2.0 PURPOSE AND NEED FOR THE PROJECT

2.1 Purpose

The purpose of the I-93 Improvements project is to improve transportation efficiency and reduce safety problems associated with this approximately 19.8-mile segment of I-93 between Salem and Manchester. The purpose of the project has not changed since the 2004 FEIS.

2.2 Need

Interstate 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 recreation 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 the reduced traveling speeds, increased density of traffic flow, as well as in the traffic backups at some interchanges and mainline segments during commuting hours.

Traffic backups and congestion are routinely exacerbated due to traffic incidents such as crashes and vehicle breakdowns. As one of the main arterials in the New Hampshire highway system, it is important that this roadway function properly to serve all users. The New Hampshire Legislature recognized the need for improving this highway and included the project in the State Ten-Year Highway Plan when that plan was enacted in 1986 and is included in the current Ten Year Transportation Improvement Plan.

The purpose and need for this project was formally agreed to in a letter dated January 23, 2001, and signed by the state and federal agencies participating in the Environmental Streamlining partnership established for facilitating the study process.

The traffic congestion and crash data supporting the need for the project have been updated since the 2004 FEIS; see Sections 2.2.1 and 2.2.2, below.

2.2.1 Traffic Flow and Congestion

During weekday peak hours, motorists traveling along the I-93 corridor currently experience traffic congestion and substantial 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. Another consequence of the traffic congestion is increased motor vehicle fuel consumption.

Average daily traffic (ADT) is the average number of vehicles that pass a specified point during a 24-hour period. ADT for 2005 ranged from approximately 72,000 vehicles per day (vpd) between Exits 4 and 5, to as high as 109,000 vpd south of Exit 1. Traffic volumes have grown on all segments of I-93 between 1997 and 2005, with the fastest growth in traffic occurring between Exits 3 and 4 (2.10 percent average annual growth rate).

Level of service (LOS) is a measure describing operational conditions within a traffic stream and motorists' perceptions of those conditions. Six levels of service are defined ranging in letter designation from LOS A to LOS F, with LOS A representing the best operating condition and LOS F representing the worst. LOS C describes a stable flow condition and is considered desirable for peak or design hour traffic flow. LOS D is generally considered acceptable where the cost and impacts of making improvements to provide LOS C are deemed unjustifiable. Level of service E is capacity. Operating conditions during the peak hours of the day are currently poor with all segments of the corridor operating at LOS E or F. Interchange operations also regularly break down during weekday peak hours. On and off ramps to I-93 southbound at Exits 1, 2 and 3 currently operate at LOS E or F during the AM peak hour.

Without substantial improvements, or dramatically reduced demand, traffic operations are expected to continue to deteriorate under future conditions, as traffic volumes increase. Traffic forecasts for the year 2020 show ADT's ranging from approximately 69,300 vpd between Exits 4 and 4A to as high as 123,100 vpd south of Exit 1 for the No Build condition. This level of traffic would further increase congestion along I-93, at the corridor interchanges, and along nearby local roadways. This additional traffic would be expected to expand the period of congestion to more hours of the day and to a greater number of days during the year. Crash frequency would be expected to increase as a result of the increased level of congestion.

I-93 ADT and LOS for 1997, 2005, 2020 and 2030 year conditions are summarized in Tables 2-1 and 2-2, respectively. The 2020 and 2030 No Build traffic projections are based on DSEIS Scenario 2 population and employment projections (See Chapter 1: Introduction, Section 1.3.1).

Table 2-1
I-93 Average Daily Traffic

Segment	1997 (2004 FEIS Base Year)	2005 (SEIS Base Year)	2020 No Build[1]	2030 No Build[1]
MA. Line to Exit 1	104,400	109,000	123,100	129,800
Exit 1 to Exit 2	81,100	87,000	96,700	101,900
Exit 2 to Exit 3	74,900	84,000	93,700	98,100
Exit 3 to Exit 4	61,800	73,000	76,500	79,700
Exit 4 to Exit 4A*	64,900	72,000	69,300	72,200
Exit 4A to Exit 5	-	-	81,000	84,500
North of Exit 5	69,300	77,000	78,400	81,700

1. Based on Scenario 2 population and employment (official state projections).
*Exit 4A is a separate future project included in the No Build condition. It does not currently exist in the 2005 baseline condition.

