CHAPTER 4 Highways

An extensive highway network serves the eighteen towns in the MPO study area. The purpose of this chapter is to provide more detailed information about the roadways and the issues that challenge the Strafford MPO region.

Plan Goals Directly Addressed By This Chapter

| Goal 1: Accessibility / Mobility
| Goal 2: Safety
| Goal 3: Security
| Goal 5: Land Use And Transportation
| Goal 6: Economic Development And Transportation

A. Background

By providing access to land, the transportation system has a tremendous impact on the physical settlement patterns of a region, and in New Hampshire, that has been defined almost solely by the extent of the roadway network. Traditionally, the region has placed the greatest emphasis on expansion and improvements to the highway system. This is reflected in the well-developed system of state and local roads that provide access to a significant portion of the land in the region. There are however, some deficiencies in that network that have become more apparent as population growth has pushed development further and further from the traditional town centers, placing larger traffic burdens on secondary state highways and local roads.

B. Existing Conditions

This section of the chapter will detail the existing roadway network and its attributes, including traffic volumes, recent improvements, and future improvements in the planning or design stages.

1. Roadway Network

The study area's principal transportation routes include NH Routes 16, 108, 125, 155, and US Routes 1 and 202, serving north-south traffic, and NH Routes 27, 84, 88, 107, and 151, and US Route 4 which serve east-west traffic. See Map 4.1 for the locations of these principal transportation routes in the region.
NH 101 and US 4 are two of the region’s major east-west facilities. Both highways run the width of the state and have experienced high congestion and accident rates. In recent years, both facilities have undergone upgrades. US Route 4 is generally a two-lane facility with Average Daily Traffic (ADTs) over 18,500 (2000) east of NH 108 and 9,300 (2000) at the Nottingham/Northwood Town Line.

Other important north-south corridors include US 1 that parallels I-95, NH 125 which runs from the Massachusetts border to the northern tip of Strafford County, and NH 16, also known as the Spaulding Turnpike from Newington to Milton. US 1 is a heavily commercialized two lane roadway for most of its length, with ADTs ranging from 12,000 (1999) in Seabrook to approximately 24,000 (1999) just south of the Portsmouth traffic circle. NH 16, also known as the Spaulding Turnpike, is a limited access toll roadway that carries heavy commuter and tourist traffic and serves as a gateway from the Seacoast to the Lakes Region. ADTs on NH 16 ranges from 61,000 (2000) just south of the Gosling Road interchange (Exit 1) to only 7,900 (1999) at the northern end of the study area in Wakefield.

Additionally, NH 125 and NH 108 serve an increasing volume of traffic from the Massachusetts line to the northern region of the MPO and beyond. NH 125, with its connections to the Spaulding Turnpike, US 4, NH 101 and Interstate 495 is quickly becoming a popular route for tourists and commuters. AADTs range from about 12,000 vehicles per day in Brentwood to about 18,000 in Epping, and 14,000 in Rochester. NH 108 serves as an alternate commuter route to the Spaulding Turnpike for those moving between the coastal towns and the northern part of the region. This route has its greatest volume of traffic near the Exeter/Stratham border (22,000), and remains a very busy route from that area north to Newmarket, Durham and Dover.

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1 All ADTs listed in this section are based upon 1999-2001 NHDOT counts and use Average Weekday numbers.
Map 4.1: Principle Transportation Routes
2. Classification of Roads and Highways
Every ten years, NHDOT, working with the regional planning commissions (RPCs), updates the State’s functional classification maps for roads. Functional classification is grouping of streets and highways into classes or systems, according to the nature of service they provide.

These groupings may be used as a basis for determining jurisdiction, design standards, and allocation of funds. In general, there are four functional classes to be considered: 1) Principal arterial; 2) Minor arterial; 3) Collector and 4) Local street. A brief description of each is contained in Appendix E to assist in the understanding of the basic hierarchy of roadway function by classification. Appendix E also includes a table classifying some of our region’s roads.

In addition to the Federal Functional Classification system, New Hampshire has it’s own highway classification system that is based on who is responsible for the maintenance of the roadway. Known as the “Legislative” classification, this structure includes six categories, and was developed in the 1940’s. This Legislative classification roughly corresponds to a third scheme, known as the “System” classification which further details the Legislative class into 18 subcategories which state who owns the facility as well as who maintains it. All of this is detailed further in Appendix E, which is available the SRPC office in Dover and on the Strafford MPO website.

3. Traffic Volumes
The NHDOT’s Bureau of Transportation Planning Traffic Research Section monitors traffic growth throughout New Hampshire and publishes monthly Automatic Traffic Recorder Reports for 79 locations throughout the state. In addition, NHDOT conducts traffic counts during the summer months at additional locations and will respond to local community requests. There are eight permanent recorder locations in the Strafford MPO study area. Table 4.1 provides a historical look at the Strafford’s permanent recorder traffic volumes for selected years from 1980 to 2001. As can be seen, at most of the recording stations, traffic in the region has been steadily increasing over the last 20-25 years.
TABLE 4.1: Traffic Volumes at Region Permanent Recorder Sites

<table>
<thead>
<tr>
<th>City or Town</th>
<th>Location of Recorder</th>
<th>Average Annual Daily Traffic AADT</th>
<th>Change</th>
<th>5 Year</th>
<th>10 Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dover</td>
<td>Dover Point Rd - S of Elliot Park</td>
<td>9,985</td>
<td>15,499</td>
<td>14,307</td>
<td>14,014</td>
</tr>
<tr>
<td>Dover</td>
<td>Spaulding Turnpike Toll</td>
<td>12,458</td>
<td>24,139</td>
<td>28,829</td>
<td>30,172</td>
</tr>
<tr>
<td>Durham</td>
<td>US 4 - East of NH 108</td>
<td>---</td>
<td>15,330</td>
<td>17,171</td>
<td>17,547</td>
</tr>
<tr>
<td>Lee</td>
<td>NH 125 N of US 4</td>
<td>5,458</td>
<td>10,033</td>
<td>12,135</td>
<td>12,827</td>
</tr>
<tr>
<td>Milton</td>
<td>NH 16 @ Wakefield T/L</td>
<td>3,609</td>
<td>6,426</td>
<td>7,048</td>
<td>7,193</td>
</tr>
<tr>
<td>Newington</td>
<td>General Sullivan Bridge</td>
<td>30,162</td>
<td>55,267</td>
<td>57,908</td>
<td>62,121</td>
</tr>
<tr>
<td>Northwood</td>
<td>US 4 @ Nottingham T/L</td>
<td>---</td>
<td>7,971</td>
<td>8,921</td>
<td>9,099</td>
</tr>
<tr>
<td>Rochester</td>
<td>Spaulding Turnpike Toll</td>
<td>7,278</td>
<td>15,694</td>
<td>18,969</td>
<td>20,023</td>
</tr>
</tbody>
</table>

AVERAGE | 11,492 | 18,851 | 20,661 | 21,625 | 22,150 | 22,768 | 23,967 | 24,691 | 25,137 | 146.99% | 29.17% | 14.27% |

*Due to non-operating counters in 1999 and 2000, 2001 is used as the final year for the NH 101 station. This means the growth rates are calculated over a longer period for this station, e.g. 11 years as opposed to 10).

