

# 7

## Corridor Recommendations and Action Plan

Chapters 5 and 6 reviewed in detail the range of alternatives considered to address the deficiencies and needs identified in the I-84 study area. These analyses, combined with broad input from the municipalities and the region sought throughout, led to the extensive list of recommended improvements for the study area. This chapter summarizes the recommendations and defines an “Action Plan” for implementation of the improvement program for the 18-mile section of the I-84 corridor from Exit 1 to Exit 11.

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### 7.1 Overview

The Connecticut Department of Transportation and the Housatonic Valley Council of Elected Officials undertook this study to evaluate the transportation deficiencies and define the long-term transportation improvements needed along the I-84 corridor between Interchanges 1 and 11 in the communities of Danbury, Bethel, Brookfield and Newtown. The study was intended to serve as a blueprint for the corridor to assist ConnDOT, the Housatonic Valley Council of Elected Officials, and the municipalities in their programming of future transportation investments in the region. The key objectives of this study are:

- **Preserve the capacity of I-84.** The study reviewed the mainline I-84 capacity issues today and in the future. It is essential, and required by Federal Highway Administration (FHWA) policy, that improvements identified for the I-84 interchanges preserve the capacity of the mainline.
- **Address each interchange’s unique operating conditions, placement in the overall system, and needs.** Each interchange under study was considered individually and within the context of the overall I-84 transportation system. The study examined opportunities to improve safety conditions within the interchanges and to eliminate and/or consolidate traffic movements through them while maintaining access to the local communities and major attractions. Particular attention and priority was paid to intersections and signals at the base of ramps and queuing distances where they affect ramp and interchange operations.

- **Enhance arterial street system operations.** The tight geometry of the interchanges and close proximity of adjacent intersections constrain operations and affect safety along both the arterial street system and the interstate. Weaves and the presence of left-hand exit/entrance ramps are particularly difficult in the vicinity of Exits 3/4 and Exits 7/8. The geometry is obsolete at a number of the older interchanges within the study area, including Exit 5. The study looked creatively at a wide range of options to improve access to I-84 and enhance arterial street system operations.
- **Provide for future growth.** The I-84 system is tremendously important to provide access to existing and developing land uses. Future improvements need to keep open the options for development and accommodate growth in traffic flows, both regionally and locally. The Project Team worked closely with local officials to make sure that the growth rates used for this study were reasonable and that the proposed corridor improvements address the long-term needs of the region.

The study was completed in compliance with the “Policy and Procedures for New or Revised Interstate Access Approval in Connecticut” prepared by the Connecticut Department of Transportation. Key issues for consideration in proposing changes to interstate access, as defined by this policy directive, include:

- Demonstrated existing and/or future need(s)
- Transportation system management (TSM) alternatives (only) inadequate
- Positive (or benign) impact on interstate operations
- Provides meaningful connectivity to public roads
- Consistent with local and regional plans
- Consistent with interstate system master plan
- Coordinated with TSM improvements
- Consistent with National Environmental Policy Act (NEPA)

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## 7.2 Summary of Needs/Prioritization of Recommended Actions

Growth along the I-84 study corridor is expected to continue as a result of economic growth in southwestern Connecticut, throughout the rest of the state, and New England. This conclusion is reinforced by I-84's strategic position in Connecticut's overall transportation system combined with the limited availability of viable alternative routes. Projected traffic volumes indicate that much of the study corridor will reach or exceed capacity within the next five years. By 2025, absent any action, projected demands would exceed the highway's capacity by as much as 50 percent.

The analysis of strategies to address the potential short-fall in capacity along I-84 in the future, either through demand reduction actions or capacity expansion options, generally concluded that:

### **With Regard to Demand Reduction Strategies:**

- No new transit services are currently programmed in the study area.
- Expansion of existing transit services are projected to have a minimal effect on traffic demands on I-84 itself.
- An aggressive TDM program expansion in the region would likely only marginally reduce corridor traffic demands (on the order of 1 to 2 percent).
- Limited viable alternative routes exist for travel through the study corridor.

### **With Regard to Adding Mainline Capacity:**

- Widening I-84 by a general purpose travel lane in each direction generally would address the projected demands for travel through the year 2025.
- Widening I-84 by a general purpose travel lane in each direction appears feasible primarily within the existing right-of-way.
- Implementing an HOV/diamond lane as part of the widening option would not serve a significant portion of the transportation demands. This is due primarily to the dispersed employment centers in the study area, the presence of left-hand entrance/exit ramps along the corridor, and constrained right-of-way.
- Achieving a consistent three-lane cross-section for general traffic in each direction throughout the study corridor would be particularly beneficial in the near to mid-term.

