

Chapter 5

REFINEMENT OF ALTERNATIVES

The previous chapter identified a broad range of TAs that addressed the needs and deficiencies of the corridor. Through the screening process, several of these alternatives failed to demonstrate feasible solutions due to poor transportation benefits, unacceptable environmental impacts, high capital costs, or negative public reaction. Since the publication of Technical Memorandum #2 (Alternatives Evaluation), the Study Team has investigated additional improvements as well as refined alternatives that survived the preliminary screening process. This chapter documents that process. The improvements that follow can be considered as preferred or recommended for project advancement.

5.1 Additional General Purpose Lane

An additional general-purpose lane in each direction along I-84 would provide additional capacity. With an additional lane from interchange 13 to Interchange 18, all freeway segments would operate at LOS E or better in the eastbound and westbound directions. All freeway-ramp junctions would operate at LOS D or better with the additional lane in both directions. It is important to note that the addition of a general-purpose lane in each direction is a long-term solution for the corridor. Also, with the projects currently in design both east and west of the study area, the additional lane would provide continuity with the design of those projects.

Based on the conceptual alignment of I-84 on aerial photography, it appeared feasible to include an additional general-purpose lane in each direction within the existing median. Several questions were left unanswered based on this evaluation. First, the median in the vicinity of Interchange 18 was narrow and it was uncertain whether a full lane with full shoulders could fit. Secondly, the composition of the original freeway remained uncertain – e.g. whether or not concrete slab construction was used for the entire corridor with asphalt overlaid on the surface. Thirdly, structural evaluations needed to be made to determine whether the bridges carrying and spanning I-84 needed to be replaced or expanded to accommodate the additional pavement. Lastly, limits of cut and fill of slopes, as well as locations and extents of retaining walls needed to be determined for construction and cost estimation purposes.

To answer these questions, additional field review was performed and visual inspections made to determine approximate cross sections, physical constraints, and structural condition along I-84. Cross sections and the segment limits that corresponded with them were noted based on four general conditions.

- I-84 Eastbound and Westbound at same elevation with relatively flat median with swales;
- I-84 Eastbound and Westbound at variable elevation with variable slope;
- I-84 Eastbound and Westbound at same elevation with variable height rock ledge in median; and
- I-84 Eastbound and Westbound at same elevation with variable depth valley in median.

The variability in verticality was approximated by visual inspection. The variability in horizontal median width was derived from the “As-Built” design files in the CAD base mapping. Based on this methodology, cut and fill limits were derived and locations for retaining walls calculated. This information was essential for reasonable cost estimation purposes.

Additionally, structures were evaluated based on their most recent biennial inspection rating, their ability to be expanded, and whether or not the piers were constraints to the widening of I-84. [Figure 5.1](#) (11 sheets total) illustrates the results of the refined analysis for the additional lane alternative.

5.2 Intersection Operational Improvements

Several intersections in the I-84 WOW study area have been identified as having operational deficiencies. Most of these intersections have deteriorated due to the increased traffic volume that uses the interstate ramps, and in some cases these intersections are prohibiting the safe operation of the ramps themselves. These intersections have been analyzed as having a Level of Service F under the base (no-build) condition and are impeding the overall performance of the transportation system. From Interchange 13 to Interchange 16, intersection improvements have demonstrated to be low capital cost solutions to some of the deficiencies identified in the study. For this reason, and to avoid environmental impacts, TSM alternatives for these interchange areas were selected over the ramp reconstruction alternatives (discussed in the Chapter 4) for additional refinement and screening.

Table 5.1 lists the intersections that can be improved within the existing right of way or with minimal property taking. The table lists their location and their LOS before and after the proposed improvement.

Table 5.1
TSM Improvements

<u>INTERSECTION</u>	Base Condition		With Improvements	
	AM	PM	AM	PM
Interchange 14				
South Main St. and South Britain Rd.	E	F	C	C
South Britain Road and I-84 WB Ramps	D	F	B	D
S. Britain Rd. and I-84 EB Ramps/Lakeside Rd. and Georges Hill	B	F	C	C
Interchange 15				
Main Street and Main Street South /Shopping Plaza	F	F	D	D
Interchange 16				
I-84 WB Ramps and Route 188	D	D	C	C
Old Waterbury Road and Route 188	F	F	C	C

Bold-faced letters indicate un-signalized intersection.

