4

Future Transportation Conditions

The nature of this study requires forecasting travel demands and patterns to ensure that any recommended improvements have sustaining benefits to the traveling public. A 2030 planning horizon year was chosen for this study to ensure that proposed improvements provide long-term benefits for the Route 8 corridor and the region.

This chapter describes the future transportation conditions within the study area. Sections of this chapter present an overview of the land use assumptions incorporated into the traffic demand projections, the impacts of these demands on the infrastructure capacity and operations, and a summary of the future deficiencies/needs of the corridor.

Subsequent chapters will present the improvement alternatives, the final recommendations, and the plan of action for the corridor.

4.1 Forecasting Future Traffic Conditions – 2008 to 2030

Once existing traffic volumes have been quantified, predicting changes in future traffic demand is best accomplished through understanding and mapping anticipated changes in land uses and demographics, and inputting this information into a travel forecasting model. To accomplish this task, the Connecticut Department of Transportation statewide travel demand model was used to predict future traffic volumes on roadways within the study area for the design year 2030. The model is highly data-intensive and requires the following inputs to generate traffic volume projections:

- A schematic roadway network of major and secondary roads within the state. Each road's characteristics such as length, number of lanes, capacity, and travel speed are entered into the model. Changes to the roadway network, such as widening that will increase roadway capacity (planned roadway improvements) are also entered into the future year model.
- A detailed zone structure throughout the state with various load points for trips from each zone to access the roadway network. All towns within the state are

broken down into smaller zones. Trips originating in each zone are loaded onto the schematic roadway network.

- Future (2030) population and employment data for each zone.

The model uses the population and employment data from each zone to generate a *trip table* that represents the travel demand on a daily basis between all zones in the model. Travel demands, or trips, are then assigned to the roadway network, taking into account the roadway characteristics and travel times to determine the actual route a trip might take to travel from one zone to another. The statewide model is maintained by CTDOT staff and is routinely updated.

4.1.1 Study Area Land Use Update

As part of the initial public involvement plan, local outreach meetings were held with the Town of Seymour, Borough of Naugatuck and City of Waterbury to brief them on the study and obtain information on future land uses changes within the study area that might affect local access issues or needs. The Town/City officials identified the following planned or anticipated developments which may affect regional or localized interchange travel demands:

Seymour
The Route 67 & Route 42 Connector Road Planning and Preliminary Design Study (State project 124-163) is currently in progress within the study area. This project when completed is intended to relieve congestion on Route 8, provide additional capacity to interchanges serving Route 8, and create an economic development opportunity for Seymour, Beacon Falls, and the region. The planned roadway would provide direct access to several large underdeveloped parcels located on the west side of Route 8. Other potential developments identified locally include an elderly housing development on Derby Avenue and the New Haven Copper Cos. redevelopment on Main Street. The Town is also working on a Master Economic Development Plan with the Connecticut Department of Economic and Community Development (DECD).

Naugatuck
Borough of Naugatuck officials identified the Environmental Impact Evaluation (EIE) study completed for Renaissance Place, a mixed-use, transit-oriented development on approximately 60 acres of land along the Naugatuck River in downtown Naugatuck, for consideration as part of the Route 8 study. This proposed development is expected to enhance housing options, aesthetics, safety and neighborhood access, and spur economic activity in Naugatuck and the region.

Another important project in the area is the Naugatuck River Greenway Study. The purpose of this study is to determine the route of the Greenway through the Central Naugatuck Valley region. The Greenway is envisioned to include a multi-use trail

intended to provide for non-motorized transportation and access to recreational opportunities. The Greenway efforts need to be factored into the improvements that get considered, and ultimately recommended, as part of this Route 8 corridor study.

Waterbury

The City of Waterbury is currently considering changes in zoning that could affect the area surrounding Exits 29 and 30. These changes are generally focused on the underdeveloped industrial areas located to the east of the Route 8 corridor. Other planned/approved potential developments in this part of the Route 8 corridor include:

- Industrial area redevelopment to the east of Route 8 corridor in the vicinity of Exit 29;
- Approximately 500 approved residential units to be located west of the Route 8 corridor in the vicinity of Exit 30: consisting of 280 apartment units, 74 townhouses, 104 duplex units, and 31 detached townhomes;
- A new VFW Hall and big box retail development on a three-acre site at the intersection of Waterbury Road and Platts Mill Road that is expected to be developed in 2009;
- A currently stalled proposal for a food waste to energy incinerator development to be located along Washington Avenue; and,
- Renovations and reopening of the Duggan School located along Washington Avenue/Bank Street and serving the neighborhood.

Not in the immediate study area, but relevant, City officials also mentioned the proposal to relocate the Multi-modal Transportation Center in Waterbury.

Potential for Transit Oriented Development

As part of the *Waterbury and New Canaan Branch Lines Needs and Feasibility Study,* CTDOT and the corridor communities identified potential sites for transit oriented development along the Waterbury Branch within the Route 8 study area (see Transit Oriented Development Report, September 2009). These sites include:

Naugatuck

- The 60-acre Renaissance Place development site located just east of Naugatuck's central business district.

Beacon Falls

- Two small parcels (about 0.25 acre each) located adjacent to the Beacon Falls Station; and

- A 14.7-acre industrial-zoned parcel located on the opposite side of the track from the Beacon Falls platform.

Beacon Falls/Seymour

- The 260-acre Haynes Development site located between Route 67 and Route 42 and spanning the minimal boundaries of both Seymour and Beacon Falls. A preliminary master plan for the property that features a mix of uses has been developed.

Seymour

- Three small sites in downtown Seymour ranging in size from 0.25 to 0.45 acres; and
- A 1.1-acre parking lot in downtown Seymour along Wakeley Street.

None of the TOD sites identified are currently being progressed through the local approval/permitting processes.

The information obtained during the outreach meetings was used to better understand local operational needs that should be taken into consideration as part of the evaluation of improvement alternatives.

4.2 Future Traffic Demand – Year 2030

Based on forecasted traffic growth in the study area, daily and peak hour traffic volumes were developed by CTDOT for the mainline, the on and off-ramps, the weaving sections, and the key intersections under study. Morning and evening peak hour volumes were used to evaluate the operating conditions based on these forecasted traffic demands. These projected volumes account for the potential development in the region, as well as growth expected elsewhere in the state.

4.2.1 2030 Daily Volumes

Table 4-1 presents a comparison of the 2008 and 2030 daily traffic volumes for the Route 8 mainline segments. All segments are projected to experience increased traffic demand. Over the 22-year period presented, daily traffic volumes are projected to increase approximately 25 percent. This corresponds to an average annual traffic volume increase of about 1.1 percent per year), consistent with the state/regional annual average growth rates.

Table 4-1
Route 8 Mainline
Average Daily Traffic Volumes
(ADT) Comparison 2008 to 2030

Section	2008 ADT	2030 ADT	% change (2008 to 2030)	Average yearly % change (2008 to 2030)
Exit 22 to 23	55,000	68,700	25 %	1.1 %
Exit 23 to 24	48,200	60,100	25 %	1.1 %
Exit 24 to 25	55,500	69,200	25 %	1.1 %
Exit 25 to 26	53,100	66,200	25 %	1.1 %
Exit 26 to 27	51,300	63,900	25 %	1.1 %
Exit 27 to 28	60,100	75,000	25 %	1.1 %
Exit 28 to 29	60,500	75,500	25 %	1.1 %
Exit 29 to 30	53,700	67,000	25 %	1.1 %
Study Area Average			25 %	1.1 %

Source: CTDOT; 2008.

4.2.2 2030 Peak Hour Volumes

The 2030 peak hour mainline volumes are presented and compared to existing 2008 volumes in Table 4-2. Similar to the daily mainline volumes, peak hour volumes are projected to increase between 25 and 26 percent from 2008 – with an average of 1.1 to 1.2 percent per year. On average, the evening peak hour is projected to grow slightly more than the morning peak hour.

Table 4-2
Route 8 Mainline Peak Hour Volume Comparison -- 2008 to 2030

	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
Segment	2030 Volume (vph)[1]	% change (2008 to 2030)	Average yearly % change (2008 to 2030)	2030 Volume (vph)	% change (2008 to 2030)	Average yearly % change (2008 to 2030)
Exit 22 to 23	6400	25 %	1.1 %	7170	26%	1.2 %
Exit 23 to 24	5690	25 %	1.1 %	6380	26%	1.2 %
Exit 24 to 25	6510	25 %	1.1 %	7280	26%	1.2 %
Exit 25 to 26	6080	25 %	1.1 %	7060	26%	1.2 %
Exit 26 to 27	5950	25 %	1.1 %	6940	26%	1.2 %
Exit 27 to 28	6810	25 %	1.1 %	8000	25%	1.1 %
Exit 28 to 29	6570	25 %	1.1 %	7730	25%	1.1 %
Exit 29 to 30	5950	25 %	1.1 %	7110	25%	1.1 %
Study Area Average		25 %	1.1 %		26 %	1.2 %

Source: CTDOT; 2008.
1 vph – Vehicles per hour, including all vehicle types (e.g. passenger cars, trucks, motorcycles, etc.).

In the morning, the growth along Route 8 is expected to be 25 percent more traffic than the highway carried in 2008. In the evening, the growth along Route 8 is expected to be a 26 percent increase over existing demands.

More detailed characteristics of the morning and evening 2030 peak hour traffic volumes for mainline segments are presented in Table 4-3. As Table 4-3 indicates, under 2030 conditions, both morning and evening peak hour volumes generally represent between about 8 and 10 percent of the daily volumes. Morning peak hour volumes are about 8 to 15 percent lower than evening peak hour volumes. Similar to existing conditions, the directional flow of traffic is heavier in the southbound direction in the morning for all segments. On average, 64 percent of the morning peak hour traffic is southbound (toward I-95). In the evening, the opposite occurs and traffic is heavier in the northbound direction (57 percent of the total evening traffic, on average).

Table 4-3
Route 8 Mainline Peak Hour Volumes- 2030 Future Conditions

Section	Weekday Morning Peak Hour					Weekday Evening Peak Hour				
	2030 Volume (vph)[1]	% of Daily Traffic	Directional Split (vph) NB	SB	Directional Distribution	2030 Volume (vph)	% of Daily Traffic	Directional Split (vph) NB	SB	Directional Distribution
Exit 22 to 23	6400	9.3	1910	4490	70% SB	7170	10.4	4570	2600	64% NB
Exit 23 to 24	5690	9.5	1690	4000	70% SB	6,380	10.6	4080	2300	64% NB
Exit 24 to 25	6510	9.4	2080	4430	68% SB	7,280	10.5	4520	2760	62% NB
Exit 25 to 26	6080	9.2	2060	4020	66% SB	7,060	10.7	4150	2910	59% NB
Exit 26 to 27	5950	9.3	2280	3670	62% SB	6,940	10.9	4030	2910	58% NB
Exit 27 to 28	6810	9.1	2660	4150	61% SB	8,000	10.7	4390	3610	55% NB
Exit 28 to 29	6570	8.7	2920	3650	56% SB	7,730	10.2	4150	3580	54% NB
Exit 29 to 30	5950	8.9	2700	3250	55% SB	7,110	10.6	3810	3300	54% NB
Study Area Average		9.2			63% SB		10.6			59% NB

Source: CTDOT
1 vph – Vehicles per hour, including all vehicle types (e.g. passenger cars, trucks, motorcycles, etc.).

4.3 Future Traffic Operations – Year 2030

The procedures and criteria used to evaluate the future conditions were based on the methodology presented in the HCM similar to the analyses completed for the existing conditions. A detailed description of the level of service methodology and criteria is provided in Chapter 2. The following sections provide a summary of the future conditions for the study area.

4.3.1 Mainline Operations

The results of the freeway segment analysis under 2030 traffic conditions are summarized in Table 4-4 and illustrated in Figures 4-1 and 4-2. For each segment of Route 8 within the study area, Table 4-4 provides a brief description of the geometry (the numbers of travel lanes and the general terrain type), 2030 morning and evening peak hour traffic volumes, and the corresponding levels of service for each segment.

