

ES.4 AFFECTED ENVIRONMENT

ES.4.1 TRAFFIC AND TRANSPORTATION

Routes 82 and 85 in the corridor are two-lane arterials, considered substandard at the present time. The traffic carrying capabilities, especially that of Route 85, are decreased by local street intersections, numerous driveways, some steep grades which lack truck climbing lanes, sections with narrow pavement widths, and narrow shoulder widths. These result in marginal friction which impedes traffic flow, reduces capacity, increases congestion and increases the potential for accidents.

Functionally, Routes 11, 82, and 85 north of the junction with I-395 are classified as rural principal arterials. That section of Route 85 south of the I-395 intersection is classified as an urban principal arterial. Although designated as principal arterials, Routes 82 and 85 are also serving the function of collectors and rural local road systems, by providing access to land adjacent to the roadway network and by serving for travel over relatively short distances. Consequently, traffic conflicts are present within the corridor between through traffic, which seeks the most expedient route between points lying outside of the corridor, and local traffic, which requires access to the numerous residences, commercial establishments, and local roads located along Routes 82 and 85.

1998 Existing Traffic Volumes: Automatic Traffic Recorder (ATR) counts were performed at 12 locations within the corridor study area. The purpose of the counts was to determine hourly patterns (particularly confirmation of the peak hours for analyses), determination of daily or seasonal variations and growth trends, and estimating annual traffic (used in pavement structural design calculations). ATR counts were performed for a minimum of twenty-four hours during the week. The counts were conducted during the winter of 1998 between January 28 and February 3. Table ES-4 lists the counter location by town, and the unadjusted volumes recorded.

TABLE ES-4
AUTOMATIC TRAFFIC RECORDER (ATR) LOCATIONS

TOWN	ATR LOCATION	DAILY VOLUME
Salem	Route 85 south of Hagen Road	3,700
Salem	Route 85 south of Forsyth Road	10,840
Salem	Route 82 east of Center Street	3,330
Salem	Route 82 west of Shingle Mill Road	8,300
Salem	Route 11 off-ramp at Route 82	3,500
Salem	Route 11 on-ramp at Route 82	3,380
Montville	Route 85 south of Salem Turnpike	11,280
Montville	Route 85at Waterford/Montville town line	9,720
Waterford	Route 85, Cross Road Ext. to Dayton Road	17,670
Waterford	Cross Road Ext., Route 85 to Foster Road	8,600
East Lyme	Route 1, Summit Avenue to I-95	9,970
East Lyme	Route 161, Walnut Hill to Mostowy Road	5,170

At 29 critical locations within the corridor study area, manual turning movement counts were performed during the AM and PM weekday commuter time periods. Intersection turning movement volumes and daily traffic volumes were adjusted to account for seasonal variation. Figure ES-4 depicts the 1998 and 2020 Average Daily Traffic (ADT) volumes within the study area.

2020 Future Traffic Volumes: Future traffic volumes were forecasted for 2020 based upon ConnDOT's statewide travel demand model which relates current and future population and employment with projected future travel demand. Estimated future traffic volumes (year 2020) establish the basis for decision-making regarding selection of an appropriate improvement alternative and, ultimately, future programs and policies for the Routes 82/85/11 corridor. Projected conditions are evaluated to ensure that any proposed project can safely accommodate not only the current, but also projected future peak period travel demands.

