

NH Long Range Transportation Plan 2010 – 2030

July 2010



<i>Categories Modes</i>	Maintenance	Preservation	Modernization	Expansion
Bus Transit				
Intercity Bus & Rail				
Highway				
Rail Freight				
Bicycle				
Pedestrian				
Inter-modal Facility				

NH Long Range Transportation Plan

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Executive Summary

NH Long Range Transportation Plan: A Framework for Transforming Transportation in New Hampshire

The NH Long Range Transportation Plan outlines the broad strategic direction for the State and the Department of Transportation for a 20 year time horizon. The Plan articulates a future Vision for the State in which transportation will play an active role to:

- Preserve our Unique Character & Quality of Life
- Enhance Environmental Quality
- Promote Sustainable Economic Development & Land Use.

This is a new, strategic approach in that plans and investments will be explicitly linked to support a set of goals and transportation system performance targets. Currently, this link happens more by chance than by choice.

The Plan's recommendations are centered on achieving four **Strategic Outcomes** that were derived from the recommendations of the Community Advisory Committee and the public outreach process that took place in the Spring of 2006

The four **Strategic Outcomes** are:

- **Unify Transportation Planning and Investment with Broader State Goals and Actions.** This includes linking future transportation planning to the State Development Plan that brings together statewide initiatives in economic development, environment and quality of life. This

provides the opportunity to maximize and better leverage the benefits from transportation investments.

- **Integrate Planning and Investment Decision-making across all Transportation Modes, Facilities and Services.** This involves developing new *systems*-level planning and analysis capabilities including corridor planning, asset management, multimodal planning, and performance measurement. Planning and investments are primarily done now on a mode-by-mode basis.
- **Increase Investment in the Areas of Transportation Infrastructure Preservation and Maintenance, Travel Demand Management, and Travel Choices.** This will involve difficult choices in a period when the buying power of future transportation revenue levels is expected to be flat or declining, fuel prices are rising, and freight and passenger travel demand is rising.
- **Establish new, more effective Collaborative Partnerships to Better Leverage Resources and to Achieve Long Term Goals.** This involves reaching out, communicating more effectively and partnering with our customers and stakeholders to find the most effective solutions to problems using an inclusionary approach featuring a 'whole picture' perspective.

The Transportation Vision & Goals

Our Vision and Goals for transportation reinforce its relationship to other important statewide interests and describes the transportation system to which we aspire.

The Vision places a priority on safety, more equitable mobility options, the preservation of existing infrastructure over creation of new infrastructure, and connecting New Hampshire to its neighbors and global markets. The Goals describe the Vision in more detail.

New Hampshire Transportation Vision

Transportation in New Hampshire is provided by an accessible, multimodal system connecting rural and urban communities. Expanded transit and rail services, a well-maintained highway network and airport system provide mobility that promotes smart growth and sustainable economic development, while reducing transportation impacts on New Hampshire's environmental, cultural, and social resources. Safe bikeways, sidewalks, and trails link neighborhoods, parks, schools, and downtowns. Creative and stable revenue streams fund an organization that uses its diverse human and financial resources efficiently and effectively.

The Transportation System Goals

Goal 1. Land Use-Transportation Integration. Integrate local, regional and state land use and economic development goals with transportation investment decision-making, planning, system management, and project design.

Goal 2. Mobility & Modal Choice. Provide mobility, accessibility, and modal choice to meet existing and future travel needs of people and goods.

Goal 3. Safety. Employ appropriate design, measures, and practices to improve the safety of transportation users by reducing the frequency and severity of crashes.

Goal 4. Security. Work with private and public sector partners to protect the physical security of passenger and freight transportation systems and system users from acts of terrorism and other crimes.

Goal 5. Environment & Public Health. Make transportation investments that preserve and enhance public health, the environment, and quality of life.

Goal 6. System Preservation & Maintenance. Provide appropriate investment in existing and future infrastructure, facilities and equipment to maintain and preserve the physical condition and operability of the transportation system.

Goal 7. Collaboration & Coordination. Establish collaborative partnerships with local governments, regional and state agencies, and the private sector to meet transportation needs through open and transparent planning and decision-making processes.

Goal 8. Stewardship of Public Resources and the Transportation System. Be cognizant of legal mandates and fiscal constraints; ensure an appropriate and cost-effective allocation of resources; and, use innovation in technology and financing to deliver better transportation services and infrastructure.

Important Trends Affecting Transportation

A number of key trends present substantial challenges to the State's future transportation system:

- **New Hampshire's economic transformation** is accelerating, moving toward services and high-technology-based industries, which is impacting various regions of the state differently – some regions positively, some regions negatively.
- **Changes in demographics**, such as the aging of the state's population and where and how future growth occurs, will affect the demand for different types of transportation.
- **Low density land development patterns** threaten the state's environmental quality and increase automobile dependency, making transportation alternatives to the automobile become less viable options in the future.

- **Transportation construction cost inflation coupled with flat revenues** are dramatically straining the sustainability of funding sources and levels, and creating a large funding gap.
- **Fossil fuel prices, availability and environmental impacts** will influence travel choices and demand.

How these trends are addressed could exacerbate problems or present new opportunities for the State.

The Recommended Strategy

The Recommended Strategy is an inter-related package of actions, policies, programs, and investments specifically tailored to work in a coordinated fashion toward achievement of the Plan’s Vision and Goals. The Strategy combines internal actions that the Department itself can implement as well as recommendations that will require working in concert with a broad array of partners. Some of these partners will be familiar, while some, if not most, will be new or at least require a new level of coordination and collaboration.

The Recommended Strategy recognizes the realities of travel needs and trends of today and recommends a shift in investments to better position the state to remain economically competitive and meet multiple challenges.

This Strategy reflects a balanced approach to working toward the Transportation Vision and System Goals to:

- Advance the economic, environmental, and quality of life needs of the State.
- Place renewed emphasis on the preservation of existing transportation infrastructure over added capacity.

- Create new opportunities for travel choices in tandem with transit and pedestrian-supportive land uses and travel demand management.

A set of inter-related **Key Initiatives** have been identified that are central for the Plan’s long term success. Collectively, they comprise the primary actions to achieve the four **Strategic Outcomes**.

These **Key Initiatives** are:

- **Traveler Safety**, reducing fatalities and serious injury crashes of all travelers through public education, enforcement, and infrastructure programs and investments.
- **‘Preservation First’**, a policy to keep existing transportation infrastructure in good operating condition before building additional capacity.
- **Statewide Corridor Management Planning**, integrating transportation, economic, land use and environmental considerations into the planning for the most important statewide travel corridors (with a parallel and complementary regional program for each region’s important regional corridors).
- **Asset Management**, a set of analytical tools and decision-making processes to cost-effectively operate and make investments in the varied assets that make up the transportation system.
- **Performance Measurement**, the establishment of targets for how the transportation system should perform and the systematic monitoring and reporting of results to document if those targets are met.
- **Context Sensitive Solutions (CSS)**, developing transportation design and investment decisions based upon vigorous discussion of problems, community values, and priorities with the public.

Section I: Introduction -- A Long Range Transportation Plan for New Hampshire

Background

Each state is required by federal statute to periodically prepare a new or update an existing Long Range Transportation Plan (LRTP). The framework for these State Long Range Transportation Plans is found in Title 23 §450.214 of the Code of Federal Regulations. This framework includes:

- Inclusion of capital, operations and management strategies, investments, procedures, and other measures to ensure the preservation and most efficient use of the existing transportation system.
- Reference of applicable planning and/or strategic planning documents & efforts.
- Incorporates the recommendations & strategies of the Strategic Highway Safety Plan.
- Incorporates a discussion of transportation security elements.
- Incorporation of a public involvement and consultative process.
- Outlines environmental mitigation efforts.

Long range planning ideally establishes a comprehensive, yet strategic, policy direction for the state's transportation system. The more financial resources become constrained, the more essential long range planning becomes. This planning helps determine what outcomes are most important to achieve, establishes priorities and then ensures that resources are being used to best meet those outcomes.

Transportation is a complex topic. It is inter-woven with other important issues affecting the state such as economic development, environmental quality and housing.

Transportation enables and impacts much of what we consider essential in our day-to-day lives. An effective transportation system is essential for a growing state and national economy. Transportation connects us to each other and to global markets and opportunities.

The quality of our experience with the transportation system impacts many decisions -- large and small -- every day, and throughout our lives: where we live, work and recreate; how (*or even if*) we make a trip somewhere; and the costs of the goods and services we buy. How well the transportation system meets our needs directly affects our quality of life and the economic vitality of the State.

This Plan offers a Vision for transportation for the State and details about how the Department of Transportation and its many partners will work toward achieving that Vision over the next 20 years.

Purposes & Approach

This Plan also proposes a 20-year strategic blueprint to continue the transformation of the Department and its relationships with other federal and state agencies, regional and local partners, the private and non-profit sectors, elected officials and the citizens of New Hampshire. Much work is still required for successful implementation and refinement of the Recommended Strategies and Action Plan.

The Plan itself has four main Purposes:

- Identify key customer issues.
- Develop a transportation Vision for the State of New Hampshire.
- Look at a wide range of realistic strategies and actions to achieve the Vision.

- Identify opportunities for consideration that might serve to improve policies and transportation investment decisions in the State of New Hampshire.

The adopted approach to developing the Plan is:

- Customer-driven – develops a transportation system that meets needs from a customer perspective, all residents, businesses, and visitors who use transportation
- Performance-based – measures the outcomes that result from the investment and policy choices that are made.
- Comprehensive – considers all modes and actions that affect the demand side of transportation in addition to the supply side.
- Transformational – develops a plan that promotes positive change in the way the Department of Transportation makes investment decisions.

Plan Content

To meet the stated Purpose and Approach, the Plan includes the following elements:

- Identifies a broad series of Issues and Trends influencing the performance of the current transportation system and future transportation opportunities.
- Articulates a Transportation System Vision and Goals.

In subsequent revisions to this Plan, many of the recommended actions will necessarily need to be changed and priorities reassessed based upon successes and failures to date.

An important consideration is that this is a *Policy-level Plan* in contrast to a *Project-level Plan*.

What is a Strategic Approach to Planning?

A strategic approach articulates the outcomes the Department and its partners wish to achieve and figures out the best way to use the full range of resources at its disposal to achieve the desired results.

How Does This Plan Relate to other Planning Processes and Plans?

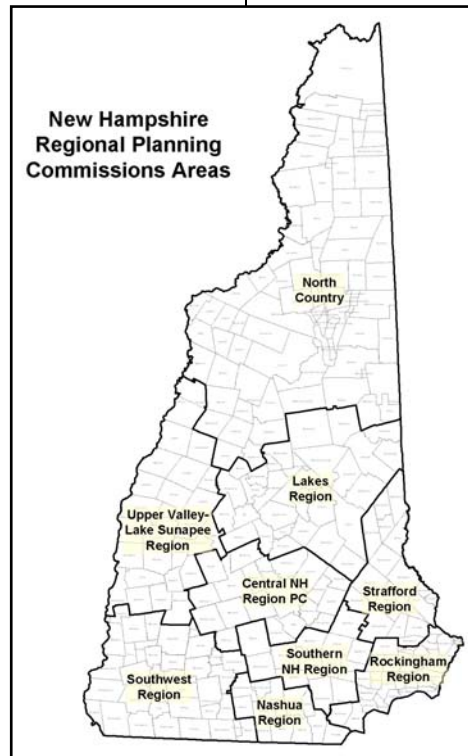
Local Master Plans

Municipalities that have Planning Boards are required to develop local Master Plans. Typically, these plans are comprehensive in nature, but consideration of transportation and many other issues is still optional. In the transportation chapter of Master Plans, communities can identify potential long-term projects and strategies for addressing transportation problems.

Regional Planning

Regional Planning Commissions

The State is divided into nine regional planning service areas. Each area is served by a regional planning commission (RPC). Each planning commission develops regional plans that discuss transportation in the broader context of other regional issues. Each region develops priorities for transportation improvements and services



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and works with the NHDOT collaboratively to implement those priorities. The RPCs receive biennial funding through the NHDOT for their Unified Planning Work Programs (UPWPs), contracts that allow the RPCs to undertake various transportation-planning activities in response to regional and state needs. This plan supports the general goals established in each of the RPC Regional Transportation Plans.

Metropolitan Planning Organizations

In addition to the RPCs, four Metropolitan Planning Organizations (MPO) coordinate transportation planning within areas with a contiguous resident population of 50,000 persons or more. In New Hampshire, the four MPOs are found in the Southern NH Region, the Nashua Region, the Rockingham Region and in the Strafford region.

Each MPO has responsibility for preparing a Long Range Metropolitan Transportation Plan (similar to this Plan) and a Transportation Improvement Program (TIP) that lists regional projects to be funded within the next four years. The state TIP must be consistent with the MPO TIP. This LRTP is supportive of the general goals established in each of the MPOs MTPs.

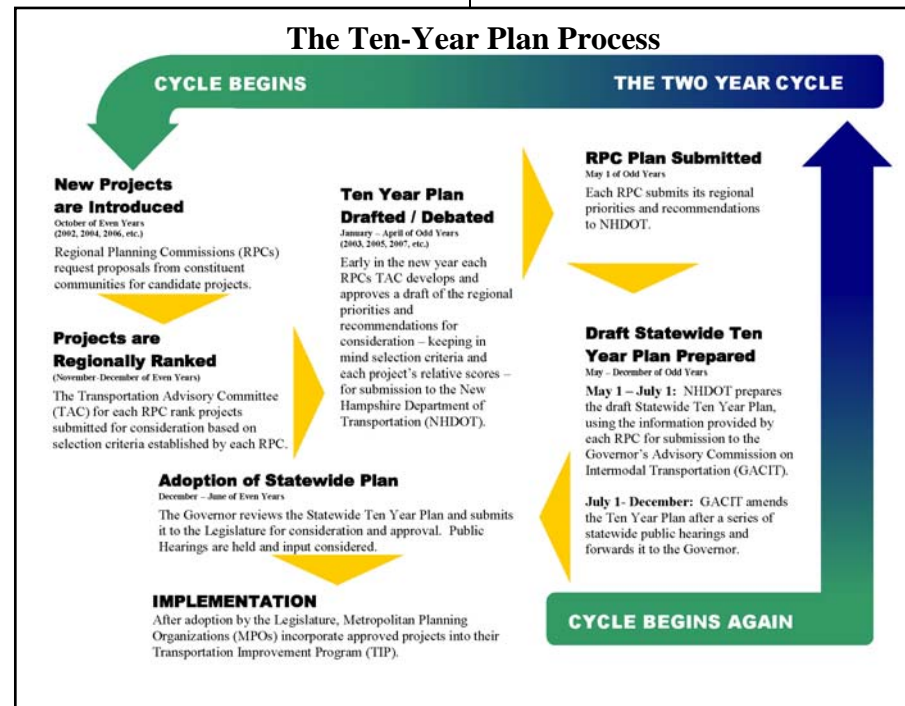
Statewide Plans

State Development Plan
The State Development

Plan, by statute, sets the overall statewide context for state planning and investment for all agencies. The Office of Energy and Planning (OEP) every two years in cooperation with other state agencies and adopted by the Governor produce it. By design it is intended to integrate planning, programs, and investments made by the State.

Long Range Transportation Plan

The Long Range Transportation Plan is developed by NHDOT in consultation with many stakeholders to identify long range (20 years) planning issues and the policies and recommendations for addressing those issues. It is a document that informs policy makers to assist them in establishing long-term direction for policies and investments for the state.



The Ten-Year Plan

The Ten Year Plan (TYP) is arguably the most influential transportation document in the State.

The 2011-2020 Ten Year Plan identifies and prioritizes the critical transportation projects in New Hampshire in an ongoing effort to address transportation needs at the local, regional and statewide levels. The Ten Year Plan is updated every two years - allowing

transportation priorities to be revisited, existing projects to be removed as appropriate and allowing new projects to be added.

With the previous Ten Year Plan as a starting point, the Ten Year Plan process includes input from individual communities, development of Transportation Improvement Plans (TIPs) by the Regional Planning Commissions (RPCs), numerous public hearings by the Governor's Advisory Commission on Intermodal Transportation (GACIT and review and approval by the Governor and Legislature. Performance measures and conditions such as pavement condition, bridge ratings, congestion levels, crash rates, user surveys and available funding levels are considered in determining project need and prioritizing project implementation.