Table 4-4
Summary of Route 8 Freeway Segment Analysis – 2030 Future Conditions

Segment Description: From	To	Terrain	Number of Travel Lanes	Peak Hour	2030 Volumes (vph*)	Density (pc/mi/ln**)	Level of Service
Route 8 Northbound:							
Exit 22	Exit 23	Level	2	AM	1910	15.1	B
				PM	4570	>45	F
Exit 23	Exit 24	Level	2	AM	1690	13.4	B
				PM	4080	40.0	E
Exit 24	Exit 25	Rolling	2	AM	2080	16.7	B
				PM	4520	>45	F
Exit 25	Exit 26	Rolling	2	AM	2060	17.3	B
				PM	4150	>45	F
Exit 26	Exit 27	Rolling	2	AM	2280	19.6	C
				PM	4030	>45	F
Exit 27	Exit 28	Rolling	2	AM	2660	23.1	C
				PM	4390	>45	F
Exit 28	Exit 29	Rolling	2	AM	2920	25.8	C
				PM	4150	>45	F
Exit 29	Exit 30	Rolling	2 Lane Segment	AM	2700	22.3	C
				PM	3810	39.9	E
Exit 29	Exit 30	Rolling	3 Lane Segment	AM	2700	14.5	B
				PM	3810	20.7	C
Route 8 Southbound							
Exit 30	Exit 29	Rolling	3 Lane Segment	AM	3250	17.9	B
				PM	3300	18.2	C
Exit 30	Exit 29	Rolling	2 Lane Segment	AM	3250	29.2	D
				PM	3300	30.0	D
Exit 29	Exit 28	Rolling	2	AM	3000	26.0	C
				PM	3100	27.2	D
Exit 28	Exit 27	Rolling	2	AM	4150	>45	F
				PM	3610	35.1	E
Exit 27	Exit 26	Rolling	2	AM	3670	37.1	E
				PM	2910	25.7	C
Exit 26	Exit 25	Rolling	2	AM	4020	>45	F
				PM	2910	25.7	C
Exit 25	Exit 24	Rolling	2	AM	4430	>45	F
				PM	2760	24.1	C
Exit 24	Exit 23	Level	2	AM	4000	38.0	E
				PM	2300	17.7	B
Exit 23	Exit 22	Level	2	AM	4490	>45	F
				PM	2600	20.9	C

Source: VHB Inc. and CTDOT

Note: Boldface segments operate at LOS E or F during one or both peak periods.

* vph – Vehicles per hour, including all vehicle types (e.g. passenger cars, trucks, motorcycles, etc.).

** pc/mi/ln – Passenger cars per mile per lane

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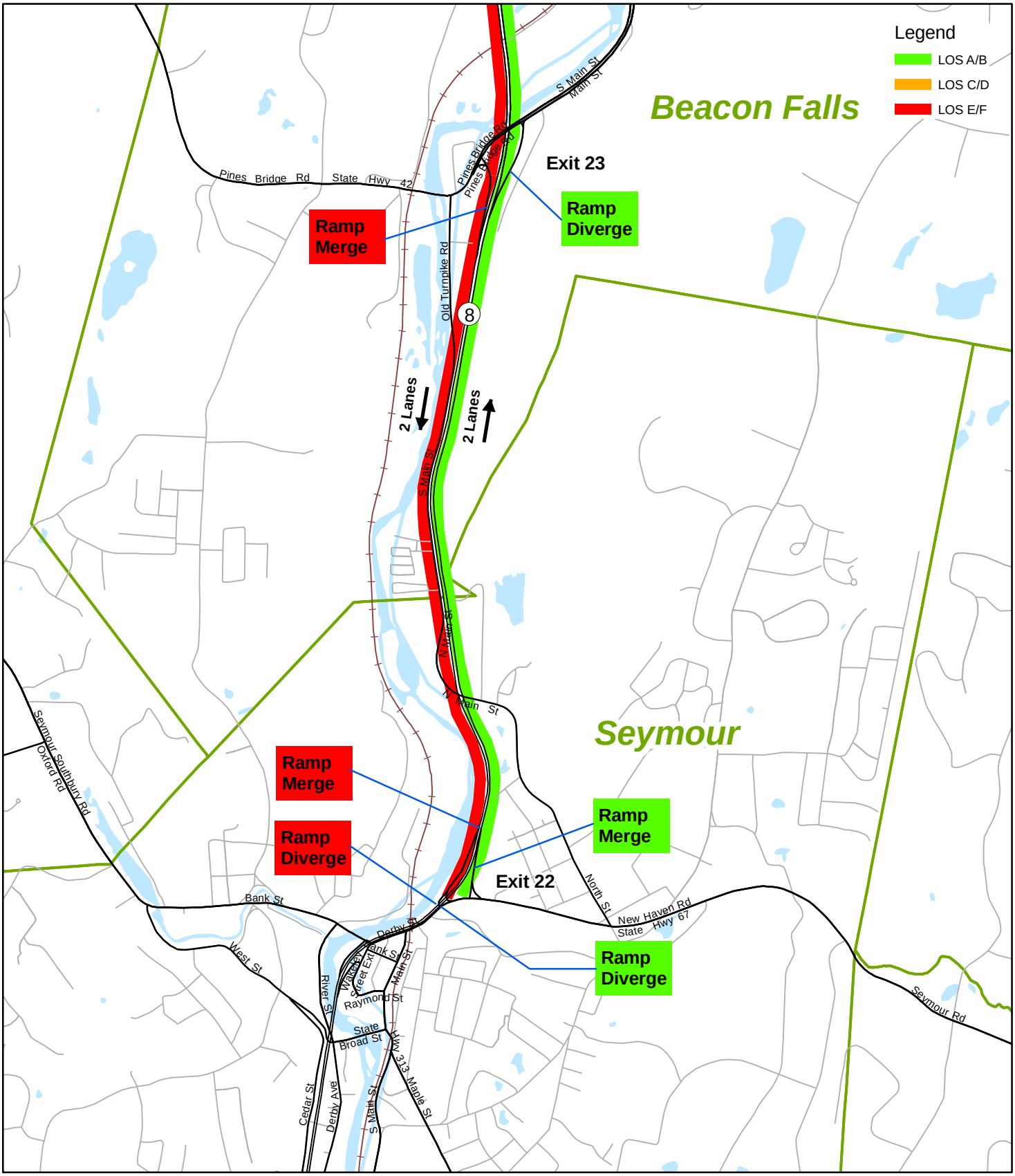

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Figure 4-1 (Sheet 1 of 3)
Route 8 Deficiencies/Needs Study
State Project 124-164
Mainline/Ramp/Weave Capacity Analysis
2030 Future Conditions - Morning Peak Hour

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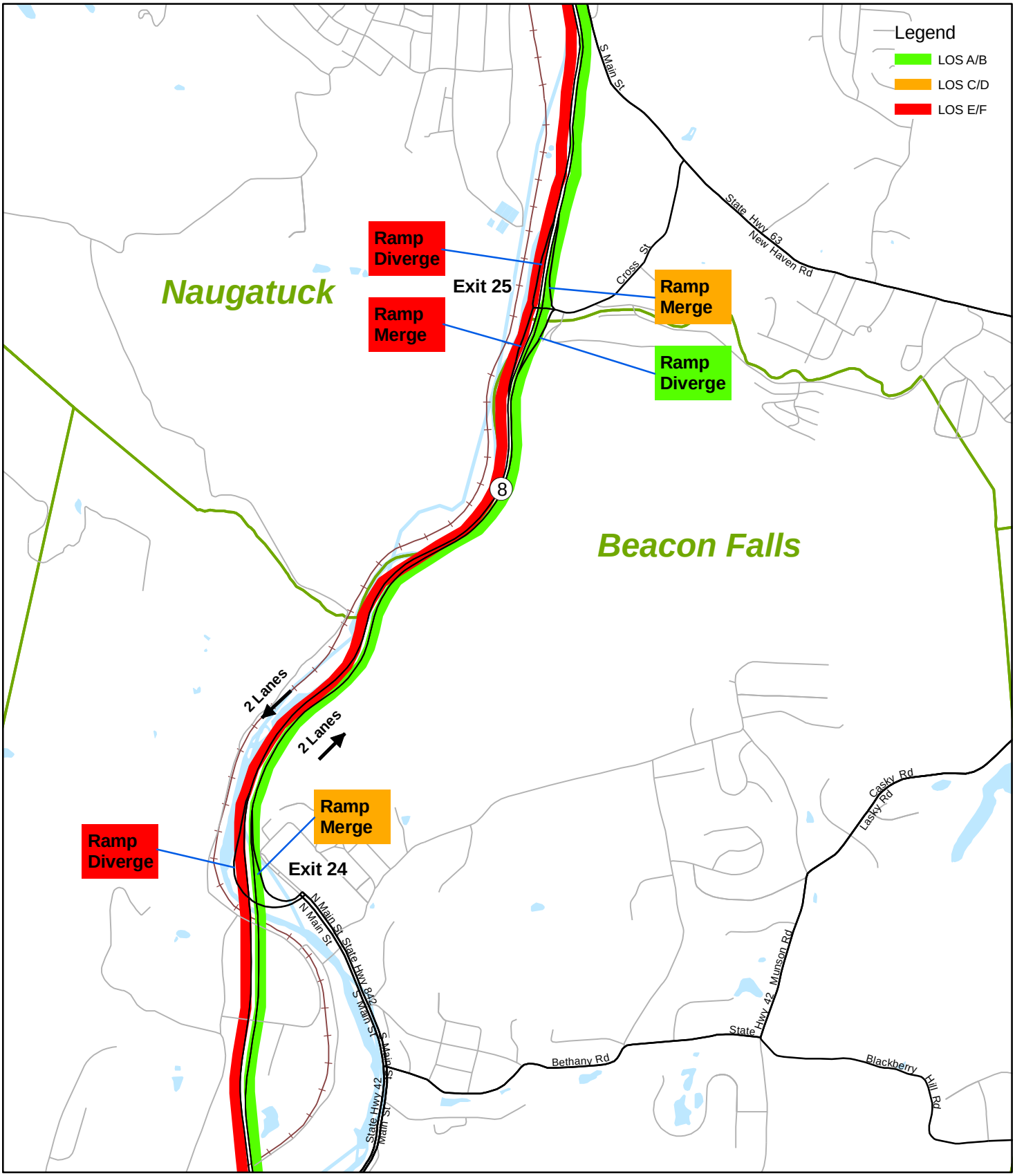

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Figure 4-1 (Sheet 2 of 3)
Route 8 Deficiencies/Needs Study
State Project 124-164
Mainline/Ramp/Weave Capacity Analysis
2030 Future Conditions - Morning Peak Hour

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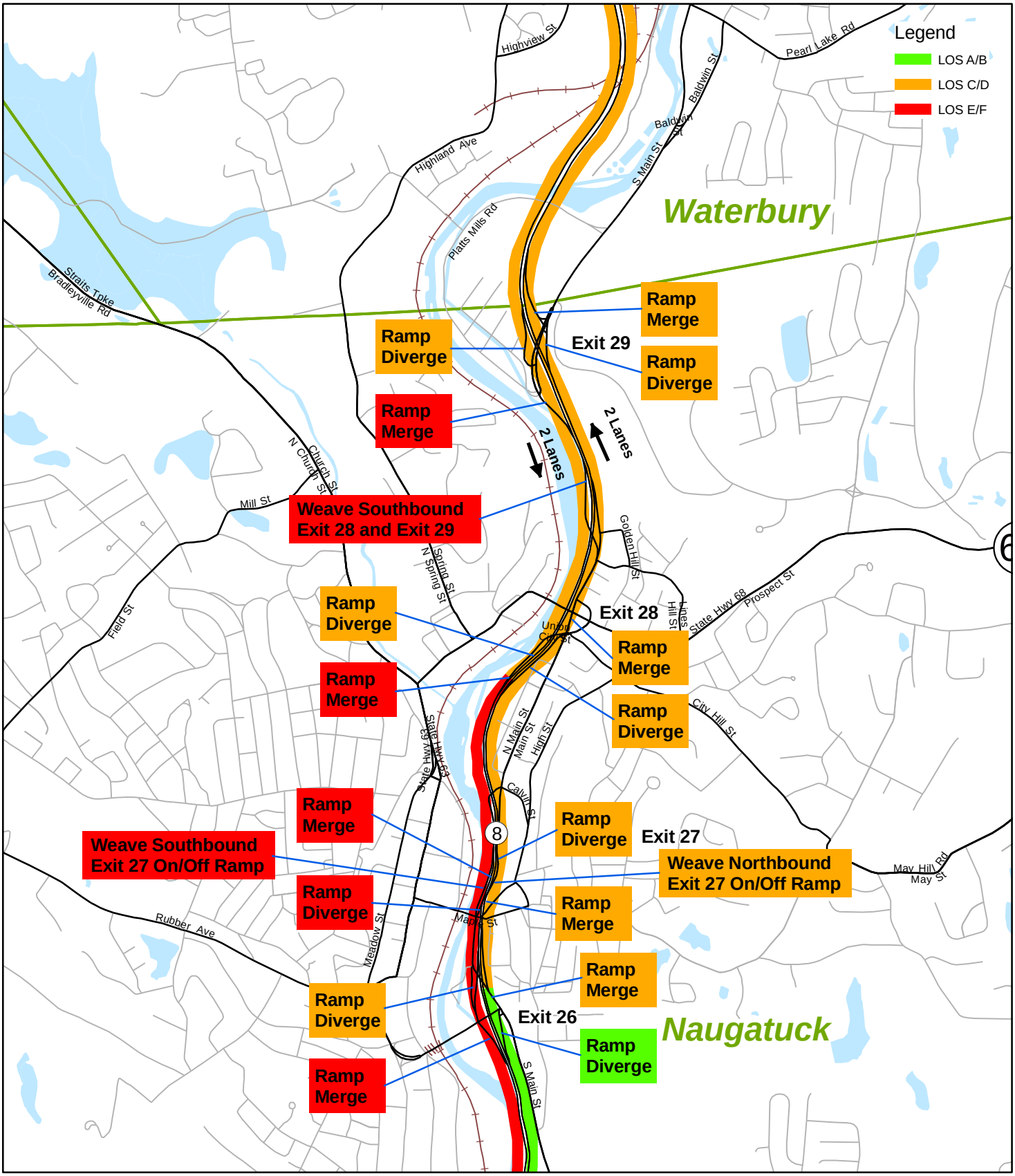

