

EXECUTIVE SUMMARY

A. Project Description

The New Hampshire Department of Transportation (NHDOT) and the Federal Highway Administration (FHWA) have prepared this Draft Supplemental Environmental Impact Statement (DSEIS) for proposed improvements to the Interstate Route 93 (I-93) corridor between Salem and Manchester, New Hampshire. The basic purpose of the I-93 Salem-Manchester project is to improve transportation efficiency and reduce safety problems associated with this approximately 19.8-mile segment of highway from the Massachusetts/New Hampshire State line to Manchester.

I-93 is a north-south principal arterial Interstate highway within the State of New Hampshire and is part of the National System of Interstate and Defense Highways. I-93 in New Hampshire extends a distance of approximately 132 miles from the Massachusetts border at Salem, New Hampshire to the Vermont border at Littleton, New Hampshire. The segment of I-93 under study intersects a number of the important highway routes in southern New Hampshire. Due to population growth, development, and recreational opportunities in New Hampshire, the travel demands for I-93 between Salem and Manchester have exceeded the capacity of this existing four-lane facility for a number of years. Population and traffic projections for the next twenty years support the conclusion that the existing facility will be increasingly less able to function at the levels of service and safety for which it was originally designed. Decreases in the level of service are evident in reduced traveling speeds, increased density of traffic flow, as well as in the traffic backups at some interchanges during commuting hours.

During weekday peak hours, motorists traveling along the I-93 corridor currently experience substantial traffic congestion and delay. The congestion not only results in increased travel times, but also contributes to safety problems, as the limited spacing between vehicles does not afford the motorists desired mobility – often leading to frequent and abrupt lane change maneuvers and sudden stops. Without substantial improvements, traffic operations and safety along this section of I-93 are expected to continue to deteriorate under future conditions as traffic volumes increase.

The proposed project involves a combination of transportation infrastructure improvements and strategies for the 19.8-mile study corridor. The main element of the proposed project involves widening I-93 from the existing two-lane highway in each direction to a four-lane highway in each direction. The proposed improvements begin in the Town of Salem, NH at the Massachusetts/New Hampshire State line and extend northerly through Salem, Windham, Derry and Londonderry, and into Manchester, ending at the I-93/I-293 interchange. In addition, the proposed project includes the following design modifications and infrastructure improvements for the five interchanges and local roads within the project corridor:

- Replace the red-listed Cross Street Bridge in the Exit 1 Interchange area.
- Reconstruct the Exit 1 interchange to improve substandard ramp geometry and replace seven red-listed bridges.

- Reconstruct the Exit 2 interchange to a diamond-type interchange configuration and replace four red-listed bridges.
- Widen and reconstruct Pelham Road from Policy Road to Stiles Road.
- Replace the Brookdale Road bridge.
- Replace four bridges, including two red-listed bridges, and relocate both the northbound and southbound barrels of I-93 into the median area in the vicinity of Exit 3.
- Reconfigure the Exit 3 interchange ramps with a diamond interchange design.
- Reconstruct and widen NH 111 beginning just west of the NH 111/NH 111A intersection.
- Relocate NH 111 north of its existing location before tying into existing NH 111 near the NH 111/Wall Street intersection.
- Relocate NH 111A on a new alignment near the NH 111/Wall Street intersection.
- In the Exit 4 Interchange area, widen I-93 to the east, retaining the existing layout for the southbound ramps.
- Reconstruct the existing Exit 4 northbound ramps diamond configuration with longer ramps.
- Reconstruct and widen NH 102 from Londonderry Road to the southbound ramps.
- Replace the NH 102 bridge over I-93 with a new bridge built directly south of the existing bridge.
- Reconstruct the Ash Street/ Pillsbury Road Bridge off-line.
- Reconstruct and widen NH 28 on-line from Symmes Drive to Liberty Drive including the reconstruction of the Perkins Road, Vista Ridge and Symmes Drive approaches, as well as the reconstruction of a portion of both Liberty and Independence Drives.
- Reconstruct the existing substandard diamond interchange at Exit 5 and replace four red-listed bridges.