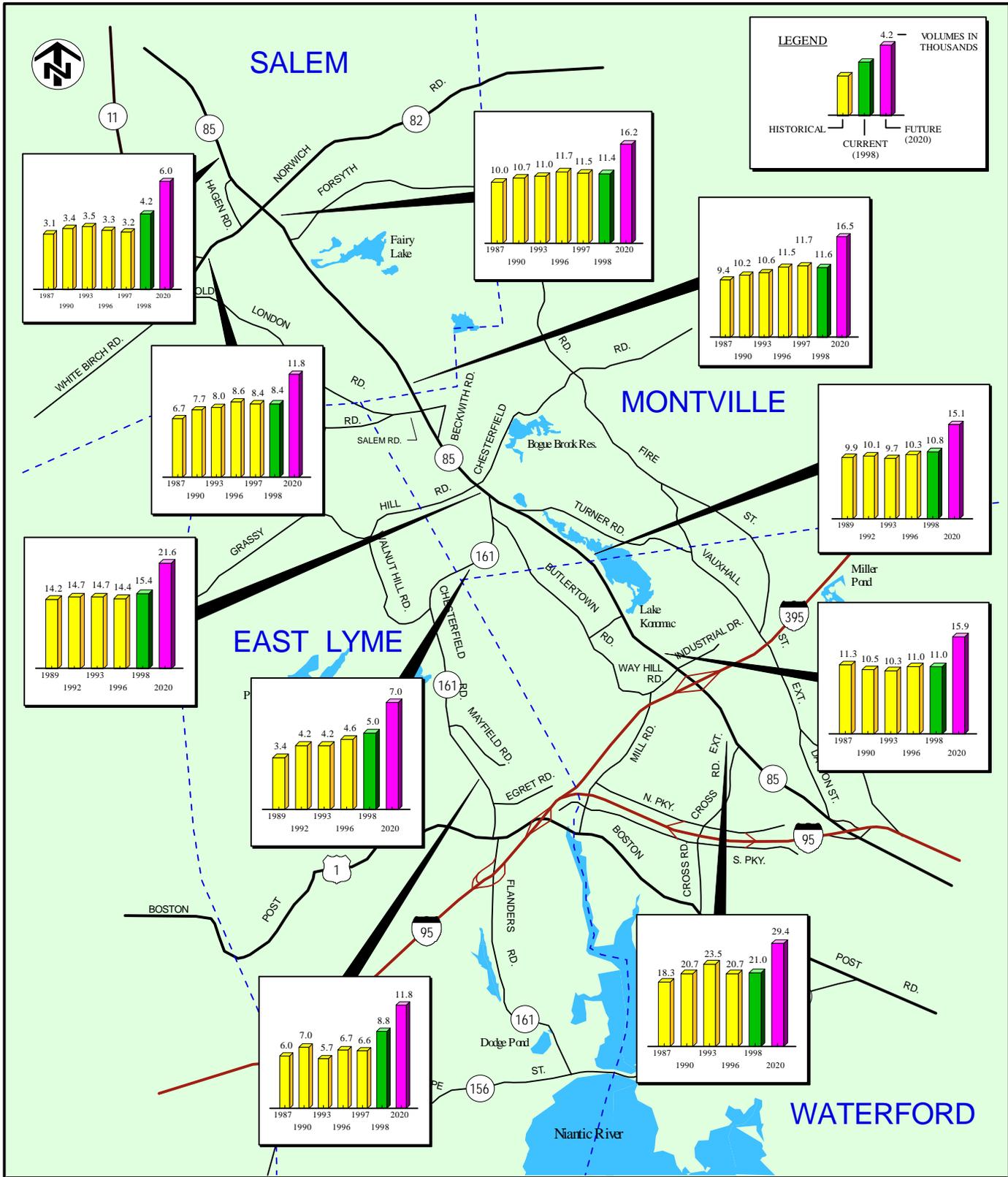
Existing Vehicular Speed Data: The quality of travel is often associated with speed or travel time. Speed is an important consideration in highway transportation because the rate of vehicle movement has a significant economic, safety, time, and service (comfort and convenience) meaning to both the motorist and the general public. Using a floating car method, a speed study was conducted to determine the prevailing speed through different segments of Routes 82, 85, I-95 and I-395 for the AM and PM peak and off-peak weekday periods. A summary of travel speeds by route is given in Table ES-5.

Comparison of the average travel speeds with the legal posted speed limits reveals the following generalizations:

- ! Average speeds on I-95 and I-395 exceed the posted limit during all survey periods.
- ! On Route 85, the average travel speeds are higher in the 40 mph section and lower in the 50 mph sections.
- ! On Route 82, average travel speeds are less than the posted speed limit of 45 mph.

Accident History: Accident records investigated covered the most recent three-year period from 1994 to 1996. The data collected included intersection and roadway segment data for Routes 85, 82 and 161. Figures ES-5, ES-6 and ES-7 summarize the accident history including collision type and severity statistics for Route 85 and Route 161, based on the most recent available three-year data period, 1994 through 1996.

1998 Existing Operating Conditions: Existing traffic operations studies were performed within the corridor study area for both intersections and roadway segments. The purpose of this task is to quantify operating conditions relative to LOS. The analysis was performed for intersections under traffic signal, stop sign, and yield traffic control in accordance with procedures established in the *Highway Capacity Manual*.



State of Connecticut Department of Transportation
 Federal Highway Administration
 ROUTE 82/85/11
 ENVIRONMENTAL IMPACT STATEMENT (EIS)
 IN THE TOWNS OF
 EAST LYME, MONTVILLE, SALEM AND WATERFORD