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Figure 4-1 (Sheet 3 of 3)
Route 8 Deficiencies/Needs Study
State Project 124-164
Mainline/Ramp/Weave Capacity Analysis
2030 Future Conditions - Morning Peak Hour

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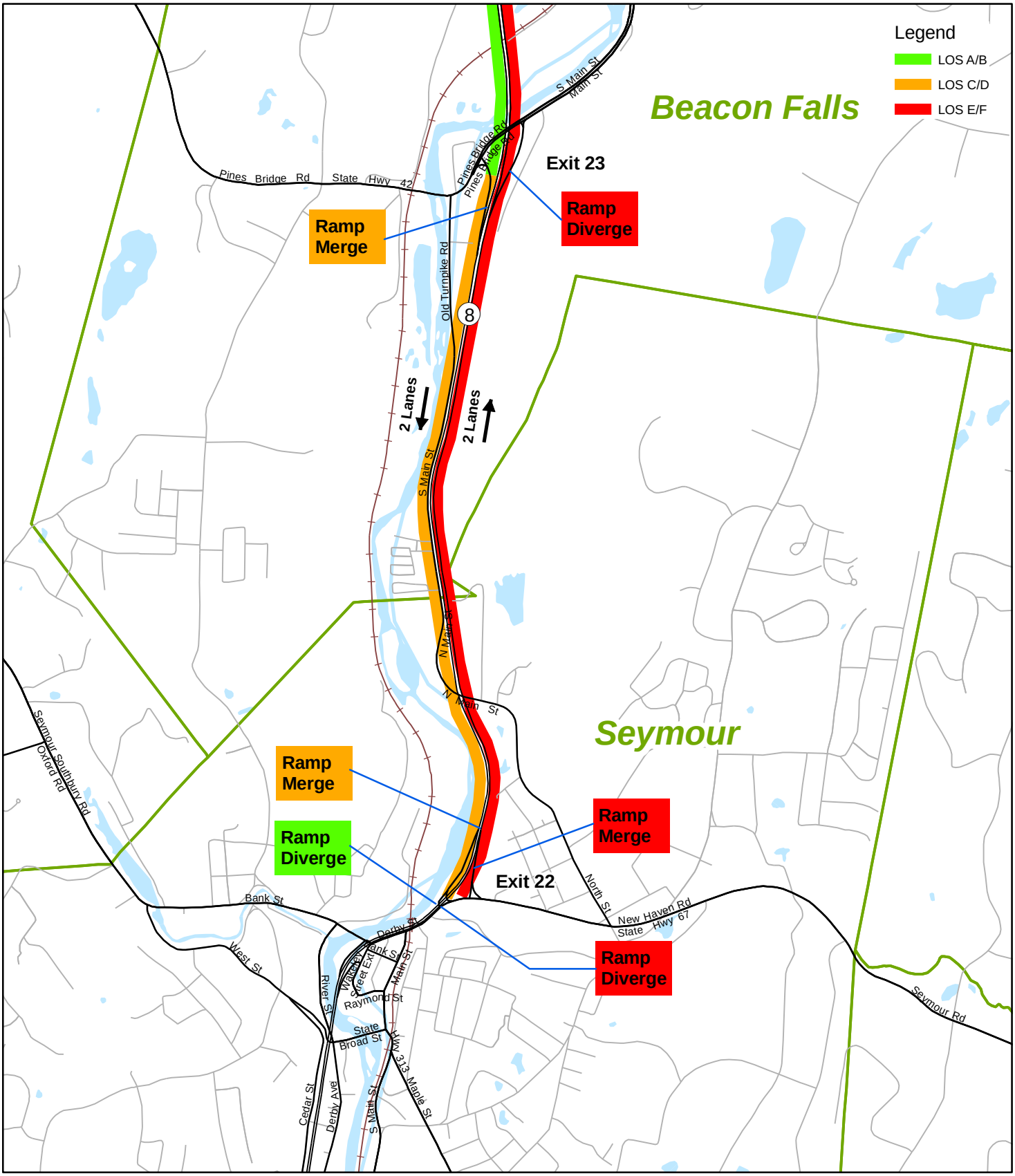

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Figure 4-2 (Sheet 1 of 3)
Route 8 Deficiencies/Needs Study
State Project 124-164
Mainline/Ramp/Weave Capacity Analysis
2030 Future Conditions - Evening Peak Hour

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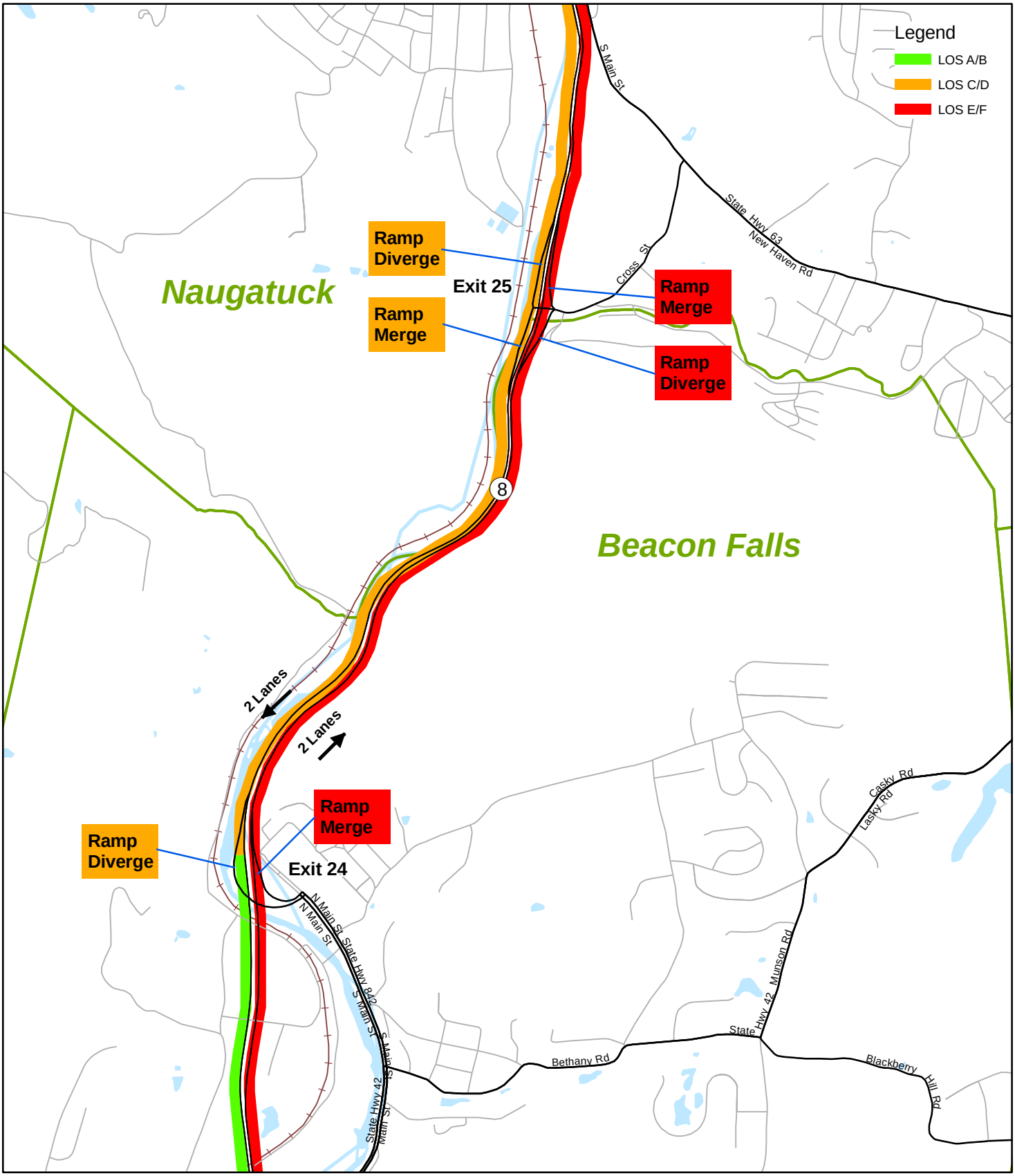

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Figure 4-2 (Sheet 2 of 3)
Route 8 Deficiencies/Needs Study
State Project 124-164
Mainline/Ramp/Weave Capacity Analysis
2030 Future Conditions - Evening Peak Hour

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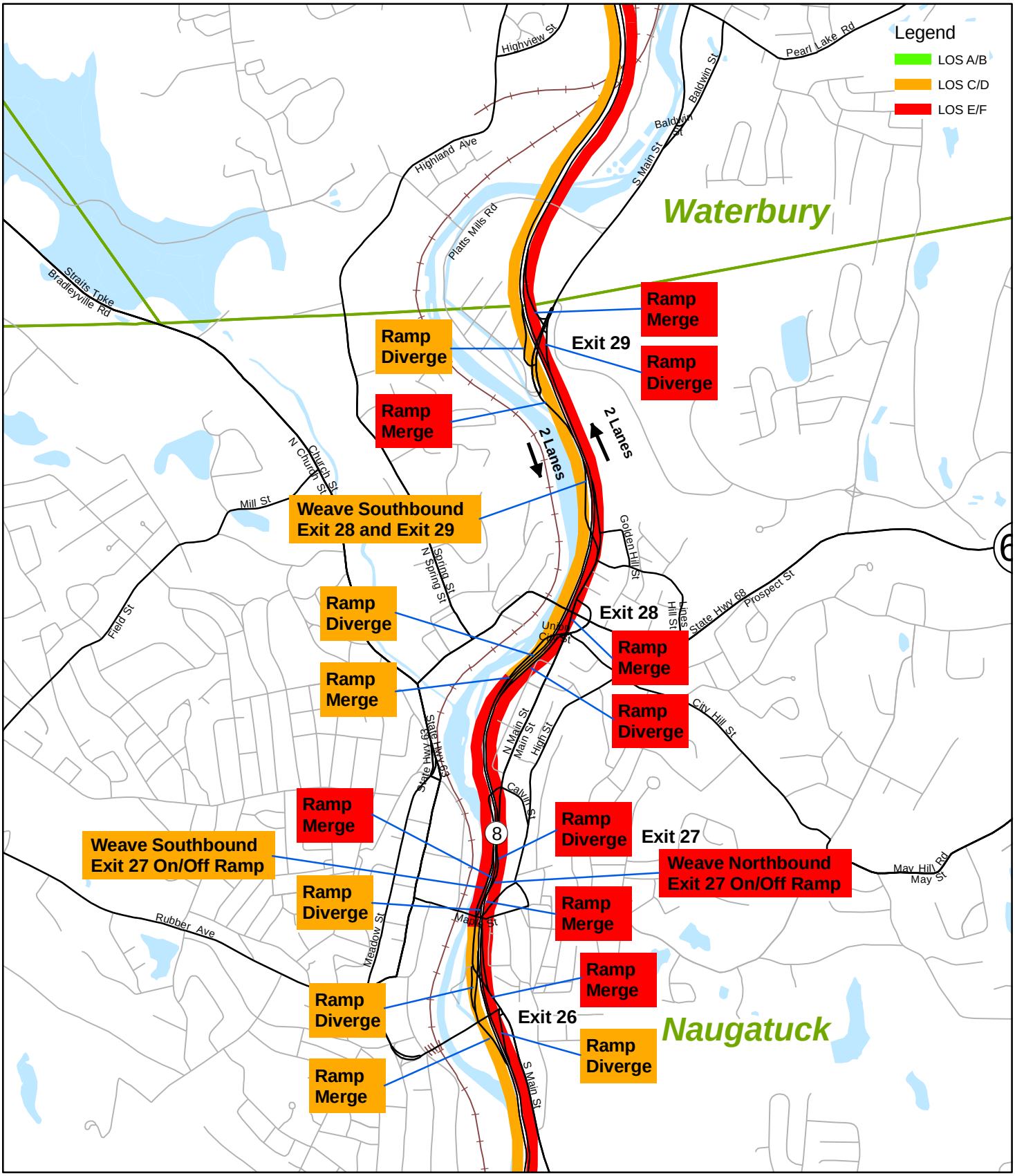

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Figure 4-2 (Sheet 3 of 3)
Route 8 Deficiencies/Needs Study
State Project 124-164
Mainline/Ramp/Weave Capacity Analysis
2030 Future Conditions - Evening Peak Hour

Northbound Freeway Segments

During the morning peak hour, the northbound direction of Route 8 is expected to operate at acceptable LOS C or better throughout the study area under the 2030 traffic conditions.