Table 4.2: Average Annual Growth Rates and Growth Projections at Region Permanent Traffic Recorder Sites

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AADT</td>
<td>AAGR (2)</td>
<td>AAGR (2)</td>
<td>AAGR (2)</td>
<td>ADT</td>
<td>ADT</td>
<td>ADT</td>
<td>ADT</td>
<td>ADT</td>
<td>ADT</td>
<td>ADT</td>
<td>ADT</td>
</tr>
<tr>
<td>Dover</td>
<td>Dover Point Rd - S of Elliot Park</td>
<td>14829</td>
<td>0.019775038</td>
<td>-0.0072811</td>
<td>0.0102237</td>
<td>22814</td>
<td>12627</td>
<td>18548</td>
<td>18807</td>
<td>14589</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dover</td>
<td>Spaulding Turnpike Toll</td>
<td>35663</td>
<td>0.052587537</td>
<td>0.0390285</td>
<td>0.0420455</td>
<td>110128</td>
<td>82798</td>
<td>88252</td>
<td>60155</td>
<td>52111</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Durham</td>
<td>US 4 - East of NH 108</td>
<td>18951</td>
<td>---</td>
<td>0.0212045</td>
<td>0.0200986</td>
<td>---</td>
<td>30069</td>
<td>29360</td>
<td>27600</td>
<td>21333</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lee</td>
<td>NH 125 N of US 4</td>
<td>13860</td>
<td>0.046596229</td>
<td>0.0323127</td>
<td>0.0199855</td>
<td>37749</td>
<td>27900</td>
<td>21421</td>
<td>23493</td>
<td>15944</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milton</td>
<td>NH 16 @ Wakefield T/L</td>
<td>8212</td>
<td>0.041108289</td>
<td>0.0245244</td>
<td>0.0354049</td>
<td>19923</td>
<td>13994</td>
<td>17655</td>
<td>13087</td>
<td>16911</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northwood</td>
<td>US 4 @ Nottingham T/L</td>
<td>9641</td>
<td>---</td>
<td>0.0190215</td>
<td>0.008862</td>
<td>---</td>
<td>14593</td>
<td>11732</td>
<td>13201</td>
<td>16389</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rochester</td>
<td>Spaulding Turnpike Toll</td>
<td>23617</td>
<td>0.058855535</td>
<td>0.0408688</td>
<td>0.0421138</td>
<td>83106</td>
<td>57008</td>
<td>41246</td>
<td>23378</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AAGR is the compounded Average Annual Growth Rate over the number of years (20, 10, or 5) and is taken from existing traffic volume data. The Regional Traffic model is not calibrated to provide individual link volumes, but to estimate travel on the regional level. Forecast utilizes linear regression analysis to create a “best fit” growth curve using historic data and extends it out to future years.

The data represents only a small sample of traffic volume trends but still provides some insight into regional traffic growth on the primary roadways in the region. The table shows significant growth in traffic volumes at all locations between 1980 and 2000. This growth was especially rapid during the 1980’s, with many locations experiencing a near doubling of traffic volumes. From 1990 to 1995 growth generally continued, but at a much slower pace, which coincided with slower population growth and economic activities. This trend can be seen by looking at the change in traffic volumes over the entire period and by looking...
at the historic 5, 10, and 20-year average annual growth rates. This shows high traffic growth during the 1980’s (on average 4.38%), relatively slower growth from 1990 to 1995 (1.69 percent - not shown in table), and greater growth again during the mid to late 1990’s (2.98 percent on average from 1995 to 2001).

The volume information in Table 4.1 can also be projected into the future, and Table 4.2 does that using the computed historic average annual growth rates, the Regional Traffic Model, and simple linear regression technique. Using the historic growth rates [5, 10, and 20 year Average Annual Growth Rates (AAGR)] to project current traffic volumes 20 years to the horizon of this plan produces a very wide range of estimates. Utilizing the 4.38% AAGR seen over the twenty years period from 1980 to 2000 creates a tremendous increase in traffic volumes over current levels, and in many cases would quickly outgrow the available capacity of the roadway network. Using the 5 or 10-year average annual growth rates produces more moderate estimates of what traffic volumes could be if growth continues at past levels. None of the estimates utilizing the historic growth rates take into account any limits, such as roadway capacity, that might restrict future growth. However, the information provides a useful comparison with estimates developed through other means, such as the regional traffic model, and those predicted using simple linear regression to create a “best fit” estimate of future growth.

The linear regression method of forecasting future traffic volumes also uses historic changes in traffic levels to predict the future. This method involves developing a “best fit” line that represents past growth and continuing that trend into the future. Where this differs from using the average of the historic growth rates is that while an average rate tends to smooth the high and low growth periods and applies that rate consistently to future years, the regression method looks at the trend (in this case high growth early that slows in later years) and attempts to find the best way to continue that trend to future years. In this application, the volumes predicted by regression fall between those predicted by historic average growth rates and those predicted by the Regional Traffic Model. This method predicts an average growth rate of approximately 1.8% per year for these sites.

The MPO Regional Traffic Model utilizes a feedback loop system that integrates land use into the traditional four-step trip modeling process. Base year trip ends are calculated based on existing land use at the zone level, the trip distribution module separates them into origins and destinations which are then split into the various available modes of travel, and finally distributed to the transportation network. This information is then fed back into the model to calculate the next analysis year. The 2022 PM peak travel estimates of traffic for model links equivalent to the permanent recorder sites were expanded into Average Daily Traffic for comparison with the projections performed using historic growth rates. For comparison purposes, the average of the growth predicted by the model for these locations in total is approximately 1.3% per year, which is significantly lower than the other methods. These volumes are shown in the
Table 4.2 column labeled “Model Forecast for 2022”, and are generally significantly lower than the levels predicted by the historic growth levels discussed in the previous paragraph. This is primarily due to the fact that the model considers constraints on the system in terms of available land for growth and traffic congestion changing travel patterns. At this time, the model is calibrated for predicting traffic on a regional level, and not on the individual link or intersection scale. Current work on upgrading the model and adding new capabilities may provide additional validity to these estimates, but the volumes the values presented should be taken as very general estimates that would need to be examined more closely to serve as the basis of any analysis.

The model is primarily used to make projections regarding the Vehicle Miles of Travel (VMT) within the region on a daily level and is calibrated specifically for this purpose. Generally, these projections are based on current assumptions about growth and development in the area and about future construction of transportation projects. Overall, the model is predicting an approximate 1.4% growth in VMT per year over the life of this plan or a total growth of approximately 31%. This equates to 10-year growth rates in the range of 14%, which is comparable to historic changes in VMT. The Bureau of Transportation Statistics (Part of the Federal Highway Administration) in its Transportation Statistics Annual Report 2000 [SOURCE: U.S. Department of Transportation, Federal Highway Administration, Highway Statistics (Washington, DC: Annual issues)] shows New Hampshire as a whole having a 10-19% increase in VMT during the period of 1989-1999.

NHDOT and both planning commissions also conduct non-permanent automatic traffic counts throughout the region. Staff chose the count locations with consideration of regional significance and community requests for information. These locations are mapped at both RPCs and count data is contained in traffic volume reports published by each agency every two years. This information is organized by town and can be seen in the annual Traffic Volume Reports published by NH DOT.

<table>
<thead>
<tr>
<th>Analysis Year</th>
<th>Weekday VMT</th>
<th>Ave Annual Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>6,538,050</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>7,539,713</td>
<td>1.58%</td>
</tr>
<tr>
<td>2022</td>
<td>8,580,136</td>
<td>1.43%</td>
</tr>
</tbody>
</table>

Change 2003-2022 2,042,086

From 2002 Model Runs for Air Quality Conformity Purposes - Fall, 2002
which are available at the Planning Commission Offices, as well as through the NHDOT website [http://webster.state.nh.us/dot/]

Tourism plays a large role in the Seacoast’s traffic volumes. Examples of this effect can be seen in Figure 4.1. This chart shows the average distribution of traffic between 1994 & 2000 over the calendar year on Interstate 95 at the Hampton Tolls and on The Spaulding Turnpike at the Dover Tolls. It can be seen that while both sites show an increased percentage of their annual traffic during the summer months, the variation on Interstate 95 is much greater between summer and non-summer months than it is on the Spaulding Turnpike due to the influx of tourist to the Seacoast of New Hampshire and Maine. Between 1994 & 2000, the difference between the month with the lowest traffic volumes (January) and the largest volumes (August) on the Spaulding Turnpike averaged about 8,700 vehicles per day. During that same period on Interstate 95, the difference between the lowest (January) and highest month (August) averaged about 37,000 cars per day. This illustrates the large increases in volume during the Seacoast’s prime tourist season, as well as the influence of traffic bound for Maine and the Canadian Maritime Provinces via Interstate 95. This phenomenon is seen on most of the coastal roadways in the area.