EXISTING AND FUTURE TRAFFIC VOLUMES

FIGURE ES-4

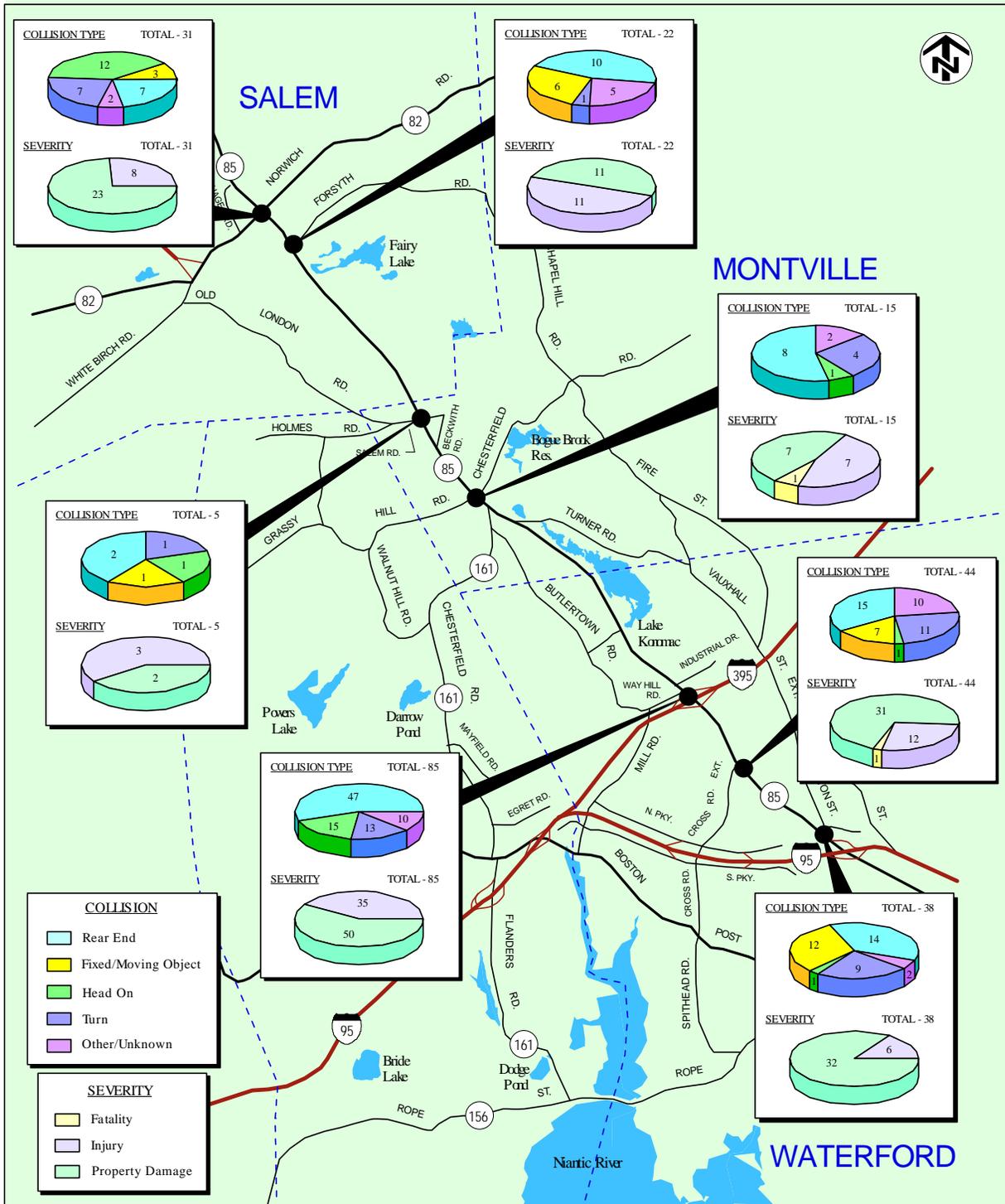
TABLE ES-5
SUMMARY OF AVERAGE TRAVEL SPEED SURVEY

ROUTE	LOCATION	DIRECTION	POSTED SPEED	AVERAGE TRAVEL SPEED (MPH)		
				AM	MID-DAY	PM
I-395	North of Rte. 85	Northbound	55	60	62	60
I-395	North of Rte. 85	Southbound	55	60	62	61
I-95	North of Rte. 161	Northbound	55	60	61	59
I-95	North of Rte. 161	Southbound	55	58	59	58
Rte. 161	North of Rte. 1	Northbound	35/45	38	42	43
Rte. 161	North of Rte. 1	Southbound	35/45	41	45	43
Rte. 85	South of Rte. 82	Northbound	40/50	43	48	42
Rte. 85	South of Rte. 82	Southbound	40/50	44	42	43
Rte. 82	East of Rte. 85	Eastbound	45	42	42	42
Rte. 82	East of Rte. 85	Westbound	45	42	45	43

Results indicate that all signalized intersections in the study area currently operate at acceptable levels of service in both the AM and PM peak hours as shown on Table ES-6. It should be noted that the analysis assumed the signal phasing and timings would be optimized; therefore, it is possible that the analysis produced results that are better than actual pre-optimization field conditions. For the unsignalized intersections, several locations currently operate at or near unacceptable LOS during the PM peak hours. The three locations that experience long delays are Route 85/I-395 northbound ramps, Route 85/Way Hill Road/Industrial Drive and Route 1/I-95 southbound off-ramp. Table ES-7 summarizes the 1998 LOS results at the unsignalized intersections.