Once the NH Legislature adopts the Ten Year Plan, it is considered the final plan until the subsequently reviewed and modified in the next cycle. Projects contained in the first four years of the Ten Year Plan form the basis for New Hampshire's Statewide Transportation Improvement Program (STIP), as required by federal law.

Current federal regulations require that the STIP include all projects contained in the Metropolitan Planning Organization (MPO) TIPs, as approved by the Governor. For non-MPO areas, the NHDOT uses the RPC TIPs as guidance, although project-by-project inclusion is not required. The TIP represents a strategy developed at the regional level to meet current and future transportation needs. The STIP development process within the Ten Year Plan is a two-year cycle. The GACIT plays a key role in the development process by reviewing the plan

and providing recommendations to the plan and providing them to the governor.

State Transportation Improvement Plan (STIP)

The STIP is the four-year State project listing for federally funded projects. The STIP is a federal requirement under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) as signed into law in 2005. SAFETEA-LU built upon previous legislation, outlining and expanding funding categories as well as the associated requirements of the Federal-aid program for transportation. Those requirements, as codified in title 23 part 135 and 49 part 5305 of the United States Code (USC), stipulate that each state will develop a continuing, cooperative, and comprehensive statewide multimodal transportation planning process, including the development of a statewide transportation improvement program (STIP). In New Hampshire the STIP is updated every two years and is developed through a coordinated statewide and metropolitan planning process.

The metropolitan planning process, as defined in 23 USC part 134 and 49 USC part 5303, is carried out by the four metropolitan planning organizations (MPOs) in New Hampshire: Nashua Regional Planning Commission, Rockingham Planning Commission, Southern NH Planning Commission, and Strafford Regional Planning Commission. Each of the MPOs has adopted a metropolitan transportation plan (MTP) and a Transportation Improvement Program (TIP). The MTPs were developed and approved in accordance with 23 part 450.322 of the Code of Federal Regulations (CFR) and include a financially constrained program of transportation projects within their regions.

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The MPO TIPs are consistent with the regulations outlined in 23 CFR §450.324, including requirements related to financial constraint, and have been incorporated, without change, into the 2009-2012 NH STIP.

As there are nonattainment areas for ozone and carbon monoxide within the MPO boundaries, applicable findings of conformity to the NH State Implementation Plan of all MPO TIPs and MTPs have been made and documented through a process consistent with the requirements of 23 CFR part 450 and 40 CFR part 93. The data and supporting analysis for the conformity determinations from each of MPOs are available in the *Summary of Transportation Conformity Determinations for New Hampshire: 2009-2035*.

The STIP Financial Plan is prepared to satisfy the requirements of 23 CFR §450.216 and to provide information to the public. According to federal regulations, the STIP shall include projects, or identified phases of projects, only if full funding can reasonably be anticipated to be available for the project within the time period contemplated for completion of the project. Additionally, in the first two years of the STIP, funds for projects located in the non-attainment or air-quality maintenance areas of NH must be committed or available.

The STIP ensures that funding is available for all projects within the STIP through a variety of resources, including, but not limited to, federal aid with appropriate match amounts, state resources from the Highway Trust Fund and those provided in the budget of the State of NH, turnpike revenue, and local and private revenue.

Report on Growth Management

The Council on Resources and Development (CORD) provides a forum for interagency cooperation in assuring consistency with established policies relating to the environment, natural resources, and growth management issues under [RSA 162-C](#). CORD is also responsible for resolving interagency conflicts in the implementation of the state's tourism policy, for oversight of the statewide public boat access program, and for reviewing the disposal of state owned real property. NHDOT holds a seat on this committee, which is chaired by the NH Office of Energy & Planning.

Principal among CORD's duties is the implementation of the state's smart growth policy, as embodied in [RSA 9-B](#). CORD is responsible for encouraging smart growth consistency in the distribution of state agency funds to local and regional entities, the capital budget requests of state agencies, state agency facility location planning, and building operation and maintenance plans. Every four years, CORD is required to report to the Legislature relative to its findings on the consistency of state agency actions with the smart growth principles. CORD also facilitates the coordination of state, regional, and local planning consistent with [RSA 9-A](#). This report details:

“I. Progress by state agencies in considering the state's policy on smart growth when providing advice or expending state or federal funds.

II. Progress by the state agencies represented on CORD in coordinating their activities to encourage smart growth.

III. Efforts to encourage development in accordance with the principles of smart growth by regular review of state operating procedures, granting policies, and regulatory framework.

IV. Suggested policy changes or legislation that CORD believes would strengthen the state’s ability to achieve smart growth.” (CORD, December 2006)

RSA 9-B “requires each state agency to consider ‘smart growth’ principles when providing advice, expending funds, or distributing grant monies, for public works, transportation, or major capital improvement projects, and for the construction, rental, or lease of facilities.” (CORD, December 2006)

NH Climate Change Action Plan

Over the course of 2008, through a process that engaged over 125 stakeholders and received input from over 200 citizens, the 29 members of Governor John Lynch’s Climate Change Policy Task Force developed a Climate Action Plan for New Hampshire. The plan is aimed at achieving the greatest feasible reductions in greenhouse gas emissions while also providing the greatest possible long-term economic benefits to the citizens of New Hampshire. The Plan notes that the most significant reductions in both emissions and costs will come from: 1.)substantially increasing energy efficiency in all sectors of our economy, 2.) continuing to increase sources of renewable energy, and 3.) designing our communities to reduce our reliance on automobiles for transportation.

This Climate Action Plan provides insight into the role of the transportation system from an emissions perspective. Below is a chart displaying the increase – by sector – of greenhouse gas emissions from 1990 to 2005. Note the prominence of the Transportation sector as the largest contributor to greenhouse gas emissions in figure 1.1 and again in Table 1.1.

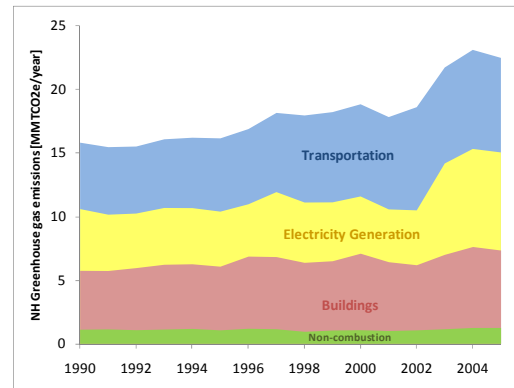


Figure 1.1 Historical Emissions by Sector (NH CAP)

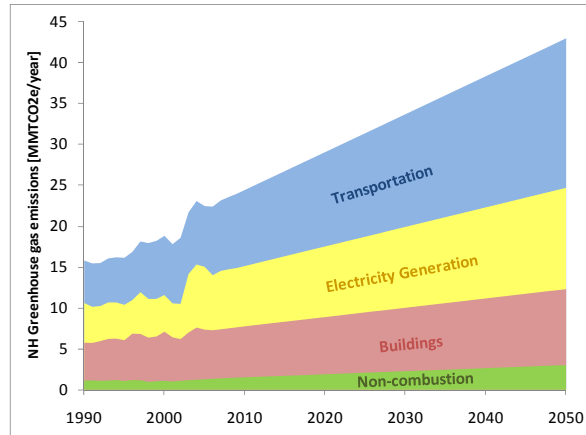
	1990	1995	2000	2005
Total Energy Related Emissions	14.68	15.08	17.74	21.21
Commercial	1.32	1.15	1.44	1.93
Industrial	0.83	1.09	1.64	0.98
Residential	2.47	2.76	2.93	3.17
Transportation	5.21	5.76	7.24	7.43
Electric Power	4.85	4.32	4.49	7.7

Historical Emissions by Sector (NH CAP)

Plan Background

As noted in Figure 1.2, business as usual results in continued emissions output increases.

Figure 1.2



Future Emissions if no Change (NH CAP)

Table 1.2

	2012	2025	2050
Total Energy Related Emissions	23.76	29.3	39.95
Commercial	1.47	1.64	1.98
Industrial	1.53	1.81	2.34
Residential	3.38	3.92	4.96
Transportation	9.74	12.66	18.27
Electric Power	7.63	9.26	12.39

Future Emissions if no Change (NH CAP)

The Plan points out that New Hampshire’s economic future and its response to climate change are inextricably linked and New Hampshire needs to focus on how New Hampshire’s energy is produced and how it is used. Future economic growth in New Hampshire as well as mitigation of, and adaptation to, a changing climate will depend on how quickly the state transitions to an economy that is based on a far more diversified energy mix; more efficient use of energy; and

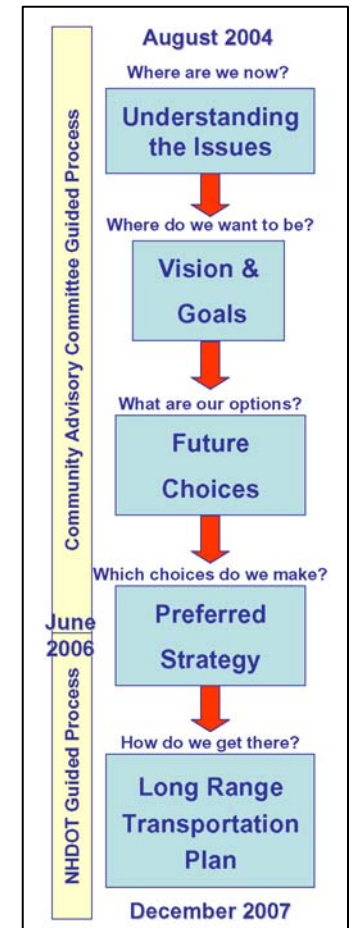
development of our communities in ways that strengthen neighborhoods and urban centers, preserve rural areas, and retain New Hampshire’s quality of life.

The NHDOT was represented on the task force, and is supportive of, or directly involved in the implementation of several action items and goals, which are detailed in Section II and V of this Long Range Transportation Plan.

The Long-Range Transportation Planning Process

A five phase planning process was used to develop this Plan. These phases were:

- Understanding the Issues, “*What are the critical issues that affect transportation in New Hampshire?*”
- Vision & Goals, “*What are the desirable attributes and outcomes of the future transportation system?*”
- Future Choices, “*What are the options to achieve the Vision, and what are the trade-offs and implications of these choices?*”
- Preferred Strategy, “*Which is the best combination of transportation and related strategies to work toward the Vision which recognizes potential constraints*”



and takes advantage of opportunities”

- **Implementation Plan** “*What series of actions must be taken, by when, by whom, and with what resources, to implement the Plan?*”

The Community Advisory Committee (CAC), appointed by the NH Charitable Foundation and the NHDOT, guided the process through to mid-way of phase four (Preferred Strategy) ending in June 2006. That month, the CAC published its Final Report which set out broad-brush recommendations to the NHDOT and the State for resolving pressing issues facing transportation in New Hampshire. It also proposed five early ‘Action Items’ to demonstrate the effectiveness of a new approach to transportation. (For a copy of the report, go to: www.nh.gov/dot/org/projectdevelopment/planning/lrtbp.htm)

The CAC Report developed recommendations for action at the Local, Regional and Statewide levels. The seven Recommendations directed at the State/NHDOT-level are:

1. Develop a truly comprehensive statewide transportation plan that serves a broader vision for the state.
2. Compile updated data on transportation trends, alternatives and financing for local, statewide and regional planners.
3. Adopt and fully implement the “Common Sense Solutions” approach to transportation and land use, using place-making tools to identify strongly-felt community values and special places for protection in the project development process.
4. Develop new performance measures for transportation that go beyond vehicle speed and congestion, such as measures for increased reliability and safety.
5. Manage the growth of freight traffic.
6. Clarify transportation language to make the process transparent and accessible to all.

7. Broaden and coordinate transportation services across all state agencies to improve transportation choices.” (CAC Final Report Executive Summary, June 2006).

Following publication of the CAC Report, the NHDOT looked in more detail at the actions it and its partners should take to implement applicable portions of the CAC’s recommendations. This additional work focused on the ‘Preferred Strategy – *What choices do we make?*’ and ‘Long Range Plan / Implementation Plan – *How do we get there?*’ phases.

Plan Background

Public Participation & Outreach

A variety of methods were used to engage traditional and nontraditional participants in the transportation planning process. Public outreach and participation efforts and initiatives were used throughout the Long Range Plan's development. These efforts include:

- Partnering with the New Hampshire Charitable Foundation (NHCF) to develop the Plan.
- Convening the CAC in partnership with the NHCF which met over a dozen times.
- Holding 'Listening Sessions' within each of the nine RPC areas in the Fall 2004 to initiate the LRTP process and holding a Listening Summit in December 2004 to discuss the key issues that were raised.
- Holding dozens of informational and consultation sessions with agencies, groups and organizations throughout New Hampshire.
- Periodically updating and holding workshops with the Regional Planning Commission Executive Directors and staff.
- Conducting a series of nine public meetings in the Spring 2006 at which over 400 citizens attended and provided invaluable input to and feedback on the draft CAC report.
- Posting of project materials on a project website.
- Creating a toll-free number for collecting citizen comments and input.
- Posting this Draft Long Range Transportation Plan on the project website for public comment in May 2008.
- Revising the Draft Long Range Transportation Plan in response to FHWA comments dated March 2009.
- Conducting Draft Plan review sessions with key agencies and stakeholders from April 2008 to May 2010.

Section II: Understanding the Issues Affecting Transportation

The Importance of Transportation to our Daily Lives

Transportation plays an instrumental role in the daily life of every citizen and business in New Hampshire. The State's transportation system provides access to the places where we live, shop, work, create businesses, recreate, and learn. Increasingly, 'getting there' is becoming more of an issue due to lengthening work commute distances and congestion, rising fuel costs, and the growing awareness of the potential environmental impacts of our individual and collective transportation decisions.

The economic vitality of the State relies on a quality transportation system. In 2002, total trade in the State amounted to 44 million tons, valued at over \$64 billion. By 2035, this tonnage is forecasted to more than double to 108 tons with the value of goods forecasted to quadruple to \$257.3 billion.

While most trade occurs with our neighboring and nearby states of Massachusetts, New York, Maine and Vermont, the importance of foreign trade to the economy is increasing dramatically. Currently, foreign trade makes up 13 percent by weight and 6 percent by value of all NH trade (FHWA, Freight Analysis Framework). Foreign trade is growing faster than other segments of trade.

Clearly, a robust transportation system is required if New Hampshire is to remain economically competitive within the US and globally, and is to maintain a high quality of life.

Understanding the Transportation System and its Components

The transportation system is primarily described by the various modes and facilities.

Modes are the methods of travel, such as the automobile, bicycle, bus, rail, walking, ferry, truck, and airplane. Modes can be further differentiated between passenger modes (those moving people) and freight modes (those moving goods).

Facilities are the infrastructure that makes travel possible. Various modes can rely on overlapping facilities. Roadways support a variety of modes including Autos, trucks, bicycles, pedestrians and buses.

Inter-modal facilities are infrastructure where several modes of transportation (either passenger or freight) intersect. These facilities ideally enable seamless transfers between modes. An example is the Portsmouth Intermodal Facility adjacent to I-95 and the Pease Tradeport that allows bicyclists and automobile users to transfer seamlessly to intercity buses, local shuttle buses, and to carpools/vanpools.

Transportation, Land Use & the Economy

Transportation systems neither exist nor operate in a vacuum. Transportation opportunities strongly influence the surroundings, and conversely, are strongly influenced by those same surroundings. The land use patterns of a region, its size and its economy are all greatly influenced by its transportation system and how well that system operates in terms of available mobility for people (workers, tourists, shoppers) and goods (freight, produce, services). Where transportation options are limited in terms of modes and corridors, economic opportunities are typically limited; where multiple modal opportunities are available and corridors

options are robust, the area's economy is typically strong and sustainable.

On a more granular level, transportation modes can influence and compliment land use and population density. Conversely, land use and population density (or lack thereof) can make a particular mode (such as rail or transit) successful (or unsuccessful). Understanding that there is a need for diversity in the economy, there is a need for diversity in land use and in available transportation modes.

Emergence of Seven “Core Issues”

At the onset of the LRTP a series of Listening Sessions was conducted throughout the state, co-hosted by the Regional Planning Commissions. At these sessions, attendees were asked to identify the most critical regional and statewide transportation related issues.

From the input at these sessions and from the deliberations of the Community Advisory Committee, seven “Core Issues” emerged as the issues that participants saw as most influential to the future of the transportation system in New Hampshire.