In addition to the overall corridor highway improvements, the proposed project includes three new park-and-ride lots at Exits 2, 3 and 5, improvements to the existing park-and-ride facility at Exit 4, and new bus terminals at Exits 2, 4 and 5. An expanded commuter bus service to Boston began operation from the Exits 2, 4, and 5 park-and-ride lots in November, 2008.

Intelligent Transportation System (ITS) technologies and Incident Management strategies are an integral part of the overall transportation improvement strategy for the I-93 corridor. NHDOT proposes to implement some of these measures such as variable message boards, highway advisory radio broadcasts, web site information, emergency reference markers, and coordination strategies among safety agencies before the highway widening. Additional measures will be added when the highway widening is completed.

The proposed project will also accommodate space for potential future mass transit opportunities between the MA/NH State line northerly to the Exit 5 Interchange (See Chapter 3: Alternatives for more information).

B. Project History

The interstate system in New Hampshire was built in the 1960's and early 1970's. The 19.8 mile section of I-93 between the Massachusetts/New Hampshire State line in Salem and I-93/I-293 junction in Manchester has not been substantially reconstructed or widened since it was first constructed in the early 1960's. The New Hampshire Legislature formally recognized the need to widen this section of I-93 and included the project in the first State Ten-Year Highway Plan, when that plan was enacted into legislation in 1986.

In 1988, NHDOT initiated the development of conceptual widening alternatives for the southern section of the I-93 corridor in the Town of Salem. At that time, the idea was to systematically reconstruct and widen the 19.8 mile segment of I-93 by proceeding from south to north over a period of years with completion by the year 2001-2002. However, as NHDOT proceeded, the environmental resource agencies registered their concern that an in-depth corridor-wide Environmental Impact Statement (EIS) that considered all alternatives would be necessary to gain environmental approvals.

In 1991, FHWA and NHDOT initiated preliminary design and environmental evaluation work for Salem to Manchester I-93 improvements within the framework of an EIS. A Notice of Intent to prepare an EIS for the project was published in the Federal Register on February 21, 1992. As the EIS moved forward, questions were raised as to NHDOT's methodology for projecting future traffic volumes on I-93 and how any proposed highway improvements to I-93 would interface with the rest of the intermodal transportation network in New Hampshire. In response, NHDOT agreed in 1993 to develop a Statewide Transportation Model, which would provide a more effective methodology for projecting future traffic volumes and for considering the interplay between highway improvements and traffic patterns.

In 1999, with the development of the Statewide Transportation Model nearing completion, NHDOT restarted the EIS process by initiating preliminary engineering and environmental studies. In 2000, the NH State Legislature via House Bill (HB) 1106 identified I-93 as a high priority project because of the importance of this highway corridor to the region and the state. A new Notice of Intent to prepare an EIS was published in the Federal Register on October 27, 2000.

The development of the 2002 Draft EIS (2002 DEIS) involved a comprehensive public participation program, which included the creation of a local Advisory Task Force (ATF) to assist NHDOT in identifying issues and possible solutions regarding the project's purpose and need. The development of the 2002 DEIS also included numerous resource agency coordination meetings and public information meetings. Following the spirit and intent of environmental streamlining, the five Federal and three State agencies participating in the review of this project signed off on the basic project purpose and need in January 2001 and the reasonable range of alternatives to be studied in September 2001. The basic project purpose was to improve transportation efficiency, and reduce safety problems associated with the approximately 18-mile segment of I-93 from Salem to Manchester. The reasonable range of alternatives agreed on by the agencies included the No Build alternative, Transportation Systems Management (TSM) and Transportation Demand Management (TDM) measures, widening I-93 to four-lanes in each direction, widening I-93 to three lanes in each direction, a combination of four lane and three lane widening, and expanded bus service. In September 2002, the I-93 Improvements DEIS was issued.

After circulation of the 2002 DEIS, joint public hearings with the U.S. Army Corps of Engineers (ACOE) and the New Hampshire Department of Environmental Services (NHDES) were held on November 12, 2002 at Salem High School, and on November 14, 2002 at McLaughlin Middle School in Manchester. In August of 2003, after review of the revised and expanded project mitigation package, the U.S. Environmental Protection Agency (EPA) indicated that, based on the proposed mitigation, they did not intend to veto the project. In a letter dated December 30, 2003, the ACOE confirmed the Selected Four-Lane Alternative as the Least Environmentally Damaging Practicable Alternative (LEDPA) and that the minimization measures and proposed mitigation were appropriate to the scope and degree of proposed impacts, and meet the requirements of the 404(b)(1) Guidelines necessary for permitting the project. The FEIS was developed to respond to comments on the 2002 DEIS. Additional interagency coordination to address outstanding issues/comments on the 2002 DEIS and studies were conducted, as appropriate. In April 2004, the I-93 Improvements FEIS was issued.