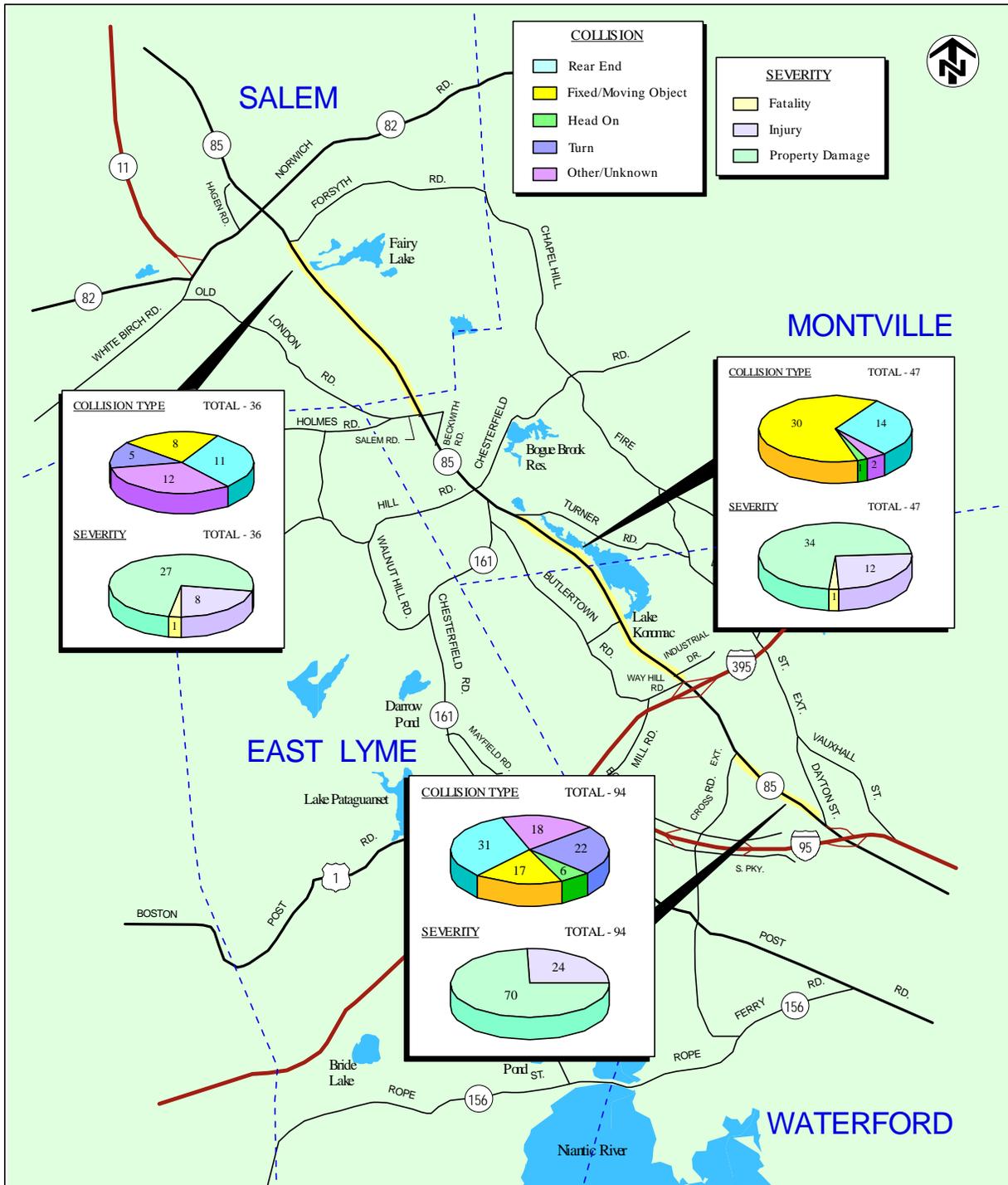
1998: All signalized intersections... currently operate at acceptable levels of service in both the AM and PM peak hours. For the unsignalized intersections, several locations currently operate at or near unacceptable LOS during the PM peak hours.

When analyzing unsignalized intersections on Route 85, it is important to note that even though the intersection may operate at an overall LOS of C or better, the side streets fail in many locations, primarily because of the higher volume of traffic traveling north and south along Route 85. This traffic creates unsafe conditions for vehicles turning onto Route 85 from the east/west side streets or from local driveways. As few as three vehicles waiting in queue can result in LOS F conditions. This delay causes a level of frustration for local motorists who use these minor roads to access Route 85 and causes them to enter the traffic stream using less than acceptable gaps between vehicles. This creates the potential for accidents as slower moving vehicles enter the much faster moving traffic flow.



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 ROUTE 82/85/11
 ENVIRONMENTAL IMPACT STATEMENT (EIS)
 IN THE TOWNS OF
 EAST LYME, MONTVILLE, SALEM AND WATERFORD
**ROUTE 85 1994-1996 ACCIDENTS BY
 TYPE AND SEVERITY (INTERSECTION)**