These Core Issues are:

- Land Use & Transportation Connection
- Mobility and Mode Choice
- Safety and Public Health
- Environment and Public Health
- System Maintenance & Preservation
- Governance/Institutional Arrangements
- Funding & Fiscal Constraints - Choices & Priorities.

For each Core Issue category, a series of key questions and key issues were identified along with the trends that affect these issues.

Trends, Implications & Opportunities

Related to these Core Issues, seven important trends were identified and are described below. These trends are in the areas of:

1. Demographics
2. Land Use & Environment
3. Economics & Economy
4. Travel Trends
5. Fiscal Policy
6. Transportation Infrastructure & Services
7. System Management & Technology

1. Demographics		
Key Trends	Potential Implications	Opportunities
Intra-state & Statewide		
<ul style="list-style-type: none"> Population growth has been strongest in southeastern area of the State and is expected to continue in next 20 years. 	<ul style="list-style-type: none"> Traffic congestion, environmental impacts, and loss of quality of life may choke future growth opportunity. 	<ul style="list-style-type: none"> Direct growth into existing revitalized town and city centers and make alternative modes of transportation available.
<ul style="list-style-type: none"> The North Country has been losing population for the last 20 years. 	<ul style="list-style-type: none"> Continued loss of workforce and population base to viably sustain the economy. 	<ul style="list-style-type: none"> Target transportation investments in the North Country to better facilitate tourist oriented economic opportunities and the harvesting of natural resources.
<ul style="list-style-type: none"> The Central & Western areas are growing more modestly in absolute terms with the Lakes Region growing faster on a percentage basis. 	<ul style="list-style-type: none"> Erosion of rural and historic ambiance that potentially degrades agricultural, tourism and recreational opportunities 	<ul style="list-style-type: none"> Direct transportation investments and land use change toward village/town centers and downtowns.
<ul style="list-style-type: none"> The population of the state overall is aging rapidly, with NH is on track to have one of oldest populations in the nation over the coming decade. 	<ul style="list-style-type: none"> The transportation system may not accommodate such a dispersed, older population. 	<ul style="list-style-type: none"> Invest in transportation modes and land uses that provide mobility for seniors that result in less driving or shorter trips.
National & Global		
<ul style="list-style-type: none"> The population is becoming less tethered to industrial centers due to advances in Internet and wireless technologies. 	<ul style="list-style-type: none"> Service oriented, creative economy workers can 'live anywhere'. Increased reliance on quality of life issues for where these workers choose to live. 	<ul style="list-style-type: none"> NH can preserve its competitive advantages of being a desirable place to live, work, and recreate by preserving its high degree of environmental, historical & community qualities.

2. Land Use & Environment		
Key Trends	Potential Implications	Opportunities
Intra-state & Statewide		
<ul style="list-style-type: none"> Land consumption in NH is four times higher than population growth. 	<ul style="list-style-type: none"> Continued loss of open space , fragmentation of forestland and habitat and loss of farmland. 	<ul style="list-style-type: none"> Use less consumptive residential growth strategies such as Conservation Subdivisions in outlying areas while directing most growth into new and established village/town and city centers in traditional neighborhood development.
<ul style="list-style-type: none"> Population & Jobs are becoming more dispersed in a low-density development pattern. 	<ul style="list-style-type: none"> Increasing automobile & truck freight dependency Non-auto travel options become less cost-effective and efficient to deploy and use. 	<ul style="list-style-type: none"> Utilize integrated land use and transportation strategies that maximize the efficiency of the transportation system such as directing growth to designated growth areas.
National & Global		
<ul style="list-style-type: none"> Growing awareness of potential impacts of Global climate change/greenhouse gas (GHG) emissions. 	<ul style="list-style-type: none"> Possible new requirements for transportation investments and for the transportation system to contribute to stringent and possibly dramatic GHG emission reductions. 	<ul style="list-style-type: none"> Continue initiatives (studies and investments) to diversify transportation options that are less GHG producing per passenger-mile (clean fuels, walking, bicycling, rail, bus, congestion pricing, etc.)

3. Economics & Economy		
Key Trends	Potential Implications	Opportunities
Intra-state & Statewide		
<ul style="list-style-type: none"> Transitioning to an increasingly service-based economy is forecasted to continue. 	<ul style="list-style-type: none"> Some regions may be left behind without an integrated development plan for the state. 	<ul style="list-style-type: none"> A greater share of the workforce will be workers for which flextime or telecommuting may be possible to reduce peak-hour commuting impacts.
<ul style="list-style-type: none"> Manufacturing jobs that survive may involve lower volume, albeit higher value products. 	<ul style="list-style-type: none"> More goods may travel greater distances from production to consumption. 	<ul style="list-style-type: none"> Focus transportation investments to facilitate the efficient flow of goods.
<ul style="list-style-type: none"> Employment and wages lag in the northern region of the state relative to other regions. 	<ul style="list-style-type: none"> Continued decline could increase pressure for less environmentally sustainable development. 	<ul style="list-style-type: none"> Develop rural-specific economic development strategies that complement transportation investments to make the region more attractive for investment.
National & Global Trends		
<ul style="list-style-type: none"> Globalization of the economy is expected to continue and possibly accelerate. 	<ul style="list-style-type: none"> With increasing trade and limited transportation capacity, reliability may become the most important characteristic of the transportation system. 	<ul style="list-style-type: none"> A focus on transportation reliability can maintain and create a comparative advantage for NH in the northeast and internationally.
<ul style="list-style-type: none"> Increased instability of the price and supply of gasoline. 	<ul style="list-style-type: none"> Over-reliance on automobile and truck freight may create large disruption to mobility of citizens and the state's economy. 	<ul style="list-style-type: none"> Diversify transport options for movement of goods and people.

4. Travel Trends		
Key Trends	Potential Implications	Opportunities
Passenger		
<ul style="list-style-type: none"> Travel for all types of trips is becoming increasingly inter-regional as trip distances (such as for commutes and tourism) increase. 	<ul style="list-style-type: none"> Solutions that address root causes go beyond one town or city to include more than one region and sometimes multiple states and provinces. 	<ul style="list-style-type: none"> Develop mechanisms to address problems at larger scales, such as longer corridors, multiple regions or multiple states.
<ul style="list-style-type: none"> The percentage of Single Occupancy Vehicle (drive alone) commuting is increasing. 	<ul style="list-style-type: none"> Peak commuting demands often dictate roadway capacity needs and are therefore a critical trip purpose to be actively managed. 	<ul style="list-style-type: none"> Manage commuting trends via travel demand management methods such as peak period pricing, transit and telecommuting.
<ul style="list-style-type: none"> Peak travel periods are spreading into larger portions of the day and week due to “trip chaining” whereby the commute involves a number of stops along the way home. 	<ul style="list-style-type: none"> Trip chaining is increasing which can be more difficult to mode shift. 	<ul style="list-style-type: none"> Mixed-use development can reduce the need for trip chaining.
Freight		
<ul style="list-style-type: none"> Freight movement via trucks and highways is forecasted to increase by 80% over the next 20 years. 	<ul style="list-style-type: none"> Increased wear and tear on roads, truck-related traffic congestion, and safety concerns. 	<ul style="list-style-type: none"> Strategically invest in rail corridors and freight intermodal facilities to minimize bulk freight traveling long distances by highways.
<ul style="list-style-type: none"> Business models increasingly rely on ‘Just in Time’ Delivery for raw and finished goods – essentially, mobile inventory management. 	<ul style="list-style-type: none"> Reliability of shipping becomes more critical. Number of individual shipments to increase. 	<ul style="list-style-type: none"> Implement accessible, real time traffic condition systems in NH and with regional neighbors (such as the I-95 Corridor Coalition) that allow trucks to maintain on-time delivery.

5. Fiscal & Policy		
Key Trends	Potential Implications	Opportunities
Intra-state & Statewide		
<ul style="list-style-type: none"> ▪ The Ten Year Plan has been dramatically oversubscribed in past years. 	<ul style="list-style-type: none"> ▪ Potential loss of credibility in establishing priorities for investment. 	<ul style="list-style-type: none"> ▪ Continue to establish ten-year “plan” of projects that is fiscally constrained.
<ul style="list-style-type: none"> ▪ The buying power of existing transportation revenue sources is not keeping pace with revenue generation and inflation. 	<ul style="list-style-type: none"> ▪ Further erosion of ability to maintain current levels of service and system performance. 	<ul style="list-style-type: none"> ▪ Increase and diversify funding sources.
<ul style="list-style-type: none"> ▪ Modal planning remains largely independent with little focus on intermodal relationships. 	<ul style="list-style-type: none"> ▪ Lost opportunity to leverage strength of individual modes. 	<ul style="list-style-type: none"> ▪ More fully integrate planning across passenger and freight modes through corridor and other opportunities.
<ul style="list-style-type: none"> ▪ Local match for transit operating funding is reliant on local resources and can be difficult to raise. 	<ul style="list-style-type: none"> ▪ Limits public transit options statewide. 	<ul style="list-style-type: none"> ▪ Utilize development to create opportunities for funding public transit options.
National & Global		
<ul style="list-style-type: none"> ▪ The continued solvency of the Highway Trust Fund is a national concern and can be expected to influence discussions regarding the next Federal transportation-funding package. This fosters insecurity regarding future funding for transportation. 	<ul style="list-style-type: none"> ▪ Demonstrates need to diversify funding sources. ▪ Potential for cuts to federal funding programs. 	<ul style="list-style-type: none"> ▪ Continue discussions regarding funding challenges and opportunities.
<ul style="list-style-type: none"> ▪ Concerns for global climate change and green house gas (GHG) emissions are becoming high-priority policy issues. 	<ul style="list-style-type: none"> ▪ More regulations may be forthcoming which potentially require significant reductions in GHG emissions. 	<ul style="list-style-type: none"> ▪ Continue deliberations regarding options for retrofitting transportation and other economic sectors.
<ul style="list-style-type: none"> ▪ Increasing emphasis on safety and performance measures in planning and system operation. 	<ul style="list-style-type: none"> ▪ Requires quality data and multimodal systems planning and management approach. 	<ul style="list-style-type: none"> ▪ Continue implementation steps of Performance Measures and Asset Management.

6. Transportation Infrastructure & Services		
Key Trends	Potential Implications	Opportunities
Intra-state; Statewide; Regional & Local		
<ul style="list-style-type: none"> ▪ Much of the roadway infrastructure is approaching the end of its design life (more red list bridges, etc). 	<ul style="list-style-type: none"> ▪ Large investments are needed to preserve and rehabilitate the road and bridge systems while congestion needs also call for new transport capacity. 	<ul style="list-style-type: none"> ▪ Develop Asset Management systems to prioritize and assess cost-effectiveness of investment options. ▪ Continue with Preservation based strategies.
<ul style="list-style-type: none"> ▪ Expansion of the roadway system is becoming cost-prohibitive and more environmentally difficult at the same time the urgency of congestion is calling for action to alleviate it. 	<ul style="list-style-type: none"> ▪ Roadway expansion projects may consume larger portions of available budgets and will involve increasingly stringent environmental scrutiny/oversight. 	<ul style="list-style-type: none"> ▪ Employ Context Sensitive Solutions approach to maximize support for needed improvements. ▪ Give more emphasis to roadway operations and travel demand management than to system expansion.
<ul style="list-style-type: none"> ▪ Much of the rail network in NH cannot support moderate to high-speed rail operations. 	<ul style="list-style-type: none"> ▪ Continued erosion of mode share by rail freight leading to further dependency on truck freight. 	<ul style="list-style-type: none"> ▪ Invest in rail freight infrastructure to improve competitiveness of rail freight network in NH.
<ul style="list-style-type: none"> ▪ Local road networks are being constructed with lesser degrees of connectivity and too often lacking consideration of collector-level roads and needs. 	<ul style="list-style-type: none"> ▪ Arterial roadways will continue to be overburdened if traffic cannot be more efficiently managed through a better-connected roadway network. 	<ul style="list-style-type: none"> ▪ Create interconnected collector & local roadway networks to reduce or delay the need to widen arterial streets to better distribute traffic, and enhance bicycle and pedestrian travel opportunities.
<ul style="list-style-type: none"> ▪ Road capacity along major corridors is stressed by peak demands for travel. 	<ul style="list-style-type: none"> ▪ Continued pressure by the public for new and expensive roadway capacity. 	<ul style="list-style-type: none"> ▪ Emphasize travel demand management, connectivity & ITS.
National & Global		
<ul style="list-style-type: none"> ▪ Border passenger and freight security issues highlight lack of border capacity to expedite passenger and freight flows. 	<ul style="list-style-type: none"> ▪ Potential stifling of trade and travel that could have economic development impacts on NH. 	<ul style="list-style-type: none"> ▪ Work with neighboring states and provinces to advocate for investment to eliminate potential bottlenecks.

7. System Management & Technology		
Key Trends	Potential Implications	Opportunities
Intra-state; Statewide; Regional & Local		
<ul style="list-style-type: none"> Traffic & available technology are both growing rapidly. 	<ul style="list-style-type: none"> Traffic volumes continue to outstrip available capacities, reducing system Levels of Service. 	<ul style="list-style-type: none"> As access to technology grows, efforts to install latest available, compatible tech should be made to ensure improved control to sustain current LOS.
<ul style="list-style-type: none"> Increased user volumes on roadways during all weather events – including hazardous winter driving conditions. 	<ul style="list-style-type: none"> Demands on NHDOT for seasonal maintenance are increasing. 	<ul style="list-style-type: none"> Opportunity to utilize TMC for central dispatch & resource mobilization increases.
<ul style="list-style-type: none"> Capacity related infrastructure costs outstripping revenues. 	<ul style="list-style-type: none"> Systems management/maintenance requires ever increasing access to detailed & real time data sources 	<ul style="list-style-type: none"> Implement TMC plans for ITS expansion to increase & improve access to quality traffic/conditions data.
National & Global		
<ul style="list-style-type: none"> Intelligent roadway & vehicle technology efforts growing with support of US DOT 	<ul style="list-style-type: none"> Administrative & implementation burdens will require training and potential new legislation. 	<ul style="list-style-type: none"> Opportunities to utilize knowledge, skills, abilities of TMC staff as well as improve available ITS infrastructure will increase.
<ul style="list-style-type: none"> Technology & policy development in western states seeks to reconcile the economic impact of decreased gas tax revenue resulting from increased fuel economy. 	<ul style="list-style-type: none"> Administrative challenges and reluctant public depending on the selected technology (GPS) 	<ul style="list-style-type: none"> Opportunity to move from a more regressive revenue source (gas tax) to a purer user-fee (miles driven) could address maintenance shortfalls.

Description of New Hampshire's Transportation System & System Issues

The transportation system in New Hampshire is comprised of individual **modes** of transportation that move people and goods. Each of these individual modes itself is a sub-system. The transportation system as a whole is made up of the combined modes, facilities and services.

Facilities comprise infrastructure such as roads, bridges, paths, sidewalks, railroads, airports and train and bus stations. Services are made up of equipment and personnel such as snowplows, bus drivers and traffic control personnel.

Key transportation systems include:

- Bus and rail passenger transit
- Roads and bridges
- Intermodal Centers and Park & Ride Lots/Rideshare
- Bicycle and pedestrian facilities
- Rail freight
- Intelligent Transportation Systems (ITS).
- Aeronautics

For each of these facility and service types, a short description of the system is given, recent related planning initiatives, and important issues the particular system faces.

Each system is described by:

- its components that make up the different functionalities of the system (if applicable)
- an Overview of the System
- Important System Issues
- Recent Planning Initiatives.

Bus & Passenger Rail Transportation

The mass-transit Passenger Transportation system is made up of Bus Transit and Passenger Rail. Within each, there are many variations on the types of services provided and markets served.

Ground based passenger transportation services and facilities fall into the following categories:

- Intercity Bus service, Inter-city Passenger Rail service
- Fixed Route Bus services; Paratransit services
- Local Shuttle and Trolley services.

Bus Transit: Overview

Bus transit service is most often described as *Inter-city Bus* service, *Fixed Route* services or *Para-transit* services.

Inter-city Bus service, as the name implies, operates typically at longer distances, often serving multiple cities and towns along a linear route. Fixed Route services generally operate on an area-wide basis within a multiple town and/or city area with a specific timetable and routes. Para-transit or Demand Responsive service, meanwhile, is generally dispatched based upon a set appointment between the provider and rider.