The 2004 FEIS identified the Selected Alternative as widening I-93 from the existing two-lanes in each direction to four-lanes in each direction from Salem to Manchester. The Selected Alternative also includes improvements to existing interchanges, the replacement of 18 red-listed bridges¹ and the construction of new park-and-ride lots. The 2004 FEIS included a comprehensive mitigation and enhancement package for the Selected Alternative developed with extensive interagency review of the proposed mitigation options (See Chapter 11 of the 2004 FEIS). The 2004 FEIS made 87 mitigation and enhancement commitments, including:

- Protection of approximately 1,000 acres of land as part of compensatory wetland and floodplains mitigation.
- Funding of \$3 million for the NHDES Drinking Water Supply Land Grant Program to be used to purchase property rights to aid in the protection of water quality around Massabesic Lake, which is used to supply drinking water to Manchester, and parts of Derry and Londonderry.

¹ New Hampshire's red-list identifies bridges requiring interim inspections due to known deficiencies, poor conditions, weight restrictions, or type of construction. These structures are inspected twice yearly.

- Funding of \$3.5 million for a Community Technical Assistance Program to help I-93 corridor municipalities manage growth related issues.
- Extensive stormwater treatment measures.
- Participation in ongoing regional chloride studies. NHDOT has dedicated \$4.5 million for salt reduction, including \$2.5 million available to I-93 corridor municipalities to fund salt reduction.

On June 28, 2005, FHWA issued a Record of Decision (ROD) approving the Selected Alternative (referred to as the “2005 Selected Alternative” in this DSEIS) for implementation.

In February 2006, the Conservation Law Foundation (CLF) brought suit in U.S. District Court for the District of New Hampshire against FHWA and NHDOT challenging the ROD and alleging violations of National Environmental Policy Act, 42 U.S.C. § 4321 *et seq.* and the Federal-Aid Highway Act, 23 U.S.C. § 101 *et seq.* The case was decided on cross motions for summary judgment. The District Court entered its decision on August 30, 2007 in *Conservation Law Foundation v. Federal Highway Administration and New Hampshire Department of Transportation* (Civ. No. 06-cv-45-PB (D.N.H)).

The District Court rejected the majority of the claims raised by CLF, including those related to the elimination of rail as an alternative for further study during scoping, the assessment of direct impacts on air quality, the assessment of cumulative impacts, water quality, and wildlife, claims related to the Federal Aid Highway Act, segmentation, the adequacy of the proposed mitigation measures and the public involvement process. The Court found that these issues were considered adequately by FHWA and NHDOT during the NEPA process and that their decisions on these issues were not arbitrary and capricious.

The Court held that the traffic projections in the 2004 FEIS relied on an outdated population growth forecast from New Hampshire’s Office of Energy and Planning (OEP). As a result, the court determined that FHWA and NHDOT failed to consider in the 2004 FEIS how the “substantial additional traffic that results from the use of the more recent forecasts affects both their assessment of the Four Lane Alternative as a traffic congestion reduction measure and the impact that the additional traffic will have on secondary roads and air quality issues.” The Court order directed NHDOT and FHWA to prepare a focused SEIS:

“...that specifically considers how the Delphi Panel’s population forecasts affect Defendants’ analysis of both the effectiveness of the Four Lane Alternative as a traffic congestion reduction measure and the indirect effects of the additional population predicted by those forecasts on secondary road traffic and air quality issues.”

C. Purpose of this Draft Supplemental Environmental Impact Statement and Reevaluation

This DSEIS was prepared to meet the requirements of the August 30, 2007 decision of the U.S. District Court for the District of New Hampshire in the case *Conservation Law Foundation v. Federal Highway Administration and New Hampshire Department of Transportation* (Civ. No.