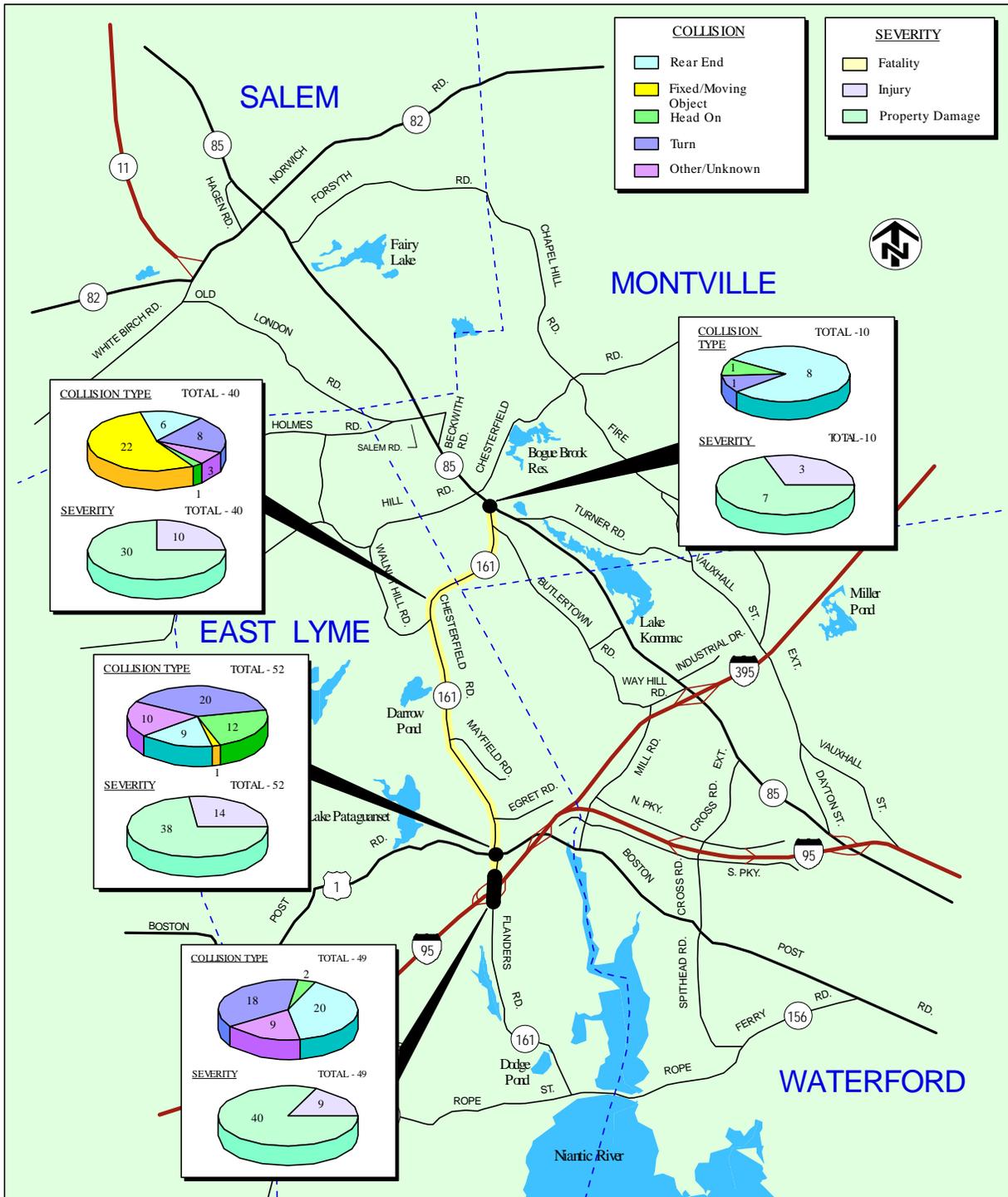
FIGURE ES-5



Note: Only highest number of accidents segments shown

State of Connecticut Department of Transportation
 Federal Highway Administration
 ROUTE 82/85/11
 ENVIRONMENTAL IMPACT STATEMENT (EIS)
 IN THE TOWNS OF
 EAST LYME, MONTVILLE, SALEM AND WATERFORD
**ROUTE 85 1994-1996 ACCIDENTS BY
 TYPE AND SEVERITY (SEGMENT)**

FIGURE ES-6



State of Connecticut Department of Transportation
 Federal Highway Administration
 ROUTE 82/85/11
 ENVIRONMENTAL IMPACT STATEMENT (EIS)
 IN THE TOWNS OF
 EAST LYME, MONTVILLE, SALEM AND WATERFORD

**ROUTE 161 1994-1996 ACCIDENTS
 BY TYPE AND SEVERITY**

FIGURE ES-7

TABLE ES-6
1998 EXISTING CAPACITY ANALYSIS - SIGNALIZED INTERSECTIONS

TOWN	INTERSECTION	1998 EXISTING AM PEAK HOUR			1998 EXISTING PM PEAK HOUR		
		LOS ⁽¹⁾	DELAY ⁽²⁾	V/C ⁽³⁾	LOS ⁽¹⁾	DELAY ⁽²⁾	V/C ⁽³⁾
Salem	Route 85/Route 82	B	11.6	0.692	B	9.5	0.716
Montville	Route 85/Grassy Hill/Chesterfield Rd.	B	8.5	0.773	B	6.9	0.737
Montville	Route 85/Route 161	B	6.2	0.557	B	6.9	0.654
Waterford	Route 85/I-395 (southbound ramps)	B	10.3	0.386	B	8.8	0.451
Waterford	Route 85/Douglas Lane	B	5.1	0.449	B	7.2	0.624
Waterford	Route 85/Cross Road Extension	B	8.5	0.566	B	7.4	0.642
Waterford	Route 85/Dayton Road	A	0.6	0.257	A	2.8	0.494
Waterford	Route 85/I-95 (southbound ramps)	B	7.4	0.453	B	12.7	0.864
Waterford	Route 85/I-95 (northbound ramps)	B	12.3	0.629	B	13.4	0.864
Waterford	Cross Road Ext./Parkway North	B	9.8	0.381	B	13.5	0.637
Waterford	Cross Road /Parkway South	B	5.4	0.425	B	8.0	0.794
East Lyme	Route 161/I-95 (northbound ramps)	B	8.1	0.324	B	7.6	0.516
East Lyme	Route 161/Route 1	B	12.2	0.582	C	17.7	0.822