Intercity Bus Service

Description

New Hampshire is served by several private intercity bus operators, which carry over 875,000 riders per year (2009). While privately operated, public funding for motor coaches and intermodal passenger facilities are typically provided by the State of NH. The system serves most of the major cities in New Hampshire with connections to neighboring states.

Recent Planning Initiatives

- Statewide Intermodal Study, 2003 (KFH group)
- I-93 Transit Investment Study

Important System Issues

- While most major cities have service, there are large service gaps between several regions of the state along important corridors with the most pronounced gaps in the northern and western parts of the State.

Fixed Route Service

Description

Fixed Route service is provided in 11 areas of the state providing over 3.5 million rides per year (2009). There are ten local trolley/shuttles operating.

Recent Planning Initiatives

- Nashua Region Transit Plan, 2004
- Study of Expanded Transit Service in Meredith, NH, 2004
- Statewide Coordination of Community Transportation Services Study , 2006
- NH Public Transit Program State Management Plan, 2008
- Regional Coordinated Transit Plans 2009-2010
- NH Route 10 Job Access Study 2009

Important System Issues

- Most fixed-route systems operate with limited service frequency, days of operation, and service areas.
- Providing local match to Federal Transit operating funds.
- Service coordination and efficiencies between fixed route and demand-responsive services.

- Current development patterns favor lower density, to the detriment of mass transit’s strength

Para-transit / Demand Responsive Service

Description

Paratransit services provide door-to-door, appointment based transit trips for its riders. These services are typically provided to the elderly or persons with disabilities.

Of the 10 public transportation providers, four operate primarily social service or community based services: The City Express (Keene), Community Transit Services (Sullivan County), North Country Transit, and the Lakes Region Transit.

Recent Planning Initiatives

- Statewide Intermodal Study, 2003 (KFH Group)
- Human Service Transportation Coordination Study, 2006.

Important System Issues

- Largest gaps in paratransit service areas and service hours are in the North Country and western/southwestern areas of the State.
- Coordination of funding sources to provide the most efficient and effective services. Current funding sources place specific restrictions on how funding can be spent.

Roads & Bridges

The road and bridge system is the backbone of the transportation system in NH, carrying the vast majority of passengers and goods.

Roads

Short Description

New Hampshire's public road system consists of approximately 16,125 miles. Of these:

- The State maintains 4,269 miles (Class I, II, & III).
- Other public authorities maintain the remaining 11,856 miles (Class IV, V).
- The New Hampshire Turnpike System presently consists of 89 miles of limited access highway. The Turnpike System is comprised of three limited-access highways: the Blue Star Turnpike (I-95) and the Spaulding Turnpike, which are collectively referred to as the Eastern Turnpike, and the F.E. Everett Turnpike, also known as the Central Turnpike. The Turnpike System uses an open barrier system of toll collection. The Blue Star Turnpike is currently being enhanced to a non-barrier system (open tolling) to reduce congestion and increase travel efficiency. Customers may pay toll charges with cash or E-Z Pass.
- The Statewide National Highway System includes 790 miles of the federal designated National Highway System (NHS). The NHS supports New Hampshire's

mission-critical applications for public safety, emergency preparedness, and transportation. The NHS is essential in connecting other State routes and other NHS routes in the surrounding states: Vermont, Maine, and Massachusetts.

Highway Pavement Condition

The expected future condition of NH's pavements is based on a number of factors. These include, but are not limited to, the type and depth of base material, the most recent date of construction, traffic and heavy truck volumes, and roadway drainage features. If this information is known for a particular roadway, some assumptions can be made to predict a pavement's future condition. Many roads in the state have evolved from old wagon trails or cow paths, with little done over the intervening years to address sub grade issues. For those roads that are newer, designs include good base structure and material to support the pavement on top.

Pavements built with substantial base courses generally require little work until 15 years after construction. If the road is maintained and resurfaced every 8-12 years, the pavement should remain in a good condition nearly indefinitely.

Pavements that evolved out of some former type of trail or path typically have little or no structural support under the pavement. Because of this, maintenance is required more frequently. Roads like these will typically be in fair condition at best or in poor condition at worst. Unless there is complete reconstruction, it is unlikely the road will be in good or excellent condition. Typically, any resurfacing or other maintenance project will show only an improvement for a

very short period of time (perhaps 5 years) before it is back to fair/poor condition again.

The NHDOT’s current philosophy is to keep roadways that are the most widely used in good condition. These roads are most likely to have been constructed or reconstructed with a good base, due to the amount of traffic using the road. Previous levels of funding for the Statewide Interstate Pavement Preservation Program (IPPP) and Federal Resurfacing Program are maintained in the Plan to keep up with these needs.

Less traveled, poor condition roads, though treated regularly, are seldom in better than fair condition. The prohibitive cost of complete reconstruction prevents a better solution to the problem. The Highway Maintenance Districts have begun a plan of “Low Cost Reconstruction” to address these roads. Less expensive than normal reconstruction, this plan includes upgrading highway drainage, recycling pavement, resurfacing, and a process called sandwiching. Sandwiching is a cost effective treatment that involves the placement of 6-12 inches of crushed gravel over an existing pavement and then repaving the surface. Otherwise these roads receive periodic thin overlays, which are intended to seal and bind together to the degree possible the existing pavement, in an effort to keep the road passable. Funding has been included in the Plan to continue to address these needs.

One of NHDOT’s goals is to address roads in poor condition. The major objective for the future will be to upgrade those roads in poorer condition, while maintaining and preserving those in good condition. Newer technologies and maintenance techniques, such as thicker overlays, the use of paving fabrics/reinforcement, and preservation treatments such as micro-surfacing and chip seals, are being

investigated, to increase pavement service life. The Department has also started to include crack sealing as part of the yearly resurfacing program. Studies have shown that crack sealing can extend the life of a pavement by 2 years. Continued funding and local project ranking will remain important elements in addressing low volume highways on the State’s system.

Pavement Condition	Miles
No Work Required	951
Some Work Required	1902
Major Work Required	1532
Unrated	374

Source: NHDOT 2011-2020 Ten-Year Plan

Highway Congestion

Traffic congestion and travel delay are common concerns when considering highway mobility and performance. Congestion can be recurring (commuter traffic, Friday night traffic to tourist destinations), seasonal (foliage viewers heading north), event driven (NASCAR races), or caused by a particular incident (a crash or breakdown).

Traffic congestion in New Hampshire is measured in terms of Level of Service (LOS). There are six categories, A through F. LOS A denotes free flowing, and LOS F means heavily congested. LOS is determined by comparing the volume of traffic on a roadway section to the roadway's capacity to handle the volume (based on traffic engineering procedures outlined in the Highway Capacity Manual). Capacity is based on roadway factors that affect congestion: alignment, lane and shoulder width, the number of access points, and others. To ensure uniformity, the traffic volumes used for comparison purposes are weekday PM peak hour volumes

(normally an example of a high recurring peak condition) throughout the state.

The chart below represents the LOS for the major state highways, including state maintained and numbered routes, based on 2008 traffic data.

Level of Service Description	Miles
No Congestion (LOS A and B)	1189
Moderate Congestion (LOS C and D)	1235
Congested (LOS E and F)	305
Unrated	1830

Source: 2011 – 2020 NH Ten-Year Plan

Recent Planning Initiatives

- I-93 Salem – Manchester SEIS, ongoing
- Bow – Concord I-93 Study
- Route 101 Corridor Study
- NH Strategic Highway Safety Plan
- NH Route 104 Access Management Study 2007
- NH 28 Corridor Safety Study
- US 3 – Whitefield to Columbia – Corridor Study
- NH 120 Corridor Management Plan – Lebanon
- NH 125 – Lee, Barrington & Rochester – Corridor Plan

Important System Issues

- Most residential and commercial development occurs with low-density land development and poor collector and local road connectivity. This often overburdens the State highways.

- Traffic growth rates during the last 20 years have outpaced population and employment growth rates.
- Poor access management along many state highways contributes to safety and congestion problems.
- Many streets lack facilities to accommodate bicyclists and/or pedestrians, or do so poorly – not ‘Complete Streets’.
- Until the recent economic downturn, road maintenance and construction costs were rising much faster than revenues, reducing the buying power of that revenue.
- Major roads and bridges in some areas of the state are posted with weight restrictions during the winter and spring months due to poor pavement conditions, greatly reducing truck access in these areas.

Bridges

Bridges are located on all classes of roadways and are principally described by condition, type of construction, length, and their ‘ownership’ (whether they are maintained by the state or by a municipality). In NH, bridges are structures more than 10 feet in length that carry a roadway.

Red List bridges are bridges that require more frequent inspections due to known deficiencies, poor structural conditions, weight restrictions, or the type of construction (such as a replacement bridge installed on a temporary basis).

Short Description

- There are 3,789 bridges total statewide, of which, 2,127 are State maintained structures, and 1,662 are municipally maintained.

Recent Major Initiatives

- Bridge Summary Report, June 2010

Important System Issues

- There is a significant backlog of bridges designated as ‘Red List’ and Structurally Deficient.
- Investment levels in bridge maintenance, preservation and modernization are not keeping pace with inflation.
- Older bridges constructed to out-of-date standards may be down-posted, even though their condition is acceptable. Such bridges constrain truck traffic movements to the detriment of individual businesses and the state’s economy.

Bridge Condition	Ownership	
	State	Municipal
Red-List (non-historic)	127	332
Red List Bridges (Historic)	12	26
Structurally Deficient or Functionally Obsolete	213	229
Good Condition	1,775	1,075
Total	2,127	1,662

Note: Historic bridges will always remain on the Red List.
 Source: 2011-2020 TYP ‘Bridge Conditions’ Report.

Bicycle & Pedestrian Systems

Description

- The Regional Bicycle Route network is designated along 4031 miles of roadway.
- The State owns 23 abandoned/inactive rail corridors totaling approximately 315 miles with many suitable for

walking/hiking but not bicycling due to unimproved surfaces.

- Numerous regional and local on-road bicycle networks exist.

Recent Planning Initiatives

- Regional Bicycle Route Maps, April 2008
- Statewide Bicycle and Pedestrian Plan, 2000
- NH State Trails Plan, 2005
- Salem to Concord Bikeway Feasibility Study, 2003

Important System Issues

- More effective integration of bicycle and pedestrian facilities is needed with the planning, design and construction of roadways through Context Sensitive Solutions to create ‘Complete Streets’.
- Local street networks with a high degree of connectivity are needed to provide low traffic volume bicyclist and pedestrian route alternatives from busier arterial and collector roads.
- The level of bicycling and walking is dependent on land development patterns at sufficient density, proximity to destinations, a mixture of land uses, and the availability of safe, convenient and attractive facilities.

Freight

Description

- The NHDOT maintains and operates 11 year round and 5 seasonal Rest Areas/Welcome Centers, providing facilities used by trucks.

- Private sector truck rest areas provide important truck/trucker services (gas, food, parking, restrooms).
- There are approximately 112 miles of Tier 1 rail freight lines comprised of three operators: B&M Freight Main; Connecticut River line; and, the St. Lawrence & Atlantic.
- The Port of Portsmouth provides intermodal freight movement at the Marine Terminal with marine, highway and rail access.

Recent Planning Initiatives

- NH State Rail Plan, Ongoing
- Marine Terminal Master Plan, 2000

Important System Issues

- Truck freight volumes are forecasted to more than double over the next twenty years, placing increased stress on the highway network.
- System reliability (via congestion and incidents), environmental constraints (green house gas emissions) and fuel prices/availability (increasing prices/restricted supplies) will become increasingly important issues and potentially affect local to global transportation freight demand and freight mode choice.
- Commercial Vehicle Operations (CVO) will become more critical to facilitate the clearance and permitting of cross border traffic and goods through electronic systems.

Intelligent Transportation Systems (ITS) / Travel Demand Management (TDM) / Transportation Systems Management (TSM)

Description

- ITS, TDM, and TSM initiatives are crucial for obtaining the most efficiency out of existing transportation infrastructure and services.
- ITS is the application of technology such as traffic signal coordination systems, traveler information systems and automatic vehicle locator systems to the transportation system.
- TDM is to the various means by which travel can be managed through such measures as the price of travel, land use accessibility, and the convenience of available travel choices.
- TSM involves the use of hardware and software systems to perform a variety of tasks associated with the management of transportation systems. These activities range from signal control to data capture and everything in between in both the public and private arenas.

Recent Planning Initiatives

- I-93 Community Technical Assistance Program (CTAP), On-going
- Statewide ITS Plan, 2005
- I-93 Incident Management System, 2007
- I-95 ITS Upgrade Effort (ongoing)

Important System Issues

- Adopting an ITS/TDM/TSM approach (integrated with CSS) to better manage existing capacity versus providing additional capacity.

Aeronautics

Description

- System of airports in New Hampshire is comprised of 25 public use airports that are both publicly and privately owned.
- Over 1,240 aircraft based at NH airports around the state.
- Estimated annual aircraft operations (takeoffs & landings) of over 700,000 in NH.

Recent Planning Initiatives

- NH Aviation Airport Systems Plan (2003)

Important System Issues

- 2003 Modal Plan recommends focus of development efforts on existing facilities that provide ‘adequate’ level of access.
- Airport hangar capacity adequate at all but Boire Field – which 2003 plan recommended monitoring of to assess situation in future.
- Business & economic development potential for the existing facilities remains high and potential exists to increase benefits.

Rail

Description

The New Hampshire rail system is comprised of one regional railroad (Pan Am Railways), eight local railroads and four passenger/tourist rail operations. The local railroads range in size from fairly small intrastate railroads to carriers that haul in excess of 6.6 million gross tons on the lines that pass through New Hampshire. The New Hampshire rail lines (as of 2008) comprise an operating rail system of 415 miles. This mileage of operating rail lines is owned and/or operated by 137 separate entities.

Recent Planning Initiatives

- 2001 State Rail Plan
- 2009 Capital Corridor Study Initiative (ongoing)

Important System Issues

- 2010 Rail Plan Update is in process and will focus on inventory of existing services as well as opportunities to expand freight & passenger services. Update will also identify enhancement of multi-modal opportunities.

Livability

While livability has recently become a topic of interest on the national stage, it is not a new topic for NHDOT.

FHWA has defined livability “as efforts that tie the quality and location of transportation facilities to broader opportunities such as access to well-paying jobs, affordable housing, quality schools and safe streets. This effort includes

addressing safety and capacity issues on all roads through better planning & design, maximizing and expanding new technologies such as ITS and the use of quiet pavements and approaches like Travel Demand Management in systems planning & operations.

NHDOT currently supports the concept of livability through the following programs:

- **CSS:** Over the last 5 years, the NHDOT has increased the application of the Context Sensitive Solutions (CSS) process for the design of transportation projects. This effort is aimed at engaging all parties impacted by proposed projects to build consensus around the project design – thereby ensuring that the project ‘fits’ the community and meets its needs, as well as the needs of the state’s transportation system. This process has lead directly to the inclusion of bicycle and pedestrian elements in projects that may not have previously had them prior to CSS.
- **SPR & UPWP:** Continued use of Statewide Planning & Research (SPR) & Unified Planning Work Program (UPWP) funds to coordinate increased planning & outreach in communities to ensure that projects support community needs. Some recent examples include those mentioned in previously in this section.
- **UPWP & RCCs:** NHDOT continues its efforts in partnership with the Department of Health & Human Services to increase access to public transportation opportunities through the development of Regional Coordinating Councils (RCCs) the regional elements of a planned statewide system improvement. These RCCs will work to ensure increased access through improved

planning, which will provide enhanced efficiencies in a more cost effective and coordinated manner.

- **Municipally Managed Project Programs:** The NHDOT manages a variety of programs – from routine paving and maintenance, to multi-million dollar construction projects. In an effort to reduce the staffing requirements to the NHDOT and ensure that municipalities are positioned to design and build projects that are responsive to their needs, the NHDOT allocated programmatic funds through traditional TE, SRTS and CMAQ programs to municipalities to oversee the design and construction of planned bicycle and pedestrian infrastructure.

TE: The Transportation Enhancements (TE) Program has an established track record of success – implementing approximately 300 projects, with over 100 active projects still in various stages of development. The program is specifically targeted to provide federal funds to communities to implement planned bicycle and pedestrian improvements (as well as other system enhancements). The success of this program is owed to the focus on putting participating communities in the ‘driver’s seat’ in terms of project management – allowing the community leaders to guide the design and construction to ensure the project meets the needs for each particular community.