C. Progress Since Adoption of 1999-2020 Long Range Plan

Some progress has been made in the implementation of roadway projects since the adoption of the 1999-2020 Long Range Plan for the region. Some projects, such as the Spaulding Turnpike improvements in Rochester and Newington-Dover are closer to implementation, and other projects have been completed. Highway projects that have been completed include the following:

- Safety Improvements to US 4 in Durham.
- Improvements to NH 108 in Durham.

In addition, planning has progressed on many projects. The Spaulding Turnpike improvements in Rochester, Dover and Newington are in the midst of planning and engineering.

D. ROADWAY ISSUES

The Strafford region is faced with many important issues involving its highways and roads. Some of the major issues of the region are addressed in this section.

1. Access, Access Management, and Corridor Preservation
The location, density and site design of land use all have a large influence on the transportation system, as does the transportation system on the development of land. Simply stated, development and land use determine where highways (or highway improvements) are needed, and highways to a large extent determine what land is improved, and the use patterns that growth takes. This “Transportation Land Use Cycle” is discussed in greater detail in the
Transportation and Land Use chapter (Chapter 10) of this document. A major outcome of this pattern has been the proliferation linear development along transportation corridors with large numbers of closely spaced driveways and intersections along highways that, when combined with the large volumes of destination and through traffic, create significant operational and safety problems. As traffic volumes increase, making turns become more difficult and dangerous, congestion increases travel times and delay, traffic begins to spill onto parallel streets, and in the most extreme cases, people stop going to the businesses in the area or through the region. In the past, this has led to calls from the community to widen the road or build a “bypass” to relieve traffic congestion, but these solutions are costly and can create an entirely new set of problems, such as loss of community character, increased speed, accidents and congestion on widened roadways, and loss of economic activity as traffic shifts to a bypass. Access Management has developed in response to these issues as an effort to develop solutions to congestion that makes more efficient use of the existing roadway system, and attempts to be sensitive to the context in which the improvements are needed.

Access management seeks to balance the need for people to access property (residences and businesses) with the need to move traffic through an area safely and efficiently. There are several different approaches that can be taken to do this, and they are often utilized together to develop area or corridor wide improvements. This often takes the physical form of roadway changes that control the movement of vehicles, but also entails the establishment of appropriate standards and policies for fair implementation. The standards and policies generally establish the conditions to make many of the physical improvements possible by setting site distance minimums, driveway and intersection spacing standards, and others as well as laying out a general Access Management Plan for an area or corridor. The physical changes are typically related to managing how vehicles enter and exit driveways through appropriate numbers and locations of curb cuts, encouraging shared driveways, restricting turning movements, providing access roads connected to traffic signals, and turning lanes. When Access Management policies and techniques are combined, significant gains can be made in terms of improved traffic flow and reduced accident potential. There are six basic Access Management techniques that can be applied to roadways (From: Access Management,

What are the Symptoms of Poor Access Management?

• High Crash Rates
• Poor traffic flow and congestion
• Numerous brake light activations by drivers in the through lanes
• Unsightly strip development
• Neighborhoods disrupted by through traffic
• Using a local street parallel to the overburdened “arterial” to make a one-way pair
• Pressures to widen an existing street or build a bypass
• Bypass routes as congested as the roadways they were built to relieve
• A decrease in property values

From: Access Management, Location and Design, FHWA Course No. 13378, S/K Transportation Consultants

Benefits of an Effective Access Management Program

• Fewer and less severe crashes
• Less auto-pedestrian conflict
• Less stop & go traffic
• Reduced delay
• Increased & preserved capacity
• Reduced fuel consumption
• Preservation of investment in roadway system
• More attractive corridors and improved community appearance
• Enhances community character
• Preserves neighborhood integrity
• Preservation of private investment in abutting property
• Lower vehicular emissions
Location and Design, FHWA Course No. 13378, S/K Transportation Consultants):

1. **Limit the number of conflict points**: This type of change looks to reduce the complexity of driving by limiting the information that drivers must process at any given time. Limiting the interaction between vehicles & between vehicles & pedestrians/bicyclists that are moving in different directions simplifies the driver’s task, which in turn reduces the potential for accidents and improves traffic flow.

2. **Separate conflict areas**: This type of improvement attempts to increase the time or distance between decision points for drivers, allowing them to face potential conflicts one at a time, or at least in reduced numbers. This would include for example not allowing left turns from a driveway. In this case, the driver only has to focus on approaching traffic from one direction rather than two. As with #1, the intent is to simplify driving to reduce numbers of accidents and better flowing traffic.

3. **Remove turning vehicles from through traffic lanes**: The addition of turning lanes reduces the impact that vehicles slowing to make a turn have on traffic that is continuing in the same direction. In congested areas without turning lanes, all traffic stops behind vehicles waiting to greater turn. This leads to increased congestion and accident potential.

4. **Reduce the number of turning movements**: This technique focuses on the elimination of short distance, slow movement travel on the primary roadways. By interconnecting parking lots, providing access roads, and connections to side streets, vehicles can move between businesses without having to re-enter the roadway only to exit again shortly after. This results in less congestion and reduced accident potential.

5. **Improve roadway operations**: This technique uses a variety of methods to manage traffic operations on a corridor. This includes implementing long, uniform signal and intersection spacing.

6. **Improve driveway operations**: This type of improvement looks to improve the operation and safety of the roadway by making improvements to driveway intersections. Well defined driveways of appropriate width and adequate curve radii reduce the impact on through traffic by making the entering or exiting movement less difficult, and provision of adequate sight distance reduces accident potential.

Development patterns including location, density and design of land use have a great impact on the transportation system, as does transportation on development. Simply stated, land use determines where highways are needed
and highways to a large extent determine land use patterns. Part of this pattern has been the proliferation of driveway access points along highways that do not have strict access restrictions in place. In many cases, these driveways are located very close to each other, and may be multiple access points to the same property or business (Figures 4.2 & 4.3). This creates safety and capacity issues on the roadway as vehicles turn in or out of businesses. Turning vehicles create conflicts with other vehicles, pedestrians or cyclists. Vehicles slowing due to the turning vehicles also create a potential for accidents, as well as generally reducing the capacity of the roadway to carry traffic.

Land use characteristics are strong determinants of travel mode choice. Over the past 50 years, development patterns and people’s life choices have evolved such that they demand a near total dependency on the single occupancy vehicle. The increasing traffic volumes that have resulted have had detrimental social and environmental effects. It is recognized that the automobile will continue to be the dominant mode of travel in the region. However, changes in land use that support alternatives to the automobile could have a positive effective on both the air quality and congestion on our roadways.

More fundamental land use changes would consist of the development of land into densely developed centers or nodes with a variety of land uses. Such concentration requires less automobile travel and preserves scenic beauty, which is a huge tourism draw for the region and state. Such centers do already exist in our region. Portsmouth is a good example, but this is not the norm for newer developments.