Analysis of the effects of adding a general purpose lane to the mainline of I-84 through the study area revealed a significant benefit to traffic flow and corridor operations over the next 20 years. Between 2020 and 2025, based on current projections, some segments of the corridor will begin to experience periods of congestion similar to current conditions. Specifically, the segments between Exits 4 and 5, between Exits 6 and 7, and between Exits 7 and 8 westbound, are projected to reach their capacity by this time. The majority of the corridor, however, is projected to operate under capacity through 2025 with the addition of a general purpose lane in each direction.

### **With Regard to Interchange Needs:**

- In relation to interstate operations, Exits 3 and 4 and Exits 7 and 8 are the most pressing interchange needs due to high traffic demands, weaving conditions, and left-hand exits/entrances from the interstate.
- In relation to local access, Exits 5 and 6 are the highest needs due to high traffic demands, obsolete geometry, and their importance within Danbury's overall transportation network.
- All interchanges, with the exception of Exit 1, were found to need some level of infrastructure investment to mitigate current deficiencies, enhance local access, or address long-term travel needs.

- The most significant investment in interchanges is needed in the I-84/Route 7 overlap area between Exits 3 and 8.

The transportation improvement strategies identified were screened to determine corridor priorities through the process of evaluating each on the basis of its technical merits and by seeking public input to assess its implementation feasibility and need. The latter is especially important to gauge those strategies which are the most pressing and those which require longer lead time to implement. Improving public safety and traffic-operational issues along the interstate were given highest consideration as part of the screening evaluation criteria, generally followed by:

- Potential to improve local access
- Potential to improve system efficiency
- Sensitivity to historic/environmental resources
- Right-of-way/abutter issues
- Conceptual cost

The process of screening the initial set of potential transportation improvement ideas was completed by the consultant team with the input of the ConnDOT in several working sessions. Three timeframes have been defined for proceeding with an Implementation Plan of the various study recommendations. Improvements have been identified for these timeframes: short-term (2000 to 2005); medium-term (2005 to 2010); and long-term (2010 and beyond).

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### 7.3 I-84 Action Plan

The Connecticut Department of Transportation has been systematically reviewing the long-term needs of the I-84 corridor between Hartford and the New York State line. The last I-84 Deficiencies/Needs Study is just underway between Waterbury and Southbury and slated for completion in 2001. With completion of that study, ConnDOT will have a full understanding of its long-term infrastructure needs through the entire corridor. Earlier studies of the I-84 corridor east of Waterbury have already progressed into design and construction of needed improvements.

While this study covered approximately 18 miles of the I-84 corridor, the study area really defines itself as three unique sections of interstate. The New York State line to Exit 3 is the first section and can be characterized as a relatively good section of highway with few near-term needs. Both interchanges within this section have been more recently reconstructed and much of the corridor has been widened to provide three general purpose travel lanes in each direction. Further widening to the west would only benefit by a coordinated widening program into New York State. (As of the completion of this study, New York has no plans for upgrading this section of I-84).

The second unique section of the corridor is from Exit 3 to Exit 7, commonly referred to as the “I-84/Route 7 overlap area”. I-84 through the overlap area is a six-lane highway, providing three general purpose travel lanes in each direction. The operation of this section of I-84 is dominated by its interchanges. The interchanges through the I-84/Route 7 overlap area are constrained and fast approaching obsolescence. While the deficiencies have been demonstrated, the needed interchange improvements through the I-84/Route 7 overlap area are the most complex and costly improvements defined as part of this study. As such, they will most likely take the longest to implement.

The final section of the I-84 corridor under review as part of this study, that could logically be progressed as its own project, is the four-lane section between Exit 8 and the Housatonic River, including the three Newtown exits 9, 10 and 11. This section is characterized by its more rural nature and undulating hills. The most pressing issue through this section of the I-84 corridor is the need for a third travel lane in each direction. Investment in interchanges at Exit 8, 9, 10 and 11 will also need to occur over the next decade, as they are characterized in some cases by obsolete geometry and traffic demands that will soon outstrip their useful capacity.

Because of the unique nature and needs of these three sections of the I-84 corridor within the study area, it is recommended that the Action Plan for implementing be approached as three separate projects. These three sections also provide logical starting and ending points for potential improvement project limits. This strategy allows ConnDOT the ability to focus and progress those improvements that are most pressing as funds become available. The environmental permitting and design of the needed long-term improvements with largely dictate the implementation phasing and schedule of these projects (see later discussion on “Environmental Considerations”). As such, it is recommended that Environmental Assessments of the improvements defined for the I-84/Route 7 overlap area (Exits 3 to 7) and for the eastern section (Exit 8 to the Housatonic River) be progressed immediately as part of the short-term improvement program.

### 7.3.1 Short-term Actions - Exits 1 to 11

There are a wide range of actions that address existing and short-term needs along the I-84 corridor that have independent utility and may be advanced with minimal effort and additional evaluation. (Under Categorical Exclusion Checklists as defined by the National Environmental Policy Act). The short-term improvement program by corridor section is defined in Table 7-1. For the entire corridor (Exits 1 through 11), the short-term improvement program is estimated at \$3.4 million. It should be noted that several of the improvements defined in Table 7-1 are already programmed for implementation by ConnDOT.