Safe Routes to School: The Safe Routes to School (SRTS) program, in existence since 2005, provides 100% federal funds to communities to plan and implement measures that increase opportunities for children to safely walk and bicycle to school. The program funds both infrastructure (e.g.: sidewalks, bike racks, radar speed signs) as well as non-infrastructure (e.g.: bike rodeos, bike/walk to school day events) projects. The program is

similar to the TE program in that the community is the project leader, and the growing popularity of this program option is a testament to its success.

CMAQ: The Congestion Mitigation & Air Quality (CMAQ) Program can also serve to further the livability objective by providing funds to communities to implement planned bicycle and pedestrian projects. The program also requires that such improvements enhance the air quality in areas served, given the programmatic focus to reduce emissions from transportation. Not only does the program provide for new infrastructure, but it also serves to reduce the use of automobiles in the process.

State Aid Funds for Class I, II, and III Highways (State Aid Highway Program): These funds are provided per RSA 235:10-:21 for the purpose of constructing or reconstructing sections of Class I, II, and III highways. This work, when requested by a municipality, would include improvements to sections of State highways, in the form of intersection improvements and work such as improving drainage, riding surface, or elimination of sharp curves. These projects are often managed by municipalities in order to ensure that these project meet the needs of particular communities.

Travel Demand Management (TDM): Travel Demand Management (TDM) is a set of strategies that seek to mitigate traffic congestion and alter travel behavior through programs of incentives, services, and polices, including encouraging the reduction of single occupancy vehicles and by spreading out peak hour travel volumes. In the state of NH there are several Transportation Management Associations from the Upper Valley Region

to the Seacoast that are implementing various TDM strategies, with support from NHDOT.

I-93 Community Technical Assistance Program (CTAP): To assist communities in the I-93 region plan for growth, the New Hampshire Department of Transportation committed to a comprehensive five-year \$3.5M program to provide technical assistance to the 26 towns and cities influenced by the I-93 improvements project. The Community Technical Assistance Program (CTAP) has helped communities meet the wide range of challenges faced in the region by providing technical assistance and access to tools for innovative land-use planning. CTAP is a major initiative involving the 26 communities in the corridor, state and federal agencies, regional planning commissions and several non-governmental organizations (NGOs).

Safety & Security

The NHDOT endeavors – with its partner agencies in some instances – to provide a safe and secure transportation system for users.

- **TMC:** Perhaps the most impressive improvement to the safety and security of NH’s transportation system has been the development of the Transportation Management Center (TMC). This facility – featuring many new and high technology systems, allows for improved coordination and communication regarding operation of NH’s transportation system. Recently tested by severe weather, events in 2008, 2009 & 2010, the TMC ably demonstrated its potential to assist in communications

facilitation and effective resource allocation to address the challenges of major weather events.

▪ **Intelligent Transportation Systems (ITS)**

Intelligent Transportation Systems (ITS) are the application of information and communications technology to transportation infrastructure to improve safety and operation efficiency. ITS will become increasingly important due to its ability to maximize the efficiency and effectiveness of existing transportation facilities and modes.

Familiar ITS applications within New Hampshire are the EZ Pass system for electronic tolling, variable messaging signs providing construction zone information or safety alerts, and the Traveler Information System (511 & TRIO) that provides real-time weather and road condition reports.

▪ **NH Strategic Highway Safety Plan (2008)**

The Strategic Highway Safety Plan (SHSP) is an outgrowth of the reauthorization of federal highway funding (SAFETEA-LU, 23 USC 148), with the purpose of clearly identifying the State's critical safety needs and developing strategies to achieve significant reductions in fatalities and serious injury crashes on all public roads. To make progress towards safer highways in NH, the SHSP was developed in 2007 with input from federal and state agencies, local governments and private entities with an interest and a role in highway safety. They made recommendations on strategies, that if implemented could have a significant effect on reducing crashes and improving the safety of our highways.

The strategies are grouped by five (5) categories that are:

- Education/Outreach
- Enforcement
- Engineering
- Emergency Medical
- Data

Intellidrive

Intellidrive is a recent US Department of Transportation, Research and Technology Administration initiative focused on enabling safe, interoperable wireless communications between vehicles, infrastructure and passengers. Intellidrive technologies are focused on connectivity:

- Among vehicles to enable crash prevention;
- Between vehicles and infrastructure to enable safety, mobility and environmental benefits;
- Among vehicles, infrastructure and wireless devices to provide continuous, real-time connectivity to all system users.

Applications are currently under development that address safety, mobility & the environment. These applications include:

- **Safety applications** would enable vehicles to have 360-degree awareness to inform a vehicle operator of hazards and situations they can't see. IntelliDrive safety applications have the potential to reduce crashes through advisories and warnings. For instance, vehicle operators may be advised of a school zone; sharp ramp curve; or slippery patch of roadway ahead. Drivers could also be advised of the presence of IntelliDrive - equipped bicycles and pedestrians around them, which would

enhance the safety of pedestrians and bicyclists as well as motorists. Warnings could be provided more imminent crash situations, such as during merging operations put vehicles on a collision path, or when vehicle ahead stops suddenly.

- **Mobility applications** are intended to provide a connected, data-rich travel environment based on information transmitted anonymously from thousands of vehicles that are using the transportation system at a particular time. This information could help transportation managers monitor and manage transportation system performance, by adjusting traffic signals, transit operations, or dispatching maintenance crews or emergency services. This information could also help transportation agencies and fleet operators to manage crews and use resources as efficiently as possible.
- **Environmental applications** that provide travelers with real-time information about traffic congestion and other travel conditions helps them make more informed decisions that can reduce the environmental impact of their trip. Informed travelers may Site sponsored by the US Department of Transportation Research and Innovative Technology Administration decide to avoid congestion by taking alternate routes or public transit, or by rescheduling their trip – all of which can make their trip more fuel-efficient and eco-friendly. The ability for vehicles to "talk to" the infrastructure could provide information to the vehicle operator so that he/she can drive through a traffic signal network at optimum speeds to reduce stopping. Many transportation management activities that enhance mobility, by reducing vehicle idling due to traffic congestion, also potentially reduce emissions.

- **Revenue diversification applications:** As stated previously, the road toll tax revenues at the state level have been decreasing steadily over the last decade. As a result, NH's increased infrastructure needs are being addressed by fewer available dollars. This presents a direct need for a paradigm shift in revenue collection. The opportunities provided by this new technological direction follow similar pilot programs in western states whereby users road toll taxes are based on miles driven/infrastructure used, as opposed to fuel consumed – representing a much purer user-fee approach to system maintenance.

The potential for this new technology is still unknown, given the early stages of development. However, the potential is certainly there for this type of intelligent infrastructure to greatly improve the way in which NHDOT manages its transportation systems, and as such – efforts should be made to stay informed and open to integrative possibilities that make sense for NH's system users.

System Integration Issues & Opportunities

Land Use

- Decentralized and low-density residential and commercial land uses has resulted fewer destinations that are within safe and convenient walking or bicycling distances as well as a less adaptable transit system.

Reliability & Redundancy as Emerging Issues

- Interruptions of systems through natural disaster or other manmade occurrences are of increasing importance in terms of reliability (dependability/variability of travel

times) and redundancy (are there backup modes or facilities available).

Connectivity

- Connectivity involves linking key transportation hubs such as airports, bus and rail stations, marine terminals.

Modal & Land Use Synergies

- Land use patterns and design create demand for particular types of transportation and vice versa, creating the opportunity to leverage Transit Oriented/Transit Ready Development along corridors to initiate new rail and bus services.

Equity / Environmental Justice / Modal Choice & Balance

- Demographic, environmental and socio-economic trends point to more demand for public transportation choices.

Listening & Being Responsive: Public & Stakeholder Input

From the public participation process a number of key themes emerged from discussions regarding the current way the transportation system in New Hampshire is planned, managed and funded.

These themes are:

- The process for deciding transportation priorities in the Ten Year Plan must continue to be transparent and understandable and involve consideration of local, regional, and statewide needs.

- Solutions to transportation problems must be provided in a more timely and responsive way, address root causes, and not just symptoms.
- The Department's priority setting and spending decisions need to be more transparent.
- Transportation solutions must be tailored to meet the needs of specific regions of the State.
- Transportation must be linked to broader State economic, environmental and quality of life goals.
- The state must integrate transportation and land use decision-making more effectively.
- More transportation funding is needed to meet growing unmet transportation needs.
- The Department must communicate more frequently and clearly with the public and its many partners.
- The Department must create planning and decision-making processes that ensure that transportation spending yields maximum benefits for the State.

These issues are crucial to address and their many underlying messages will guide the Department as it transforms the way it does business to better serve the public, communities, and the State.

Transforming How the NH DOT Does Business

The transformation at NHDOT must build on the many current successful initiatives and broaden the current *Tactical* approach of doing business to a much more *Strategic* approach. This strategic approach will consider transportation planning, decision-making, and spending together in a comprehensive way.

A fundamental part of this approach is to link plans with actions to achieve well-defined long-term objectives, measure progress along the way, and communicate progress clearly internally and externally -- to our partners and customers.

The Balanced Scorecard Initiative

In an effort to accomplish the goal identified above, NHDOT created a ten person Strategic Working Group [SWG] to engage in a new strategic initiative. Known as the Balanced Scorecard (BSC), the initiative was to fulfill three primary functions:

- Communication Tool
- Strategic Management System
- Measurement System

The SWG first updated the NHDOT Mission, defined a Purpose, and revised the Vision to better represent today's current social, environmental, and economic climate. Four Strategic Goals were identified: Employee Development, Performance, Effective Resource Management, and Customer Satisfaction. Eleven Strategic Objectives describe in more detail what NHDOT must do well in the four Goal areas to

implement the strategy. Performance Measures track progress in achieving these Objectives.

The Balanced Scorecard displays the Goals, Objectives and Performance Measures together and portrays how they relate to each another. In this era of limited resources, it is essential to capture the key aspects of NHDOT strategy, to measure current year performance against our targets, and to set future year performance targets based on a prioritization of these limited resources.

The balanced scorecard allows the Department to look not only where it currently stands, but where it desires to be.

Environmental Mitigation

At the forefront of the NHDOT project development process are two interagency consultative committees to address the potential mitigation requirements for projects. Both the environmental and cultural resource committees are consulted early in the process to provide input on proposed projects to ensure compliance with state and federal resource protection regulations. Issues related to resource impact avoidance, minimization and mitigation are determined by these groups. The resource committees are comprised of appropriate staffers from NHDOT, FHWA, US EPA, USACOE, NHDES, USFW, NHFG and the NH DHR.

NHDOT has also been involved in the Eco-Logical project lead by the NH Audubon Society (NHA). This project is focused on development of data and tools necessary to support the coordination of transportation and resource planning in New Hampshire with the goal of improving the environmental outcomes of transportation projects. The project began with the development of an impact assessment

framework to identify conflict areas at an ecosystem scale. The final data products and planning framework are together expected to serve as a model for other regions that, like New Hampshire, do not have widely distributed habitat or a clearly defined ecosystem that supports one or more rare species.

To foster existing relationships and develop the new relationships necessary to develop the framework, NHA established the "Eco-Logical Project Partnership Work Group" (Work Group). The Work Group was comprised of representatives from Federal and State agencies, NGOs, one regional planning organization, and one consultant. Together this group worked to conduct outreach on the effort and to identify major conservation data gaps.

NHDOT has also been heavily involved in addressing the environmental issues presented by the use of calcium chloride to manage ice and snow accumulations on the state's highways. The lion's share of that effort has been the efforts focused on the I-93 corridor in southern NH. The project to expand the roadway has resulted in the development of a Chloride Total Daily Maximum Limit (TMDL) threshold for four regional waterways identified as having impaired water quality due, in part, to elevated concentrations of chloride in the waters. NHDOT has responded by developing an implementation plan for this section of roadway to meet the TMDL established, and has instituted a Salt reduction Work Group, comprised of representatives of the NHDOT and the NH Department of Environmental Services. . New Hampshire's public road system consists of approximately 16125 miles. The State highway system has 4559 system miles (Class I, II, III, IV). The State maintains 4269 miles (Class I, II, & III) and other public authorities maintain the remaining 11856 miles (Class IV, V). Class IV highways

make up 290 miles of the State highway system, but are maintained by local municipalities.

In addition, NHDOT has for several years' funded regional efforts – most notably in the Rockingham & Nashua Regional Planning areas – to identify potential resource areas that may be impacted by transportation projects. This will allow for sensitive resource areas to be identified in advance.

Transportation Funding and Finance

Background

New Hampshire's transportation funding needs continue to grow against a stagnant revenue background. This situation certainly challenges the ability of policy makers to develop appropriate methods of address. Efforts to maintain fiscal constraint begun with the previous Ten Year Plan will carry over into the current plan. The 2011-2020 Ten Year plan assumes that the level federal funding of \$140 million in federal limitations with no increase for inflation on obligations in 2010 will carry forward over the period of the plan. This assumption is based on the uncertainty of future Federal Funding allocations. As such, for the 2011-2020 Ten Year Plan period it is estimated that the State will receive \$1.4 billion in federal highway formula funds. This anticipated federal funding (along with the appropriate State or municipal match) is reconciled with the estimated costs of projects, which is the basis used to financially constrain the Plan.

Where Transportation Funds Come From

Funding for transportation comes from a variety of sources. These funds are collected and distributed at the federal, state and local levels. The primary sources of these funds are:

- Direct and Indirect User fees, such as turnpike tolls and bus fares (Direct) or the gas tax (Indirect)
- Motor Vehicle fees, such as the annual registration fees for vehicles
- General sources, such as general funds or general revenue bonds.

The amount of federal highway revenue New Hampshire receives has increased by less than 2% per year during the last five years. The transportation revenue received from the state gas tax and motor vehicle fees (comprising the Highway Fund) has increased by only about 3% per year during the last five years (NHDOT, 2006).

The federal road toll tax was last increased in 1993, almost 15 years ago. The state road toll tax was last increased in 1992 and then again in 1999 for a total of 19.5 cents per gallon today. The 1999 increase of 1.5 cents per gallon was dedicated to the Betterment fund, providing funding to municipalities for roads and bridges.

In 2009, transportation-related revenue totaled \$608 million. The largest revenue categories were the Highway Fund (gas tax, vehicle registration fees), Federal funds (for roads, buses, airports) , and Turnpike tolls.

2009 Transportation Related Revenues

Category	Amount (\$ M)	Percent of Total
Highway Fund (including ARRA)	\$311	51%
Federal	\$187	31%
Turnpike	\$108	17%
General Fund/Other	\$2	1%
Total	\$608	100%

Source: NHDOT Annual Report, 2009.

Where Transportation Funds Go

Transportation revenues are used for a wide variety of purposes: to fund other transportation-related state agency functions (Dept. of Safety, Office of Information Technology, Judicial Branch), to pay for NHDOT personnel and agency operating expenses, other expenses (debt service of bonds, fuel and equipment) and to fund transportation infrastructure projects and services.

2009 Transportation Related Expenses

Category	Amount (\$ M)	Percent of Total
Construction & Local Aid	\$285	42%
Operating Expenses	\$186	27%
Transfer to other Agencies	\$85	13%
Other Expenses	\$87	13%
Other Programs	\$37	5%
Total	\$680	100%

Source: NHDOT Annual Report, 2009.

Potential Future Funding Issues

A large number of potential funding issues face the State over the next 25 years. Many of these can be categorized as:

- Funding gap – growing gap between ‘needs’ and revenues
- Funding sustainability – can revenue sources keep up with project inflation costs and needs and be sustained over time
- Promote goals via funding choices – such as managing travel demand, energy efficiency and equity.

New Revenue Opportunities: Innovative Finance

"Innovative finance" is a broadly defined term that encompasses a combination of techniques and specially designed ways to fund programs to supplement traditional transportation financing sources and methods.

To overcome the numerous funding issues that have been identified, New Hampshire continues to study opportunities to diversify the sources of funding upon which the State currently relies. This diversification can be done for various purposes and have various outcomes: raise additional funds; it can be "revenue neutral"; or distribute the funding burden to different users; or, combinations of all of these options.

Revenue neutral options keep the total amount of revenue the same but use more or different sources to maintain a constant revenue level. This course may be chosen if current sources will not be as reliable in the future (so more sources are needed) or to spread the burden more broadly.