PROJECTS DESIGNED TO ADDRESS ACCESS
There are a few projects in the region that are designed to address access and access management issues. The Town of Exeter has a project I the State Ten Year Plan that will specifically examine the implementation of an Access Management Plan for Epping Road (NH 27), which is an area that is under significant development pressure. The US 1 corridor is also currently being studied for necessary improvements, and access management will be considered as part of that work.

A related highway issue that has received a significant amount of attention in other areas in recent years is the concept of corridor preservation. This entails preserving the right-of-way for new highways, or for the improvement of existing roadways so that when the new or expanded facility is needed, there is a reduced amount of development within the property needed for construction. This reduces the cost of projects, as well as shortening the lead-time needed to bring a project from the planning stages to construction. There are currently no
The Legal Case for Controlling Access

The land use/transportation cycle goes like this . . . (1) development along a road necessitates increased road capacity, (2) when capacity is increased, land along the road becomes more commercially viable, (3) new developments get built fronting the road, (4) the new development then attracts more traffic which eventually necessitates another increase in the road's capacity.

Communities must realize that whatever short-term benefits may arise from this pattern, the long-term results are generally increased traffic, unattractive strip development, and changes in the community's character.

Municipalities have many ways in which they can influence development patterns and better manage all forms of traffic, but a comprehensive approach to the problem of sprawl and haphazard traffic patterns is critical. Development that is guided toward bicycle and pedestrian friendly concentrations of development (nodes) is a goal of the MPO. Development nodes should be identified through a Master Plan process which is then implemented through a number of ways that may include public investment policies, tax increment financing districts, the Main Street Program, downtown revitalization groups, and local regulation such as zoning.

Managing the access to properties along state and local highways is also an effective method of limiting the negative impact of roadside development on traffic flow and congestion. Attorney Peter Loughlin, in Section 29.13 of his treatise Land Use Planning and Zoning (N. H. Practice, Vol. 15, Michie-Butterworth, 1993, p. 357), states the following:

"The fact that a subdivision has access onto a state highway, however, does not mean that the planning board must automatically grant the access to that roadway simply because a driveway permit has been received from the state."

There are two relevant N. H. Supreme Court cases regarding a planning board's authority to deny a subdivision based on the access to a state highway and the rulings in the two cases, one in Hopkinton and one in Sandown, are at odds with each other. Attorney H. Bernard Waugh, Jr., in chapter VII, section E of his book, A Hard Road to Travel, (1997 Edition, New Hampshire Municipal Association, p. 153), states the following:

"In my view, Hopkinton all but overruled Sandown, and today a planning board can consider the impact of a development on state highways. If you disapprove a plan showing a brand new curb-cut onto a state highway, for the reason that it adversely impacts the state highway, your written decision should, with a nod to Sandown, contain a statement to the effect that you are not disapproving the curb-cut altogether, merely disapproving its use for this proposed intensity of development."

Planning boards should carefully consider the impact of development patterns and unmanaged access to highways. The NHDOT does not have the same latitude that the planning board does with respect to reviewing the impact of development on state highways. Therefore it is the responsibility of local boards to carefully review the impact of development on existing roads.

Many local planning boards do not realize that they have the authority to enact policies and regulations that would allow them to review and possibly modify or reject a development’s access even if access permits are granted by the state.

projects in the Long Range Plan specifically designed to preserve transportation corridors.

1. Balancing the Need for Maintenance & Improvements

As traffic volumes have steadily increased nation wide, it has become clear to many in recent years that it is not affordable or practical to continue to expand the roadways to offset congestion. In much of the Seacoast region, this holds true as well - expanded roadways in many cases are either infeasible or unwanted by the communities. Those major improvements that are necessary and feasible are becoming a bigger drain on resources as they take more time and
funds to complete. There are still some significant improvements that can and should be made to make the system safer and more efficient but these projects need to be balanced with smaller scale improvements and maintenance needs.

In addition, maintenance needs are an ongoing issue for the region as many roads are carrying more, faster, and heavier traffic than they were designed for. This leads to unsafe road conditions, such as structurally deficient bridges, inadequate intersections, and crumbling pavement, which creates problems for motorists as well as pedestrians and cyclists. With limited funding available for the maintenance and minor improvements to the roadway system, choices need to be made about what takes priority. The fact that all necessary improvements and repairs cannot be made given existing resources may have several negative impacts such as increased accidents, further deterioration of the roadways leading to more expensive repairs, and public disapproval. Many of our region’s roads and bridges have reached or exceeded their intended life span and are in need of repair or replacement.

PROJECTS DESIGNED TO ADDRESS SYSTEM PRESERVATION
The vast majority of the highway projects in the long-range plan are designed to improve the existing roadways as opposed to the development of new roadways. All of the rehabilitation projects listed for bridges and roadways, intersection improvements, and expansions of existing facilities will be built with this idea in mind.

2. Capacity and Congestion on Regional Highways
There are a number of existing roadway capacity deficiencies within the Strafford MPO region. Some of the most problematic areas, such as the Little Bay Bridges area of the Spaulding Turnpike, are in the midst of planning and engineering work for construction that will alleviate the problem. However, there are also deficiencies that exist now that are not being addressed in existing plans or construction. NH DOT, as part of its development of the 2003-2012 Ten Year Plan, performed an analysis of Level of Service and congestion statewide, identifying those areas that were not congested (LOS A or B), moderately congested (LOS C or D) and congested (LOS E or F). The following areas in the Strafford MPO were identified as being congested:

- NH 125 from the intersection with NH 111A in Brentwood north to the intersection with NH 9 in Barrington.
- US 4 in Barrington, Lee, Durham, and Dover.
- NH 11 in Farmington.
- NH 108 from the Intersection with NH 101 in Stratham/Exeter to the intersection with US 4 in Durham.
- Segments of the Spaulding Turnpike (NH 4 & NH 16) Newington, Dover, and Rochester.
The analysis did not make any determination as to the nature of the capacity deficiencies or what would be necessary to correct them, however this type of analysis will be necessary before projects can be developed to address the congestion.

In addition to the known deficiencies discussed above, the regional traffic model was used to determine where future growth would create roadway capacity problems. The model projects current traffic and development patterns out to the horizon year of this plan (2022) and loads them on the roadway network that includes all known improvements out to 2022. In addition, the model takes into account all known large commercial, industrial or residential developments. The results of that analysis show a few areas in the region that are predicted to experience significant peak hour congestion. This is based on estimates of volume to capacity during the PM peak hour and additional data should be collected prior to the development of projects to address the congestion. The locations identified by the Regional Traffic Model are:

- Portions of NH 125 in Rochester.
- Portions of the NH 101 & I-95 Interchange.
- The I-95 & Spaulding Turnpike interchange.

The MPO is currently in the midst of both a model upgrade and a model update. The model upgrade promises to provide additional capabilities that will enhance the usefulness of the model in performing regional traffic analysis while the update will provide up to date information on which to base future growth assumptions (such as census journey to work data). The new information will also allow the MPO to check the validity and calibration of the model by providing us the detailed information necessary to check model projections for the year 2000 against known traffic volumes, populations, and employment levels. This work is expected to be completed during 2003 and will begin to be implemented into SRPC work at that point.

There are a number of projects in the Long Range Plan that are designed to address capacity issues. Foremost among these is again the Newington-Dover Spaulding Turnpike improvement project that will address capacity constraints in that corridor. In addition, there will be some improvements at the Hampton Ramp Tolls and along the northern section of the Spaulding turnpike to address congestion issues. Many of the intersection improvement projects in the region will address capacity constraints through the addition of turning lanes, traffic signals, or other improvements. Some of the primary facilities in the region that are facing congestion problems are discussed below in greater detail.