During the evening peak hour, 8 of the 9 study segments of Route 8 are expected to operate under congested conditions. The northbound direction represents the peak directional flow in the evening (from I-95 and Bridgeport). With the anticipated growth in corridor demands, six of the 8 segments are expected to operate at LOS F, with the segments between Exits 23 and 24 as well as Exits 29 and 30 (the 2 lane segment) projected to operate at LOS E. The 3 lane segment of Route 8 between Exits 29 and 30 is anticipated to operate at LOS C.

Southbound Freeway Segments

During the morning peak hour, 6 of the 9 southbound segments analyzed, between Exits 22 and 28, are expected to operate at LOS E or F under the 2030 traffic conditions. The southbound direction represents the peak directional flow in the morning (toward I-95 and Bridgeport). The segments between Exit 23 and Exit 24 as well as Exit 26 and 27 are expected to operate at LOS E and the remaining four segments between Exits 22 and 28 are expected to operate at a LOS F. The portion of Route 8 between Exits 28 and 30 are expected to operate at LOS D or better.

During the evening peak hour, the southbound segment between Exits 27 and 28 is expected to operate at LOS E. The remaining eight segments of the study area are expected to operate at LOS D or better.

4.3.2 Ramp Operations

Level of service for ramp operations is based on the density of the vehicles within the influence areas on the mainline created by the merging or diverging vehicles. The results of the freeway merge and diverge analyses under 2030 traffic conditions are summarized in Table 4-5 and also illustrated in Figures 4-1 and 4-2.

Northbound Ramps

During the morning peak hour, all 14 northbound ramp termini analyzed are expected to operate at LOS D or better; all northbound off-ramps operate at LOS C or better with the exception of Exit 27 and all northbound on-ramps operate at LOS C or better with the exception of Exits 27 and 28.

During the evening peak hour, 13 of the 14 northbound ramps analyzed are expected to operate under congested conditions at LOS E or F. The Exit 26 off-ramp is expected to operate at a LOS D. Again, the northbound direction is the peak flow direction in the evening for the Route 8 mainline, resulting in added ramp-related turbulence and delays.

Table 4-5
Route 8 Ramp Level-of-Service Analysis Summary - 2030 Future Conditions

	Northbound Ramps								Southbound Ramps							
	Weekday Morning Peak Hour				Weekday Evening Peak Hour					Weekday Morning Peak Hour				Weekday Evening Peak Hour			
	Ramp Volume (vph)[a]	Speed[b]	Density[c]	LOS[d]	Ramp Volume (vph)	Speed	Density	LOS		Ramp Volume (vph)	Speed	Density	LOS	Ramp Volume (vph)	Speed	Density	LOS
Exit 22 on-ramp	440	61	18.2	B	820	44	--	F	**Exit 22 on-ramp**	610	48	--	F	690	60	24.8	C
Exit 22 off-ramp	510	57	14.0	B	870	56	>35	E	**Exit 22 off-ramp**	760	56	>35	E	630	56	18.7	B
Exit 23 off-ramp	220	57	15.9	B	490	57	--	F	**Exit 23 on-ramp**	490	46	--	F	300	60	23.5	C
Exit 24 on-ramp	390	61	20.7	C	440	38	--	F	**Exit 24 off-ramp**	430	57	--	F	460	57	22.4	C
Exit 25 on-ramp	160	61	20.2	C	250	46	--	F	**Exit 25 on-ramp**	590	40	--	F	250	59	28.0	D
Exit 25 off-ramp	180	58	19.5	B	620	56	--	F	**Exit 25 off-ramp**	180	58	>35	E	400	57	22.2	C
Exit 26 on-ramp	510	61	21.7	C	580	52	>35	E	**Exit 26 on-ramp**	640	53	>35	E	430	60	26.3	C
Exit 26 off-ramp	290	57	16.8	B	700	56	33.1	D	Exit 26 off-ramp	290	57	33.5	D	430	57	24.8	C
Exit 27 on-ramp	440	59	29.0	D*	520	36	--	F*	**Exit 27 on-ramp**	100	43	--	F*	100	52	>35	E*
Exit 27 off-ramp	60	58	29.6	D*	160	58	--	F*	**Exit 27 off-ramp**	580	56	--	F*	800	56	31.8	D*
Exit 28 on-ramp	630	58	29.3	D	480	46	--	F	**Exit 28 on-ramp**	780	51	--	F	660	56	32.6	D
Exit 28 off-ramp	370	57	23.0	C	720	56	>35	E	Exit 28 off-ramp	280	57	32.0	D*	630	56	27.9	C*
Exit 29 on-ramp	230	59	27.7	C	300	51	>35	E	**Exit 29 on-ramp**	650	54	>35	E*	480	54	>35	E*
Exit 29 off-ramp	450	57	25.8	C	640	56	>35	E	Exit 29 off-ramp	250	57	29.3	D	200	57	30.3	D

Source: VHB Inc. and CTDOT

Note: Boldface ramps indicate locations operating at LOS E or F during one or both peak hours.

* Capacity of this segment of Route 8 is affected by the weaving condition that is present (see Table 4-6 and the related discussion).

-- Demand Exceeds Capacity

a vph – Vehicles per hour, including all vehicle types (e.g. passenger cars, trucks, motorcycles, etc.).

b Speed is expressed in miles per hour

c Density is expressed in passenger cars/hour/lane

d LOS -- Level of service

Southbound Ramps

During the morning peak hour, 11 of the 14 southbound ramps analyzed are expected to operate under congested conditions (LOS E or F). Exit 26, 28 and 29 off-ramps are expected to operate at a LOS D.

During the evening peak hour, only 2 of the 14 ramps analyzed are expected to operate under congested conditions (LOS E or F). Both the Exit 27 and Exit 29 on-ramps are expected to operate at LOS E.

4.3.3 Weaves

As detailed in Chapter 2, weaving areas occur when a merge area is closely followed by a diverge area, or when an on-ramp is closely followed by an off-ramp. The LOS criteria are based on vehicle speeds in the weaving section. There are three study area locations where weaving conditions are experienced on Route 8. These locations and the resulting LOS analyses are presented in Table 4-6, and shown graphically on Figures 4-1 and 4-2.

Table 4-6
Route 8 Weaving Sections Level of Service Analysis Summary
2030 Future Conditions

Weave Location	Number of Lane Changes for Weaving Traffic	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
		Density [a]	LOS [b]	Density	LOS
Route 8 NB Between Exit 27 On Ramp and Exit 27 Off Ramp	1	24.5	C	45.8	F
Route 8 SB Between Exit 27 On Ramp and Exit 27 Off Ramp	1	36.3	E	33.0	D
Route 8 SB Between Exits 28 and 29	1	36.1	E	35.3	D

a Speed is expressed in miles per hour.
b LOS – Level-of-Service.

In the morning peak hour, the weave sections on Route 8 southbound between the Exit 28 and Exit 29 as well as between the Exit 27 on and off ramps are expected to operate at LOS E. The weave on Route 8 northbound between the Exit 27 on and off ramps is expected to operate at a LOS C. In the evening, the southbound weave sections are expected to operate at LOS D while the Route 8 northbound weave between the Exit 27 on and off ramps will operate at LOS F.

4.3.4 Intersections

The results of the intersection analysis under 2030 traffic conditions are summarized in Table 4-7 for signalized intersections and Table 4-8 for unsignalized intersections. The intersection LOS results are also presented graphically in Figures 4-3 and 4-4. The tables and figures encompass the intersections that were evaluated for the existing morning and evening peak hour levels of service. The following paragraphs summarize the expected 2030 operating conditions.

Signalized Intersections

- Out of the 16 signalized intersections analyzed for 2030 traffic conditions, seven are expected to experience saturated conditions during at least one of the peak hours and two of the intersections will operate at a LOS E or F during both peak hours. An estimated five signalized intersections are projected to be significantly over capacity, with a volume-to-capacity (V/C) ratio in excess of 1.2 during at least one of the peak hours. Of the seven intersections reviewed where the Route 8 ramps intersect with the local streets, four are expected to operate under saturated conditions and two of these are projected to have V/C ratios over 1.2. When V/C ratios significantly exceed 1.0, the intersection cannot process the traffic demands placed upon it and will fail (LOS F) causing significant delays and/or long queues.

Unsignalized Intersections

- There are 17 unsignalized intersections within the study area including 13 that occur where Route 8 ramps intersect with local streets. Under 2030 traffic conditions, four of the 17 intersections under study are expected to have approaches that operate at a LOS E or F during one or both peak hours. In addition, three of the four intersections that are expected to have a failing approach are where the Route 8 ramps intersect the local street system including intersections at Exits 22 and 25.

Table 4-7
Signalized Intersection Level of Service Summary - 2030 Future Conditions

Signalized Intersections	Time Period	2030 Future Conditions LOS*	V/C**	Delay***
Exit 22 SB Off Ramp at Route 67	Morning Peak Hour	C	0.95	33.3
	Evening Peak Hour	F	1.21	>80
Route 67 at Exit 22 SB On Ramp	Morning Peak Hour	B	0.61	14.6
	Evening Peak Hour	C	0.85	22.9
Route 67 at Route 115	Morning Peak Hour	F	0.87	>80
	Evening Peak Hour	F	1.16	>80
Route 313 at Pearl Street	Morning Peak Hour	C	0.83	21.3
	Evening Peak Hour	B	0.71	17.8
Route 313 (Broad Street) at Route 115	Morning Peak Hour	B	0.58	15.1
	Evening Peak Hour	C	0.83	21.0
Route 313 at West Street	Morning Peak Hour	B	0.75	15.7
	Evening Peak Hour	F	1.39	>80
Exit 23 NB Off Ramp at Route 42	Morning Peak Hour	A	0.70	8.1
	Evening Peak Hour	A	0.53	8.8
Route 42 (South Main Street) at Route	Morning Peak Hour	B	0.47	19.6
42 (Bethany Road)	Evening Peak Hour	B	0.57	15.1
Route 63 at Cross Street	Morning Peak Hour	B	0.47	11.9
	Evening Peak Hour	B	0.80	19.4
Exit 26 NB Off Ramp at SR 709	Morning Peak Hour	D	0.92	38.4
	Evening Peak Hour	F	1.55	>80
Exit 26 SB Off Ramp at Route 63	Morning Peak Hour	B	0.47	10.2
	Evening Peak Hour	B	0.49	11.0
Exit 27 SB Off Ramp/NB On Ramp at	Morning Peak Hour	D	0.76	38.8
Maple Street	Evening Peak Hour	F	1.18	>80
Exit 28 NB Off/SB On Ramp at SR 710	Morning Peak Hour	C	0.89	27.6
	Evening Peak Hour	E	1.19	78.9
Route 68 at SR 723	Morning Peak Hour	F	1.33	>80
	Evening Peak Hour	F	2.23	>80
SR 847 at Platts Mill Road	Morning Peak Hour	A	0.29	7.7
	Evening Peak Hour	A	0.40	8.3
SR 847 at Sheridan Road	Morning Peak Hour	A	0.36	6.4
	Evening Peak Hour	A	0.37	7.3

Source: Vanasse Hangen Brustlin, Inc.
Note: Boldface intersections operate at LOS E or F during one or both peak hours
* Level of Service
** Volume to Capacity Ratio
*** Delay = Average control delay to all vehicles entering the intersection in seconds per vehicle.