**Table 7-1  
I-84 Exits 1 to 11: Short-term Improvement Program (2000 to 2005)  
Recommendations Screening/Prioritization**

Project/Location	Project Cost	Comments	Recommended Action Plan Priority	Existing Safety Problem	Deficient Geometry	Operation Affects Mainline	Environmental Impacts	Compatibility with Other Improvements
<b>Corridor-wide Actions</b>								
™ Complete Environmental Assessment/Preliminary Engineering of Exits 3 to 7/8	TBN <sup>1</sup>	Needed to progress long-term improvements	High					
™ Complete Environmental Assessment/Preliminary Engineering of Exits 8 to 11 (River)	TBN <sup>1</sup>	Needed to progress long-term improvements	High					
<b>New York State Line to Exit 3</b>								
<b>Exit 1 Interchange</b>								
™ Extend Exit 1 EB off-ramp deceleration lane	\$90,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
™ Extend WB lane drop beyond off-ramp to better transition traffic through lane drop	\$410,000	Minor roadway widening	Med	No	No	Yes	Min	Yes
<b>Exit 2 Interchange</b>								
<i>Interstate:</i>								
™ Extend Exit 2 EB off-ramp deceleration lane	\$75,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
™ Extend WB on-ramp acceleration lane	\$75,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
<i>Local Roads:</i>								
™ Widen Old Ridgebury Road to provide NB right-turn lane	\$30,000	Minor roadway widening	Med	No	No	No	Min	Yes
™ Revise signal timings at Route 6/Old Ridgebury Road Intersection	n/a	Assumed to be implemented through local forces	Med	No	No	No	None	Yes
™ Improve signage on mainline and ramps	\$5,000-\$25,000	Depending on changes made to signage	Med	No	No	No	None	Yes
<b>Exit 3 to Exit 7 ("I-84/Route 7 Overlap Area")</b>								
<b>Exit 3/4 Interchange</b>								
<i>Interstate:</i>								
™ Extend Exit 4 EB on-ramp acceleration lane	\$120,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
™ Restripe Exit 4 EB off-ramp deceleration lane	\$2,500	No roadway widening, only striping	High	No	Yes	Yes	Min	Yes
™ Restripe Exit 4 WB off-ramp deceleration lane	\$2,500	No roadway widening, only striping	High	No	Yes	Yes	Min	Yes
™ WB lane balance at Route 7 southbound diverge	\$50,000	No roadway widening, only striping and new overhead signs	High	No	Yes	Yes	None	Yes
<i>Local Roads:</i>								
™ Improve signal timing/coordination along Lake Ave. (Rte.6)	n/a	Assumed to be included in current ConnDOT design project	High	Yes	No	No	None	Yes
™ At Exit 4 EB ramps/Mill Ridge Road intersection, add right-turn lane NB on Segar Street	\$35,000	Minor roadway widening	Med	Yes	No	Yes	Min	Yes
™ Implement access management along Lake Ave. (Route 6)	n/a	Assumed to be included in current ConnDOT design project	High	Yes	No	No	Min	Yes

1. TBN - A definitive cost cannot be assigned at this time. This item is therefore identified as a "to be negotiated" cost item.

Table 7-1 (Cont'd.)  
I-84 Exits 1 to 11: Short-term Improvement Program (2000 to 2005)  
Recommendations Screening/Prioritization