**NH 125**

One example of a section of roadway that has received a great deal of attention from the municipalities that lie along it is NH 125. NH 125 is an important north-south corridor in the Seacoast region that extends from the New
Highways

Hampshire/Massachusetts border at Plaistow to Milton. This route is two lanes with almost unlimited access to the road. This unplanned access to the road has been a center of much concern. Perceived high accident rates along NH 125 have been expressed by many residents and communities on the corridor as well as those who travel the route. The problems of NH 125 are a result of poorly planned intersections, lack of signage for side roads, high speeds, and uncontrolled driveway and commercial access.

This road has also seen a great increase in its ADTs over the recent years. This increase in traffic has led to a call for widening of the road to 4 lanes in some highly traveled sections. Epping was able to use the TIP and Ten-Year Planning process and obtain a project to widen NH 125 from the Brentwood town line north to NH 87. Other communities should work within the TIP and Ten-Year Planning process to obtain increased funding and support for their roadways in need of maintenance and improvements.

**Spaulding Turnpike (NH 16)**

NH 16, also referred to the Spaulding Turnpike from Portsmouth through Rochester, is a major transportation corridor in New Hampshire. NH 16 extends from New Hampshire’s historic Seacoast in Portsmouth through the Lakes Region to the White Mountains and onto the great northern forest. Along the way, it offers commerce, employment, recreation, and the scenic beauty typical of New Hampshire. In the Seacoast region, NH 16 stretches from Portsmouth to Wakefield. Along this section of the corridor, the communities, the MPO, and the State are actively addressing many transportation issues.

One project that is currently slated for funding is the proposed **widening of the Spaulding Turnpike in Rochester**. It is proposed to start the expansion at Exit 11/12 (NH 125) and continue north about 5 miles to Exit 16 (Chestnut Hill Road Connector). The suggested improvements would widen the Turnpike from its current two lanes to four lanes and include interchange reconfiguration for capacity and safety. This widening project is faced with many environmental issues including wetlands, historic properties, local access, air quality, noise pollution, and floodplains.

A second project on NH 16 is a reconstruction of the Spaulding Turnpike in the **Newington-Dover area** including the Little Bay Bridges. This improvement area runs from just south of the Dover tolls to just north of the Newington-Portsmouth Town Line, approximately 3.5 miles. The project is intended to improve safety and relieve congestion in this section. This is a problematic area due to the large population and employment centers in the area. The project includes short-term improvements involving frontage roads and alterations in access to the Spaulding Turnpike.

A third project under consideration in the region is a new interchange labeled Exit 10. This interchange is to be located between Exits 9 and 11/12. The interchange would require new roadways to be constructed or current roadways
to be improved. The main purpose of Exit 10 is to provide improved access from the Spaulding Turnpike east to the City of Somersworth. Alternatives and the need of this exit are currently being studied and debated. There is a great deal of public opposition to the exit. The public opposition that has developed revolves around the potential impact on homes, land, and the environment. Other public opposition concerns the purpose and need for the legislation, and how much will Somersworth’s economy directly benefit versus the cost of the project.

Toll Facility Congestion
Congestion at the regions toll facilities is another issue facing both the NH 16/Spaulding Turnpike and Interstate 95 corridors. Currently these facilities face significant congestion at times due to commuter and tourist traffic. The placement of Electronic Tolls at the facilities in the region has been proposed as a method of mitigating some of the impacts of this congestion. Electronic tolls are a form of Intelligent Transportation Systems (ITS) technology. NHDOT is currently studying the use of electronic tolls and places to implement electronic tolls on the entire New Hampshire turnpike system within the next five years. The project will be partially funded by the use of Congestion Mitigation and Air Quality (CMAQ) funds. Although the MPO does not support the use of CMAQ funds for this project, it is in support of a study of electronic tolls in NH. The MPO feels that turnpike funds should be used for this project. Electronic tolls are a great tool for easing congestion on the NH’s turnpikes. The tolls would allow for vehicles to travel through the tolls and pay electronically therefore not having to come to a complete stop, as they do now. In addition to the implementation of ETC, there are also some other Toll Facility upgrades occurring in the region. The Hampton main Toll Plaza just added another lane in each direction to shorten peak hour queues, and the Hampton Ramp toll will be widened in 2004 to accommodate the additional traffic generated by the completion of the NH 101 expansion, as well as to prepare for ETC.

3. Safety
Over the period between 1998 & 2000 there was slightly more than 9,000 traffic accidents in the 18 Strafford MPO towns. A listing of accidents by town taken from the State Traffic Accidents Database is shown in Table 4.4, and illustrates the distribution of accidents over the years and between the region’s towns. The limits of the database make detailed analysis challenging, but there is generally a trend that shows the number of accidents increasing between 1998 and 2000. The most common types of accidents are:

- Collisions between multiple motor vehicles (67%)
- Collisions with fixed objects (17%)
- And collisions with animals (4%).

There are 17 other accident types detailed in the standard Motor Vehicle Accident Report [DSMV 400] that make up the remaining 12% on incidents. This includes bicycle (0.8%) and pedestrian (1.2%) accidents. While many people
believe that there are more accidents in bad weather and with bad road conditions, the vast majority of collisions occurred under clear or cloudy skies (79%), or with dry roads (72%). Sixteen percent of all accidents in the region occurred during some precipitation (rain/snow/sleet) and 24% happened with slippery road conditions (wet/snow/slush/ice) due to that precipitation.

Some relevant statistics related to when accidents occur:

- 27% of all weekday accidents occurred between 3:00 and 6:00 PM
- The day with the greatest frequency of accidents is Friday (18%)
- The day with the lowest frequency of accidents is Sunday (11%)
- 22% of all weekend accidents occurred between 3:00 and 6:00 PM
- 20% of all accidents occurred in December and January.

Given this information, as well as NHDOT analysis of accident rates (crashes/million VMT), a number of road segments warrant further investigation into the causes and potential solutions to accidents. In the Strafford MPO region (based on 2000 Accident data), portions of the following roadways have been identified as high accident areas in need of further investigation:

- NH 75 in Farmington
- NH 202A in Rochester
- NH 125 in Rochester
- NH 9 in Barrington
- NH 152 in Lee

In addition, there are other areas that have lower accident rates, but may warrant investigation in the future. These segments include portions of:

- NH 108 in Stratham, Newmarket, Dover, and Somersworth
- NH 125 in Lee
- NH 155A in Madbury
## TABLE 4.4: TRAFFIC ACCIDENTS BY TOWN & YEAR