Revenue raising options bring in additional revenue above existing revenue levels. This course may raise additional funds through existing sources, via new sources, or through a mixture of existing and new sources.

Distributive revenue options spread the revenue raising burden differently than is currently done, such as reducing funding from one source but raising it from another. This may be done for policy purposes; such as to purposefully manage the supply and demand for travel within heavily traveled corridors. For instance, many state and regions are now implementing peak period pricing, raising tolls for peak period travel while reducing it for off-peak period travel. (This can be done to be revenue neutral or to raise additional revenue.) This approach is used by almost all privately

owned utility and travel industries such as the airline, telecommunications and energy industries.

When considering new transportation funding opportunities, criteria can help evaluate how well various options suit the particular situation of the State. A recent federal review of funding sources suggests the following for criteria when evaluating options for generating revenue:

- Revenue Yield, Adequacy, Stability – *is the source reliable over the long term?*
- Cost Efficiency – *is it cost-effective to collect and manage?*
- Equity – *is it fair?*
- Economic Efficiency – *does it price usage of the system effectively to promote transportation and/or other goals?*
- Political Acceptability – *is it politically palatable?*
- Technical Feasibility – *is the technology in place and reliable?*

Source: NCHRP 20-24(49), 2007.

As New Hampshire's transportation needs grow and become more complex, the state must continue to investigate and, then find and use, funding and management approaches that are cost-effective, diverse and sustainable in the long term. The difficult choices that will need to be made can be best made in a "non-crisis" atmosphere.

Alternative Financing options currently available to NH

Bonds

The State of NH, through action of the legislature, has the ability to issue and utilize Grant Anticipation Revenue Vehicles (GARVEE) up to an amount equal to \$195 million dollars for construction associated with the improvement and expansion of Interstate 93 from Salem to Manchester. The legislature also recently approved the ability to utilize GARVEE funds up to \$45 million dollars for improvements to the Memorial Bridge in Portsmouth.

A GARVEE is essentially a bond issued by the state with the presumption that federal funds will continue to be available to pay for debt service in the future. GARVEE bonds provide a short-term influx of funding to advance projects that may otherwise take many years to construct. GARVEE bonds may only be issued with the concurrence of FHWA.

Turnpike Toll Credits

Federal regulations (23 USC §120) allow a State to use toll credits toward the non-Federal match requirement of a project, provided that the project is listed in the STIP. These credits are based on toll revenues that are generated and used by public, quasi-public, and private agencies to build, improve, or maintain highways, bridges, or tunnels that serve the public purpose of interstate commerce. Such public, quasi-public, or private agencies shall have built, improved, or maintained such facilities without Federal funds.

To receive these Turnpike toll credits, a State shall show that it has maintained its non-Federal transportation capital

expenditures in accordance with the given requirements. NHDOT has shown that they have met these requirements in the past, and has utilized turnpike toll credits to match federal funds. Consistent with existing practices, the STIP identifies the use of toll credits for specific projects.

It should be noted that New Hampshire is uniquely positioned to take advantage of its toll roads to address highway modal needs. Unlike other states in the New England region that house toll roads, NH's turnpikes function as an enterprise account under the authority of the NHDOT, as opposed to as their own independent authority. This ability to allow for the state's transportation agency to appropriately manage the state's roadway network.

As an example, the NHDOT transferred ownership of a section of I-95 to the NH Turnpike system. This action allowed for two appropriate management functions to occur. The first was an appropriate shift to the turnpike system what was in fact already a toll road, which allowed for this heavily trafficked stretch of highway to move into a system more capable of providing funds for necessary maintenance and improvements. The second was a transfer of cash from turnpikes to the NHDOT, which in turn resulted in influx of much needed revenue for non-toll system maintenance and improvements.

Moving forward, this example certainly raises the potential for a 're-rationalization' of the way New Hampshire designates both turnpike and non-turnpike roadways. Highways that carry high traffic volumes also tend to constitute a hefty fiscal burden for maintenance. This fiscal responsibility may be addressed through traditional resources – existing motor vehicle revenue sources for example, some of which have not been increased for the past decade, or NH

might examine the possibility of connecting those routes that provide the best services to the largest volumes of commuters and goods with the revenue potential of the Turnpike system (known as aggregation).

For example, the needs to address maintenance or capacity needs on I-93 South, the Sarah Long Bridge and heavily traveled sections of NH 101 are competing with other system maintenance needs across the transportation network and the tendency of NH's decision makers to remain fiscally conservative and averse to new taxes. As an example – the transfer of certain sections of NH 101 to the Turnpikes system would result in freeing up approximately \$1 million dollars per year in existing maintenance obligations to this road – making those funds available elsewhere. This move would amount to the same fiscal impact as an increase in the existing gas tax of 1 cent /gallon. An additional benefit to this approach is the opportunity to diversify the revenue stream to include the benefits accrued from out-of-state system users.

In summary, the potential to link infrastructure needs to revenue sources derived from infrastructure users is something in need of additional review and study going forward. That the NH turnpike system is without the same bureaucratic obstacles as some other regional neighbors is a benefit that thus far has been underappreciated, and tracks well against a growing national trend to better utilize turnpike resources.

Advance Construction

Under the provisions of 23 USC part 115(a) and as further outlined in 23 CFR §630, the State may utilize Advance Construction (AC) on Federal-aid projects with the approval of FHWA. Guidance from the FHWA Resource Center has

indicated that the cumulative amount of AC should remain below 1½ times the annual apportionment of federal funds for FHWA programs. Advance construction is subject to approval from FHWA and will be tracked as normal Federal-aid projects in the federal Financial Management Information System.

Section III: Vision, Goals & Needs

Introduction

The Vision and Goals articulate the aspirations of the State through its long range planning for the State and the NHDOT. Needs illustrate the magnitude and types of investments, policies and programs to achieve the Vision and Goals.

The Vision and Goals are the highest level of desired outcomes for transportation. They form the foundation from which all activities must spring. The figure below defines the relationship between the Plan’s Transportation Vision, Goals, Objectives, and Performance Measures. In this era of more limited resources, it is essential that all activities of the Department and its partners -- the FHWA/FTA, other state agencies, Legislature, the Executive Council, the RPC/MPO, etc -- be well coordinated and work toward achieving the same, well articulated outcomes. This is not currently the case.



The Plan’s Vision and Goals were developed by the Community Advisory Committee through a facilitated, consensus-based process in Winter 2005.

An assessment of Transportation ‘Needs’ was conducted to explore the order of magnitude of financial resources that might be required to attain the Vision. A key outcome of this assessment is that even if there were unlimited financial resources, the Vision could not be achieved without tough decisions.

A Vision for the Future of Transportation

The transportation Vision statement sets the big-picture strategic direction for future policy, investments, and actions by the State. An important part of all subsequent planning initiatives and investment decision-making is to “check-in” with the Vision Statement to assess whether efforts by the Department and its partners are working in concert toward achievement of the Vision or working counter to the Vision.

New Hampshire Transportation Vision

Transportation in New Hampshire is provided by an accessible, multimodal system connecting rural and urban communities. Expanded transit and rail services, a well-maintained highway network and airport system provide mobility that promotes smart growth and sustainable economic development, while reducing transportation impacts on New Hampshire's environmental, cultural, and social resources. Safe bikeways, sidewalks, and trails link neighborhoods, parks, schools, and downtowns. Creative and stable revenue streams fund an organization that uses its diverse human and financial resources efficiently and effectively.

Goals & Objectives

Goals are still broad, but provide more specific outcomes that are derived from the Vision Statement. Each of the eight Goals covers a topic area of particular importance. Objectives are more specific still and are tangible outcomes tied to each Goal area.

The eight Goal areas are:

1. Land Use – Transportation Integration
2. Mobility & Modal Choice
3. Safety
4. Security
5. Environment & Public Health
6. System Preservation & Maintenance
7. Coordination & Collaboration
8. Stewardship of Public Resources and the Transportation System.

Goal 1: Land Use-Transportation Integration.

Integrate local, regional and state land use and economic development goals with transportation investment decision-making, planning, system management, and project design.

Objectives:

- Manage transportation demand through improved land use practices and planning.
- Promote sustainable economic development in locally identified growth areas through transportation investments and decisions.
- Implement transportation strategies that discourage sprawl and promote compact development.
- Preserve community character through Context Sensitive Solutions.

Goal 2: Mobility & Modal Choice.

Provide mobility, accessibility, and modal choice to meet existing and future travel needs of people and goods.

Objectives:

- Meet and maintain system-specific level of service targets on the interstate highway and state roadway systems.
- Improve the reliability of the freight and passenger transportation networks.
- Increase the use and availability of transit, rideshare, bicycle and pedestrian modes.
- Increase access to and use of transportation by the traditionally underserved to meet daily travel needs.
- Expand the emphasis on transportation systems & demand management measures in lieu of system expansion.
- Increase connectivity between transportation modes for passenger and freight modes.

Goal 3: Safety.

Employ appropriate design, measures, and practices to improve the safety of transportation users by reducing the frequency and severity of crashes.

Objectives:

- Reduce the number of transportation-related fatalities and injuries.
- Increase the quality and availability of traveler information.
- Implement the Highway Strategic Safety Plan Recommendations in a timely fashion for the NHDOT Emphasis Areas.

Vision, Goals & Needs

Goal 4: Security.

Work with private and public sector partners to protect the physical security of passenger and freight transportation systems and system users from acts of terrorism and other crimes.

Objectives

- Increase the use of appropriate technologies and practices to enhance the security of the transportation systems.
- Increase readiness and capabilities to respond to emergencies and incidents.

Goal 5: Environment & Public Health.

Make transportation investments that preserve and enhance public health, the environment, and quality of life.

Objectives

- Use environmental best practices in project development.
- Use environmental best practices in system operations and maintenance.
- Maintain a positive net impact on Air Quality in New Hampshire through transportation programs, projects and operations.
- Reduce the adverse effects of transportation-related impacts on cultural and natural resources.
- Increase the energy efficiency of passenger and freight transportation.

Goal 6: System Preservation & Maintenance.

Provide appropriate investment in existing and future infrastructure, facilities and equipment to maintain and preserve the physical condition and operability of the transportation system.

Objectives:

- Meet and maintain system condition targets for the State transportation system.
- Increase user satisfaction with the condition of the transportation system.
- Preserve the functional integrity of transportation corridors for future needs.

Goal 7: Coordination & Collaboration.

Establish collaborative partnerships with local governments, regional and state agencies, and the private sector to meet transportation needs through open and transparent planning and decision-making processes.

Objectives:

- Ensure that all affected and interested parties understand the decision-making process, particularly the evaluation criteria, for development and funding of transportation projects and programs.
- Improve the quality, quantity and timeliness of technical assistance to the RPCs/MPOs and local governments.
- Foster improved coordination among state agencies during development of long-range, statewide plans and policies.

- Actively seek to develop public-private partnerships to leverage resources for the development of the State's transportation system.
- Increase the level of collaboration between NHDOT, other state agencies, local governments and the private sector in planning, programming and project development activities.

Goal 8: Stewardship of Public Resources and the Transportation System.

Be cognizant of legal mandates and fiscal constraints; ensure an appropriate and cost-effective allocation of resources; and, use innovation in technology and financing to deliver better transportation services and infrastructure.

Objectives:

- Improve the cost-efficiency, timeliness, and effectiveness of administering Federal, State & Municipal Programs in all endeavors.
- Develop plans and programming documents (e.g., LRTP, STIP and the Ten Year Plan) that reflect anticipated revenue levels.
- Develop plans and investment programs that reflect LRTP priorities.
- Expand the use of innovative finance to deliver more and better projects faster.
- Expand the development and deployment of new transportation technologies.
- Diversify and maintain the buying power of funding sources used to fund 10 Year Plan projects.

Funding & Pricing Opportunities to Help Attain the Plan's Goals

New Opportunities with Current Revenue Sources

New Hampshire's transportation funding needs continue to grow and these needs outpace currently available, traditional sources of revenue to pay for meeting those needs.

Discussions of funding and revenue during the development of the LRTP focused on a number of issues. These issues are:

1. Revenue levels are inadequate to meet transportation Needs ('the funding gap')
2. The Reliability, Sustainability and Diversity of primary funding sources further increase the uncertainty in the ability to meet needs
3. The inflexibility of the primary funding sources restricts the State's ability to respond and adapt to changing needs and priorities in a timely way
4. Finding new funding and revenue sources to raise revenue that also furthers other plan objectives.

Issue #1: Revenue Levels Are Inadequate to Meet Needs

Potential strategies to address the funding gap issue suggest several possible options, including:

- Increasing the rates or fees for existing revenue streams such as gas tax, vehicle title fees, vehicle excise taxes
- Reducing or eliminating diversions of current revenues, such as the Highway Fund, from direct delivery of transportation facilities or services
- Funding Turnpike projects exclusively with Turnpike revenues

Vision, Goals & Needs

- Re-rationalizing turnpikes given their status as a pure ‘user fee system’.

On this last point, promising opportunities to reduce future needs include:

- Funding highway and bridge preservation treatments at a higher level of priority to prevent the need for higher cost treatments later
- Reducing the growth of travel demand so that highway capacity expansion needs are reduced or delayed
- Finding lower cost, more cost-effective solutions to reduce project costs, through Context Sensitive Solutions, Value Engineering during design, Access Management, and Transportation System Management, etc.

Issue #2: Funding Reliability, Sustainability, and Diversity

Much of the issue surrounding the reliability and sustainability of current revenue streams has to do with the erosion of the buying power of existing revenue streams due to inflation. Currently, the primary revenue sources, such as state and federal gas taxes, vehicle registration fees, and Turnpike tolls are fixed, requiring difficult legislative action to increase. When increases occur they typically lag behind inflation, often by many years. Revenue projections show forecasted increases approximately tracking the consumer price index (CPI) inflation rate (3% to 4%). In contrast the FHWA construction cost index is more than twice the CPI. Thus the buying power further erodes over time. Also, if gas prices increase substantially, sales of fuel may decline, further reducing gas tax revenues.

Potential strategies addressing Reliability and Sustainability of traditional revenues sources include:

- Indexing gas taxes, tolls and/or fares to the CPI or to a construction cost index
- Fixing gas taxes as a percentage of gasoline prices so they rise or fall with the price of gas.

Funding Diversity – broadening the sources of revenues available – can be addressed via a number of creative approaches and include:

- Tax Increment Finance (TIF) to capture a portion of the property tax increases due to rising property values from development within a designated development district
- Impact Fees that charge developers per vehicle trip added to the transportation system
- Local options fees on vehicle registrations are available to communities in New Hampshire to fund transportation projects but are sparingly used.

The first two of these techniques have been primarily used to fund offsite roadway improvements but can be more creatively used to fund bus or rail transit, sidewalks, and pathways.

Issue #3: Increasing the Flexibility of Funding

Funding flexibility relates to the level of restrictions that are applied to specific types of revenue or funding, thereby limiting their flexibility to address priorities. The state Highway Fund (comprised of the state gas tax and state vehicle registration fees) is restricted by the State constitution to highway-related expenditures. Turnpike tolls may only be spent on Turnpike-related facilities and programs. Some federal funding also comes targeted to narrow programs, such

as the federal Enhancements program (bicycle, pedestrian, environment, and historic projects and programs) or Safety funds.

Some federal funds have more available flexibility than has been historically used. Federal surface transportation funding (“STP funds”, traditionally thought of as federal “highway funds”) can be “flexed” to be spent on non-highway projects, such as bus or rail transit within certain guidelines. The lack of sources to match “flexed” federal funds restricts this from occurring (for instance, state Highway Funds could not match many transit types of projects).

Potential strategies addressing funding flexibility suggest several options:

- Review opportunities to adequately fund public transit in New Hampshire.
- Seek revision of the restriction of Turnpike tolls to spending on Turnpike related expenditures.

If one of both of these provisions were enacted, “circuit breaker” type protections could be included that maintain base level or indexed amounts of funding for maintenance, preservation and modernization activities on the state’s roadways. The flexibility afforded by these changes could also be applied to new revenue levels from these sources and indexed to change as well.

Issue #4: Using Pricing Policies to Raise Revenue and/or to Further Other Plan Objectives

One important objective of the LRTP is to more effectively reduce the growth in vehicle miles traveled and reduce the growth in the number of vehicle trips. Using various pricing

options has been shown to be the single most effective and responsive way to influence travel behavior.