Project/Location	Project Cost	Comments	Recommended Action Plan Priority	Existing Safety Problem	Deficient Geometry	Operation Affects Mainline	Environmental Impacts	Compatibility with Other Improvements
<b>Exit 3 to Exit 7 ("I-84/Route 7 Overlap Area") (Cont'd.)</b>								
<b>Exit 5 Interchange</b>								
<i>Interstate:</i>								
™ Restripe Exit 5 EB on-ramp acceleration lane	\$2,500	No roadway widening, only striping	High	No	Yes	Yes	Min	Yes
™ Extend Exit 5 EB off-ramp deceleration lane	\$125,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
™ Extend Exit 5 WB off-ramp deceleration lane	\$175,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
™ Restripe Exit 5 WB on-ramp acceleration lane	\$240,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
<i>Local Roads:</i>								
™ At WB ramps/Route 39/Golden Hill Road intersection, add left-turn lane EB on Route 39, Add left turn lane SB on Golden Hill Road	n/a	ConnDOT project programmed for construction	High*	Yes	Yes	Yes	Min	Yes
™ Widen Exit 5 WB off-ramp to intersection of Route 39	n/a	ConnDOT project programmed for construction	High*	Yes	Yes	Yes	Min	Yes
™ Review signal timings and phasings at base of WB off-ramp	n/a	ConnDOT project programmed for construction	High*	Yes	Yes	Yes	None	Yes
™ Restripe Route 37 to provide a NB left-turn lane at Madison Ave.	\$2,500	No roadway widening, only striping	High	Yes	No	No	None	Yes
™ Revise signal timings at Main Street/Downs Avenue (Routes 53, 37, and 39) and Route 37/Balmforth Ave. intersections	n/a	Assumed to be implemented through local forces	High	Yes	No	No	None	Yes
™ Restrict Route 39 access to Hillside Avenue and Tooley Lane to right-turn in/right-turn out only	\$5,000	Provide signage and channelization	Med	No	No	No	None	Yes
<b>Exit 6 Interchange</b>								
<i>Interstate:</i>								
™ Extend Exit 6 EB on-ramp acceleration lane	\$140,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
™ Extend Exit 6 WB off-ramp deceleration lane	\$75,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
<i>Local Roads:</i>								
™ Widen Route 37 at Exit 6 underpass to provide 4 lanes	\$100,000	Minor roadway widening with no bridge work	Med	No	No	Yes	Min	Yes
™ Widen Exit 6 off-ramp and formalize as 2 lanes	\$45,000	Minor roadway widening	Med	No	No	Yes	Min	Yes
™ Signalize Route 37 at EB on-ramp	\$115,000	New signal installation	Med	No	No	Yes	None	Yes
™ Restrict Route 37 access to Padaranam Avenue to right-turn in/right-turn out only	n/a	Assume signage only	Med	No	No	No	None	Yes
™ Revise signal timings at Route 37/Hayestown Avenue intersection	n/a	Assumed to be implemented through local forces	High	Yes	No	No	None	Yes
<b>Exit 7 Interchange</b>								
<i>Interstate:</i>								
™ EB lane balance at Route 7 northbound diverge	\$50,000	No roadway widening, only striping and new overhead signs	High	No	Yes	Yes	None	Yes
™ Widen WB mainline to provide option to either exit to Route 7 NB or continue on I-84 WB from right lane and extend beyond Exit 7 on-ramp	n/a	Costs, impacts suggest that this action may require longer to implement (see medium-term actions)	High	No	Yes	Yes	Mod	Yes
<i>Local Roads:</i>								
™ Restripe/widen Federal Rd. at Old Brookfield Rd. and install a traffic signal	n/a	STC committed project by private developer	High*	No	No	No	Min	Yes

Table 7-1 (Cont'd.)  
I-84 Exits 1 to 11: Short-term Improvement Program (2000 to 2005)  
Recommendations Screening/Prioritization

Project/Location	Project Cost	Comments	Recommended Action Plan Priority	Existing Safety Problem	Deficient Geometry	Operation Affects Mainline	Environmental Impacts	Compatibility with Other Improvements
<b>Exit 8 to Housatonic River</b>								
<b>Exit 8 Interchange</b>								
<i>Interstate</i>								
™ Extend Exit 8 EB on-ramp acceleration lane	\$65,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
™ Extend Exit 8 WB off-ramp deceleration lane	\$105,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
<i>Local Roads</i>								
™ Revise signal timings at EB off-ramp/Newtown Road intersection	n/a	Assumed to be implemented through local forces	High	No	No	Yes	None	Yes
™ Revise signal timings at WB on-ramp/Mountainview Terrace intersection	n/a	Assumed to be implemented through local forces	High	No	No	Yes	None	Yes
™ Revise signal timings at Route 6 EB/Old Sherman Turnpike intersection	n/a	Assumed to be implemented through local forces	High	No	No	Yes	None	Yes
<b>Exit 9 Interchange</b>								
<i>Interstate:</i>								
™ Extend Exit 9 EB on-ramp acceleration lane	\$175,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
™ Extend Exit 9 EB off-ramp deceleration lane	\$175,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
™ Extend Exit 9 WB on-ramp acceleration lane	\$120,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
™ Extend Exit 9 WB off-ramp deceleration lane	\$245,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
<i>Local Roads:</i>								
™ At EB ramps/Route 25 intersection, install traffic signal, add left-turn lane SB on Route 25 and right-turn lane NB on Route 25	\$130,000	Assume lane geometry is accommodated by the existing pavement width	Med	No	No	Yes	Min	Yes
™ At Route 25/6 intersection, add left-turn lane EB on Route 6	\$50,000	Minor roadway widening	Med	No	No	No	Min	Yes
<b>Exit 10 Interchange</b>								
<i>Interstate:</i>								
™ Extend Exit 10 WB on-ramp acceleration lane	\$190,000	Minor roadway widening	High	No	Yes	Yes	Min	Yes
<i>Local Roads:</i>								
™ Provide overheight warnings on Route 6	\$10,000							
™ Revise signal timings at WB ramps/Route 6 intersection	n/a	Assumed to be implemented through local forces	High	No	No	No	Min	Yes
™ Implement access management along Route 6	n/a	Assumed to be implemented through local forces	High	Yes	No	No	Min	Yes
<b>Exit 11 Interchange</b>								
<i>Interstate:</i>								
™ Install rumble strips	\$25,000	Safety improvement to improve interstate to local roadway transition	High	Yes	No	Yes	None	Yes
™ Install lighted warning signs to slow down	\$70,000	Safety improvement to improve interstate to local roadway transition	High	Yes	No	Yes	None	Yes
<i>Local Roads:</i>								
™ At Wasserman Way/Route 34 intersection, add left-turn lane NB on Route 34	\$50,000	Minor roadway widening	High	No	No	No	Min	Yes
™ Revise signal timings at ramps/Mile Hill Road intersection	n/a	Assumed to be implemented through local forces	High	No	No	No	None	Yes
<b>Total Short-term Improvement Program</b>								
	\$3,400,000	(exclusive of environmental assessment/preliminary engineering costs)						