06-cv-45-PB (D.N.H)). The District Court directed the New Hampshire Department of Transportation (NHDOT) and the Federal Highway Administration (FHWA) to prepare a SEIS specifically addressing the effects of the potential induced population and employment growth estimates prepared by a Delphi Panel on: 1) the performance of the 2005 Selected Alternative from the 2004 FEIS in reducing traffic congestion; 2) traffic on secondary roads; and 3) air quality.

In addition to meeting the specific requirements of the court order, FHWA has conducted a reevaluation of the 2004 FEIS as part of this DSEIS in order to provide an up-to-date consideration of the 2005 Selected Alternative and its effects on the environment. The primary purpose of the reevaluation process is to determine whether any changes in the project; changes in the existing physical or regulatory environment, including project design, concept and scope; or changes in the affected environment, impact analysis and proposed mitigation measures would result in the need to update technical information from the 2004 FEIS.

D. Analysis Framework

Population and Employment Scenarios

To address the Court Order requirement to evaluate the effects of the population and employment growth estimated by the Delphi Panel on traffic and air quality, NHDOT and FHWA decided that the New Hampshire Statewide Model was the best available traffic modeling tool for this purpose. Two population and employment scenarios were evaluated. For one set of analyses (Scenario 1), the Delphi Panel's blended average population and employment estimates (the "PBAA") were used as inputs in the Statewide Model. The DSEIS also includes traffic modeling based on the latest official state population and employment projections (Scenario 2). Scenario 2 includes a 2020 analysis year for comparison to the analysis year used by the Delphi PBAA and also a 2030 analysis year in order to match the analysis year of the updated model (i.e., a 20-year horizon typically used in transportation planning). For detailed information on the development of Scenario 1 and Scenario 2, refer to Chapter 1: Introduction.

Tolling Sensitivity Analysis

On December 12, 2008, NHDOT submitted an Expression of Interest to the FHWA Tolling and Pricing Team to pursue tolling on I-93 as part of FHWA's Interstate System Reconstruction and Rehabilitation Pilot Program. The pilot program allows up to three existing Interstate facilities nationwide to be tolled to fund needed reconstruction or rehabilitation (two of the three slots have already been filled by projects in other states). The proposed toll would be on I-93 southbound between Exit 1 and the State line and is conceptually envisioned to be \$2 for passenger cars. The revenue generated by the proposed toll would be used to fund the construction of the I-93 improvements. At the time of the preparation of this DSEIS, the tolling proposal has not been approved by FHWA or the New Hampshire Legislature. Nonetheless, NHDOT and FHWA decided to include a sensitivity analysis of the potential traffic, air quality and noise effects of tolling on I-93 in this DSEIS. For more information on the tolling sensitivity analysis framework, refer to Chapter 1: Introduction and Chapter 4: Traffic.

E. Traffic

The Scenario 1 and Scenario 2 mainline traffic volume and LOS analyses reaffirm the need for and transportation benefits of the 2005 Selected Alternative. For Scenario 1, the 2005 Selected Alternative would eliminate LOS F conditions along the I-93 corridor north of Exit 1 (the segment between the State line and Exit 1 would be at LOS F in the No Build and Build conditions). For Scenario 2, the 2005 Selected Alternative eliminates LOS F conditions on all segments in 2020 and 2030. Under Scenario 2, the 2005 Selected Alternative also eliminates LOS E conditions on all segments, except for the segment south of Exit 1, which would be improved from LOS F to LOS E.

LOS F (Scenario 1) or LOS E (Scenario 2) for the segment of I-93 south of Exit 1 is considered acceptable given NHDOT's policy to not construct roadways with more than four-lanes in each direction. In addition to reducing peak hour congestion, the 2005 Selected Alternative would also reduce the congestion experienced by travelers in the shoulder hours on either side of the peak hour.

The Scenario 1 and Scenario 2 ramp junction LOS analyses show that the 2005 Selected Alternative would eliminate all LOS E and LOS F conditions as a result of the reconstruction of the interchanges along the project corridor.