<table>
<thead>
<tr>
<th>TOWN</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>TOTAL</th>
<th>% OF TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROCHESTER</td>
<td>915</td>
<td>873</td>
<td>880</td>
<td>2668</td>
<td>29.2%</td>
</tr>
<tr>
<td>DOVER</td>
<td>574</td>
<td>590</td>
<td>637</td>
<td>1801</td>
<td>19.7%</td>
</tr>
<tr>
<td>SOMERSWORTH</td>
<td>317</td>
<td>374</td>
<td>377</td>
<td>1068</td>
<td>11.7%</td>
</tr>
<tr>
<td>DURHAM</td>
<td>206</td>
<td>253</td>
<td>245</td>
<td>704</td>
<td>7.7%</td>
</tr>
<tr>
<td>LEE</td>
<td>136</td>
<td>186</td>
<td>170</td>
<td>492</td>
<td>5.4%</td>
</tr>
<tr>
<td>BARRINGTON</td>
<td>107</td>
<td>129</td>
<td>152</td>
<td>388</td>
<td>4.3%</td>
</tr>
<tr>
<td>WAKEFIELD</td>
<td>112</td>
<td>103</td>
<td>128</td>
<td>343</td>
<td>3.8%</td>
</tr>
<tr>
<td>FARMINGTON</td>
<td>116</td>
<td>97</td>
<td>124</td>
<td>337</td>
<td>3.7%</td>
</tr>
<tr>
<td>NORTHWOOD</td>
<td>82</td>
<td>80</td>
<td>95</td>
<td>257</td>
<td>2.8%</td>
</tr>
<tr>
<td>NEWMARKET</td>
<td>81</td>
<td>93</td>
<td>79</td>
<td>253</td>
<td>2.8%</td>
</tr>
<tr>
<td>MILTON</td>
<td>67</td>
<td>79</td>
<td>93</td>
<td>239</td>
<td>2.6%</td>
</tr>
<tr>
<td>ROLLINSFORD</td>
<td>56</td>
<td>60</td>
<td>60</td>
<td>176</td>
<td>1.9%</td>
</tr>
<tr>
<td>STRAFFORD</td>
<td>39</td>
<td>26</td>
<td>44</td>
<td>109</td>
<td>1.2%</td>
</tr>
<tr>
<td>MADBURY</td>
<td>31</td>
<td>34</td>
<td>40</td>
<td>105</td>
<td>1.2%</td>
</tr>
<tr>
<td>NEW DURHAM</td>
<td>28</td>
<td>23</td>
<td>43</td>
<td>94</td>
<td>1.0%</td>
</tr>
<tr>
<td>NOTTING</td>
<td>36</td>
<td>7</td>
<td>8</td>
<td>51</td>
<td>0.6%</td>
</tr>
<tr>
<td>MIDDLETON</td>
<td>15</td>
<td>17</td>
<td>11</td>
<td>43</td>
<td>0.5%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2918</td>
<td>3024</td>
<td>3186</td>
<td>9128</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

% OF TOTAL | 32.0% | 33.1% | 34.9% | 100.0% |

These areas should receive priority from the MPO for improvements based on safety conditions, although additional analysis should be performed to determine specific accident locations as well as the identification of specific causes that can be rectified by roadway improvements.

### PROJECTS DESIGNED TO ADDRESS SAFETY ISSUES

There are a number of highway projects in the region that are at least partially designed to address safety issues. The Newington-Dover Turnpike Expansion project will initially address safety through some interim improvements to the roadway network as well as through an Incident Management System. This IMS is designed to reduce the number of accidents on the turnpike in that area, as well as to reduce the congestion and delay impacts of any accidents that occur through rapid and coordinated response from all necessary resources. The primary project will also address safety through improved interchanges, roadways, and removing local traffic from the facility where possible. There are also 3 projects further north on the NH 16 corridor designed to address safety concerns in the town of Wakefield. A safety analysis of that corridor showed some minor improvements that could be made at several intersections in that town to improve the safety of the roadway. The US Route 4 Corridor Safety study has also defined a number of safety related projects that are being implemented within the plan. Other types of projects in this plan that address safety concerns are:
Highways

- Bicycle shoulder projects
- Sidewalk and other pedestrian projects
- Railroad crossing improvements
- Intersection upgrades

Descriptions of all projects in the Strafford Metropolitan Transportation Plan are included in Chapter 11: Short and Long Range Transportation Projects.

4. Security

Under new SAFETEA-LU regulations, security is an additional requirement and is separated from safety. Projects should be designed to sustain and improve the security of the transportation system for motorized and non-motorized users. The ITS Architecture Plan will provide safety and security to the regional transportation system. The use of ITS technology on the I-95 Spaulding Turnpike corridor will facilitate efficient response to emergency incidents and provide valuable information for vehicles. ITS technology for use in vehicle tracking and emergency dispatching will also improve transit security. The Strafford Regional Planning Commission will be implementing a regional ITS Architecture Plan by February 2008.

Additional regional plans are also essential to increase and support the security of the transportation system. All eighteen communities of the Strafford MPO have Hazardous Mitigation Plans. A Regional Hazardous Mitigation Plan will be completed in 2008 and the Regional Emergency Operation Plan is currently being updated. The Northern Stafford County and Southern Strafford County Evacuation Plans are in place to focus security of health-related issues during an emergency situation.

5. Systems Management and Operations

Efficiency in the operation and management of transportation systems is increasingly essential because of the trends towards fiscal constraint and decreasing levels of funding for new infrastructure and for maintenance of existing systems. Efficient operations and management ensure that available funding is properly utilized.

The Strafford MPO is currently involved in the effort to promote efficiency in transportation system management and operation through the future completion of the regional ITS Architecture Plan. ITS technologies offer many opportunities to increase the efficiency and cost-effectiveness of various components of the transportation infrastructure through improved system management. These benefits can be realized in both the public (i.e. government/public transit fleets and facilities) and private sector (i.e. freight vehicles and facilities). ITS technology enables the freight industry to more efficiently monitor shipment and streamline completion of required administration: vehicle licensing, customs arrangements and vehicle and cargo insurance. Public transit can also benefit
from the use of ITS technology to facilitate efficient operations through improvements in vehicle tracking, routing, scheduling and coordination with other modes.

E. MPO Objectives & Proposed Actions Related to Roadways

The following section details the road and highway related plan goals and objectives, as well as the roadway related policy and project recommendations that the MPO supports. In addition, specific strategies to address needs and meet objectives are detailed.

Objective 1.1: Encourage the coordination and integration of existing modes of transportation and promote the development of new intermodal transportation connections, facilities and services.

- Include public transit support facilities, such as pullouts for transit stops, in roadway projects.
- Develop intermodal transportation centers, and multimodal connections to those centers.
- Include bicycle and pedestrian facilities in roadway improvement projects.

Objective 1.3: Utilize new technologies to reduce congestion, improve traffic flow.

- Implement appropriate electronic toll technology at toll facilities within the region.
- Include signal coordination in roadway improvement projects where appropriate, and the installation of signals which allow for future coordination.
- Implement an Incident Management System at the Little Bay Bridges on the Spaulding Turnpike to reduce the negative impacts of congestion and accidents on that facility.
- Include Intelligent Transportation Systems technology in roadway projects were appropriate to improve traffic flow and reduce congestion.

Objective 1.5: Ensure that all components of the region’s transportation system are easy to understand and user friendly.

- Promote the use of user-friendly signs and comprehensive and coordinated signing programs.
- Promote the use of Traveler Information Systems to better aid tourist and commuters in reaching their destinations.
Objective 1.7: Advocate municipal ordinances and public facility investments that vehicle dependent development.
- Advocate for projects that encourage compact development patterns over those that promote sprawl.

Objective 2.1: Encourage projects, designs and initiatives that promote a shared, safe transportation system for bicyclists, motorists, transit users and pedestrians.
- The MPO Supports the inclusion of pedestrian and bicycle facilities in highway rehabilitation, reconstruction and improvement projects where feasible.
- The MPO supports the use of flexible highway design standards to develop projects that are appropriately sized and scaled to the character of the surrounding land use.

Objective 3.1: Work with local communities and NHDOT to identify existing and projected transportation system deficiencies and to develop improvement options.
- Utilize the Regional Traffic Model to help identify future deficiencies in the regional highway network.
- Use the state Highway Accidents Database and other resources to develop highway projects that address safety concerns.

Objective 3.2: Encourage effective and proper maintenance of state and local transportation facilities.
- Prioritize maintenance and improvement of the existing roadway facilities in the region.
- Use Intelligent Transportation Systems, information management systems, and other methods to improve the effectiveness of maintenance programs.