Examples of the impact of pricing on travel behavior (and informing possible strategies) include:

- If the price of gas increases, demand for gas decreases and conversely, if the price of gas decreases, demand increases – thus pricing affects travel demand inversely as well
- If transit fares are decreased, ridership increases and conversely, if fares rise, ridership typically decreases (unless the increase funds new services that provide more value than the increase)
- If the price of parking increases (and/or supply tightens), some portion of vehicle trips can be reduced or shifted to other modes if they are viable (walking, bicycling, carpool/vanpool or transit)
- “Free” parking (parking with no out of pocket costs to drivers) at workplaces and at shopping locations increases the likelihood of auto trips versus other modes and has the effect of spreading development to greenfield/suburban sites
- If tolls are increased during the peak period (congestion pricing), vehicle trips can be reduced or shifted to other times
- Dramatically increasing fees and fines as a result of serious motor vehicle infractions has been shown to have a positive impact on reducing poor driving behaviors such as aggravated speeding and driving while intoxicated, and can generate significant revenue for enforcement (and possibly reduce transfers of the Highway Fund to other state agencies).

Strategies that reduce vehicle usage can reduce or delay the need for roadway capacity projects. Pricing strategies that

Vision, Goals & Needs

charge more for peak period driving more closely charge for the true costs of the scarce resource. This is a strategy similar to what other utilities or industries, such as electrical power and airlines.

Tax credits for fuel efficiency (or penalties for “gas guzzlers”) and/or low emission vehicles can also positively influence automobile buyer behavior.

Each of the strategies above can be devised to raise additional revenues or can be devised to be revenue neutral but to advance important policy objectives.

Section IV: The Strategy for Change

Setting the Direction for Transformation

A successful transformation requires wholesale rethinking about how the business of transportation in New Hampshire is conducted. This Plan cannot and does not address all the questions and details such transformation will entail but it establishes the direction of change that needs to occur and proposes the broader framework within which transformation can occur.

The State as a whole must make sure that every facet of its operations and decisions work together and move the State in a conscious, deliberative way toward the adopted Transportation Vision and the Vision of the State Development Plan. This is the very essence of adopting a strategic approach to transportation. This means linking its decisions to measurable outcomes and then directing the state's substantial resources to accomplish these outcomes. An essential ingredient of this process of transformation is accountability -- being able to measure progress along the way, and to communicate that progress clearly.

Collectively, the proposals described here are referred to as "The Recommended Strategy", or 'The Strategy', an inter-related package of actions, policies and programs specifically tailored to work in a coordinated fashion toward achievement of the Plan's Vision and Goals. The Strategy combines internal actions that the Department itself can implement as well as recommendations that will require working in concert with a broad array of partners. Many of these partners will be familiar, while many, if not most will be new or at least require a new level of coordination and collaboration by the Department.

The devised Strategy is responsive to and incorporates the input and guidance that was received from the CAC, the public and stakeholders (see **Section II: Understanding the Issues**). Turning these concepts into workable policies and following through on them over many years is the difficult work of transformation. In some areas, this change in direction has already begun. The recommendations below build upon several successful internal and external initiatives currently underway.

The Plan's recommendations are centered on achieving four **Strategic Outcomes** that were derived from the recommendations of the Community Advisory Committee and the public outreach process. These outcomes have the aim of ensuring the planning; decision-making, and investment create a larger strategic framework within which to guide action.

NHDOT's organizational structure and the way it approaches the complex issue of transportation must reflect its mission and values. Doing this will require changes in many aspects of the approach to what is accomplished over the next two decades – how the NHDOT is organized, how transportation problems are identified and resolved, and how communication and work within the DOT and with others is best done.

Making structural changes within NHDOT will help address the areas of accounting and finances, safety and environmental practices, and communication with our partners. But this initial restructuring, as suggested, is a necessary but not sufficient step toward success. The organization must become adept at recognizing fundamental change and be continuously adaptive itself in the ways it responds positively to this change.

Institutionalizing a Strategic Planning Framework

First, the NHDOT must establish a strong strategic planning framework, in terms of how it is organized and create incentives for a strategic approach to flourish. The essential to step back and ask the big (and the right) questions: “*What do we want to achieve in the future, who are the essential partners and how do we get there?*”

Transforming How the NH DOT Does Business

The transformation at NHDOT must build on the many current successful initiatives and broaden the current **Tactical** approach of doing business to a much more **Strategic** approach. A tactical approach “solves” problems that may actually be isolated symptoms of larger problems. This strategic approach will consider transportation planning, decision-making, and investments together in a comprehensive way.

A fundamental part of this approach is to link plans with actions to achieve well defined long-term objectives, measure progress along the way, and communicate progress clearly internally and externally to NHDOT partners and customers.

In the broader picture of the State as a whole, there is a large gap in the definition of what role transportation can and should play in the future economic vitality and quality of life aspirations of the State. This was recounted (often with exasperation) by members of the Community Advisory Committee in its two-plus year work. There are initiatives and groups within the state that circle around the edges of this fundamental question, but none currently are focused enough to adequately address the questions head-on or with authority.

Due to the fundamental role that transportation plays, it is well-positioned to play a galvanizing role in developing this strategic approach. What is required is to find ways to blend strategic thought, problem-solving, and action to transportation policy-making in the State.

Context Sensitive Solutions

Context Sensitive Solutions (CSS) is the overarching foundation for the Department’s new approach to stewardship of the transportation system. While there are many aspects to CSS, it is listed under Linkage to Broader Goals to emphasize its holistic approach.

CSS is an approach to planning, design and construction that finds transportation solutions that identify, promote and reinforce community values. Community land use changes that make a transportation solution more effective are intentional outcomes as well. Another important outcome is the new type of dialogue that takes place centered on reaching consensus on the root causes of problems, not just their symptoms, as well as consensus on the solutions. CSS deliberately seeks to actively engage those who are often not traditionally involved in transportation and community planning, as well as involve those who typically are. For this approach to be most effective, both groups – the traditional and non-traditional stakeholders – are needed to reach consensus on the problems and the solutions. All too often citizens don’t become engaged (for a number of reasons) until a final project is determined. This results too often in confrontation rather than collaboration.

The Department, in 2006, began its agency-wide CSS training program and includes planning partners, such as other state agencies, the Regional Planning Commissions (RPCs) and the Metropolitan Planning organizations (MPOs). It is also implementing pilot projects to demonstrate and fine-tune the approach’s effectiveness.

The CSS approach is embedded within each of the four phases of the new project development process. These phases are:

- Problem Identification (the most important phase)
- Problem Solution
- Solution Implementation
- Operation - Evaluation.

There is also an important feedback loop from the Operation-Evaluation phase (after construction) to the Problem Identification phase to assure that the process itself and the project’s outcomes effectively addressed the initial problems identified.

Context Sensitive Solutions: Goal Area Support	Level of Support
Land Use-Transportation Integration	+++
Mobility & Modal Choice	++
Safety	+++
Security	
Environment & Public Health	+++
System Preservation & Maintenance	++
Collaboration & Coordination	+++
Stewardship	+++

Note: More plus signs mean more support for the goal.

Policies provide guidance to Department employees and accountability to our customers about the way services and

projects are delivered through many programs. Two existing areas that will receive greater emphasis in future programs are Safety and Performance Measures.

Key Initiatives in the area of Policy and Programs are:

- Traveler Safety
- Performance Measurement.

Traveler Safety

The cornerstone of future NHDOT activities will center on the safety of the traveling public. Currently, NH ranks among the safest states measured by fatality rate. In 2005, there were 166 fatalities on New Hampshire’s highways. The *fatality rate* for motorists was 1.24 persons per 100 million VMT. While over the last thirty years this rate has been reduced by over 50%, the number of deaths remains high.

Traveler Safety Goal Area Support	Level of Support
Land Use-Transportation Integration	+
Mobility & Modal Choice	+++
Safety	+++
Security	+++
Environment & Public Health	+++
System Preservation & Maintenance	+++
Collaboration & Coordination	+++
Stewardship	+++

New Hampshire’s Strategic Highway Safety Plan is a collaborative, action-oriented effort among public agencies and private stakeholders in the State. The agencies’ goal is to identify the State’s critical safety needs and to develop and implement strategies to achieve significant reductions in

fatalities and serious injury crashes on all public roads. This encompasses travelers by all surface modes of transportation.

To continue to make progress toward safer transportation, the NHDOT and its partners must build on existing programs and develop new areas employing the four E's of safety: Engineering, Enforcement, Education, and Emergency Response.

Performance Measurement

Performance Measurement (PM) is the systematic use of numerical measures to gauge how well an organization is meeting desired outcomes. For the Department, this means a set of measures directly linked to assessing progress toward achieving the LRTP Vision and Goals.

The Department will invest considerable resources to develop, use, and communicate – both internally to staff and externally to the public, decision-makers and our partners – a comprehensive set of Performance Measures. They will be phased in over time as they are finalized and as data becomes available.

A successful performance measurement system:

- Comprises a balanced set of a limited vital few measures
- Produces timely and useful reports at a reasonable cost
- Displays and makes readily available information that is shared, understood, and used by an organization
- Supports the organization's values and the relationship the organization has with customers, suppliers, and stakeholders.

FHWA Performance Measures website

The primary purpose of a Performance Measurement program is to allow the Department to track over time and communicate the effectiveness of policies, programs and public investments. To be effective performance measures must be understandable to their specific audience and address the particular measure from the “customer perspective.” The set of measures must also complement and support the other aspects in the strategic policy and program framework established in this Plan (Asset Management, Corridor Planning, etc).

Limitations of Current Approach

Traditionally reporting on the performance of the transportation system has been limited to the highway system and has been measured in terms of the condition of its bridges and the pavement and through measures for traffic flow (speed) and safety (crash rates). These measures are important and will continue to be reported. But the focus must be broader and encompass the customers' perspective. A system of measures, to be meaningful, must describe other measures and benefits for all the various transportation modes. Comprehensive sets of measures were developed early this decade but have been used mostly for reporting within the Department and not widely disseminated.

Our New Approach

Updated measures will be finalized by working with key partners and reported annually to mark the progress in meeting performance targets, addressing transportation for people, goods, and services across all components of the transportation system, and to serve as a basis to obtain feedback on these efforts.

As part of the Plan’s development, two levels of Performance Measures were developed:

1. *High-Level or ‘Dashboard’ Measures* – these are primarily for reporting to the general public and elected officials
2. *Detailed-Level Measures* – these are primarily for transportation system performance monitoring and reporting within the Department.

Meaningful measures will be developed in each of the Plan’s Goal Areas. The table on the following page illustrates draft ‘Dashboard Level’ Performance Measures in each Goal Area.

For each measure a ‘Benchmark’ is set (how well the system performs now) as well as a ‘Performance Target’ (how well you want the system to perform and by when). The results are monitored and communicated both within the Department, to transportation partners, elected officials, and the public. Ideally, the Dashboard Measures can be visually represented so the customer can, at a glimpse, understand the performance measure.

Performance Measurement: Goal Area Support	Level of Support
Land Use-Transportation Integration	++
Mobility & Modal Choice	+++
Safety	+++
Security	+
Environment & Public Health	++
System Preservation & Maintenance	+++
Collaboration & Coordination	+
Stewardship	+

Goal Area	Performance Measure Category	DRAFT 'Dashboard' Performance Measures
1. Land Use-Transportation Integration.	Extent of Land Use – Transportation Coordination	- Percent of Inter-regional Corridors-miles with Corridor Management & Land Use Plans (Inter-regional corridors are major roads such as I-93 or NH 101 serving longer distance travel. This type of plan identifies long term visions for these corridors, prioritizes multimodal investments, and looks at corridor access issues.)
	Economic Vitality / Inter-regional Mobility	- Travel Speed Index (Actual Corridor Travel Speeds compared to Free Flow Travel Speeds – travel speed by automobiles between Economic Centers)
2. Mobility & Modal Choice.	Inter-Regional Accessibility	- Quality of multimodal corridor connectivity & accessibility (highway, transit, bike networks – measures multimodal accessibility between Economic Centers)
	Reliability	- Travel Time Variability (Variability of actual corridor travel speeds measured between Economic Centers) - Transit On-Time Performance
	Mode Share	- Mode Share, Work Commute (% Drive Alone, Rideshare, Walk, Bike, Bus, etc)
3. Safety.	Traveler Safety	- Number of Fatalities (total for all modes & by individual modes) - Fatality Rate (#Fatalities per 100 million VMT; # Fatalities per 100 thousand population for non-auto/truck modes) - Serious Injury Crash Rate (# Serious Crashes per 100 million VMT)
	Safety Planning & Implementation	- Percent implementation of priorities in Comprehensive Hwy Safety Plan
	Incident Response	- Incident Response & Clearance Duration (incidents are crashes, breakdowns, etc)
4. Security.	Infrastructure Security	- Percent implementation of Security Initiatives
5. Environment & Health.	Air & Water Quality Energy	- # Days meeting Air Quality standards; Tons of Transportation-related emissions - Implementation of Water Quality Best Practices; Transport Energy Usage
6. System Preservation & Maintenance.	Preservation: Highway & Bridge	- System Condition - Road & Bridge systems (Inter-regional & entire system)
	Preservation: Transit	- Percent Bus Fleet in Good or Better Condition - % Miles State-owned Rail lines in Good+ condition
7. Coordination & Collaboration.	Coordination	- Number of Access Management Memoranda of Understanding executed
	Collaboration	- Context Sensitive Solutions (CSS) Project Effectiveness (Percent of Study Participants Rating outcomes and process Good or Better) - Number of CSS Pilot Projects underway & completed
8. Stewardship	Leveraging Resources	- Dollars generated plus Dollars deferred by cost-sharing agreements, partnerships, CSS approach & impact fees/off-site improvements.
	Customer Satisfaction: Passenger & Freight	- Overall satisfaction with the transport system condition / operations / maintenance from annual customer surveys

Source: Wilbur Smith Associates, NHDOT.

It is critical to re-frame how the State thinks about the spending of transportation dollars. The typical biennial budgeting process sometimes devolves into a “zero-sum” game – if one program or project gets more, then another project must get less. If this continues it virtually guarantees that only marginal progress can be made in meeting the large backlog of needs, and that the State cannot get out in front of the looming large amount of anticipated future needs.

Instead of “funding projects”, how the State spends funds must be thought of as essential investments in the future economic vitality of the state. The investments must be seen in relation to how they improve people’s daily lives and improve the economic competitiveness of the State.

Key Action Initiatives in the area of Investments are:

- A Revised Project Development Process
- ‘Preservation First’
- Asset Management
- The Recommended Investment Strategy.

Revised Project Development Process

Deliver Smaller Projects Faster

Traditionally, the Department has addressed multiple transportation needs on a roadway under the umbrella of a larger project. System Preservation and Modernization needs have often been deferred and bundled within a larger project that is also designed to address mobility needs (often widening of a road or intersection). Though there is some economy of scale to addressing these needs at the same time, the goal of providing a 20-year life for all mobility projects

will often result in a project that is larger in scope, environmental impacts, and budget, and frequently extends the time required for completion. Critical elements of the larger project may not, therefore, be addressed in a timely manner.

Within a Context Sensitive Solutions approach, various elements of a recommended set of improvements can be deliberately accelerated. In such a phased approach, the first phase may:

- Accelerate reconstructing a roadway, adding shoulders.
- Re-decking a bridge while adding sidewalks.
- Introduce a number of safety and land use improvements.

These safety and land use changes may include reconfiguring existing driveways and determine future access points near an intersection. A phased approach can be structured to deliver these types of highest benefit portions of a larger project first and faster. The parts of the original project that may add additional capacity can be re-evaluated in light of these early actions.

Revised Project Development Process: Goal Area Support	Level of Support
Land Use-Transportation Integration	+ ++
Mobility & Modal Choice	+ + +
Safety	
Security	
Environment & Public Health	+ ++
System Preservation & Maintenance	+ + +
Collaboration & Coordination	+++

Stewardship	+++
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Transparency in Priority Setting & Project Selection

Understandable and consistent criteria to guide priority setting and project selection (such how a project progresses into the Ten Year Plan) will be developed. This will greatly increase the transparency of decision-making and help build trust. The LRTP Goals will be the starting point for development of these selection criteria. Similar to the Performance Measurement program, these criteria need to extend beyond traditional measures to include environmental, economic, and quality of life benefits.