The following section describes and evaluates the refined improvements at these interchanges areas. Improvements identified as short-term are projects that may be pursued at a relatively faster schedule, prior to the advancement of long term recommended improvements.

Interchange 13

Table 5.2 lists the deficiencies and the suggested improvements for Interchange 13.

Table 5.2
Interchange 13 Deficiencies/ Needs and Improvements

Deficiencies/Needs	Improvements
<ul style="list-style-type: none"> ◆ Inadequate turning radius for trucks entering I-84 WB On-Ramp from Oakdale Manor Road ◆ I-84 WB Ramp entrance sign missing on Oakdale Manor Road ◆ Route marker sign faded on Fish Rock Road ◆ Inadequate acceleration length on I-84 WB ◆ Inadequate deceleration length on I-84 EB ◆ I-84 is expected to operate poorly in future (2025) in EB direction during P.M. Peak ◆ I-84 is expected to operate poorly in future (2025) in WB direction during A.M. Peak ◆ Potential for a full interchange 	<p style="text-align: center;">Short-Term</p> <ul style="list-style-type: none"> ➤ Increase corner radius to 50 ft. at the intersection to accommodate trucks ➤ Install a new sign ➤ Replace the faded sign <p style="text-align: center;">Long-Term</p> <ul style="list-style-type: none"> ➤ Provide 1400 ft. acceleration distance along I-84 WB ➤ Provide 500 ft. deceleration distance along I-84 EB ➤ Provide Additional General Purpose Lane along I-84 ➤ Provide Additional General Purpose Lane along I-84 <p style="text-align: center;">Additional Comments</p> <ul style="list-style-type: none"> ➤ Full interchange alternative did not provide benefit in highway operations

The modification for this interchange that may be accomplished in the short term would involve improving the corner radius of the westbound entrance ramp at Oakdale Manor Road. Increasing to a standard 50-foot radius would improve safety. This alternative modification has already been advanced by ConnDOT as a safety improvement that will be constructed as part of the safety improvement program. This proposal also has the potential for inclusion of a commuter parking facility and the improvement of signage in the area. [Figure 5.2](#) illustrates the proposed modifications.

As a long-term solution, I-84 in the vicinity of this interchange requires an additional general-purpose lane in each direction to accommodate future year (2025) traffic volumes. In addition,

adequate acceleration and deceleration distances need to be provided during the freeway reconstruction phase in coordination with the additional general-purpose lane.

A full interchange alternative was evaluated at this location. The evaluation process indicated that there would not be a significant amount of traffic diverted from Interchange 14 to this interchange as result of the provision of a full directional access; therefore, this alternative is not recommended.

Interchange 14

Table 5.3 lists the deficiencies and the suggested improvements for Interchange 14.

Table 5.3
Interchange 14 Deficiencies/ Needs and Improvements

Deficiencies/Needs	Improvements
<ul style="list-style-type: none"> ◆ Excessive queue on I-84 WB Off-Ramp ◆ Closely spaced intersections of I-84 WB Off-Ramp/S. Britain Rd. and S. Britain Rd./Main. St. South ◆ Inadequate acceleration lengths on I-84 EB and WB ◆ Confusing intersection at Lakeside Road ◆ I-84 directional sign missing on Main Street South ◆ Damaged directional sign on the I-84 WB Off-Ramp ◆ Inadequate deceleration length on I-84 EB ◆ I-84 is expected to operate poorly in future (2025) during P.M. Peak ◆ I-84 is expected to operate poorly in future (2025) in WB direction during A.M. Peak ◆ Offset Ramp alignment 	<p style="text-align: center;">Short-Term</p> <ul style="list-style-type: none"> ➤ Signalize the intersection to relieve queuing (TSM) ➤ Provide signal coordination and adequate lanes to improve traffic operations (TSM) ➤ This deficiency will be addressed by DOT Safety Improvement Project No. 130-169 ➤ Eliminate the all-way STOP sign control at the intersection of Lakeside Road/Georges Hill Road/I-84 EB Off Ramp to provide a traffic signal (TSM) ➤ Install a new directional sign ➤ Replace the damaged directional sign <p style="text-align: center;">Long-Term</p> <ul style="list-style-type: none"> ➤ Provide 600 ft. deceleration distance along I-84 EB ➤ Provide Additional General Purpose Lane along I-84 ➤ Provide Additional General Purpose Lane along I-84 <p style="text-align: center;">Additional Comments</p> <ul style="list-style-type: none"> ➤ The offset ramp alignment will be maintained with TSM Improvements at this interchange