Table 2-2
I-93 Level of Service[2]

Segment	1997 (2004 FEIS Base Year)	2005 (SEIS Base Year)	2020 No Build[1]	2030 No Build[1]
MA. Line to Exit 1	E	E	F	F
Exit 1 to Exit 2	E	F	F	F
Exit 2 to Exit 3	E	F	F	F
Exit 3 to Exit 4	D	E	E	F
Exit 4 to Exit 4A*	D	E	D	E
Exit 4A to Exit 5	-	-	F	F
North of Exit 5	D	E	E	F

1. Based on Scenario 2 population and employment (official state projections).
2. Based on directional design hour volumes (DDHV).
*Exit 4A is a separate future project included in the No Build condition. It does not currently exist in the 2005 baseline condition.

2.2.2 Safety Issues/Crash Data

Crash Data

Crash data from 1995 to 2002 were summarized in the 2004 FEIS purpose and need statement. For this DSEIS, updated crash data from 2000 to 2005, 2006, and 2007 was reviewed.[1] It is

[1] NHDOT. *Summary of Crash Data, I-93 Salem to Manchester, 2000 to 2007.*

important to note that the more recent crash statistics are not directly comparable to the 2004 FEIS crash statistics because the methodology used to collect and analyze the data was changed in 2000.

A review of crash data for the 19.8-mile corridor and the interchanges for the five-year period of January 2000 through December 2005 revealed a total of 1,612 crashes. Of these, 543 crashes (34 percent) resulted in personal injury with an additional 8 crashes (less than one percent) resulting in a fatality. The remaining 1,061 crashes (66 percent) resulted in property damage only.

During the period between 2000 and 2005, total crashes ranged from a high of 476 crashes in 2001 to 119 crashes in 2003, with an average of 269 crashes per year over the five year period. Crash data for 2006 and 2007 indicates a substantially higher total number of crashes than the 2000-2005 average, with 330 crashes in 2006 and 395 crashes in 2007. The crash rate for the corridor as a whole has increased in recent years from an average of 0.53 annual crashes per million vehicle miles traveled (MVMT) between 2000 and 2005, to 0.69 annual crashes per MVMT in 2006 and 0.82 annual crashes per MVMT in 2007. The crash rate has increased due to a combination of an increase in the number of crashes and a decrease in Vehicle Miles Traveled (VMT) in 2006-2007 compared to 2000-2005.

The segment of I-93 between Exits 3 and 4 recorded the highest number of crashes from 2000 to 2005 with 465 crashes (29 percent of the total number for the corridor for the time period). Between Exit 5 and I-293, 263 (16 percent of the total) were recorded. The segments between Exits 4 and 5, and between the MA state line and Exit 1 recorded 266 (17 percent of the total) and 294 crashes (18 percent of the total), respectively. The segments between Exit 1 and Exit 2, and between Exit 2 and Exit 3 recorded the fewest crashes with 177 (11 percent of the total) and 147 (9 percent of the total), respectively.

The number of crashes that occurred at each of the interchanges between 2000 and 2005 ranged from a low of zero at I-293 to a high of 90 at Exit 4.

2.2.3 Deteriorating Infrastructure

Infrastructure condition continues to deteriorate along the I-93 corridor between Salem and Manchester. This facility was constructed in the 1960's and many parts are reaching the end of their service life. In 2006, there were 18-red listed bridges in the I-93 project corridor.[2] Twelve of the red listed bridges in the corridor were ranked in the top twenty list of state priorities for replacement. Between the State Line and Exit 3, major deficiencies include fourteen red-listed bridges, poor interchange geometry, and inadequate interchange capacity, and lane drop congestion. At Exit 5, major deficiencies include four red-listed bridges, inadequate ramp lengths, and inadequate interchange capacity. Each of the interchange areas have ramps with less than desirable grades and some acceleration and deceleration lanes with less than desirable lengths. In addition, the mainline grades are also greater than the desirable maximum grades at several locations along the corridor. Pavement along many sections of the corridor is showing

[2] 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.

signs of distress. As traffic continues to grow and the infrastructure continues to age, the existing deficiencies will become more of a problem.