The Scenario 1 and Scenario 2 intersection LOS analyses show both positive and negative effects of the 2005 Selected Alternative on congestion near interchanges and on secondary roads. Particularly for Scenario 2, the 2005 Selected Alternative reduces delay at more intersections than it increases. For Scenario 2 2030, the 2005 Selected Alternative would eliminate LOS E or F conditions at five intersections during the AM peak hour and at four intersections during the PM peak hour, but would only create LOS E conditions at one intersection during the PM peak hour. The results demonstrate that the 2005 Selected Alternative would not degrade travel conditions on the secondary road system as a whole.

F. Air Quality

The DSEIS air quality analyses show that the 2005 Selected Alternative would not contribute to any exceedences of the National Ambient Air Quality Standards for carbon monoxide under either Scenario 1 or Scenario 2, including at three new analysis locations identified along the secondary road network. The 2005 Selected Alternative is in compliance with 40 CFR Part 93, the Clean Air Act Amendments and the New Hampshire State Implementation Plan. The 2005 Selected Alternative is included in the currently conforming Metropolitan Planning Organization plans and Transportation Improvement Programs per 40 CFR 93.115. The regional emissions sensitivity analysis conducted as part of this DSEIS shows that Scenario 1 and Scenario 2 would not alter the conclusions of the FY2007-2010 regional emissions conformity analyses—emissions would continue to be well below the applicable carbon monoxide, volatile organic compounds and nitrous oxides budgets. Finally, the Mobile Source Air Toxics (MSAT) analysis shows that future MSAT emissions will decrease under the No Build condition and decrease even further with the implementation of the 2005 Selected Alternative.

G. Noise

As part of the final design process, NHDOT has continued to refine the design of the noise barriers proposed in the 2004 FEIS. The process has included the reevaluation of noise barriers in locations where additional residential receptors have been constructed since the noise evaluation for the 2004 FEIS (e.g. Squire Armour Road in Windham). The final design noise barrier evaluations identified one barrier location (Location 28 in Manchester) where the barrier could be extended to cover new residential receptors and still meet the NHDOT noise abatement policy cost effectiveness index criterion. While barriers were evaluated at other locations with new residential receptors, barriers in these locations would not be reasonable under the NHDOT noise abatement policy (e.g. the cost per benefited receptor would be greater than \$30,000). With some minor design refinements, noise barriers are still proposed at all the locations where noise barriers were recommended in the 2004 FEIS.

A screening analysis for potential secondary roadway noise impacts was conducted to provide more information on the potential effects of the 2005 Selected Alternative. The secondary roadway noise screening analysis was conducted using FHWA's Traffic Noise Model version 2.5 Look-up Tables. The secondary road screening assessment did not identify any receptors where the Noise Abatement Criteria could be exceeded based on Scenario 1 and Scenario 2 traffic volumes; therefore no mitigation of secondary road noise impacts is proposed.

H. Socioeconomics

Updated population, employment, housing and wage information was gathered for the DSEIS existing conditions analysis year of 2005. As a result of design refinements since the 2004 FEIS, the number of full property acquisitions has changed. The number of residential acquisitions has decreased from the 21 estimated in the 2004 FEIS to 19 based on current right-of-way plans. The number of business relocations has increased from the 14 estimated in the 2004 FEIS to 23 based on current right-of-way plans. These minor changes do not change the conclusion of the 2004 FEIS that the 2005 Selected Alternative would not directly impact local demographics, housing or employment. Potential indirect effects on population and employment patterns are discussed in Section M.

I. Land Use

Updated information on land use and zoning conditions was obtained by reviewing recent land use plans and zoning regulations, through interviews with local and regional officials, and through windshield surveys. There has been additional development in the I-93 corridor municipalities since the 2004 FEIS and minor changes in planning and zoning. Due to design refinements, there have been minor changes in the residential and business acquisitions required for the 2005 Selected Alternative. However, the direct land use and farmlands impacts of the 2005 Selected Alternative have not changed substantially since the 2004 FEIS. Potential indirect effects on land use are discussed in Section M.

J. Contaminated Properties and Hazardous Materials

NHDOT's Risk Assessment Survey for Contamination and Appraisal of Land (RASCAL) database was reviewed to identify updated information on known hazardous material concerns along the corridor. Since the 2004 FEIS, there have been design refinements to the 2005 Selected Alternative, changes in the proposed property acquisitions and additional hazardous material studies. Additional site testing, worker safety provisions, and material disposal procedures have been and will continue to be implemented in accordance with state and federal regulations at potentially contaminated sites.