To improve traffic operations, the intersection of Main Street South and South Britain Road requires widening and signal coordination with the South Britain Road and I-84 Westbound Off-Ramp intersection. The South Britain Road and I-84 Westbound Off-Ramp intersection meets traffic signal warrants with 380 vehicles exiting the westbound off ramp and 1420 vehicles on South Britain Road during the P.M. peak hour. The suggested improvements at this intersection are illustrated in [Figure 5.3](#).

Constraints at the intersection of South Main Street and South Britain Road include a gas line that runs south of the intersection and parallel to Main Street South. There is also a commuter parking lot in the southeast quadrant of the intersection. In the northwest quadrant of the intersection, there are residential properties that should be considered prior to widening the intersection. This intersection is photographed in Figure 5.4.

Figure 5.4



View of westbound approach on Main Street South at South Britain Road intersection

The intersection of Lakeside Road, Georges Hill Road, and the I-84 Eastbound Ramp is recommended to be signalized and widened to improve traffic operations. This intersection meets traffic signal warrants during the P.M. peak hour of operation with 660 vehicles exiting the eastbound ramp and 780 vehicles approaching the intersection from Lakeside and South Britain Roads.

The east side of the intersection is constrained by rock ledge and therefore widening may need to be performed on the west side of the intersection. As a result of this widening, the intersection can be re-aligned to provide wider turning radii for recreational and heavy vehicles. The improvements at this intersection are illustrated in Figure 5.4.

As a long-term solution, I-84 in the vicinity of this interchange requires an additional general-purpose lane in each direction to accommodate future year (2025) traffic volumes. ConnDOT is currently pursuing a Safety Improvement Project No. 130-169 to improve acceleration distances

at this interchange. The deceleration distance along I-84 EB will be addressed during the freeway reconstruction phase of the project (long-term solution). Other TSM improvements at this location require fixing highway and roadway signage.

Interchange 15

Table 5.4 lists the deficiencies and the suggested improvements for Interchange 15.

Table 5.4
Interchange 15 Deficiencies/ Needs and Improvements

Deficiencies/Needs	Improvements
<ul style="list-style-type: none"> ◆ Poor intersection operations at Main Street/Route 6/67/Southbury Plaza ◆ Truck climbing lane ends prior to the I-84 EB Off-Ramp and resumes after I-84 EB On-Ramp ◆ Sign partially obscured by trees ◆ Insufficient indication in advance of left turns to I-84 EB and WB On-Ramps on Route 6/67 ◆ Inadequate acceleration length on I-84 EB ◆ Inadequate deceleration length on I-84 WB ◆ I-84 is expected to operate poorly in future (2025) in EB direction during P.M. Peak ◆ I-84 is expected to operate poorly in future (2025) in WB direction during A.M. Peak ◆ Alternate access to Main Street South via Frontage Road from WB On-Ramp to Bullet Hill Road 	<p style="text-align: center;">Short-Term</p> <ul style="list-style-type: none"> ➤ Provide additional lanes to improve traffic operations (TSM) ➤ Extend the truck climbing lane through the interchange ➤ Improve visibility of sign to drivers ➤ Provide adequate signage along Route 6/67 to alert drivers in advance of the I-84 EB and WB On-Ramps <p style="text-align: center;">Long-Term</p> <ul style="list-style-type: none"> ➤ Provide 900 ft. acceleration distance along I-84 in the EB direction ➤ Provide additional 400 ft. deceleration distance along I-84 in the WB direction ➤ Provide Additional General Purpose Lane along I-84 ➤ Provide Additional General Purpose Lane along I-84 <p style="text-align: center;">Additional Comments</p> <ul style="list-style-type: none"> ➤ The alternate access to Main Street South from the I-84 WB Off-Ramp does not provide relief in traffic operations at the Main Street/Route 6/67/Southbury Plaza intersection