Source: Wilbur Smith Associates

⁽¹⁾ LOS - LEVEL OF SERVICE

⁽²⁾ DELAY - SECONDS PER VEHICLE

⁽³⁾ V/C - VOLUME-TO-CAPACITY RATIO

TABLE ES-7
1998 EXISTING CAPACITY ANALYSIS - UNSIGNALIZED INTERSECTIONS

TOWN	INTERSECTION	1998 EXISTING AM PEAK HOUR			1998 EXISTING PM PEAK HOUR		
		LOS ⁽¹⁾	DELAY ⁽²⁾	DEMAND ⁽³⁾	LOS ⁽¹⁾	DELAY ⁽²⁾	DEMAND ⁽³⁾
Salem	Route 85/Forsyth Road	B	8.1	30	D	20.4	20
Salem	Route 82/Hagen Road	B	8.1	4	B	8.5	6
Salem	Route 82/Route 11 on-ramp	A	3.3	50	A	3.7	50
Salem	Route 82/Route 11 off-ramp	B	9.2	350	C	19.2	500
Montville	Route 85/Salem Tnpk./Beckwith Road	C	15.1	2	B	9.8	21
Montville	Route 85/Turner Road	C	10.2	20	C	16.3	20
Waterford	Route 85/I-395 (northbound ramps)	D	28.7	100	F	50.2	120
Waterford	Route 85/Way Hill/Industrial Road	D	21.0	30	F	54.2	32
East Lyme	Route 161/I-95 (southbound ramps)	B	5.9	207	C	19.4	460
East Lyme	Route 1/I-95 (northbound ramps)	B	5.6	450	B	6.6	250
East Lyme	Route 1/I-95 (southbound off-ramp)	B	6.4	300	F	100.2	690
East Lyme	Route 1/I-95 (southbound on-ramp)	B	6.3	200	B	5.3	120
East Lyme	Route 161/Egret Road	C	12.7	50	C	19.0	22
East Lyme	Route 161/Mayfield Terrace	B	8.1	25	B	9.3	8
East Lyme	Route 161/Walnut Hill Road	A	3.5	52	A	4.4	21

Source: Wilbur Smith Associates

⁽¹⁾ LOS - LEVEL OF SERVICE

⁽²⁾ DELAY - SECONDS PER VEHICLE

⁽³⁾ DEMAND - MINOR MOVEMENT PEAK HOUR VOLUME

2020: Capacity analysis results for the 2020 no build condition indicate, for signalized intersections, that many locations will operate at or near unacceptable levels of service, primarily during the PM peak hours.

2020 Future Operating Conditions: Intersection and roadway traffic operations were evaluated for the future 2020 no build condition Tables ES-8 and ES-9. Capacity analysis results for the 2020 no build condition indicate, for signalized intersections, that many locations will operate at or near unacceptable levels of service, primarily during the PM peak hours. Intersections that will operate at LOS F include Route 85/Grassy Hill Road/Chesterfield Road, Route 85/I-95 southbound ramps, Route 85/I-95 northbound ramps, and Cross Road Extension/Parkway North. Other locations that are projected to operate poorly include Route 85/Route 82 (LOS D), Cross Road/Parkway South (LOS E) and Route 161/Route 1 (LOS D).

Existing Public Transportation Services and Initiatives: Existing public transit service within the study corridor is limited to two local bus routes that operate between New London and the Crystal Mall on Route 85 just north of I-95. SEAT runs two routes between New London and the Crystal Mall, at the southern end of the corridor. There are no services that operate the length of the corridor, or services in the corridor in Salem or Montville (Figure ES-8).