K. Natural Resources

Water Resources

On May 24, 2007, the New Hampshire Department of Environmental Services (NHDES) issued a document entitled *Interim Guidance for the Structural Design of Stormwater Best Management Practices Needed to Achieve Results of Pollutant Loading Analyses*. NHDOT has agreed to strive to design and analyze the permanent stormwater treatment Best Management Practices (BMPs) for the I-93 project in accordance with the new guidance where feasible and consistent with other environmental and design considerations. The interim guidance substantially changed the design of the project stormwater treatment BMPs from those presented in the 2004 FEIS. The number of basins proposed has increased from 50 to approximately 100, and the predominant type of basins has been changed from dry extended detention basins to wet extended detention basins and gravel wetlands. Any changes in pollutant loadings as a result of the changes in the design of the proposed stormwater treatment practices are being done in cooperation with and with concurrence from NHDES. NHDOT will continue to coordinate with NHDES with respect to stormwater management and to ensure that the conditions of the Section 401 Water Quality Certification are met. The number of roadway lanes proposed as part of the 2005 Selected Alternative (four in each direction) has not changed; therefore the 2004 FEIS analysis and conclusions regarding deicing salt loadings have not changed. With the exception of the design changes in the stormwater treatment practices (doubling the number of detention basins), water resources commitments in the Record of Decision, Water Quality Certification, and NHDOT/NHDES Memorandum of Agreement remain valid.

Floodplains

Since the 2004 FEIS, 100-year floodplain impacts have been substantially reduced as a result of design modifications and updated floodplain mapping from 49.7 acre-feet to 19.8 acre-feet, which includes floodway impacts having been reduced from 6 acre-feet to 2 acre-feet. The reductions in estimated floodplain and floodway impacts indicate that reductions in the floodplain mitigation commitments would be appropriate. In addition, NHDOT has identified new potential compensatory flood storage areas at Haigh Avenue or Cluff Crossing Road in Salem that could replace the previously proposed Salem Waste Water Treatment Plant site, which requires extensive hazardous materials remediation. Proposed changes to the floodplains mitigation commitments have been and will continue to be coordinated with the resource agencies.

Wetland Resources

Based on the first eight construction contracts, the total wetland impacts of the 2005 Selected Alternative are estimated to have increased by about eight acres since the 2004 FEIS, to a total of 85 acres due to a revised delineation of wetlands along the corridor, design refinements, increases in the number/size of stormwater treatment areas and more accurate mapping. However, the type of impacts (generally edge impacts) and conclusions regarding the wetland impacts made in the 2004 FEIS have not changed—the impacts are a small percentage of the total wetland acreage within the affected wetland systems, and while experiencing an incremental loss of wetland area, the functions and values of the remaining wetland area will not be eliminated. NHDOT has been and will continue to coordinate with resource agencies regarding the increase in the total acreage of wetland impacts.

Wildlife Resources

Although the total acreage of wildlife habitat impacted by the 2005 Selected Alternative may increase by approximately 30 acres or 11.5 percent as result of final design, the 2004 FEIS conclusions regarding wildlife habitat impacts have not changed. The 2005 Selected Alternative primarily affects the edges of habitat areas adjacent to the existing I-93, and as such, habitat fragmentation is not an issue. The updated evaluation did not identify any new known occurrences of threatened or endangered species. The mitigation measures identified in the Record of Decision remain valid. Continued coordination on wildlife crossing issues has been ongoing with the natural resource agencies.

L. Cultural Resources

The cultural resources reevaluation indicates that there have been substantial changes in the impacts of the 2005 Selected Alternative since the 2004 FEIS, including the avoidance of impacts to certain resources and the discovery of additional National Register-eligible resources in the corridor. Changes in the project impacts and mitigation commitments have been and will continue to be coordinated with the New Hampshire Division of Historical Resources and FHWA.

M. Indirect Effects

The 2004 FEIS evaluated indirect effects based on the Delphi Panel estimates of future population and employment with and without the proposed project. For Scenario 1, indirect effects related to traffic, air quality and noise were evaluated by incorporating the No Build and Build Delphi Panel population and employment estimates into the updated New Hampshire Statewide model for the year 2020. The land conversion analysis based on the Delphi PBAA was updated for Scenario 1 based on changes in the minimum lot size for residences in certain towns, the area of developable land available based on recent build-out analyses, and changes in the proportion of the different types of housing (e.g. single-family, multi-family etc.) in each town.