The intersection of Main Street South and Route 6/67 at Southbury Plaza is proposed to be widened to provide an additional left turn lane in the northbound direction along Route 6/67. Due to this widening, Main Street South would need to be widened in the westbound direction to provide adequate width for left turning vehicles. Also, the northbound right turn

lane on Route 6/67 would be shifted east of its present location due to the additional left turn lane. Based on field observations, it appears feasible to provide the additional widening on the east side without impacting the parking lot in Southbury Plaza. The improvements at this intersection are illustrated in [Figure 5.5](#). The existing intersection is photographed in Figures 5.6 and 5.7.

Figure 5.6



View of the northbound approach on Main Street at the Main Street/Route 6/Southbury Plaza intersection

Figure 5.7



View of the Southbury Plaza driveway at the Main Street/Route 6/Southbury Plaza intersection

The extension of the truck climbing lane through the interchange area and improving highway signage will also be looked at as a short-term solution.

As a long-term solution, this interchange requires an additional general-purpose lane in each direction to accommodate future year (2025) traffic volumes. In addition, adequate acceleration and deceleration distances will be provided along I-84 in the eastbound and westbound directions during the freeway reconstruction phase of the project.

Interchange 16

This interchange primarily requires TSM improvements related to traffic operations and safety. Table 5.5 lists the deficiencies and the suggested improvements for Interchange 16

Table 5.5
Interchange 16 Deficiencies/ Needs and Improvements

Deficiencies/Needs	Improvements
<ul style="list-style-type: none"> ◆ Poor intersection operations at Old Waterbury Road and Route 188 ◆ Closely spaced intersections of Old Waterbury Rd./Route 188 and I-84 WB Ramp/Route 188 ◆ Inadequate acceleration length on I-84 WB ◆ I-84 directional sign missing on Old Waterbury Road ◆ Route indication sign is bent on I-84 WB Off-Ramp ◆ I-84 EB On-Ramp sign is leaning backward ◆ Inadequate acceleration length on I-84 EB and sub-standard radii on-ramp ◆ Inadequate deceleration length on I-84 EB and sub-standard radii off-ramp ◆ I-84 is expected to operate poorly in future (2025) in EB direction during P.M. Peak ◆ I-84 is expected to operate poorly in future (2025) in WB direction during A.M. Peak ◆ Truckers stop along the shoulders of the highway and ramps 	<p style="text-align: center;">Short-Term</p> <ul style="list-style-type: none"> ➤ Provide additional lanes to improve traffic operations at this intersection (TSM) ➤ Provide signal coordination and additional lanes to provide more storage and improve traffic operations (TSM) ➤ This deficiency will be addressed by DOT Safety Improvement Project No. 130-169 ➤ Install a new sign along Old Waterbury Road ➤ Install a new sign along I-84 WB Off-Ramp ➤ Straighten the I-84 EB On-Ramp sign <p style="text-align: center;">Long-Term</p> ➤ Provide 1500 ft. acceleration distance along I-84 WB ➤ Provide 600 ft. deceleration distance along I-84 in the EB direction ➤ Provide Additional General Purpose Lane along I-84 ➤ Provide Additional General Purpose Lane along I-84 ➤ Investigate the possibility of truck rest areas with ConnDOT and Municipalities

The recommendation for the intersection of Old Waterbury Road and Route 188 requires the provision of an exclusive right turn lane in the eastbound direction along Old Waterbury Road, an exclusive left turn lane in the northbound direction, and an additional through lane in the southbound direction along Route 188. The intersection of I-84 WB Ramp and Route 188 will

require additional left turn and through lanes in the northbound direction and an exclusive right turn lane in the southbound direction along Route 188 to accommodate future year traffic volume. The improvements at this intersection are illustrated in [Figure 5.8](#).

