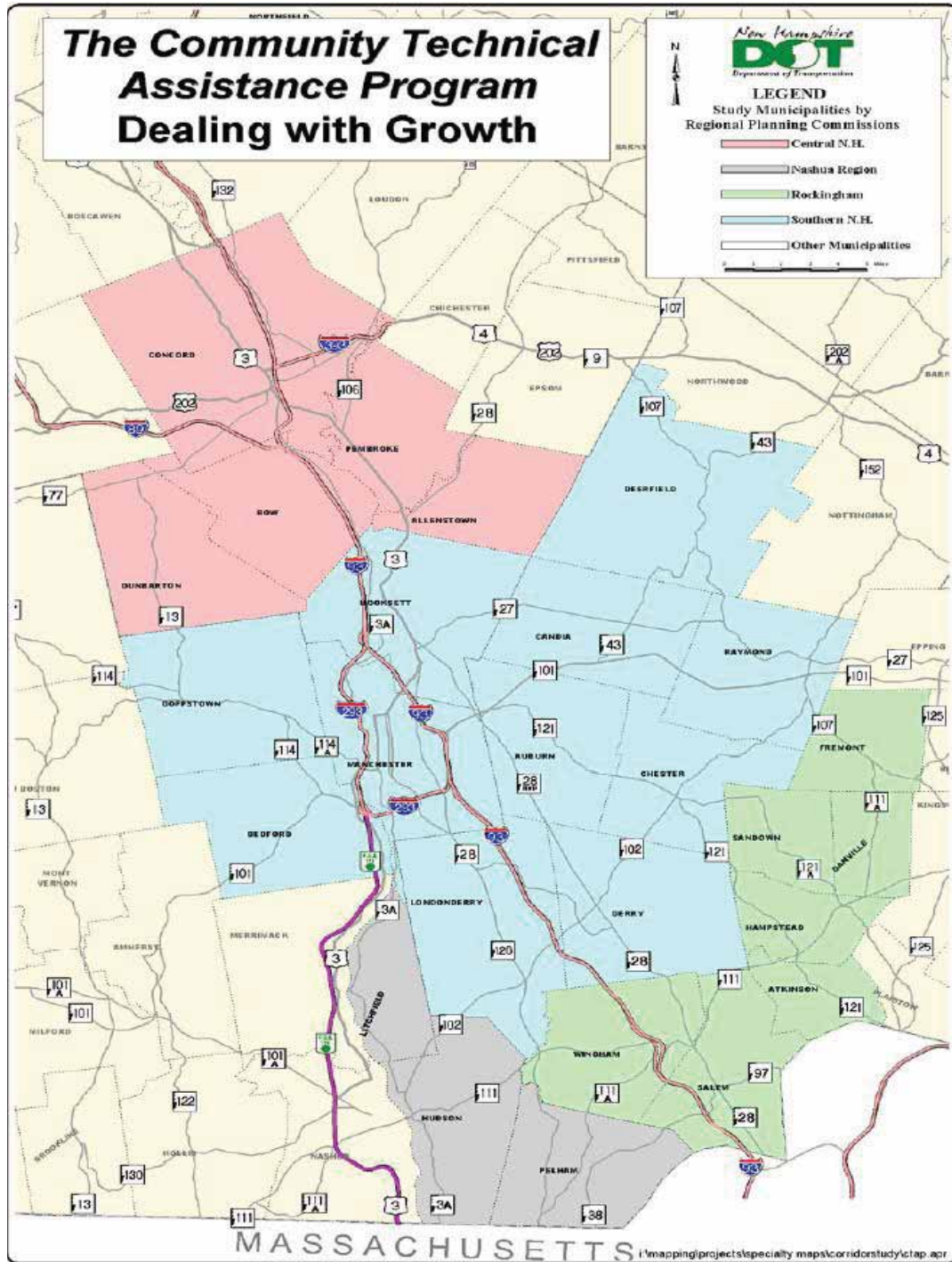
complex processes and implications; therefore the listed strategies should be used as guidelines for further research into the method that is most compatible for each municipality.

The FY 2011-2014 TIP for the SNHPC region contains a list of priority projects to be carried out during this three-year period. The TIP is financially constrained by year and includes a financial plan that demonstrates how projects can be implemented assuming anticipated costs and revenues while the existing transportation system is being adequately operated and maintained.

Two of the large-scale projects listed in the State 10-Year Plan show potential for substantial region impacts in terms of population growth and economic development. The I-93 corridor has shown sizeable increases in the average daily traffic since 1980. The widening of I-93, combined with transit improvements, is the state's response to increased traffic volumes and congestion. The I-93 widening project will strengthen the region's ties and accessibility to Boston and, it is projected to bring tens of thousands of new residents to the region by 2020. The NHDOT has identified 26 primary and secondary impact communities – including most of those within the SNHPC Region – that will be affected by this project. It is currently providing each with technical and financial growth assistance through a comprehensive five-year, \$3.5 million effort known as the Community Technical Assistance Program (CTAP). Construction has begun and the project is currently scheduled for completion in 2020. Figure 5 below shows the scope of the CTAP program.