\* Already programmed for construction

### 7.3.2 Medium and Long-term Actions - New York to Exit 3

Table 7-2 defines the I-84 improvement program for the section of the corridor between the New York State line and Exit 3. In total, approximately \$10 million worth of infrastructure investment is defined for this area. This section of the corridor, however, represents the lowest need in terms of the long-term improvement program. As such, it is recommended that beyond the short-term recommendations, further action on the long-term improvements be delayed until funding for the improvements is identified.

**Table 7-2**  
**I-84 Improvement Program: New York State Line to Exit 3**  
**Recommendations Screening/Prioritization**

Location/Project	Project Cost (\$1,000s)*	Comments
<u>Short-term (2000 to 2005)</u>		
™ Implement actions defined in Table 7-1	\$705	Focused primarily on interstate operations and safety Can progress independent of Environmental Assessment
<u>Medium-Term</u>		
™ None		
<u>Long-term (2010 and beyond)</u>		
1. Complete Environmental Assessment of long-term improvements	TBN <sup>1</sup>	(May not require EA)
2. Implement long-term interchange improvement plan at Exit 2	\$2,350	Could be advanced should development accelerate
3. Widen mainline eastbound between New York state line and Exit 2	\$5,970	
4. Widen mainline westbound between Exit 1 and New York state line	\$1,030	No benefit will occur unless I-84 is widened in New York
Total for New York State to Exit 3	\$10,055	

\* Conceptual costs shown exclude design, permitting, and right-of-way acquisition.

1. TBN - A definitive cost cannot be assigned at this time. This item is therefore identified as a "to be negotiated" cost item.

### 7.3.3 Medium and Long-term Actions - Exit 3 to Exit 7

Table 7-3 defines the I-84 improvement program for the section of the study area between Exits 3 and 7, or the "I-84/Route 7 overlap area". As previously described, interchange improvements are the highest need along this section to address the problems associated with I-84 and Route 7 sharing the same corridor and the high demands for local access to Danbury and its environs. The improvements defined within this project total approximately \$142 million, exclusive of design and right-of-way acquisition. Of these improvements, approximately \$1.3 million in short-term actions were defined. In terms of interstate operations and safety over the medium to long-term, improvements that eliminate the weave at Exit 3 / 4 and improve the left-hand off-ramps at Exits 3 and 7 are the highest priority actions. Of the long-term needs for local access, reconstructing Exits 5 and 6 are the highest priority actions. Mainline widening of the I-84/Route 7 overlap area is a long-term recommendation and should be phased with the interchange improvements.

### 7.3.4 Medium and Long-term Actions - Exit 8 to the Housatonic River

Table 7-4 defines the I-84 improvement program for the section of the study area between Exit 8 and the Housatonic River, including Exits 9, 10 and 11. Approximately \$1.4 million in short-term improvement actions were defined for this section of the corridor. The total improvement program to address long-term needs between Exit 8 and the Housatonic River is estimated at approximately \$116 million. The highest priority long-term improvement action along this section of I-84 is the widening to provide three general purpose travel lanes in each direction.