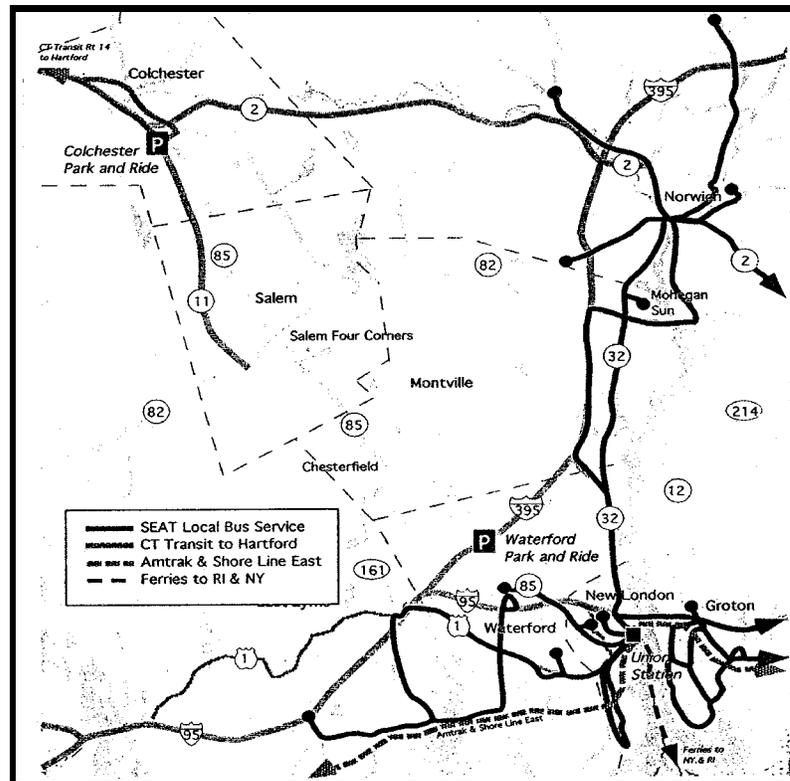


FIGURE ES-8: EXISTING PUBLIC TRANSPORTATION ROUTES

TABLE ES-8
2020 FUTURE CAPACITY ANALYSIS - SIGNALIZED INTERSECTIONS

TOWN	INTERSECTION	2020 FUTURE AM PEAK HOUR			2020 FUTURE PM PEAK HOUR		
		LOS ⁽¹⁾	DELAY ⁽²⁾	V/C ⁽³⁾	LOS ⁽¹⁾	DELAY ⁽²⁾	V/C ⁽³⁾
Salem	Route 85/Route 82	C	22.1	0.903	D	33.0	0.944
Montville	Route 85/Grassy Hill/Chesterfield Rd.	E	43.0	1.079	F	* ⁽⁴⁾	*
Montville	Route 85/Route 161	B	9.9	0.796	C	20.4	0.985
Waterford	Route 85/I-395 (southbound ramps)	B	13.6	0.574	B	11.2	0.646
Waterford	Route 85/Douglas Lane	B	5.7	0.630	B	8.4	0.856
Waterford	Route 85/Cross Road Extension	B	9.8	0.775	B	11.5	0.855
Waterford	Route 85/Dayton Road	A	0.7	0.364	A	4.0	0.678
Waterford	Route 85/I-95 (southbound ramps)	B	9.9	0.628	F	*	*
Waterford	Route 85/I-95 (northbound ramps)	C	15.5	0.918	F	*	*
Waterford	Cross Road Ext./Parkway North	B	11.3	0.632	F	65.0	1.122
Waterford	Cross Road /Parkway South	B	9.9	0.600	E	54.9	1.126
East Lyme	Route 161/I-95 (northbound ramps)	B	7.1	0.457	B	10.4	0.806
East Lyme	Route 161/Route 1	B	14.8	0.760	D	36.5	1.240

Source: Wilbur Smith Associates

⁽¹⁾ LOS - LEVEL OF SERVICE

⁽²⁾ DELAY - SECONDS PER VEHICLE

⁽³⁾ V/C - VOLUME-TO-CAPACITY RATIO

⁽⁴⁾ * - CALCULATION INFEASIBLE

TABLE ES-9
2020 FUTURE CAPACITY ANALYSIS - UNSIGNALIZED INTERSECTIONS

TOWN	INTERSECTION	2020 FUTURE AM PEAK HOUR			2020 FUTURE PM PEAK HOUR		
		LOS ⁽¹⁾	DELAY ⁽²⁾	DEMAND ⁽³⁾	LOS ⁽¹⁾	DELAY ⁽²⁾	DEMAND ⁽³⁾
Salem	Route 85/Forsyth Road	C	19.2	50	F	146.4	40
Salem	Route 82/Hagen Road	C	14.1	4	C	14.6	6
Salem	Route 82/Route 11 on-ramp	A	4.3	80	B	5.1	80
Salem	Route 82/Route 11 off-ramp	E	34.7	530	F	211.1	750
Montville	Route 85/Salem Tnpk./Beckwith Road	E	30.2	2	D	20.6	31
Montville	Route 85/Turner Road	D	22.6	40	F	66.7	40
Waterford	Route 85/I-395 (northbound ramps)	F	683.6	140	F	* ⁽⁴⁾	160
Waterford	Route 85/Way Hill/Industrial Road	F	81.0	50	F	487.8	42
East Lyme	Route 161/I-95 (southbound ramps)	B	8.9	307	F	216.7	670
East Lyme	Route 1/I-95 (northbound ramps)	C	11.7	660	C	15.8	360
East Lyme	Route 1/I-95 (southbound off-ramp)	C	12.1	440	F	547.1	1000
East Lyme	Route 1/I-95 (southbound on-ramp)	C	13.7	290	B	8.7	170
East Lyme	Route 161/Egret Road	D	28.3	70	F	51.2	32
East Lyme	Route 161/Mayfield Terrace	B	8.1	25	B	9.3	8
East Lyme	Route 161/Walnut Hill Road	C	12.3	35	C	13.4	8

Source: Wilbur Smith Associates

⁽¹⁾ LOS - LEVEL OF SERVICE

⁽²⁾ DELAY - SECONDS PER VEHICLE

⁽³⁾ DEMAND - MINOR MOVEMENT PEAK HOUR VOLUME

⁽⁴⁾ * -DELAY GREATER THAN 999.99 SECONDS PER VEHICLE

In New London, connections are also available to a number of other services, including Shore Line East commuter rail service to New Haven and New York City, Amtrak northeast corridor service, Greyhound bus services, and ferry services to Fishers Island, Block Island, and Long Island. There are currently no rail service routes in the study area, however, there are three existing rail corridors that may have some potential for development in order to offer rail transit service between New London and Hartford.

SEAT's plan, "A System in Transition", describes their planned increase in the SEAT bus fleet, expansion of local service, and implementation of new regional bus routes (Figure ES-9). Of the various route expansions planned, Route W is the only route directly related to the corridor study area. Inclusion of Route 85 service could have an effect on utilization of transit services in and through the study area towns.