As a short-term solution, the two intersections should be widened as TSM improvements. In addition to the widening, the two signals should be coordinated to reduce queuing between intersections. Based on field observations, widening along Route 188 seems achievable east of the intersection due to the existence of wetlands west of the present alignment. The existing intersection is photographed in Figure 5.9.

Figure 5.9



View of the Route 188 Northbound approach at the Route 188/Old Waterbury Road intersection

Other short-term improvements include providing highway and roadway signage in the vicinity of the interchange.

As a long-term solution, I-84 in the vicinity of this interchange requires an additional general-purpose lane in each direction to accommodate future year (2025) traffic volumes. In addition, adequate acceleration and deceleration distances will be provided along I-84 in the eastbound and westbound directions during the freeway reconstruction phase of the project. Providing adequate acceleration and deceleration distances will improve the sub-standard radii at the I-84 Eastbound interchange. Also, the possibility of providing truck rest areas will be investigated by ConnDOT in coordination with the municipalities.

5.3 Arterial Signal Coordination

This technique could improve travel times on principal arterial streets along the entire study corridor. Through coordinated traffic signal timing, vehicles will maintain a uniform speed and

encounter as few red traffic signals as possible. The result is that motorists will experience fewer delays in getting to their destinations. In addition to the congestion between intersections, the possibility of queuing along the I-84 ramps is also reduced. Some of the locations identified for arterial signal coordination are locations that are presently under signal control while some may require a traffic signal in the future (2025) condition due to the increase in traffic volumes. These are as follows:

- Interchange 14 – The possibility of signal coordination exists along South Britain Road. The intersections of South Britain Road with I-84 Eastbound and I-84 Westbound Ramps may require traffic signals in the future (2025) condition with increase in traffic volumes. A coordinated signal system can be designed along South Britain Road including the intersections of South Main Street, I-84 Westbound Ramps, and I-84 Eastbound Ramps.
- Interchange 15 – The possibility of signal coordination exists along Routes 6 and 67. The intersections of Route 6/Route 67 with North Main Street/Old Waterbury Road, Main Street/Southford Road, I-84 Westbound Ramps, I-84 Eastbound Ramps, and Community House Road are in close proximity to provide a coordinated signal system.
- Interchange 16 – The intersections of Route 188 with Old Waterbury Road and I-84 Westbound Ramps is currently operating under the same traffic controller due to its close proximity. The intersection of Route 188 and the I-84 Eastbound ramps is presently unsignalized and may require a traffic signal in the future (2025) with increase in traffic volumes. The possibility of extending the signal system along Route 188 to include the I-84 Eastbound ramps exists to obtain better progression of traffic.
- Interchange 17 – The possibility of signal coordination exists along Route 63. The intersections of Route 63 with Route 64, I-84 Eastbound Ramps, Route 188, and Country Club Road can be designed as part of the coordinated signal system. As part of the alternatives package, the possibility of providing a connection to the I-84 Westbound Ramps to Route 63 would add an intersection to the coordinated system.

5.4 Interchange Reconstruction Modifications

The recommended improvements for Interchanges 17 and 18 require a greater level of complexity and cost than the previous interchange area improvements. This is largely due to the severity of transportation deficiencies as well as the physical constraints that are present along this urban section of I-84.

Interchange 17

The biggest traffic operational concern at this interchange is the intersection of Route 63 and Route 64. As a short-term solution, a Connector Road from Route 64 to Route 63 along existing rail ROW could provide relief to congestion at the intersection and also improve operations along Route 63 and Route 64. As traffic volumes in the corridor increase, the intersection will require additional widening to accommodate these traffic volumes and therefore widening of this intersection is a long-term solution. The deficiencies and proposed improvements at this

interchange are listed in Table 5.6. The improvements proposed at this intersection are illustrated in [Figure 5.10](#). The existing intersection is photographed in Figures 5.11 and 5.12.