Table 4-8
Unsignalized Intersection Level of Service Summary -- 2030 Future Conditions

Unsignalized Intersections	Time Period/ Approach	2030 Future Conditions Demand*	Delay**	LOS***
Exit 22 NB On Ramp at Route 67	Morning			
	-- Eastbound	1360	10.1	B
	Evening			
	-- Eastbound	1700	16.7	C
Route 115 at Route 313 (Maple Street)	Morning			
	-- Southbound	940	9.5	A
	-- Northwestbound	290	12.2	B
	Evening			
	-- Southbound	770	7.5	A
	-- Northwestbound	550	32.0	D
Exit 22 NB Off Ramp at Wakeley Street	Morning			
	-- Southbound	90	3.4	A
	-- Eastbound	510	20.1	A
	-- Westbound	40	9.5	A
	Evening			
	-- Southbound	110	3.5	A
	-- Eastbound	870	>50	F
	-- Westbound	50	11.3	B
Exit 22 SB Off-Ramp at Route 67	Morning			
	-- Eastbound	380	>50	F
	Evening			
	-- Eastbound	400	>50	F
Exit 23 SB On Ramp at Route 42	Morning			
	-- Southwestbound Left	350	9.1	A
	-- Southeastbound	0	0	A
	Evening			
	-- Southwestbound Left	200	9.4	A
	-- Southeastbound	0	0.0	A
South Main Street at Depot Street	Morning			
	-- Northbound	190	3.3	A
	-- Northeastbound	80	18.0	C
	Evening			
	-- Northbound	273	2.4	A
	-- Northeastbound	170	22.2	C
Exit 24 NB On/SB Off Ramp at North Main Street	Morning			
	-- Northwestbound	370	7.8	A
	-- Eastbound	430	16.0	C
	Evening			
	-- Northwestbound	427	7.9	A
	-- Eastbound	460	19.6	C

Table 4-8 (Cont'd.)
Unsignalized Intersection Level of Service Summary -- 2030 Future Conditions

Unsignalized Intersections	Time Period	2030 Future Conditions Demand*	Delay**	LOS***
Exit 25 SB Ramps at Cross Street	Morning			
	-- Southbound	180	10.8	B
	-- Westbound	590	21.3	C
	Evening			
	-- Southbound	400	13.3	B
	-- Westbound	250	11.0	B
Exit 25 NB Ramps at Cross Street	Morning			
	-- Northbound	180	10.3	B
	Evening			
	-- Northbound	620	50.0	F
SR 709 at Hotchkiss Street	Morning			
	-- Northbound	320	0.7	A
	-- Eastbound	40	12.2	B
	Evening			
	-- Northbound	540	1.3	A
	-- Eastbound	100	17.4	C
Exit 26 NB On Ramp at SR 709	Morning			
	-- Northwestbound	830	0.0	A
	-- Southbound	240	0.0	A
	Evening			
	-- Northwestbound	1120	0.0	A
	-- Southbound	320	0.0	A
Exit 27 Ramps at North Main Street	Morning			
	-- Eastbound	0	0.0	A
	-- Westbound	50	10.4	B
	Evening			
	-- Eastbound	10	13.1	B
	-- Westbound	50	11.7	B
SR 723 at SR 710	Morning			
	-- Northbound	220	12.4	B
	-- Southbound	420	20.1	C
	-- Westbound	480	19.0	C
	Evening			
	-- Northbound	210	12.5	B
	-- Southbound	760	>50	F
	-- Westbound	400	17.9	C
Exit 28 SB Off Ramp at SR 710	Morning			
	-- Northbound	630	28.8	D
	-- Southbound	90	9.5	A
	-- Southeastbound	280	11.5	B
	Evening			
	-- Northbound	460	23.8	C
	-- Southbound	90	10.8	B
	-- Southeastbound	630	31.8	D

Table 4-8 (Cont'd.)
Unsignalized Intersection Level of Service Summary -- 2030 Future Conditions

Unsignalized Intersections	Time Period	2030 Future Conditions Demand*	Delay**	LOS***
Exit 29 SB On Ramp at SR 847	Morning			
	-- Eastbound Left	250	16.4	C
	Evening			
	-- Eastbound Left	120	13.1	B
Exit 29 SB Off Ramp at SR 847	Morning			
	-- Eastbound	250	17.8	C
	Evening			
	-- Eastbound	200	16.3	C
Exit 29 NB On Ramp at SR 847	Morning			
	-- Northbound	250	2.0	A
	-- Northwestbound	60	17.8	C
	-- Northwestbound Right	390	13.6	B
	Evening			
	-- Northbound	190	2.5	A
	-- Northwestbound	90	17.8	C
	-- Northwestbound Right	550	15.6	C

Note: Boldface intersections operate at LOS E or F during one or both peak periods
* Demand in vehicles per hour.
** Delay = Average stopped delay in seconds per vehicle.
*** Level of Service.

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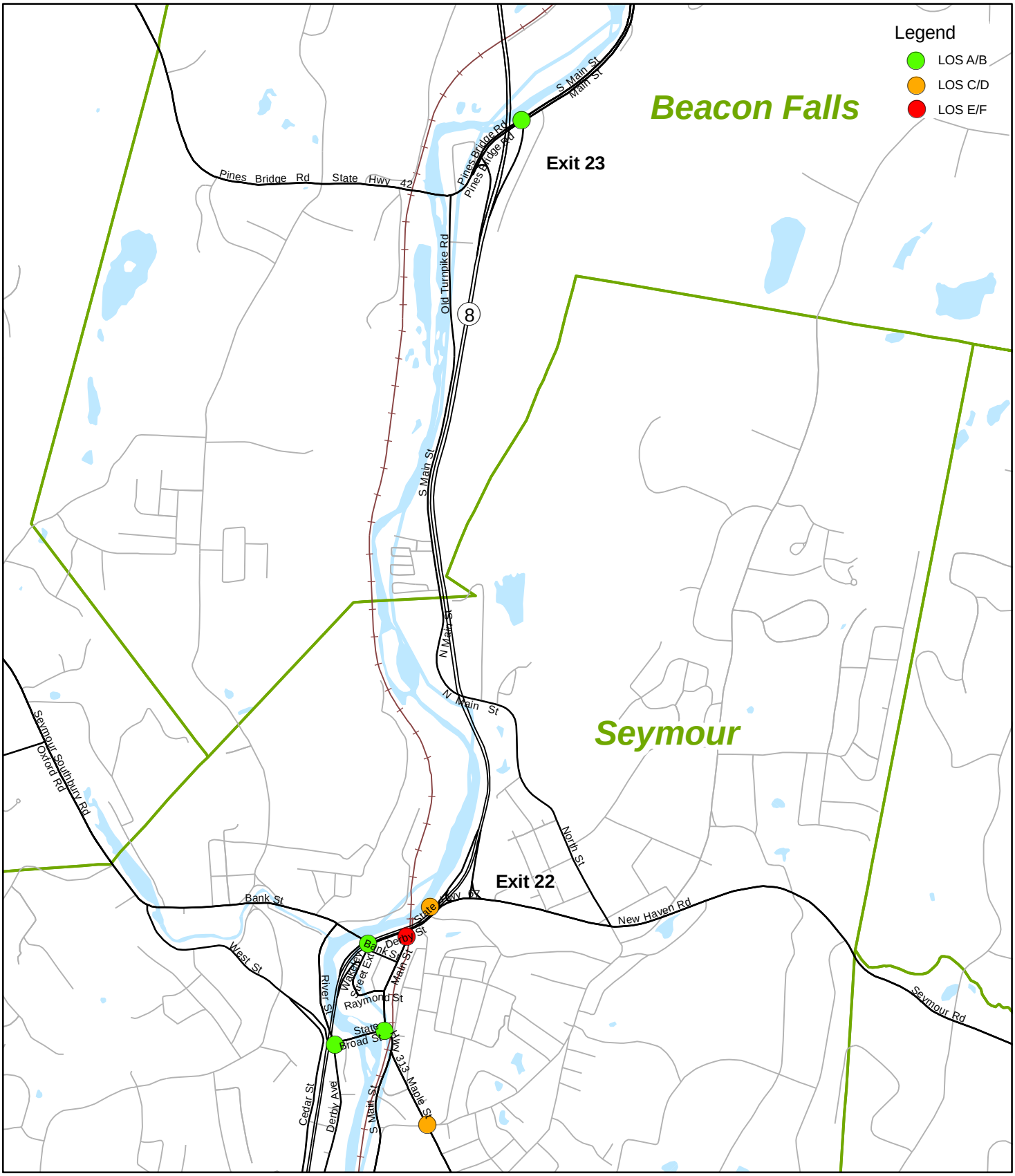

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Figure 4-3 (Sheet 1 of 3)
Route 8 Deficiencies/Needs Study
State Project 124-164
2030 Signalized Intersection Capacity Analysis
Morning Peak Hour

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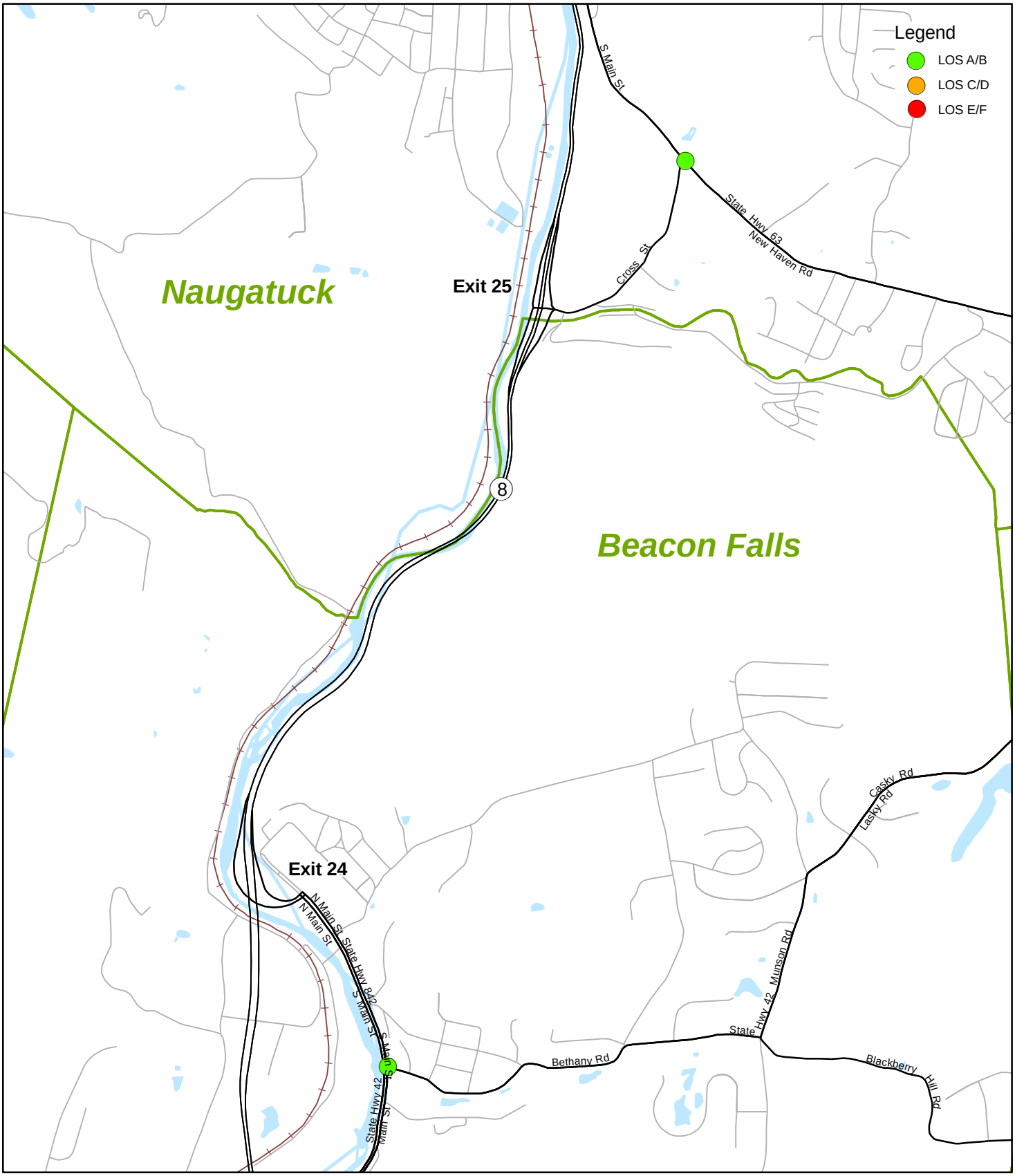