**Table 7-3  
I-84 Improvement Program: Exit 3 to Exit 7/8  
Recommendations Screening/Prioritization**

Project/Location	Project Cost (\$1,000s)	Comments
<b>Short-term (2000 to 2005)</b>		
™ Complete Environmental Assessment/Preliminary Engineering of long-term improvements	TBN <sup>1</sup>	Will likely refine implementation strategies/phasing defined below
™ Implement actions defined in Table 7-1	\$1,285	Can progress independent of Environmental Assessment
<b>Medium-term</b>		
<b>Exit 3/4 Interchange:</b>		
™ Provide direct local connection to Segar Street	\$12,040	Consolidates off-ramps and eliminates high hazard weave: advanced due to safety issues
™ Widen mainline to provide lane continuity westbound through interchange	\$1,330	Provides widened mainline with either/or option at I-84 westbound off-ramp to Route 7 SB: advanced due to safety issues
<b>Exit 7/8 Interchange:</b>		
™ Widen and provide lane continuity eastbound through interchange	\$1,625	Provides either/or option at I-84 eastbound off-ramp to Exit 7 NB: advanced due to safety issues
™ Widen to provide auxiliary lane between Exits 8 and 7 WB and extending beyond Exit 7	\$2,175	Improves merging and weave area between Exits 8/7 and 7/6: advanced due to safety issues
<b>Long-term</b>		
<b>Interchange Improvements:</b>		
1. Exit 5/6 Eastbound	\$5,470	Highest long-term priority interchange along this section of I-84
2. Exit 5/6 Westbound	\$3,980	Highest long-term priority interchange along this section of I-84
3. Exit 7/8 Eastbound		
™ Build EB C/D roadway and modify Exit 8 off-ramp	\$22,010	Possible second phase of long-term plan (first phase above)
™ Build Route 7 SB ramp to C/D roadway connection	\$15,560	Completion of long-term plan
4. Exit 3/4 Eastbound		
™ Complete Route 7 NB relocation/widening	\$12,620	Second phase of completion of long-term plan
5. Exit 3/4 Westbound		
™ Relocate I-84 WB Exit 4 on-ramp and realign I-84 WB Exit 4 off-ramp	\$4,890	Completion of long-term plan
<b>Mainline Widening:</b>		
™ Exits 3 to 4	\$1,150	Should be coordinated with interchange priorities (above)
™ Exits 4 to 5	\$13,040	Should be coordinated with interchange priorities (above)
™ Exits 5 to 6	\$7,680	Should be coordinated with interchange priorities (above)
™ Exits 6 to 7	\$16,740	Should be coordinated with interchange priorities (above)
™ Exits 7 to 8	\$12,300	Should be coordinated with interchange priorities (above)
™ Noise Abatement	\$8,000	Provision of noise barriers - will be determined upon additional environmental studies
Total for Exits 3 to 7/8 ("I-84/Route 7 Overlap Area")		\$ 141,895

\* Conceptual costs shown exclude design, permitting, and right-of-way acquisition.

1. TBN - A definitive cost cannot be assigned at this time. This item is therefore identified as a "to be negotiated" cost item.

**Table 7-4  
I-84 Improvement Program: Exits 8 to Housatonic River  
Recommendations Screening/Prioritization**

Location/Project	Project Cost (\$1,000s)	Comments
<b>Short-term (2000 to 2005)</b>		
™ Complete Environmental Assessment/Preliminary Engineering of long-term improvements	TBN <sup>1</sup>	Will likely refine implementation strategies/planning defined below
™ Implement actions defined in Table 7-1	\$1,410	Can progress independent of Environmental Assessment
<b>Medium-Term</b>		
<b>Exit 11 Interchange</b>		
™Construct direct connection from Route 34 to I-84 on-ramps	\$1,150	
<b>Long-term (2010 and beyond)</b>		
1. Mainline Widening		To achieve consistent three-lane cross section through the corridor
™ Exit 8 to Exit 9	\$38,470	Implement mainline widening improvements through this section from west to east based on traffic demands/needs
™ Exit 9 to Exit 10	\$30,220	
™ Exit 10 to Exit 11	\$10,940	
™ Exit 11 to Housatonic River	\$15,950	
™ Noise Abatement	\$1,700	
2. Exit 8		
™ Install traffic signal with geometric improvements at Route 6/Sky Edge Drive	\$150	Improves safety issues at this intersection, as voiced by local officials
™ Relocate Exit 8 eastbound on-ramp and construct Route 6 improvements	\$1,570	Possible first phase of sequenced improvement plan
™Construct 2-lane (one-way) extension of Payne Road	\$3,140	
3. Exit 9	\$2,560	
4. Exit 10	\$2,420	
5. Exit 11	\$6,460	
Total for Exits 8 to 11 ( Housatonic River)		\$ 116,140

\* Conceptual costs shown exclude design, permitting, and right-of-way acquisition.

1. TBN - A definitive cost cannot be assigned at this time. This item is therefore identified as a "to be negotiated" cost item.

### 7.3.5 Summary of I-84 Action Plan

Table 7-5 provides a summary, by corridor segment, of the short, medium, and long-term costs associated with the recommended improvement actions. This cost information has been provided in more detail in Tables 7-1 through 7-4.