The I-93 widening is considered to be necessary to manage future traffic growth in the region, yet experts believe the expansion alone will not meet transportation needs. Rather, the expansion combined with a potential rail link between Boston, Nashua, and Manchester will allow high-speed commuter transit and reduce road congestion.

Figure 13.4
 The Community Technical Assistance Program Dealing with Growth



**Table 13.8
Alternative Financing Methods**

Alternative	Description	Drawbacks/Benefits
Tax increment financing	Property values are assessed for the base year. Any taxes from an increase in property values or new property are dedicated to improvements in those areas, such as roads, transit, parking, pedestrian, and traffic signals.	Most districts use bonds initially and then use taxes to repay bonds. Immediate tax benefits from new developments delayed for several years until bonds are paid off.
Assessments	A fee on properties within a district to pay for specific improvements within the district. Can be one-time or recurring, used to retire bonds or fund maintenance costs.	Works well only with cooperation from local businesses paying the fees. Are not considered taxes and cannot be deducted from federal taxable income.
Transit Assessment District	This is similar to assessment, but rates vary according to proximity from transportation improvements. Can be divided into graduated assessment benefit zones.	Subject to voter approval. Can be done completely at a local level.
Fees	As opposed to taxes, these are levied only on those parties causing a significant impact on transportation infrastructure. May be assessed based on square ft of development, units constructed, or peak hour vehicle trips generated.	Can be challenged by the private sector. Levied at the time that the building permit is issued—assuring concurrent construction of roads. Money only funds new improvements—new and old residents must equally share maintenance costs of old roads.
Negotiated Investments	Private sector contributes or fully funds public sector transportation improvements, either in exchange for zoning changes and building permits or for projects that benefit the private company.	Can be used on the local level as a negotiation technique for developers who need zoning changes.
Private donations or initiatives	A private developer finances all or part of a transportation project that benefits him/her but is a low public priority.	Raises the question of the degree to which private interests can influence public priorities.
Use of property rights	The city or state sells or leases property rights above, below, or adjacent to highways, routes, or other transportation facilities.	Requires intensive negotiations and involvement and is a lengthy process.
Contracted transit services	When private interests dictate a public-access transit system, private funds are invested in fully financing or contracting out services for public use.	In cases with little public involvement, transit can become effective and efficient for the intended users. However, construction is totally dictated by private interests.
Tolls	Tolls are collected for use on roads.	Toll roads are constructed more quickly.
Tax on gasoline	Taxes are levied on gasoline and used towards transportation projects.	Can be passed at a local or county level. Must receive public support. Gas prices already expensive.
Beer tax	Taxes collected on beer in Birmingham, AL raised \$2 million for transportation	
Lottery	Portions of lottery proceeds go toward transit and transportation costs.	Currently, NH lotto revenues go towards operating expenses, prizes, and education. Requires legislative approval.

Table 13.9 lists regionally significant highway projects that will have large impacts on future travel behavior and traffic patterns in the SNHPC Region.

Table 13.9
Future Highway Projects with Major Impacts on Traffic Patterns SNHPC Region

Project	Location	Year
Airport Access Road	Bedford, Manchester, Londonderry	2012
I-93 Exit 4A	Derry and Londonderry	2021
U.S. 3/NH 28 Bypass	Hooksett	2025
Re-Construct Exit 6/7 on F.E. Everett Turnpike	Manchester	2021
I-93 Widening	Manchester, Londonderry and Derry	2020
Re-Construct Exit 4 on F.E. Everett Turnpike	Manchester	2025

Source: SNHPC Regional Transportation Plan, 2010

In continuing pursuit of extending passenger rail service in New Hampshire, SNHPC is participating as a member of the New Hampshire Rail Transit Authority created by the State Legislature in 2007. The mission of the Authority is to “[d]evelop and provide commuter and passenger rail and related public rail transportation services in New Hampshire.” The vision of the Authority is to “[d]evelop and implement comprehensive, coordinated and prioritized project and funding plans for passenger rail services that provide New Hampshire citizens:

- Commuter rail services to in-state and out-of-state employment centers;
- Tourist services to recreation areas;
- Easy access to regional inter-city passenger rail services and other multi-modal transportation systems.