Figure 5.11



View of the westbound approach on Route 64 at Route 63 and Route 64 intersection

Figure 5.12



View of Route 64 with limited sight distance and rock ledge on both sides of the roadway

Table 5.6
Interchange 17 Deficiencies/ Needs and Improvements

Deficiencies/Needs	Improvements
<ul style="list-style-type: none"> ◆ Poor intersection operations at Route 63 and Route 64 ◆ Poor intersection operations at Chase Parkway and I-84 Ramps ◆ Poor arterial operations along Route 63 ◆ No advance warning sign prior to the end of the truck climbing lane ◆ No Park and Ride Lot sign at Maggie McFly's ◆ Commuter parking lot at capacity ◆ Loose East auxiliary sign mounting on I-84 Route marker ◆ Directional sign missing on Route 64 for Chase Parkway ◆ A bent sign on the I-84 EB On-Ramp ◆ Inadequate acceleration length on I-84 WB On-Ramp ◆ Poor intersection operations at Route 63 and Route 64 ◆ Poor sight distance along Route 64 east of intersection ◆ Vehicle queue at Route 63/64 intersection extends east along Route 64 ◆ I-84 is expected to operate poorly in future (2025) during P.M. Peak ◆ I-84 is expected to operate poorly in future (2025) in WB direction during A.M. Peak 	<p style="text-align: center;">Short-Term</p> <ul style="list-style-type: none"> ➤ Build a Connector Road between Route 64 and Route 63 to provide relief in traffic operations ➤ Signalize the intersection with the addition of the Connector Road ➤ Provide Connector Road to relieve congestion along Route 63 ➤ Provide adequate signage to warn drivers of the end of climbing lane ➤ Provide Park and Ride Lot sign ➤ Expand Park and Ride Lot at this Interchange ➤ Fix the East auxiliary sign mounting on I-84 Route marker ➤ Install a directional sign on Route 64 for Chase Parkway ➤ Fix the bent sign on the I-84 EB On-Ramp <p style="text-align: center;">Long-Term</p> <ul style="list-style-type: none"> ➤ Provide 900 ft. acceleration distance along I-84 WB ➤ Widen the intersection and provide additional lanes to accommodate future traffic volumes ➤ Re-grade Route 64 to eliminate crest vertical curve ➤ Widen Route 64 (in conjunction with re-grade) to accommodate four lanes ➤ Provide Additional General Purpose Lane along I-84 ➤ Provide Additional General Purpose Lane along I-84 <p style="text-align: center;">Additional Comments</p> <ul style="list-style-type: none"> ➤ Alternative Concept A looked at providing a full interchange at Route 63, but turned out to be a high cost alternative with minimal benefit.
<ul style="list-style-type: none"> ◆ Split Interchange 	<ul style="list-style-type: none"> ➤ Alternative Concept A looked at providing a full interchange at Route 63, but turned out to be a high cost alternative with minimal benefit.

Other short-term improvements would include providing adequate highway and roadway signage at this interchange.

As identified earlier, a long-term improvement would be to widen the intersection of Route 63 and Route 64 to handle the increasing level of traffic. Route 64 is proposed to be widened to four lanes and re-graded to reduce the crest vertical curve that is contributing to poor sight distance approaching the intersection from the east. In addition, the provision of a general-purpose lane along I-84 through this interchange and increasing acceleration distances in the eastbound direction will be part of a freeway reconstruction phase at this location.

Interchange 18

Like Interchange 17, Interchange 18 presents operational and safety deficiencies while being constrained by the physical limits of the transportation infrastructure. While not all of the deficiencies can be addressed as part of this study, some improvement can be made to relieve the traffic pressure that is building in this area. Table 5.7 lists the deficiencies and proposed improvements for this interchange area.