**Table 7-5  
I-84 Improvement Program Summary**

Corridor Segment	Summary of Project Costs for Recommended Improvements				Total Improvement Package
	(\$1,000)*				
	Short-term Interchange Imps.	Medium-term Interchange Imps.	Long-term		
			Interchange Imps.	Mainline Widening	
New York to Exit 3	\$705	---	\$2,350	\$7,000	\$10,055
Exit 3 to Exit 7/8	\$1,285	\$17,170	\$64,530	\$ 58,910	\$ 141,895
<u>Exit 8 to Exit 11</u>	<u>\$1,410</u>	<u>\$1,150</u>	<u>\$16,300</u>	<u>\$ 97,280</u>	<u>\$ 116,140</u>
Total:	\$3,400	\$18,320	\$83,180	\$ 163,190	\$ 268,090

\* Conceptual costs shown exclude design, permitting, and right-of-way acquisition.

These cost estimates assume that the implementation of recommended improvements to local roads would be provided through the regional transportation planning program process. It is also important to recognize that the HVCEO's current update of the region's twenty year planning period, covered by their 2001 Long-Range Transportation Plan (LRP), anticipates up to \$140 million for limited improvements in the I-84 corridor from Danbury to Newtown. Identified improvements include upgrades of some interchanges and the addition of a general purpose lane through part of the corridor. Comparing the costs of the recommended Total Improvement Package (approximately \$268 million) to the LRP anticipated conceptual cost of \$140 million, therefore would be a short fall of approximately \$128 million. Therefore, to identify this need for additional funds in the LRP, HVCEO may utilize the Region's system improvement funds and/or system preservation funds, since the I-84 project has both elements. A second option for LRP purposes, would be for the region to identify the \$128 million difference in future years as unfunded needs for the I-84 corridor. This funding difference could then be identified in HVCEO's 2004 LRP update. The continued development of the recommendations of this study through environmental documentation, design, and construction will require endorsement by the HVCEO in their LRP and regional Transportation Improvement Program, and inclusion in the State Transportation Improvement Program. Inclusion in these programs results from a cooperative

agreement among the towns, regional planning agency and ConnDOT. Projects must compete statewide for limited funds, and the programs must be fiscally constrained and in compliance with air quality conformity requirements.

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## 7.4 Environmental Considerations

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### Required Clearances for Long-Term and Short-Term Improvements

The recommended improvements for I-84 will require federal and state approvals and permits before they can be implemented. This section discusses the major review processes that will affect the I-84 improvement program.

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### National Environmental Policy Act (NEPA)

Before a federal agency undertakes an action (for example, funding a highway construction project), NEPA requires that the agency first consider the environmental impacts of the action. For the recommended improvements, the Federal Highway Administration (FHWA) is the lead federal agency responsible for complying with NEPA. FHWA's NEPA regulations prescribe the procedures for processing of highway projects. The regulations allow three types of documents to be used to comply with NEPA: Categorical Exclusion Checklists (CE), Environmental Assessments (EA), and Environmental Impact Statements (EIS). CEs are used for minor projects that clearly do not have significant environmental impacts (for example, construction of bike lanes, landscaping, installation of fencing, pavement markings, etc.). An EIS is prepared for projects that have significant impacts on the environment (for example a new 4-lane highway). EAs are prepared for projects that are not CEs and that do not require an EIS, or for which the environmental impacts are not clearly known. The environmental assessment leads to either a Finding of No Significant Impact (FONSI) or, if impacts are significant, to an EIS.

Based upon the preliminary environmental review included in this report, it appears that impacts from the long-term improvements (mainline widening and interchange improvements) will be relatively minor. Because the mainline can be primarily widened within the existing highway right-of-way (and to some degree within the median), impacts to abutting properties will be minor. Impacts to surface waters and wetlands are also relatively minor. The total amount of wetland filling is small and the majority of the wetland that would be affected is relatively low value toe-of-slope/drainage ditch wetland. Furthermore, the wetland impacts can be easily mitigated. Impacts to other resource categories, such as cultural resources, Section 4(f) properties, rare species, air, and noise are also expected to be minor. Right-of-way takings at the interchanges are relatively minor except at Exit 5 where

two condominium complexes would be displaced by the recommended improvements. These takings would be mitigated, however, in accordance with ConnDOT and FHWA policies regarding relocations. While it is FHWA's decision as to the type of NEPA document that they would require, it is likely that the recommended long-term improvements would qualify to be reviewed in a single or series of (depending upon timing) Environmental Assessments. While the EA is being prepared for the long-term improvements, the recommended short-term improvements at the I-84 interchanges (such as new signals, lane restriping, longer acceleration and deceleration lanes) would qualify as stand-alone projects that could be processed with separate CEs and advanced to construction.

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### Connecticut Environmental Policy Act (CEPA)

Similar to NEPA, but at the state level, each state agency is responsible for conducting an environmental assessment under CEPA for any state action that could have a major impact on the state's land, water, air, historic structures, or landmarks. The environmental assessment leads to either a Finding of No Significant Impact (FONSI) or, if impacts are significant, to an Environmental Impact Evaluation (EIE) document which discusses the environmental, social and economic impacts and less damaging alternatives to the proposed action.