Leveraging Economic and Quality of Life Benefits of Transportation Investments

Central to the Department’s move to a more strategic approach is that it will develop and use an Asset Management System to help assess different strategies to optimize investments among competing needs for the greatest overall benefit (see following section). An Asset Management System will allow the Department to test investment options for maintaining, operating, upgrading, and expanding the transportation system. Investment priorities can then be developed and reported to the public using understandable criteria.

While this type of analysis typically uses Cost-Benefit analysis to find the most effective combination of investments, the analysis must also consider the many other types of potential benefits that transportation investments can bring. These benefits can include economic and community development benefits, environmental benefits, and quality of life benefits. Projects that rate high in terms of transportation cost-benefit, may rate quite low in environmental or quality

of life benefits. The Context Sensitive Solutions foundation for Project Development is especially useful in bridging these potential conflicts to find consensus-based solutions.

Move People, Not Just Cars

A long-time focus of the Department is improving mobility, but often the criteria for mobility have been based upon moving vehicles. Mobility must be defined in terms of moving people and goods, not vehicles. Mobility solutions must consider both efforts to increase the supply of transportation, but also programs to effectively manage the demand for transportation. This will be reflected in the project selection criteria as well as Performance Measures (see Strategic Outcome #2).

‘Preservation First’

A ‘Preservation First’ policy by the NHDOT and the State responds to the underinvestment in preservation-related activities that has occurred in recent decades, primarily in the state’s existing roads and bridges. Adequate funding of Preservation ensures that infrastructure remains in good condition and that these investments are cost-effective. Waiting too long to address bridge or road condition, for instance, dramatically increases costs.

The Recommended Investment Strategy (see Strategic Outcome #3) recommends a more than doubling of investment in Preservation funds and focused Modernization investment in roads with insufficient road bases (roads which require weight posting every Spring) and Red List bridges.

Asset Management

What is Asset Management?

As defined by the American Association of State Highway and Transportation Officials (AASHTO), "Asset Management is a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively through their life cycle."

Why Is Asset Management So Important?

Using Asset Management, Transportation agencies can view the big picture and evaluate collected data before making decisions as to how to best spend the limited resources they are given to manage their infrastructure. Asset Management principles and techniques can be applied throughout the planning process, from initial goal setting and long-range planning to development of the NH Ten Year Transportation Improvement Program (Ten Year Plan), Regional Planning Commission Transportation Improvement Programs (TIP) and the Statewide Transportation Improvement Program (STIP).

Asset Management: Goal Area Support	Level of Support
Land Use-Transportation Integration	
Mobility & Modal Choice	++
Safety	++
Security	
Environment & Public Health	
System Preservation & Maintenance	+++
Collaboration & Coordination	+++
Stewardship	+++

Note: More plus signs mean more support for the goal.

The principles can also be applied through to operations, preservation, and maintenance of the improved infrastructure.

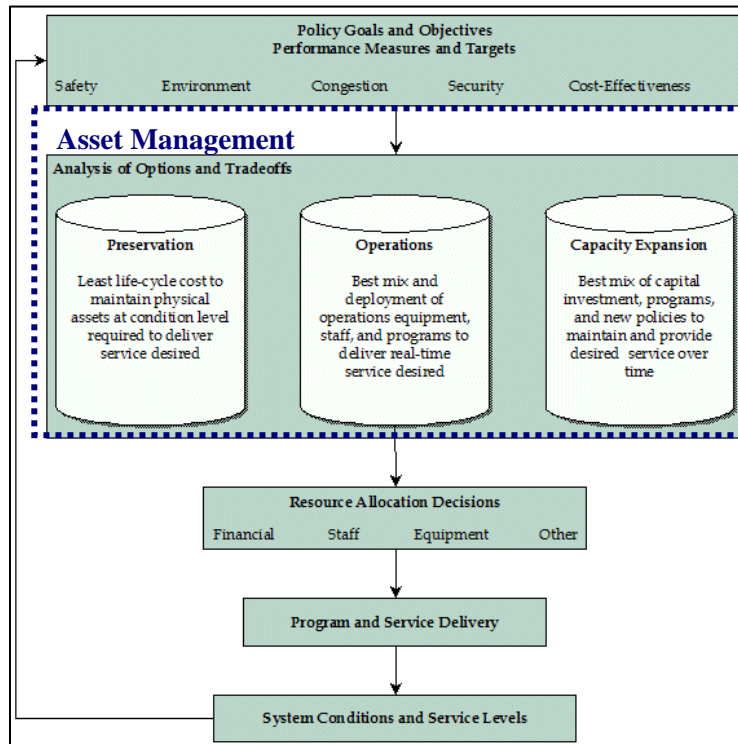
How is NH Implementing Asset Management?

The first step is to develop a mission statement reflecting the goals of Asset Management in the Department: "To develop and implement an accurate, manageable, flexible user-based transportation asset management program. This program will incorporate policy support, performance-based decision-making, efficiency and cost effectiveness."

The next step is identifying the assets that are priority items to the Department, and making sure that the data is appropriately being collected once, and then shared with users that need access to it. There is an Asset Management Steering Committee whose charge it is to develop a listing of priority assets, and work with the users of the data to make sure that the right information is being collected and to answer the right questions that need to be answered. These questions include:

- *Why do we want the data?*
- *How will we use the data?*
- *How will we collect the data?*
- *How will we maintain the data?*
- *Who needs or will use this data and what detail is needed?*

At the same time, the Department is starting to review current people; process, information and the technology used in current Asset Management related activities. The results will be compared with the latest industry techniques to provide a view of where we are with asset management decision-making capabilities. Once the review is complete, a high-



level plan and estimate of effort will be developed to build and fully implement an Asset Management System.

What is Happening in the Near-term?

In the meantime, the Department has already implemented a Bridge Management System (PONTIS), Pavement Management System (Deighton), Maintenance Management System (MATS), a Statewide Traffic Model, and a number of other asset inventory systems to allow the Department to review and make recommendations and decisions on transportation infrastructure improvements.

Statewide Corridor Planning

Introduction: What is the Statewide Corridor Management Initiative?

This program is a statewide multi-agency initiative that conducts and coordinates planning activities for a system of high-level corridors that connects designated Regional Economic Centers. These corridors serve longer distance, inter-regional travel. The result will be a Corridor Management Plan.

A corridor is linear in shape and includes all transportation infrastructure and services (roads, bus service, freight and passenger rail, trails, bicycle and pedestrian facilities) and land uses within its study area. For this initiative, the study area will typically be one to two communities wide and multiple communities long.

The Proposed Statewide Corridor Framework

Transportation does not function in a vacuum. It is important to directly connect transportation issues to broader areas such as economic development, how our communities and neighborhoods should grow and evolve (land use), environmental quality, and quality of life concerns. It must also be linked to and integrated with (and quite possibly one of the main organizing frameworks for) other statewide planning initiatives, such as the State Development Plan.

Corridor planning is an ideal platform for accomplishing this and is best done at a scale where effective solutions for problems can be developed in a strategic, pro-active approach rather than merely treating their symptoms (a tactical, reactive approach). For these types of corridors, the scale of analysis must more closely match the scale of the issues --

multiple communities in length and width. Stakeholders convened typically include multiple state agencies, regional agencies, private citizens, businesses/business groups, and private and non-profit groups.

The program is recommended to be a formal partnership between many state and regional public agencies, and the private and non-profit sectors. The corridor task forces will be tailored to fit the needs of individual corridors.

Why is this Initiative Important?

- Conducts corridor planning in a systematic way, rather than piecemeal.
- Performs planning at a scale at which long-term trends can be addressed pro-actively (e.g., land use development, travel demand).
- Coordinates and develops priorities of next steps and implementation/investments within individual corridors and also between corridors.
- Creates common understanding of issues for the corridors that are most important to the economic vitality of the State.
- Provides direct links to other statewide planning initiatives (such as the State Development Plan).

What is the Proposed Corridor Planning Approach?

Developing a Corridor System Plan will be an on-going and iterative process involving a number of partners over a number of years. It will involve numerous planning activities occurring concurrently due to the differences between the corridors and the urgency of the issues facing the various corridors.

The figure below shows a suggested planning framework that involves four phases to developing Corridor Management Plans for individual corridors. Key aspects of this process are:

- The need for continual public participation throughout including explicit buy-in at each phase
- A foundation for the process built upon the principles of Context Sensitive Solutions
- The consistent, systematic way within which the corridor planning is being conducted
- Considering the system of corridors as a whole through the systems-level “overlay”.

Corridor Management Planning: Goal Area Support	Level of Support
Land Use-Transportation Integration	+++
Mobility & Modal Choice	+++
Safety	++
Security	
Environment & Public Health	++
System Preservation & Maintenance	++
Collaboration & Coordination	+++
Stewardship	+++

Note: More plus signs mean more support for the goal.

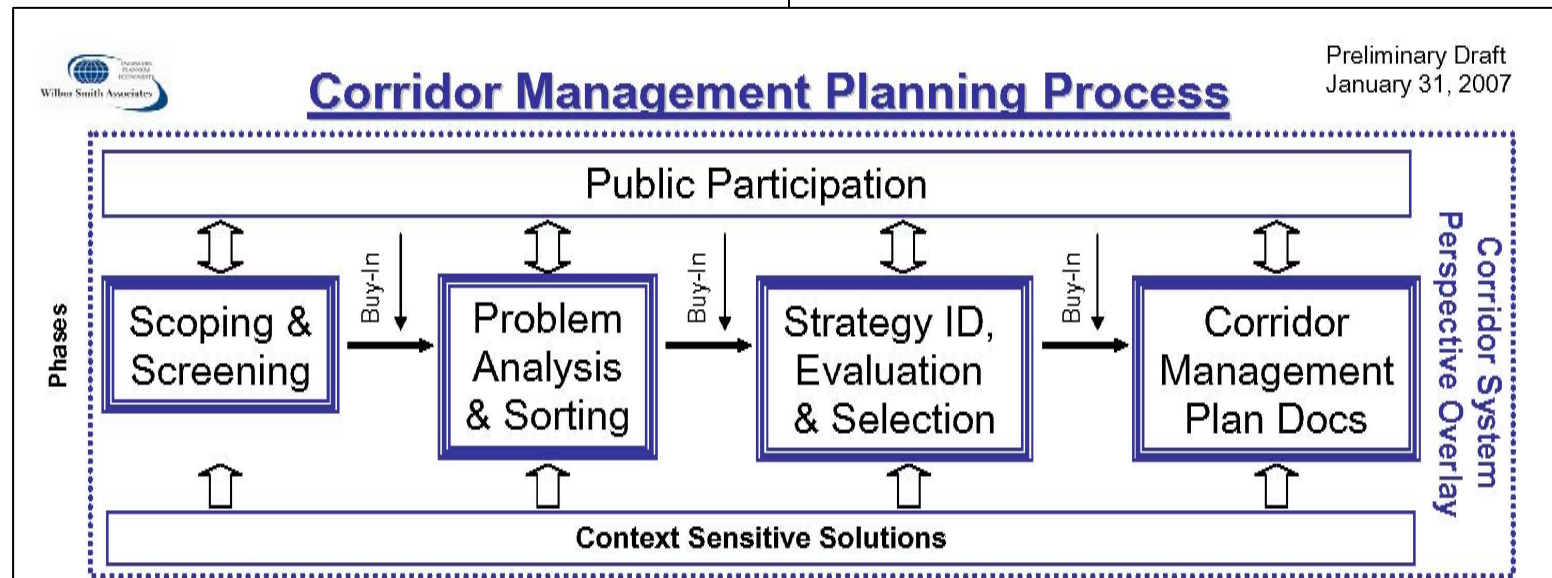
A central finding of the CAC report in 2006 was that new and innovative collaborative relationships and partnerships would need to be formed to meet the future transportation challenges in New Hampshire. No one agency will have all the required funding necessary nor will one agency have all the answers.

These new relationships will be essential to find the right mix of solutions for New Hampshire.

This section will briefly reiterate many of the initiatives mentioned earlier in the Plan but emphasize the partnership aspects that will create the basis for success.

Create a Broader Planning Framework for Transportation Planning and Investments

The State Development Plan (SDP), by statute, is intended to be the unifying context for all planning and investment activities by state and regional public agencies. This is not currently the case. Doing so creates more creative opportunities to leverage the broader planning and investment context this framework affords. For instance, the Ten Year Plan (or its successor) can demonstrate how it specifically advances the economic development, quality of life, and environmental goals of the State of NH.



When the Department's activities are placed within this framework, it can help create the constituency for many of the tough choices the Department will need to make regarding shifts in investments (see Strategic Area #3).

Partnerships

Viewed in isolation, many of the transportation and related issues facing New Hampshire appear intractable – annual funding shortfalls, chronic congestion due to economic success in the South, economic stagnation in the North, rising

***Illustrative Partnerships --
Northeast CanAm Connections: Integrating
the Economy and Transportation.***

The focus of the CanAm study is to identify and assess opportunities to attract investment and to create jobs by promoting east-west trade corridors and improving multi-modal transportation access that can effectively increase competitiveness and capture new business investment for the region.

This initiative has brought together economic development and transportation departments from Maine, New Hampshire, Vermont and New York State, as well as Nova Scotia, Prince Edward Island, New Brunswick, Quebec and Ontario.

New England Futures Website

transportation costs, etc. The list is long. New Hampshire has a history of creativity and innovation in finding solutions to problems. Partnerships will be the essential ingredient to tackling these challenges.

Communication

The positive experience with the CAC reinforced that transportation is a complicated topic. To better collaborate we must better communicate the issues of transportation choices, costs, benefits, and impacts. Language matters. Several mechanisms to enhance the quality of communications are recommended. An annual reporting of progress toward reaching transportation goals in the areas of key performance measures will provide a quantitative set of reports. An annual customer survey will provide a qualitative indication of our success. A revised Ten Year Plan process will provide a more meaningful and engaging regular forum for discussion of investment priorities.

Early and meaningful engagement and communication with transportation stakeholders is the key to the commitment to a Context Sensitive Solutions approach to planning and project development.

One of the unique communication challenges facing the Department is in the area of articulating the need to find sustainable revenues to meet changing transportation needs. This will be the case regardless of whether additional funding is needed or not. Existing funding sources, and the accompanying levels of funding each provides, will likely undergo significant changes in the coming years. This may be due to price changes or a shortage of fuels, changing technologies, changing environmental regulations, or changes in federal funding levels. It is likely that some combination of all of these changes will occur.

The key ingredient in these discussions of funding and revenue needs and investment is trust. Many of the Key Action Initiatives recommended by this Plan are intended to build this trust by more actively engaging partners in early and meaningful discussions of problems and solutions (e.g., Corridor Management and Context Sensitive Solutions) and providing the right data, tools and resources to provide timely

and germane information to the public and decision-makers (e.g., Asset Management and Performance Measures).

Strategic Outcomes resulting from identified

Communicating Needs for Revenue Enhancement

“There are seven key steps to successfully communicate the needs for additional revenues:

1. Develop a consensus on the scope of current and future transportation needs and on the importance of acting to address them;
2. Develop a specific plan and program of investments for which additional funding is needed and demonstrate what benefits are expected from the proposed investments;
3. Identify clearly established roles, responsibilities and procedures for executing the plan and implementing the proposed improvements;
4. Describe the revenue sources in detail, and provide the rationales for their use;
5. Design and carry out a public education and advocacy plan and campaign;
6. Develop sustained leadership and demonstrable, sustained support; and
7. Plan for and lay out a clear and reasonable timetable.”

NCHRP 20-24(49), p. 7-1, 2007.

approaches

1. **Unification of Transportation Planning and Investment with Broader State Goals and Actions.**

2. **Integrated Planning and Investment Decision-making across all Transportation Modes, Facilities and Services.**
3. **Increased Strategic Investment in the Areas of Transportation Infrastructure Preservation and Maintenance, Travel Demand Management, and Travel Choices.**
4. **Establishment of new, more effective Collaborative Partnerships to Better Leverage Resources and to Achieve Long Term Goals.**

The Transformation Underway: **Linking Land Use & Transportation along I-93.**

The Community Technical Assistance Program (CTAP) is a successful, five year initiative (currently in year two) to provide technical assistance on sound land use planning practices to communities in the I-93 corridor area. It was created in response to concerns about growth expressed by communities in the Salem-Manchester I-93 Corridor.

CTAP's purpose is to help communities minimize the unplanned and negative effects of growth on community services, remaining open space, schools, existing traffic patterns, quality of the environment, and existing commercial and residential zones. Many of the programs and tools developed under CTAP have immediate applicability to other NH communities.