Table 5.7
Interchange 18 Deficiencies/ Needs and Improvements

Deficiencies/Needs	Improvements
<ul style="list-style-type: none"> ◆ Poor intersection operations at I-84 WB Off-Ramp and W. Main Street ◆ Poor intersection operations at Chase Parkway and W. Main Street ◆ Poor intersection operations at Chase Parkway and Country Club Road ◆ Sub-standard ramp radius at the I-84 WB Off-Ramp ◆ Sign has insufficient advance warning at the W. Main St. and Highland Avenue split ◆ I-84 directional sign missing along W. Main Street ◆ I-84 directional sign missing along Country Club Road ◆ Part of sign marking deteriorated along Chase Parkway ◆ Directional sign unclear along Chase Parkway in the vicinity of the I-84 EB interchange ◆ I-84 route markers obscured by trees along Chase Parkway 	<p style="text-align: center;">Short-Term</p> <ul style="list-style-type: none"> ➤ Build a Connector Road between Highland Avenue and W. Main Street and improve operations at the intersection ➤ Widen the bridge over I-84 to provide an additional left turn lane on Chase Parkway ➤ Widen the bridge over I-84 to provide an additional left turn lane on Chase Parkway ➤ Provision of a Connector Road will eliminate this problem ➤ Provide advance warning sign for drivers at the split to W. Main St. and Highland Avenue ➤ Install a new directional sign at W. Main Street ➤ Install a new directional sign at Country Club Road ➤ Fix the sign along Chase Parkway ➤ Provide adequate signage along Chase Parkway to avoid driver confusion ➤ Remove trees to improve visibility

Table 5.7 - Continued
Interchange 18 Deficiencies/ Needs and Improvements

Deficiencies/Needs	Improvements
<ul style="list-style-type: none"> ◆ I-84 route markers obscured by fence along Highland Avenue ◆ Connectivity to the Route 8 Interchange ◆ Inadequate acceleration length in the eastbound direction along I-84 ◆ Inadequate deceleration lengths in the EB and WB directions along I-84 ◆ Poor ramp spacing between the Interchange 18 EB On-Ramp and Interchange 19 Off-Ramp to Route 8 ◆ Poor weaving operation between Route 8 Northbound Off-Ramp and Highland Avenue Off-Ramp ◆ I-84 is expected to operate poorly in future (2025) in EB and WB directions ◆ I-84 is expected to operate poorly in future (2025) in WB direction 	<ul style="list-style-type: none"> ➤ Move sign away from fence to improve visibility <p style="text-align: center;">Long-Term</p> <ul style="list-style-type: none"> ➤ Initiate Waterbury Access Study ➤ Provide 500 ft. acceleration distance along I-84 EB ➤ Provide 500 ft. deceleration distances along I-84 in the EB and WB directions ➤ Initiate Waterbury Access Study to address ramp spacing issues ➤ Initiate Waterbury Access Study to evaluate eliminating weaving problems ➤ Provide Additional General Purpose Lane along I-84 in both directions and tie into the Route 8 Interchange ➤ Provide Additional General Purpose Lane along I-84 in both directions and tie into the Route 8 Interchange <p style="text-align: center;">Additional Comments</p>
<ul style="list-style-type: none"> ◆ Proximity to Route 8 Interchange 	<ul style="list-style-type: none"> ➤ Due to its close proximity to the Route 8 Interchange, it is critical to study this interchange with the Route 8 Interchange in terms of highway operations

This interchange will require primarily traffic operations related improvements. The bridge over I-84 along Chase Parkway is proposed to be widened to provide six lanes to solve the operational problems between West Main Street and Country Club Road. This widening could be pursued as a short-term improvement and may require bridge reconstruction.

The sub-standard curve radius at the I-84 WB Exit Ramp to Highland Avenue/W. Main Street could also be pursued as a short-term improvement. The realigned ramp would intersect with a newly constructed Connector Road between W. Main Street and Highland Avenue. This proposed modification is illustrated in [Figure 5.13](#).

Other improvements at this interchange are related to highway and roadway signage and may be pursued as short-term improvements. The existing intersections are photographed in [Figures 5.14 and 5.15](#).

Figure 5.14



View of the Chase Parkway bridge over I-84

Figure 5.15



View of the Chase Parkway EB approach at Country Club Road and Chase Parkway intersection

The long-term improvement in the vicinity of this interchange would provide an additional general-purpose lane along I-84 in each direction and providing adequate acceleration and

deceleration distances in both directions during the freeway reconstruction phase. A key to the highway operations at this interchange is its connectivity to the Route 8 Interchange and will be investigated further when the Route 8 Interchange is evaluated in the Waterbury Access Study.