For Scenario 2, a gravity model analysis was conducted using travel time information from the New Hampshire Statewide model and updated population and employment forecasts. Gravity models are used often in transportation and travel modeling. They are based on the observation that the overall attractiveness of an area to potential residents is a function of the capacity of an area for development (vacant developable land in valued and affordable locations) and accessibility to employment and activity centers, among other things. The model produces quantified results that can serve as the basis for assessing land use change. Under Scenario 2, the 2005 Selected Alternative will enhance accessibility near I-93, incrementally shifting population and employment from other areas of the model region to the study area communities. However, the Scenario 2 population and employment allocations suggest substantially lower levels of growth and land development in the study area for 2020 (and even for 2030) than estimated for Scenario 1 or in the 2004 FEIS. These lower levels of growth reduce the potential magnitude of land use change related environmental impacts. Impacts of the projected future growth will be determined to a large extent by local land use regulations.

N. Cumulative Impacts

The updated cumulative impact analysis indicates that growth and development are expected to result in some cumulative impacts to water resources, wetlands, wildlife habitat, farmlands and cultural resources under Scenario 1 or Scenario 2. Substantial differences in the extent of potential impacts exist based on the degree of regulatory protection afforded different types of resources (e.g. wetlands vs. farmlands). For all of the resources, the direct and indirect effects of the 2005 Selected Alternative are negligible in comparison to magnitude of change expected under the No Build condition as a result of actions by others. Development impacts on environmentally sensitive features will be minimized in many cases by the presence of conserved lands, floodplain and open space zoning. Potential impacts can be further reduced through local adherence to existing zoning, and changes in planning regulations to further discourage most development in rural areas and to encourage the development that does occur in these areas to be clustered to reduce the total amount of land consumed. Focusing growth into existing cities and village centers will further reduce conflicts with the remaining natural areas in southern New Hampshire and northern Massachusetts. The Community Technical Assistance Program (CTAP) program will help the study area communities to adapt to future growth pressures consistent with local goals.

O. Visual Impacts

The 2004 FEIS stated that the 2005 Selected Alternative would increase the visual scale of the roadway due to the widening and result in the removal of some roadside vegetation. Where this vegetation is part of a forested buffer between the highway and adjacent development, this would have an adverse effect upon the quality of views from residential areas. While additional residences have been constructed in the corridor, the 2004 FEIS conclusions regarding visual impacts have not changed and the Record of Decision mitigation commitments remain valid. No additional analysis is warranted.

P. Energy Impacts

With respect to operational energy consumption, the 2004 FEIS concluded that since the project would improve the efficiency of the flow of traffic through the corridor, future vehicular energy requirements under the 2005 Selected Alternative would be lower than under the No Build Alternative. The 2004 FEIS conclusions regarding energy impacts have not changed and no mitigation is proposed. No additional analysis is warranted.

Q. Construction Impacts

The 2004 FEIS qualitatively evaluated construction impacts related to air quality, soil erosion, wildlife, noise, traffic, and visual resources. The 2004 FEIS conclusions regarding construction impacts have not changed and the Record of Decision mitigation commitments remain valid. No additional analysis is warranted.

R. Relationship Between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

The 2004 FEIS discussed generally both short-term and long-term impacts from the proposed project. The 2004 FEIS conclusions regarding short-term uses and long-term productivity have not changed. No additional analysis is warranted.

S. Irreversible and Irrecoverable Resource Commitments

The 2004 FEIS disclosed the resources that would be irreversibly and irretrievably committed to the proposed project (e.g. funds, fossil fuels, labor, and highway construction materials). The 2004 FEIS conclusions regarding irreversible and irretrievable resource commitments have not changed. No additional analysis is warranted.

T. Unresolved Issues and Areas of Controversy

There are no known major unresolved issues or areas of controversy related to this DSEIS.

U. Federal and State Actions Required

A Supplemental Record of Decision will be issued by FHWA no sooner than 30 days after the release of the Final SEIS.