For the I-84 improvements, ConnDOT would be responsible for preparing the Environmental Assessment. In practice, this requirement represents little additional effort because the federal EA under NEPA can also serve as the CEPA FONSI. While FHWA must approve the adequacy of the federal EA, the Connecticut Office of Policy and Management is responsible for determining whether the environmental analysis in the federal EA is adequate under CEPA.

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### FHWA Approval for Change in Interstate Access

The recommended improvements would also need approval from FHWA for the changes in Interstate access that are proposed. ConnDOT has specific procedures for the review of proposed changes that are prescribed in its *Policies and Procedures for New or Revised Interstate Access in Connecticut*. FHWA's access policy sets out eight requirements for new or revised access points to meet (as previously discussed). These requirements focus on the need for the change of access, safety, and consistency with regional land use and transportation plans. The policy also requires that the approval must be closely coordinated with the environmental review process, particularly NEPA. FHWA's approval of a change-in-access constitutes a federal action subject to NEPA jurisdiction, and final approval of the change-in-access must be coordinated with the completion of the NEPA process.

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## U.S. Army Corps of Engineers Section 404 Permit

Wetland filling requires a permit from the U.S. Army Corps of Engineers (ACOE) under Section 404 of the Clean Water Act. The ACOE's New England Division usually requires applicants for Section 404 Permits to follow a review process referred to as the "Highway Methodology." The Highway Methodology is intended to better integrate the Section 404 review process with the NEPA review process. It is based on a three-phase approach to avoid, minimize, and mitigate wetland impacts. However, because the I-84 improvements will occur largely within the existing right-of-way and because the alternatives being recommended at the interchanges generally have less wetland impact than alternatives that were dismissed, it is unlikely that the ACOE would require ConnDOT to follow the Highway Methodology. Nevertheless, the ACOE makes the final decision as to the need for the Highway Methodology.

The recommended long-term improvements likely can be approved under a Category II Programmatic General Permit (PGP). Category II generally allows up to one acre of wetland impact, but allows up to three acres for roadway widening projects or projects that affect degraded or low value wetlands. For most types of projects, if wetland impacts are greater than one acre, an Individual Permit is required. However, for linear projects, the ACOE generally allows wetland impacts to be considered separately when there are separate and distinct waterway crossings. Therefore, it is possible that the I-84 improvement program could be divided into individual projects for purposes of Section 404 permitting. If so, it is more likely that each individual project can stay within the three-acre threshold and therefore qualify for a PGP. The decision as to the level of permit that is required (PGP or Individual) would be made by the ACOE through consultation and review of the EA.

If a PGP permit is issued, it would also serve as the state's Section 401 Water Quality Certification (WQC). If, however, an Individual Section 404 Permit is required, the project would also require an Individual Section 401 WQC.

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## Connecticut Inland Wetlands and Watercourses Act Permit

The recommended improvements would also require an Inland Wetlands and Watercourses Act Permit. This permit program is administered by the Connecticut Department of Environmental Protection's (DEP) Bureau of Water Management. ConnDOT will need to submit an application to the Bureau of Water Management. The application may also be reviewed by the Fisheries and Wildlife Division and the Natural Diversity Database staff if impacts to fish and wildlife or rare species are of concern. Because part of the corridor is within the Kenosha Lake watershed, which is a public drinking water supply, a copy of the application would also be sent to the local water company for comment. The application must include plans and specifications describing the proposed project and its impact on the environment, and documentation of the alternatives to the project which have been considered.

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## Connecticut Flood Management Certification

The recommended improvements are likely to affect the floodplain of the Still River, Pogond Brook, and the Pootatuck River. It therefore requires a Flood Management Certification. This program is also administered by the DEP's Bureau of Water Management. The application submitted to the DEP must contain floodplain management consistency worksheets and hydrology and hydraulics, engineering design reports, plans, and specifications describing the project. Much of the analysis for the application would be completed during the preparation of the EA under NEPA.

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## National Pollutant Discharge Elimination System (NPDES) Permit

Because the recommended improvements would have more than five acres of earth disturbance, they will require a General Permit for Stormwater Discharges from Construction Sites from the U.S. Environmental Protection Agency. The NPDES regulations require that a Notice of Intent that includes a stormwater pollution prevention plan be submitted to EPA at least two days before construction.

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## Connecticut Indirect Source Permit (Air Pollution)

The purpose of the Indirect Source Permit program, administered by the Bureau of Air Management, is to ensure that new highway projects meet all applicable state and national ambient air quality standards for carbon monoxide and ozone. Mainline widening along the I-84 corridor will trigger review because it will add a new lane for more than one mile. ConnDOT will prepare an Indirect Source Permit application that will evaluate the air quality impacts from the recommended improvements. The application must contain technical analyses that demonstrate that the recommended improvements will not violate the State Implementation Plan nor exceed the NAAQS. Much of the technical analysis would be included in the EA prepared under NEPA.