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Figure 4-3 (Sheet 2 of 3)
Route 8 Deficiencies/Needs Study
State Project 124-164
2030 Signalized Intersection Capacity Analysis
Morning Peak Hour

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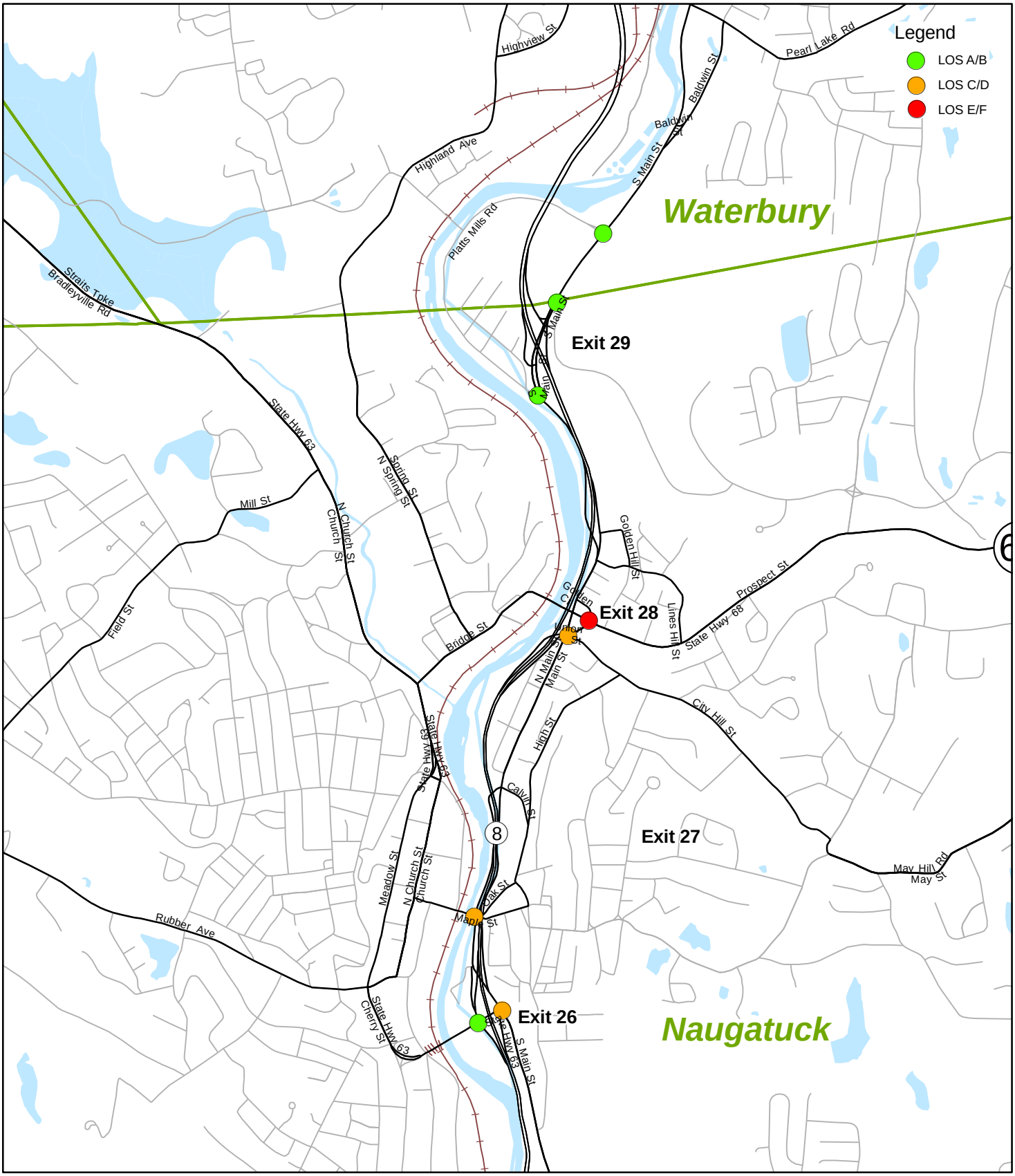

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Figure 4-3 (Sheet 3 of 3)
Route 8 Deficiencies/Needs Study
State Project 124-164
2030 Signalized Intersection Capacity Analysis
Morning Peak Hour

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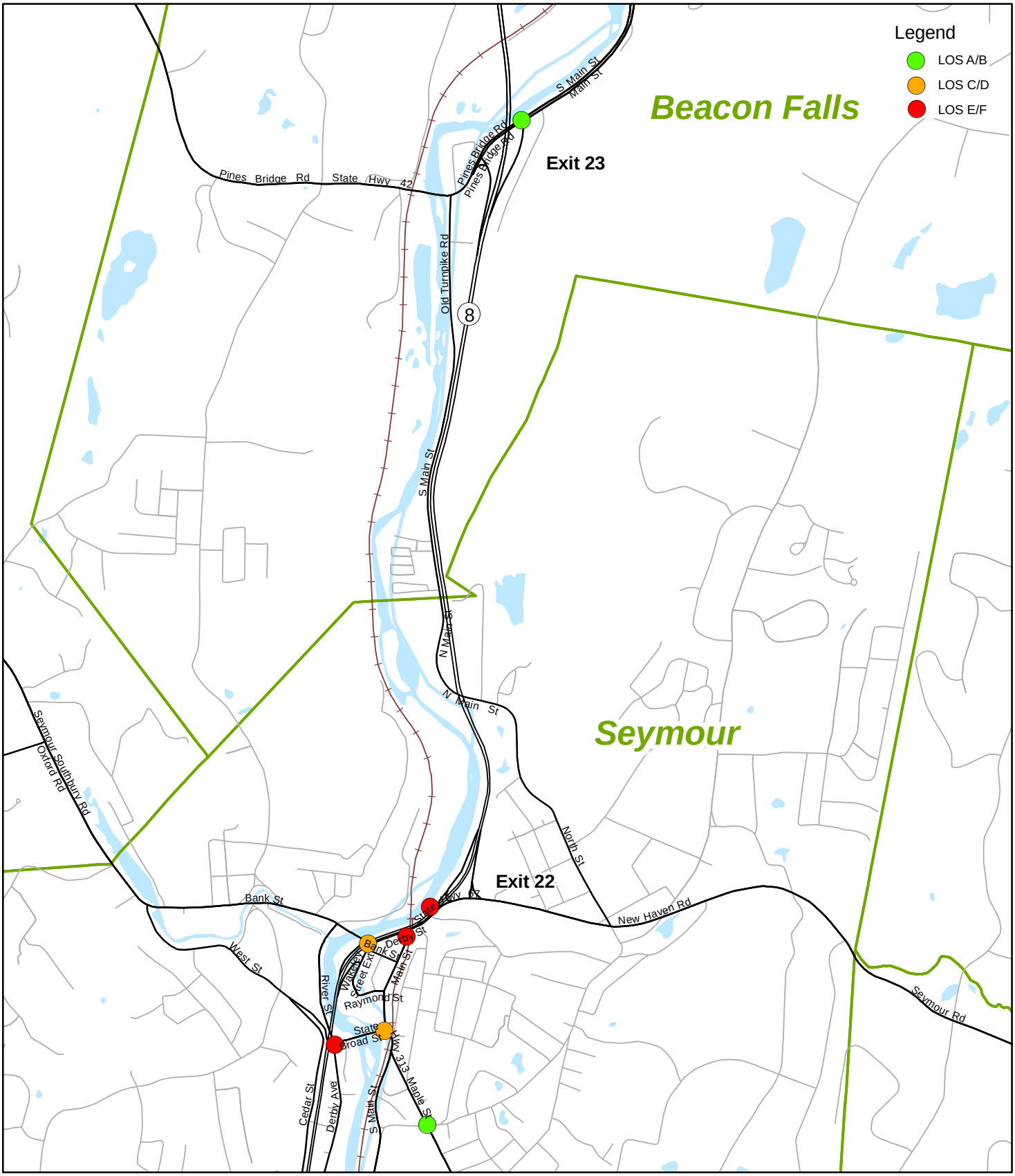

Vanasse Hangen Brustlin, Inc.

Figure 4-4 (Sheet 1 of 3)
Route 8 Deficiencies/Needs Study
State Project 124-164
2030 Signalized Intersection Capacity Analysis
Evening Peak Hour

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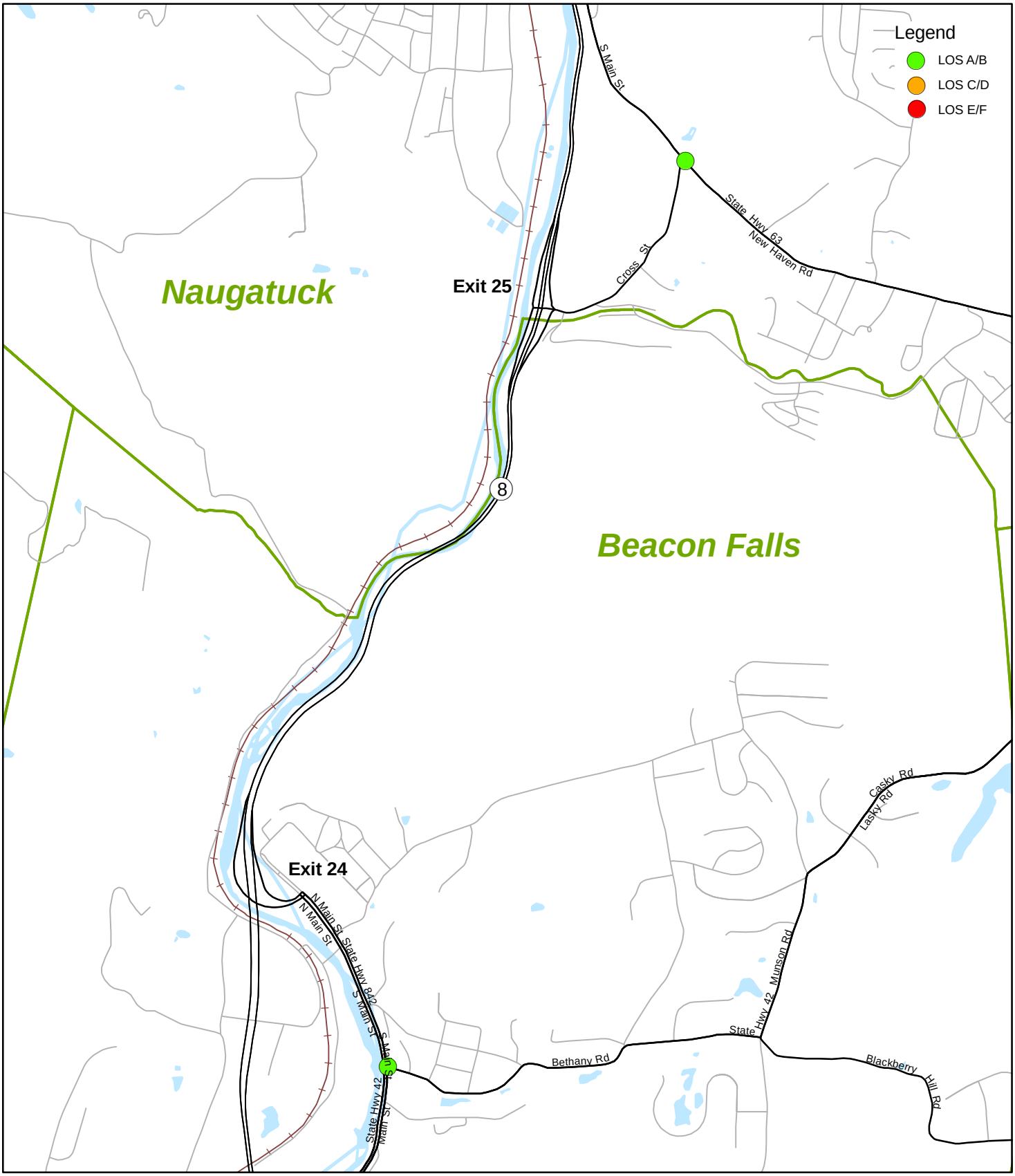

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Vanasse Hangen Brustlin, Inc.