5.5 Directional and Wayfinding Signage Plan

As part of the existing conditions analysis, the signage in the corridor was inventoried and evaluated based on condition, location and understandability. A particular need was discovered in Downtown Waterbury concerning the lack of clear route signage to and from the interstate. This study recommends that a full signage evaluation and design take place before any action is taken, but a conceptual plan has been developed based on preliminary field reviews of the area. Essentially, this plan considers the placement of Interstate 84 directional signs at each critical juncture in the downtown street system. By installing these signs, driver confusion is minimized and the most direct routing to the freeway is marked out, preventing circuitous movements that can contribute to traffic congestion. The conceptual plan is illustrated in [Figure 5.16](#).

5.6 Waterbury Access Study

The I-84 and Route 8 Interchange is a key component to the highway operations in Waterbury and its vicinity. Since this interchange is of a very complex nature, it will require a detailed study by itself to understand its impact on local traffic, Downtown Waterbury, and the state as a whole. As indicated in Table 5.8, there are a number of deficiencies that relate to the layout of the ramp geometry and ramp spacing at this interchange. As stated earlier, both Route 8 and I-84 serve the downtown Waterbury area and its vicinity, and therefore traffic operations in the downtown and at intersections served by this interchange are. Another issue related to the operation of the roadway system is the directional signage to the downtown areas and key locations in the vicinity of the downtown. Further evaluation and design of a comprehensive signage program can potentially be a component of the future Waterbury Access Study.

Table 5.8
Interchanges 19-21 Deficiencies/ Needs and Improvements

Deficiencies/Needs	Improvements
<ul style="list-style-type: none"> ◆ I-84 directional signs missing in the vicinity of Mount St. Mary’s Hospital ◆ High accident location interchange ◆ A bottleneck in the EB direction on I-84 to two lanes ◆ Left hand On and Off Ramps create weaving problems ◆ Low travel speeds through the corridor ◆ Inadequate acceleration and deceleration distances along I-84 ◆ Insufficient ramp spacing between interchanges in the eastbound direction ◆ Poor signage to key downtown locations from I-84 like Mount St. Mary’s Hospital, Municipal Parking Garage, etc. ◆ I-84/Route 8 bridge structure has some deficiencies ◆ Number of intersections in the downtown Waterbury area operate poorly 	<p style="text-align: center;">Short-Term</p> <ul style="list-style-type: none"> ➤ Install new signs directing to I-84 in the vicinity of Mount St. Mary’s Hospital <p style="text-align: center;">Long-Term</p> <ul style="list-style-type: none"> ➤ Initiate Waterbury Access Study to eliminate left hand On and Off ramps to reduce accidents ➤ Initiate Waterbury Access Study to provide additional capacity ➤ Initiate Waterbury Access Study to eliminate left hand On and Off Ramps ➤ Initiate Waterbury Access Study to provide additional capacity ➤ Initiate Waterbury Access Study ➤ Initiate Waterbury Access Study to investigate the possibility of eliminating ramps ➤ Study highway and street signage in detail as part of the Waterbury Access Study specifically to address signage deficiencies in downtown Waterbury ➤ Study the I-84/Route 8 bridge structure in detail and carry rehabilitation work ➤ Study the downtown intersections in detail and provide mitigation solutions to relieve traffic congestion

5.7 Construction Cost Estimates

A preliminary engineering estimate was prepared for each of the current project proposals. In the case of the Additional Lane Alternative, the 13-mile proposal was broken into five (5) separate construction contracts of 2 to 3 miles each. All estimates were generated using a general format derived from the Department’s preliminary estimating procedure, dated April 2001. As described by the estimating procedure, major construction items such as earthwork, pavement, structures, drainage, curbing are quantified and costed out. The summation of costs associated with the major items are then multiplied by a series of factors (percentages) which add additional cost for lump sum items such as clearing and grubbing, mobilization, and minor items. The major items and lump sum costs are added together and then a final set of factors are applied which account for incidentals, contingencies, engineering design costs, utility involvement and rights-of-way impacts.