Objective 3.3: Encourage coordinated and comprehensive planning along state highway corridors.
- Utilize corridor studies as an effective tool for planning future improvement needs.
- Develop corridor based Access Management Plans in conjunction with NH DOT and the affected communities.
- Ensure that the function, capacity and Level of Service of highway facilities are compatible with allowed land uses.

Objective 3.4: Encourage projects that aim to decrease through traffic on local roads and in residential neighborhoods by maximizing the use of primary transportation corridors.
- Roads should carry traffic that is appropriate in volume and type to its functional classification and land use setting.
Place a truck and traveler facilities on or near interstate highways to reduce the impacts of trucks on local roadways and through town centers.

Use Traffic Calming, Access Management, “Road Diets” and other techniques that seek to reduce the impacts of motor vehicle traffic on the community and to provide additional support for public transit, pedestrian and bicycle travel.

Objective 4.1: Coordinate with various safety and security agencies, such as FEMA, to ensure development of safe, secure transport routes throughout the region and their connection with routes beyond the region.

- The MPO will encourage the delineation of routes for the movement of Hazardous Materials through the region that minimize any safety concerns to the population.

Objective 4.2: Support, through planning and programming, the installation, operation, upgrading, and timely maintenance of system infrastructure, including regional Intelligent Transportation Systems (ITS) plan that will implement safe practices for drivers within the region.

- The MPO will implement a regional ITS Architecture Plan to ensure that projects will provide safe and secure transportation infrastructure to the region.

Objective 6.2: Improve the transportation of people, goods and services by promoting the maintenance, improvement and development of intermodal connections between transportation facilities including; transit, highways, airports, seaports, pipelines, and rail lines.

- The MPO will work to ensure that roadway connections to intermodal facilities are appropriately designed and have adequate capacity.

Objective 10.2: Prioritize projects and programs that contribute to the achievement of federal air quality standards.

- Ensure that transportation projects have complete and accurate air quality analysis prior to final determination of preferred alternatives.

- Encourage the development of consistent methodologies for the completion of air quality analysis for projects to better enable comparison of impacts and benefits.

Objective 10.3: Ensure the protection of wetlands and other environmental resources in the design of new transportation facilities, with appropriate mitigation for unavoidable impacts.

- The MPO will fully participate in the environmental documentation of highway projects to minimize the impacts on wildlife and natural resources.
Objective 10.4: Ensure the preservation and enhancement of cultural, historic and recreational resources in the development of transportation projects, with appropriate mitigation for unavoidable impacts.

- Advocate the documentation, preservation and enhancement of cultural, historic and recreational resources in developing the transportation system.
- Use the transportation planning process to objectively evaluate the full range of reasonable impacts, and make all reasonable efforts to avoid negative impacts on open space, park lands, or historic places when developing or upgrading any part of the transportation system.

Objective 10.5: Prioritize roadway projects that improve existing facilities over those that develop new roadways and encourage the use of existing right-of-ways for the development and expansion of the transportation system.

- The MPO will advocate alternatives for transportation improvements utilizing existing facilities as opposed to a new roadway on undeveloped land.
- The MPO supports the use of Access Management, Traffic Calming, “Road Diets”, Intelligent Transportation Systems, and other techniques that seek to improve traffic flow and capacity without expansion of right-of-way.

Objective 10.9: Advocate that aesthetic and scenic values are considered in road design and adjacent land development to maintain a sense of place and scale.

- The MPO will advocate the inclusion of appropriate landscaping in highway improvement projects.
- The MPO will encourage the sizing of improvement projects to a scale appropriate for the location and adjacent land use (Context Sensitive Design).

Objective 5.1: Encourage the coordination of land use and transportation planning to ensure that existing and future industrial, commercial, service centers and housing concentrations are adequately connected by the region’s transportation system; and appropriately located to preserve the quality of life in surrounding areas.

- Ensure that the function, capacity and Level of Service of highway facilities are compatible with locally allowable land uses.
- Recommend the use of Access Management techniques to more effectively utilize roadway capacity, promote safety and reduce congestion.

Objective 6.3: Encourage standards, ordinances, projects and plans that aim to maintain roadway safety and traffic carrying capacity of roadways by improving the design of access to businesses and residential developments.

- The MPO will pursue the implementation of an Access Management Memorandum of Understanding (MOU) between the communities in the region and NH DOT.
The MPO will support the development of corridor and town wide Access Management Plans.

F. Programmed and Planned Roadway Projects

This section of the chapter will discuss current and future roadway projects that are designed to address the deficiencies and other issues discussed earlier in the chapter. These projects are divided into three categories; short term projects [those included in the Transportation Improvement Program (TIP)], Long term projects [those included in the State Ten Year Program of Projects], and other future projects, or those projects which address identified needs, but for which funding has not been identified. Additional details on many of these projects can be found in Chapters 11 & 12 [2007-2010 TIP and 2003-2012 Ten Year Plan].

Highway Projects in the 2003-2005 Transportation Improvement Program

This is a brief listing of highway projects that are included in the 2007-2010 Transportation Improvement Program. The listing provides information on the town in which the project is occurring, the specific location of the project, and it’s planned construction start year. The complete list of projects is included in Chapter 11 [2007-2010 TIP], and includes additional details regarding each project. Many of these projects will extend beyond the scope of the current TIP (2007-2010) and are also listed in the following section that discusses long-range projects.

Highway Projects in the State Ten Year Plan

This is a listing of projects included in the timeframe outside of the current TIP, but for which funding has been identified and construction has been tentatively scheduled. Additional detail on these projects is included in Chapter 12 [2003-2012 Ten Year Plan and long range projects].

Highway Project Envisioned But Not Programmed

This is a listing of projects for which a need has been identified, but for which no funding source or schedule for construction has been determined. These projects are listed in Table 4.5: Long Range Highway Projects. The date shown for the projects is intended only as a placeholder to perform the fiscal constraint analysis [Appendix A]. The cost developed for these projects should be taken as “order of magnitude” only, and are not intended to be used for programming of projects within the TIP. For project programming additional detail regarding the scope, schedule, and costs of a project should be developed.
Table 4.6: Long Range Bridge Projects provides a listing of all of the bridge projects that the MPO has identified as necessary over the timeline of this long-range plan. Many of these projects are directly from the State “Red List” of bridges, and are either functionally or structurally obsolete. The estimated costs for those projects taken from the “Red List” have been developed by the NHDOT as part of its work to evaluate those bridges on the list, however similar to the roadway projects above, additional work should be completed on the scope and schedule of the project before the cost estimates should be used for project programming. As with the roadway projects, the cost estimates were used in the development of the financial plan for this document [Appendix A].

In addition to the actual construction projects listed in the tables on the following pages, there are a number of studies that need to be conducted to identify and prioritize other future improvement needs. To be comprehensive, the studies should identify specific corridors where deficiencies are present or predicted, and they should involve the NHDOT, local communities, as well as the MPO. Several corridors have been identified as potential candidates for studies within the region, and these are:

- **NH 108 Corridor**: Between Dover and Exeter (or portions) serves as a commuter route and a connection between NH 101 and the Spaulding Turnpike.

- **NH 125 Corridor**: The southern section of this corridor has undergone significant study, and the portion between Brentwood and Rochester should be examined for improvement needs as well.