Figure 4-4 (Sheet 2 of 3)
Route 8 Deficiencies/Needs Study
State Project 124-164
2030 Signalized Intersection Capacity Analysis
Evening Peak Hour

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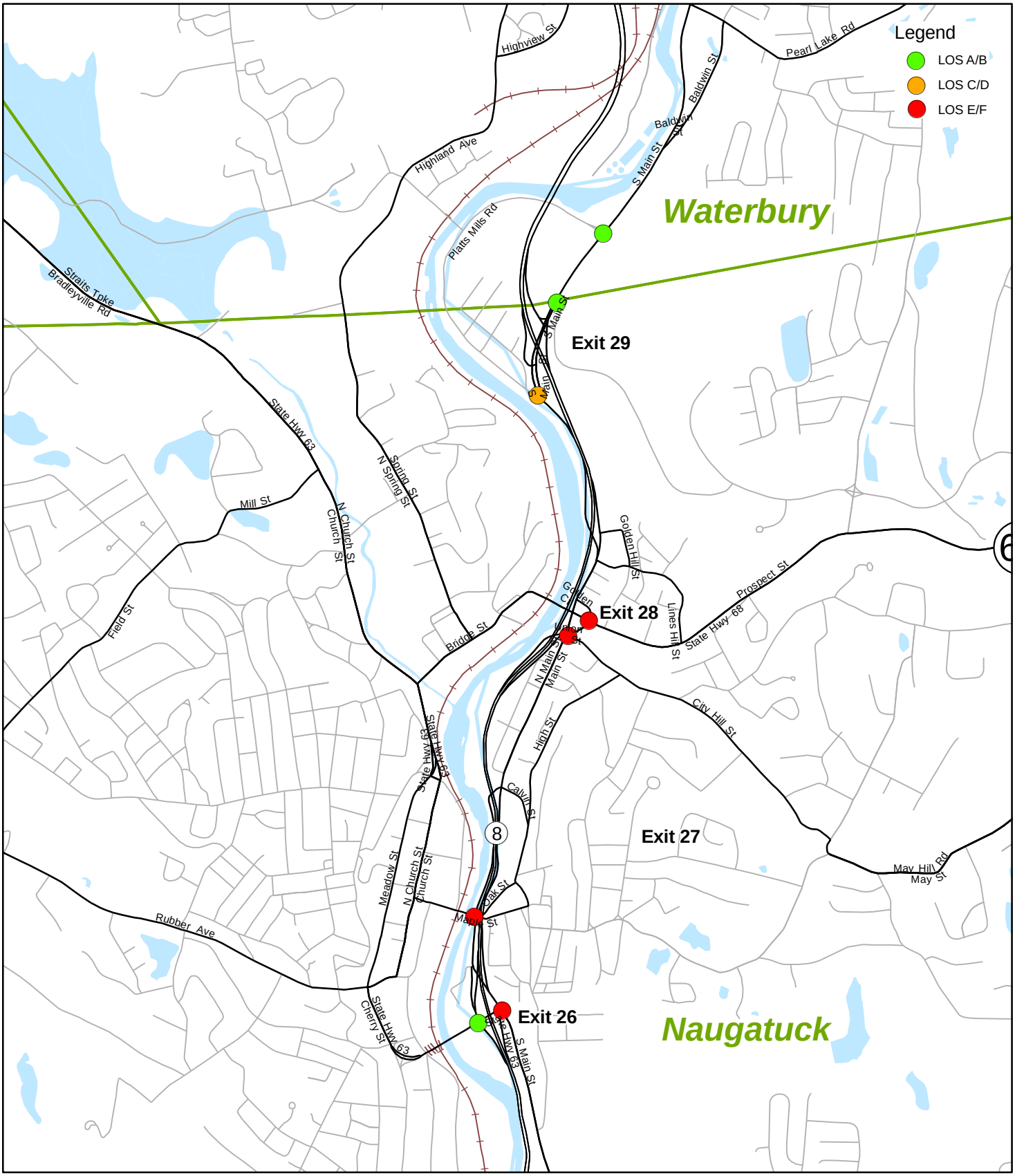

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Figure 4-4 (Sheet 3 of 3)
Route 8 Deficiencies/Needs Study
State Project 124-164
2030 Signalized Intersection Capacity Analysis
Evening Peak Hour

4.3.5 Comparison of Existing and Future Conditions

The projected 2030 analyses of the Route 8 corridor and study area present a degradation from the existing operations, as detailed in the previous sections. Table 4-9 and the following paragraphs provide a comparison of existing and projected traffic conditions within the Route 8 corridor.

Mainline

The expected 2030 operating conditions along most of the northbound Route 8 mainline will remain acceptable during the morning peak hour. During the evening peak hour, however, the number of congested segments is expected to increase from none under existing conditions to eight under future conditions.

In the southbound direction, during the morning peak hour, the number of congested segments is expected to rise from none under existing conditions to six under future conditions. During the evening peak hour, there is an increase to one congested segment from existing to future conditions.

Table 4-9
Route 8 Study Area -- Comparison of Existing and Future Study Area Traffic Conditions 2008 to 2030

Locations	Total Locations Reviewed	Summary of Deficient Locations (LOS E or F)			
		Morning Peak Hour		Evening Peak Hour	
		2008	2030	2008	2030
Mainline					
Northbound	9	0	0	0	8
Southbound	9	0	6	0	1
Ramps					
Northbound	14	0	0	2	13
Southbound	14	2	11	0	2
Weaves	3	0	2	0	1
Signalized Intersections	16	0	2	3	7
Unsignalized Intersections	17	0	1	1	4

Ramps

During the morning peak hour, all northbound ramp termini analyzed are expected to operate at LOS D or better under 2030 conditions. Under existing conditions, all 14 ramps operate at LOS C or better.

During the evening peak hour, 13 of 14 northbound ramp termini analyzed are expected to operate under congested conditions at LOS E or F under 2030 conditions. Under existing conditions, 2 of the 14 ramps operate at LOS E or F.

During the morning peak hour, 11 of the 14 southbound ramp termini analyzed are expected to operate under congested conditions (LOS E or F) under 2030 conditions – an increase of 9 ramps from the existing conditions.

During the evening peak hour, 2 southbound ramp termini analyzed are expected to operate under congested conditions (LOS E or F) while none operate under congested conditions during the existing condition.

Weaves

Under 2030 conditions, all weaving sections are expected to operate at LOS E or F during at least one of the peak periods. Under existing conditions, all weaves operate at LOS D or better.

Intersections

Under 2030 conditions, the operating LOS of most intersections (signalized and unsignalized) is expected to deteriorate from existing conditions due to increased volumes. The number of signalized intersections with LOS E or F during at least one of the peak hours is expected to increase from 3 under existing conditions to 9 under 2030 conditions. Similarly, the unsignalized intersections with an approach operating at LOS E or F during at least one peak hour is expected to increase from 1 to 4 between existing and 2030 conditions. At all intersections where there will be volume increases, longer delays and higher volume to capacity (v/c) ratios are expected.

5

Deficiencies and Needs Summary

This chapter summarizes the existing and future transportation deficiencies and needs within the Route 8 study area, as defined through the analysis of existing and future conditions in Chapters 2 and 4, respectively.

5.1 Existing Conditions (Year 2008)

In 2008, average daily traffic volumes along mainline Route 8 range from 48,200 vehicles per day (vpd) between Exits 23 and 24 t6o 60,500 vpd between Exits 28 and 29. Traffic on Route 8 is heavier in the southbound direction 9towards Bridgeport and I-95) during the morning commute and in the northbound direction during the evening commute (towards Waterbury and I-84). Evening demand exceeds morning demand by about 14 percent, on average. Heavy vehicles comprise 5 to 7 percent of the total peak period traffic demands.

The evaluation of existing traffic conditions provides an overview of the physical and operational characteristics for the Route 8 freeway mainline, ramps, and weaving movements. Additionally, a number of signalized and unsignalized intersections directly and indirectly impacting operations along Route 8 were reviewed as part of this study. The analyses have shown that there are specific locations where traffic conditions were reviewed as part of this study do not meet current geometric or operational guidelines, exclusive of any future traffic volume growth in the study area.

5.1.1 Geometric Assessment

The area of study consists of an approximately 11 mile stretch of expressway mainline containing nine interchanges with a total of 28 ramps. For the mainline, each of the geometrics evaluated were considered to be compliant only if they met current CTDOT and AASHTO standards for a design speed of 60 mph.

In the vicinity of Exit 22, it was found that several horizontal curves only meet a 50 mph design standard, and the same was found for a horizontal curve near Exit 26. Left shoulders were noted to be below the standard width at Exit 22 and between Exits 26 and 28. The right shoulder, while generally compliant with current standards, was found to be sub-standard on several bridge structures near Exits 22, 26, and 28 and

additionally at Exit 27 along an existing weave lane. At the southbound off-ramps for Exits 22 and 29, decision sight distance was noted to be a problem where horizontal or vertical curvature was present near the nose of the ramps.

Separately, several interchange ramps were found to be non-compliant with regards to deceleration and acceleration distances. Acceleration lanes on the southbound on-ramps at Exits 25 and 26 do not meet current standards for length. The deceleration lanes of off-ramps on Exits 22, 23, 25, 26, and 28 NB and Exit 26 SB have insufficient length as well. The auxiliary/weave lanes at Exit 27 both northbound and southbound do not provide adequate distance for merging with mainline traffic. Lastly, queue lengths on Exits 22 and 26 NB are excessive and interfere with the required stopping distance on these ramps.

5.1.2 Structural Evaluation

The study area contains a large number of bridges of varying structure type, physical condition, and geometric configuration. With regard to their physical state, the bridges are in satisfactory condition. However, to maintain their structural adequacy to the year 2030, it is likely that these bridges will require periodic maintenance and rehabilitative work. In addition, a number of the bridges are operationally deficient when compared to current AASHTO and CTDOT standards. More than half have traffic safety features not meeting current requirements, and a quarter of the structures provide inadequate vertical or horizontal clearance over intersecting travel ways.

5.1.3 Traffic Operations

This study analyzed traffic operations on segments of Route 8, on and off-ramps, weaving sections, and key intersections in the study area. Level of Service (LOS) is used as the qualitative measurement denoting the different operating conditions that occur under various traffic volume loading. Similar to a report card, LOS designations are letter based, ranging from A to F, with LOS A representing the best operating condition under relatively free flowing traffic conditions and LOS F representing the worst operating condition, or locations that are at or approaching capacity.

Mainline

There are nine mainline segments, in each direction, studied from Seymour to Waterbury. In the morning peak hour, four southbound segments are approaching capacity, operating at a LOS D, while all northbound segments operate at LOS C or better. In the evening peak hour, seven northbound segments are approaching capacity, operating at a LOS D, while all southbound segments operate at LOS D or better.

Ramps

A total of 28 ramps were analyzed – 14 in the northbound direction and 14 in the southbound direction. In the morning peak hour, two southbound ramps operate at LOS E. All northbound ramps operate at LOS C or better in the morning. In the evening, two northbound ramps operate at LOS E. All southbound ramps operate at LOS D or better in the evening.

Weaves

Three segments with intense weaving maneuvers were analyzed –between Exits 28 and 29 (southbound) and the Exit 27 on and off ramps (in both directions). In the morning, all weaving sections operate at a LOS C or better. In the evening, all weaving sections operate at LOS D or better.

Intersections

A total of 33 intersections were evaluated. These locations were at the base of ramps, or on key roadways in the vicinity of the Route 8 corridor. Of these, 16 signalized and 17 unsignalized intersections were analyzed. For the signalized locations, three operate at LOS E or F during one or both peak hours. One of these locations occurs where Route 8 ramps intersect the local street system. For unsignalized intersections, one intersection where Route 8 ramps intersect the local street system has at least one approach that operates at LOS F during one or both peak periods.

5.1.4 Safety

Safety data for Route 8 for the most recent three-year period available indicates that there are twelve segments along Route 8 within the project limits which are exhibiting fairly high accident frequencies. These include:

- Exit 22 Interchange Area;
- Route 8 between Exits 22 and 23;
- Interchange at Exit 24;
- Route 8 between Exits 24 and 25;
- Interchanges at Exits 25, 26, 28 and 29;
- Route 8 between Exits 29 and 30; and,
- Northern interchange of Exit 30.

The most common type of accident for most of these locations, as well as the entire Route 8 corridor, was "Fixed Object" accidents.