The New Hampshire Rail Transit Authority is pursuing the implementation of passenger rail service on the New Hampshire Main Line (Capitol Corridor) extending from North Station in Boston to Concord including station stops in downtown Manchester and MBRA. This service is being pursued as the first phase of a Boston to Montreal rail service. Two of the more recent accomplishments related to the development of this service involve addressing the issue of liability for operation of the service and identification of the anticipated economic impacts of the service. Rail liability legislation introduced and passed by the Legislature during the 2008 session was signed by the Governor in June 2008. A study assessing the economic impacts of restoring intercity passenger rail service between Boston, MA and Concord, NH via the Capitol Corridor was completed in March 2010. The report focuses on the long-term effects that this new service will have on job creation, increased labor income and improved business output.

The proposed MBRA station in Bedford would provide the SNHPC Region with a crucial intermodal link between passenger rail and air travel and help the region from an economic development standpoint. By creating greater transportation access to and from MBRA to other major East Coast metropolitan centers, the region would be a more attractive place in which to do business. Rail access near MBRA would also enhance both the region and state’s ability to serve national markets by means of freight rail. With the physical and economic costs of moving

freight by truck rising rail freight is becoming more practical and popular, yet New Hampshire is severely underserved by both lines and facilities. Additionally, improved access to MBRA could make the region a more attractive base for tourists, both day trippers from Massachusetts as well as travelers from outside the immediate area looking to use Manchester as a base in which to explore New England. MBRA has already committed to providing shuttle service from the Bedford station to the airport.

Sustainable Transportation Measures

The SNHPC promotes Transportation Demand Management (TDM) to reduce the number of single-occupancy vehicle trips. Organized TDM programs can include benefits such as vanpools, bicycling and walking programs, incentive programs, and compressed workweeks. While office employers can coordinate TDM benefits for their employees, Transportation Management Associations can coordinate TDM commuter benefits on a regional scale, making TMAs a valuable and sustainable transportation administration tool for the region.

A substantial proportion of traffic in the region is created by commuters who live far distances from where they work. Transit Oriented Development, in which towns build mixed-use, pedestrian-friendly developments around transportation centers (such as transit stations or Park and Ride facilities) can be promoted as a sustainable response to this issue. These higher-density complexes allow residents to live in close proximity to retail services and have easy access to their workplaces. They serve the towns by easing infrastructure costs and reducing traffic congestion. Park and Ride lots and facilities are another similar tool that can be used to pursue similar ends. Cheaper and easier to implement than Transit Oriented Developments, Park and Ride facilities placed at major crossroads can promote car pooling and reduce congestion and carbon emissions. Park and Ride can be viewed as a low hanging fruit when pursuing larger sustainable transportation measures as it can be a small but important first step toward that goal. The New Hampshire DOT maintains a list of all Park and Ride facilities in the state, offers a commuter matching service, and provides other Park and Ride information through its Rideshare program.⁹

Other measures that promote a more sustainable transportation network that can be considered moving into the future include:

- The continued pursuit and promotion of bicycle and pedestrian planning;
- Increased public transit options, including the possible creation of a regional transit authority;
- Increased park-and-ride facilities near interstate entrance ramps and other major roadway junctions to encourage more carpooling and vanpooling;
- Commuter rail to Boston and other passenger rail services;
- Park and ride facilities near major highway access points;
- Intelligent Transportation Systems (ITS) that utilize advanced communication and information technology to increase driver safety, improve transportation times, reduce fuel consumption, make freight delivery more efficient and generally improve upon the current transportation system;

⁹ NH Rideshare, <http://www.nh.gov/dot/nhrideshare/index.htm>

- Provide alternative fuel infrastructure as the technology becomes widely available. Examples of this would include pumps for alternative fuels at filling stations and recharging stations for electric cars;
- Additional smart growth land use techniques similar to TOD that promote compact development and less auto-dependence, including Planned Unit Developments (PUD), Traditional Neighborhood Design (TND) developments, Village Plan Alternatives (VPA) and Conservation Subdivisions.

Conclusion

Transportation plays a central role in the day-to-day life of SNHPC residents. Currently, the region is well served by all modes of transportation. However, to maintain this status, careful financial and physical planning is necessary. All future regional transportation expenditures are carefully documented, outlined and approved in the TIP, UPWP and RTP. Over \$500 million in roadway projects and improvements are to be made over the next decade. These projects and improvements are expected to increase the efficiency and safety of the regional transportation network.

With transportation engineering and infrastructure costs constantly rising and state and municipal budgets often shrinking, the role of long range transportation planning is as important as ever. Going into the future, it will be increasingly important to identify alternative sources of transportation funding at all levels.

Additionally, issues of energy and environmental sustainability have come to the forefront of discussions on transportation and transportation planning. The inefficient and environmentally damaging but highly preferred single occupancy trip in the private automobile may no longer be sustainable. In light of this, it will be important to remain aware of the techniques available that can promote more sustainable transportation and land use practices and attitudes.