### G. CONCLUSION

It is recognized that the private automobile will continue to be the dominant transportation mode in the near future. As such, our region’s highways and local roads must be properly maintained and improved as necessary and appropriate. At the same time however, the natural environment and scenic beauty of the region must be taken into consideration. A balance must be struck between growing transportation demands and ensuring environmental quality.
### INTERSECTION IMPROVEMENTS

<table>
<thead>
<tr>
<th>Applicant/Source</th>
<th>Location</th>
<th>Project Description</th>
<th>Cost Estimate</th>
<th>Start Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-2020 LRP</td>
<td>Barrington</td>
<td>NH 9 and US 202 intersection analysis study and reconstruction</td>
<td>$ 269,174</td>
<td>2014</td>
</tr>
<tr>
<td>1999-2020 LRP</td>
<td>Barrington</td>
<td>NH 125 @ Green Hill Road - Add dedicated turning lanes</td>
<td>$ 197,922</td>
<td>2013</td>
</tr>
<tr>
<td>1999-2020 LRP</td>
<td>Somersworth</td>
<td>High St./Blackwater/Indigo Hill Intersection - Upgrade signals and improve channelization</td>
<td>$ 411,836</td>
<td>2015</td>
</tr>
<tr>
<td>1999-2020 LRP</td>
<td>Somersworth</td>
<td>Washington Street Intersection Improvements (High and West High Street)</td>
<td>$ 357,062</td>
<td>2017</td>
</tr>
<tr>
<td>1999-2020 LRP</td>
<td>Somersworth</td>
<td>Market and Winter Street Intersection improvements - ties in with BR-10</td>
<td>$ 285,649</td>
<td>2017</td>
</tr>
<tr>
<td>NH 16 Safety Study</td>
<td>Wakefield</td>
<td>Improvements to Intersection NH 16 and Pine River Road</td>
<td>$ 131,948</td>
<td>2013</td>
</tr>
<tr>
<td>NH 16 Safety Study</td>
<td>Wakefield</td>
<td>Improvements to Intersection NH 16 and Stoneham Road</td>
<td>$ 131,948</td>
<td>2013</td>
</tr>
</tbody>
</table>

### RECONSTRUCTION PROJECTS

<table>
<thead>
<tr>
<th>Applicant/Source</th>
<th>Location</th>
<th>Project Description</th>
<th>Cost Estimate</th>
<th>Start Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPO Traffic Model</td>
<td>Dover</td>
<td>Columbus Avenue and NH 9 - Intersection Signalization</td>
<td>$ 1,114,461</td>
<td>2019</td>
</tr>
<tr>
<td>1999-2020 LRP</td>
<td>Dover-Rochester</td>
<td>County Farm Road - Rochester Neck and Tolend Road. Upgrade facilities to go with (BR-14)</td>
<td>$ 1,485,947</td>
<td>2019</td>
</tr>
</tbody>
</table>

### NEW FACILITIES/MAJOR UPDATES

<table>
<thead>
<tr>
<th>Applicant/Source</th>
<th>Location</th>
<th>Project Description</th>
<th>Cost Estimate</th>
<th>Start Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-2020 LRP</td>
<td>Dover</td>
<td>Exit 9 - Upgrade to full cloverleaf - Turnpike Project</td>
<td>$ 11,201,931</td>
<td>2016</td>
</tr>
<tr>
<td>TAC</td>
<td>Newmarket</td>
<td>NH 108 Corridor Upgrade from Newfields T/L to downtown Newmarket add center turning lane and shoulder improvements</td>
<td>$ 1,456,811</td>
<td>2018</td>
</tr>
<tr>
<td>1999-2020 LRP</td>
<td>Rochester</td>
<td>NH 125 - South Main Street to Brock Street upgrade - add lanes and coordinate signals</td>
<td>$ 297,189</td>
<td>2019</td>
</tr>
<tr>
<td>1999-2020 LRP</td>
<td>Rochester</td>
<td>North Main Street - Bridge to Ten Road Rod Intersection improvements (signalization at Ten Rod Road)</td>
<td>$ 891,568</td>
<td>2019</td>
</tr>
</tbody>
</table>

### INTERSECTION SIGNALIZATION

<table>
<thead>
<tr>
<th>Applicant/Source</th>
<th>Location</th>
<th>Project Description</th>
<th>Cost Estimate</th>
<th>Start Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPO Traffic Model</td>
<td>Dover</td>
<td>Columbus Avenue and NH 9 - Intersection Signalization</td>
<td>$ 1,114,461</td>
<td>2019</td>
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</tbody>
</table>
### Table 4.6: Long Range Bridge Projects

<table>
<thead>
<tr>
<th>Applicant/ Source</th>
<th>Location</th>
<th>Project Description</th>
<th>Cost Estimate</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-2020 LRP</td>
<td>Dover-Rochester</td>
<td>Rebuild County Farm Road Bridge over river [separate associated road project is RD-37 which does not need to be in model]</td>
<td>$3,642,000</td>
<td>0</td>
</tr>
<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Rollinsford</td>
<td>Replace/Rehab structurally deficient bridge on Oak Street over BMRR 069/046</td>
<td>TBD</td>
<td>2.0</td>
</tr>
<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Madbury</td>
<td>Perkins Road over BMRR 119/074</td>
<td>TBD</td>
<td>15.1</td>
</tr>
<tr>
<td>1999-2020 LRP</td>
<td>Durham</td>
<td>Bennett Road over B&amp;M Railroad bridge replacement 093/080</td>
<td>TBD</td>
<td>15.7</td>
</tr>
<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Rollinsford</td>
<td>Old Mill over Rolls Brook - 090/052</td>
<td>TBD</td>
<td>20.8</td>
</tr>
<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Durham</td>
<td>Durham Point Road over Crommet Creek - bridge 150/065</td>
<td>TBD</td>
<td>25.4</td>
</tr>
<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Farmington</td>
<td>Paulson Road over Brook - 101/125</td>
<td>$295,000</td>
<td>26.8</td>
</tr>
<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Farmington</td>
<td>Sheepboro Road over Berry’s River - structurally deficient bridge 142/050</td>
<td>$320,000</td>
<td>28.2</td>
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<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Milton</td>
<td>Garage Way over Salmon Falls River - structurally deficient 198/131</td>
<td>$840,000</td>
<td>29.0</td>
</tr>
<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Farmington</td>
<td>Old Bay Road over Cochecho River Relief - 059/143</td>
<td>TBD</td>
<td>30.0</td>
</tr>
<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Milton</td>
<td>Allen Hastings Way over Jones Brook - structurally deficient 104/109</td>
<td>$390,000</td>
<td>31.7</td>
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<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Farmington</td>
<td>Ten Rod Road over Mad River - 080/086</td>
<td>$340,000</td>
<td>31.8</td>
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<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Northwood</td>
<td>Old Canterbury Road over Narrows Brook - 045/100</td>
<td>$175,000</td>
<td>40.4</td>
</tr>
<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Nottingham</td>
<td>Freeman Hall Road over North River - 145/145</td>
<td>TBD</td>
<td>40.9</td>
</tr>
<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Nottingham</td>
<td>Mill Pond Road over Little River - 204/082</td>
<td>TBD</td>
<td>40.9</td>
</tr>
<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Milton</td>
<td>Townhouse Road over Northeast Pond - structurally deficient 168/152</td>
<td>TBD</td>
<td>44.0</td>
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<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Strafford</td>
<td>Northwood-Bow Lake Road over Brook - 085/040</td>
<td>TBD</td>
<td>46.2</td>
</tr>
<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Dover</td>
<td>Bellamy Road over Bellamy River 120/098</td>
<td>TBD</td>
<td>53.7</td>
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<tr>
<td>NHDOT Red List Bridge Summary</td>
<td>Strafford</td>
<td>First Crown Point over Brook - 069/164</td>
<td>TBD</td>
<td>54.0</td>
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<tr>
<td>NHDOT 2002 Red List Bridge Summary</td>
<td>Nottingham</td>
<td>Deerfield Road over Bean River - Structurally deficient 127/078</td>
<td>TBD</td>
<td>63.1</td>
</tr>
</tbody>
</table>