There are also three local intersection locations in the study area that experience accidents with some frequency, including: Route 67 (North Main Street) at the Route 115 (Main Street) in Seymour; Route 68 (Prospect Street) at S.R. 723 (Union Street) and Naugatuck Court in Naugatuck; and S.R. 847 (South Main Street) at Platts Mill Road in Waterbury. The most common type of accident for these locations was "Rear End" collisions.

5.2 Future Conditions – Year 2030

The following section provides a summary of traffic demand projections for the year 2030, and the future deficiencies and needs identified in the study area.

5.2.1 Traffic Demand

From 2008 to 2030, daily and peak hour traffic volumes on Route 8 are expected to increase by an average of 25 percent – about 1.1 percent per year. Although the magnitude of traffic demand is expected to increase from 2008 to 2030, the patterns exhibited by Year 2030 demand are unchanged from 2008. Peak hour volumes generally represent between 8 and 11 percent of the daily volumes. The morning peak hour demand is about 14 percent lower than the evening peak hour. Traffic flow is more heavily oriented toward I-95 and Bridgeport (southbound) in the morning and from I-95 and Bridgeport (northbound) in the evening.

5.2.2 Traffic Operations

A comparison of Figures 2-3 through 2-6 (existing conditions) to Figures 4-1 through 4-4 (future conditions) graphically illustrates how the projected 2030 scenario worsens in comparison to existing operations. Operational problems identified in the existing conditions are exacerbated in the future condition analyses.

Table 5-1 compares the existing levels-of-service (LOS) presently experienced on the freeway segments of Route 8 to those that would be experienced under year 2030 traffic conditions. Presently during the morning and evening peak periods, there are no freeway segments operating at or near capacity (LOS E or F). In the future, LOS E or F operations are projected during one or both peak periods for: 14 of the 18 mainline segments; for 24 of the 28 ramp merge/diverge areas; for all three weave areas; for seven of the 16 signalized intersections; and for four of the 17 unsignalized intersections.

Table 5-1
Comparative Levels of Service for Freeway Segments
(Existing vs. 2030 Conditions)

	Northbound					Southbound				
	Existing		Future		LOS	Existing		Future		LOS
Segment	Density*	LOS	Density	LOS	Change	Density	LOS	Density	LOS	Change
Exit 22 to Exit 23										
AM	12.2	B	15.1	B	–	14.3	B	17.9	B	–
PM	31.6	D	>45	F	D-F	14.6	B	18.2	C	B-C
Exit 23 to Exit 24										
AM	10.8	A	13.4	B	A-B	21.7	C	29.2	D	C-D
PM	26.7	D	40.0	E	D-E	22.2	C	30.0	D	C-D
Exit 24 to Exit 25										
AM	13.4	B	16.7	B	–	25.1	C	26.0	C	–
PM	34.7	D	>45	F	D-F	24.5	C	27.2	D	C-D
Exit 25 to Exit 26										
AM	13.9	B	17.3	B	–	29.9	D	>45	F	D-F
PM	30.0	D	>45	F	D-F	24.2	C	35.1	E	C-E
Exit 26 to Exit 27										
AM	15.8	B	19.6	C	B-C	25.9	C	37.1	E	C-E
PM	29.1	D	>45	F	D-F	20.1	C	25.7	C	–
Exit 27 to Exit 28										
AM	18.4	C	23.1	C	–	29.3	D	>45	F	D-F
PM	33.6	D	>45	F	D-F	20.1	C	25.7	C	–
Exit 28 to Exit 29										
AM	20.1	C	25.8	C	–	34.5	D	>45	F	D-F
PM	30.6	D	>45	F	D-F	19.0	C	24.1	C	–
Exit 29 to Exit 30 (2 Lane Portion)										
AM	17.3	B	22.3	C	B-C	25.7	C	38.0	E	C-E
PM	25.9	C	39.9	E	C-E	14.2	B	17.7	B	–
Exit 29 to Exit 30 (3 Lane Portion)										
AM	11.5	B	14.5	B	–	31.3	D	>45	F	D-F
PM	16.3	B	20.7	C	B-C	16.7	B	20.9	C	B-C

* Density is expressed in passenger cars/hour/lane

Table 5-1 shows that all 9 segments of Route 8 experience degradation in level of service during one or both peaks from the existing condition to the Year 2030 future condition. Fifteen peak period operations degrade from an acceptable LOS D or better to an unacceptable LOS E or F condition by 2030.

5.3 Summary of Deficiencies

Table 5-2 presents an overall summary of the deficiencies/needs determined through the technical analyses of the transportation system in the study area. These findings, and the public input provided through the study's outreach efforts, provided the basis for determining where future corridor improvements are warranted as further discussed in Chapters 6 and 7 of this report.

Table 5-2
Route 8 Interchanges 22 through 30 Summary of Deficiencies/Needs

Location	Existing Deficiencies			Future Operations	Notes:
	Safety	Geometry	Operations		
Interchange 22 – Mainline					
NB/SB segment from Exits 22 and 23 (including Bridge Nos. 2074 and 4382)	■			■	Fixed Object Accidents
Exit 22 NB off-ramp to Exit 22 NB on-ramp (including Bridge No. 0588)	■	■			Fixed Object Accidents, Geometric – Shoulder Width, Cross Slope, Minimum Radius
Exit 22 NB on-ramp to Exit 23 NB off-ramp		■			Geometric – Cross Slope, Roadside Clear Zone
Exit 22 SB off-ramp to Exit 22 SB on-ramp (including Bridge No. 0587)	■	■			Fixed Object Accidents, Geometric – Shoulder Width, Cross Slope, Minimum Radious
Exit 23 SB on-ramp to Exit 22 SB off-ramp (including Bridge Nos. 2074 and 4382)		■			Geometric – Cross Slope, Decision Sight Distance, Roadside Clear Zone
Interchange 22 – Ramps					
NB off-ramp (including Bridge No. 0587)	■	■		■	Fixed Object Accidents, Geometric – Decel Lane
NB on-ramp				■	
SB off-ramp				■	
SB on-ramp (including Bridge Nos. 0587 and 0588)	■			■	Fixed Object Accidents
Local Intersections – Seymour					
Route 67 at Route 115	■		■	■	Rear-end Accidents
NB off-ramp at Wakeley Street			■	■	
Signalized SB off-ramp at Route 67				■	
Unsignalized SB off-ramp at Route 67				■	
SR 728 at Route 313/West Street				■	
Interchange 23 – Mainline					
NB/SB segments between Exits 23 and 24 (including Bridge Nos. 4383, 4384, 4385, 4386, and 4387)				■	
Exit 23 NB off-ramp to Exit 24 NB on-ramp		■			Geometric – Cross Slope
Exit 24 SB off-ramp to Exit 23 SB on-ramp		■			Geometric – Cross Slope
Interchange 23 – Ramps					
NB off-ramp		■		■	Geometric – Decel Lane
SB on-ramp				■	
Interchange 24 – Mainline					
NB/SB segments between Exits 24 and 25				■	
Exit 24 NB off-ramp to Exit 25 NB off-ramp	■	■			Fixed Object Accidents; Geometric – Cross Slope
Exit 25 SB on-ramp to Exit 24 SB off-ramp	■	■			Fixed Object Accidents; Geometric – Cross Slope
SB at interchange	■				Fixed Object Accidents
Interchange 24 – Ramps					
NB on-ramp				■	
SB off-ramp				■	
Interchange 25 – Mainline					
NB/SB segment between Exits 25 and 26 (including Bridge Nos. 4388 and 4389)	■	■		■	Fixed Object Accidents; Geometric – Cross Slope
Exit 25 NB off-ramp to Exit 25 NB on-ramp	■	■			Fixed Object Accidents; Geometric – Cross Slope
Exit 25 SB off-ramp to Exit 25 SB on-ramp	■	■			Fixed Object Accidents; Geometric – Cross Slope
Interchange 25 – Ramps					
NB on-ramp (including Bridge Nos. 4388 and 4389)				■	
NB off-ramp (including Bridge Nos. 4388 and 4389)		■		■	Geometric – Decel Lane
SB off-ramp (including Bridge Nos. 4388 and 4389)				■	
SB on-ramp (including Bridge Nos. 4388 and 4389)		■	■	■	Geometric – Accel Lane
Local Intersections – Naugatuck					
NB off-ramp at Cross Street				■	
Route 63 at Cross Street	■				Rear-end Accidents
Interchange 26 – Mainline					
NB/SB segment between Exits 26 and 27 (including Bridge Nos. 590 and 591)		■		■	Geometric – Shoulder Width, Cross Slope, Minimum Radius
Exit 26 NB off-ramp to 26 NB on-ramp (including Bridge Nos. 590 and 591)	■	■			Fixed Object Accidents, Geometric – Shoulder Width, Cross Slope
Exit 26 SB off-ramp to 26 SB on-ramp (including Bridge Nos. 590 and 591)	■	■			Fixed Object Accidents, Geometric – Cross Slope

Table 5-2
Route 8 Interchanges 22 through 30 Summary of Deficiencies/Needs

Location	Existing Deficiencies			Future Operations	Notes:
	Safety	Geometry	Operations		
Interchange 26 – Ramps					
NB on-ramp	■			■	Fixed Object Accidents
NB off-ramp	■	■			Fixed Object Accidents; Geometric – Decel Lane
SB off-ramp (including Bridge No. 591)	■	■			Fixed Object Accidents; Geometric – Decel Lane
SB on-ramp		■		■	Geometric – Accel Lane
Local Intersections – Naugatuck					
NB off-ramp at SR 709/Route 63	■		■	■	Rear-end, Turning Angle Accidents
Route 63 and SB on/off-ramps	■				Rear-end Accidents
Interchange 27 – Mainline					
NB/SB segment between Exits 27 and 28 (including Bridge Nos. 592A and 593)		■		■	Geometric – Shoulder Width, Cross Slope
Exit 27 NB on-ramp to 27 NB off-ramp		■			Geometric – Shoulder Width, Cross Slope
Exit 27 SB on-ramp to 27 SB off-ramp	■	■			Fixed Object Accidents; Geometric – Shoulder Width, Cross Slope
Interchange 27 – Ramps					
NB weaving section (including Bridge No. 593)		■		■	Geometric – Weave Lane Insufficient
SB weaving section		■		■	Geometric – Weave Lane Insufficient
NB on-ramp (including Bridge No. 593)		■	■	■	Geometric Accel Lane
NB off-ramp (including Bridge No. 593)		■	■	■	Geometric Decel Lane
SB off-ramp		■		■	Geometric Decel Lane
SB on-ramp			■	■	
Local Intersections – Naugatuck					
Exit 27 SB off-ramp/NB on-ramp at Maple Street	■			■	Rear-end Accidents
Interchange 28 – Mainline					
NB segment between Exits 28 and 29 (including Bridge Nos. 594, 595, 596, and 597)	■	■		■	Rear-end Accidents; Geometric – Cross Slope, Roadside Clear Zone
Exit 28 NB off-ramp to 28 NB on-ramp		■			Geometric – Shoulder Width, Cross Slope
Exit 28 SB off-ramp to 28 SB on-ramp		■			Geometric – Shoulder Width, Cross Slope
Exit 29 SB on-ramp to 28 SB off-ramp		■			Geometric – Shoulder Width, Cross Slope, Roadside Clear Zone
Interchange 28 – Ramps					
NB on-ramp				■	
NB off-ramp		■		■	Geometric – Decel Lane
SB off-ramp					
SB on-ramp				■	
SB weaving section				■	
Local Intersections – Naugatuck					
Route 68 at SR 723	■		■	■	Rear-end Accidents
SR 710 at SR 723					
SR 723 at City Hill Street Connector	■				Rear-end/Turning/Fixed object accidents
NB off-ramp/SB on-ramp at SR 710/SR 723			■	■	
Interchange 29 – Mainline					
NB segment between Exits 29 and 30 (2-lane segment)				■	
Exit 29 NB off-ramp to Exit 29 NB on-ramp		■			Geometric – Cross Slope
Exit 29 SB off-ramp to Exit 29 SB on-ramp (including Bridge No. 3175)		■			Geometric – Cross Slope, Shoulder Width, Decision Sight Distance
NB/SB at interchange	■				Fixed object/Rear-end/Sideswipe Accidents, Decision Sight Distance
Interchange 29 – Ramps					
NB on-ramp				■	
NB off-ramp				■	
SB on-ramp				■	
SB weaving				■	
Local Intersections – Naugatuck					
SR 847 at Platts Mill Road	■				Rear-end Accidents