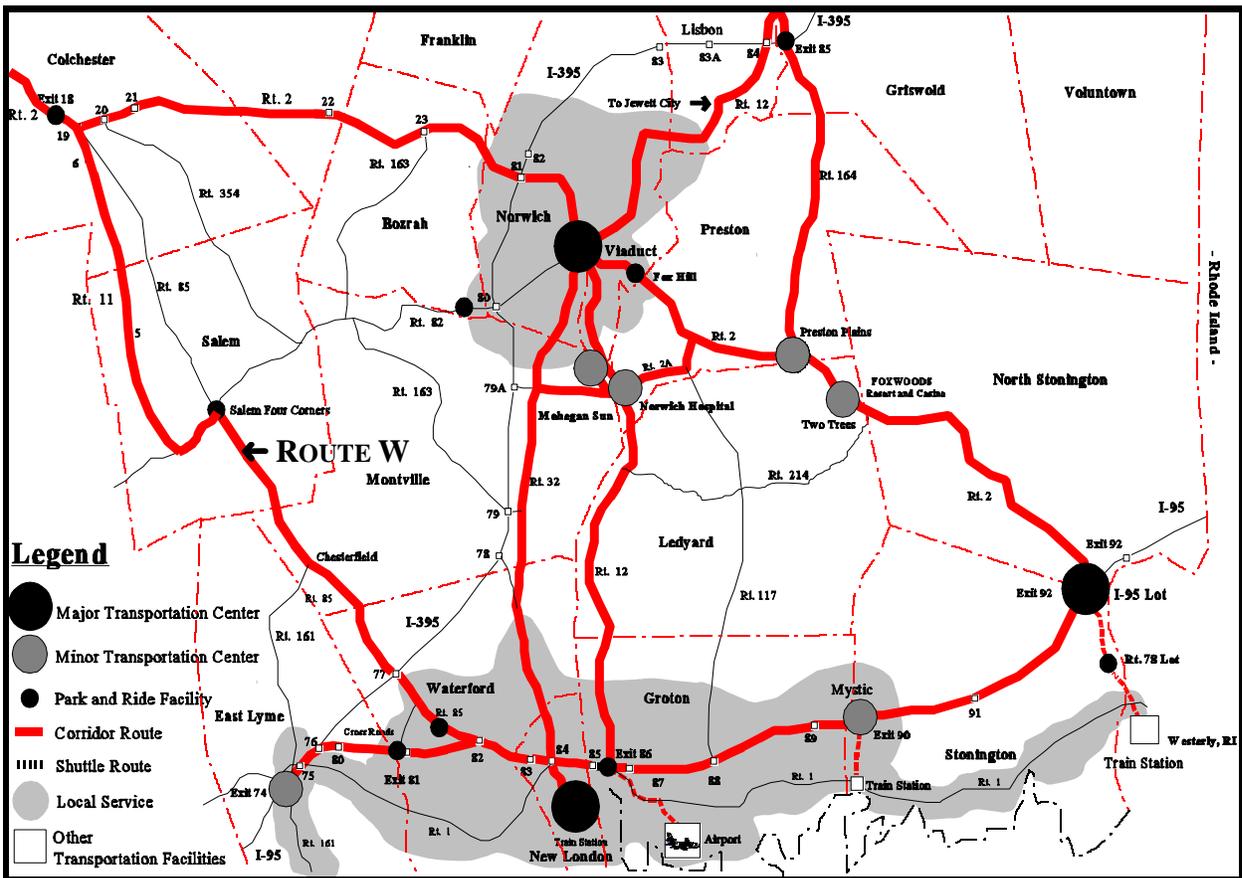


FIGURE ES-9 PROPOSED SEAT EXPANSION ROUTES

Because of the corridor’s basic rural character and other socioeconomic characteristics, local ridership within the Route 85 corridor is expected to be quite low. The primary work-trip market would be commuters who work in Hartford. Including New London, only about 300 area residents commute to work in Hartford, and of these, approximately 15% already use transit. With direct service to Hartford brought closer to Route 82/85/11 corridor residents, the percentage of residents who would use transit would also be expected to increase. With more direct service, and an increase in the transit mode split from 15% to 25%, approximately 40 new work trips would be attracted. Overall, Hartford ridership would total approximately 110 trips per day in 2000 and 130 trips per day in 2020.

Projected ridership for the Route W transit alternative is summarized in Table ES-10.

TABLE ES-10		
ROUTE W BUS SERVICE: PROJECTED RIDERSHIP		
WEEKDAY RIDERSHIP BY DESTINATION	2000	2020
Corridor	110	120
Hartford	110	130
Local New London	240	270
Connecting	50	60
TOTAL WEEKDAY	510	580

Source: KKO Associates

Existing Rail Service: Three existing rail routes with the potential to be developed to service the study corridor were identified, as follows:

- ! Connecticut Valley Route - consists of the Amtrak Northeast Corridor (“Shore Line”) plus the former Connecticut Valley Railroad. The “Shore Line” is owned and maintained by Amtrak with local freight service provided by the Providence and Worcester Railroad. Frequent Amtrak and ConnDOT “Shore Line East” passenger service exists on this line.

- ! Willimantic/Manchester Route - consists of the New England Central (Central Vermont) main line plus the former Hartford, Providence, and Fishkill Railroad.

The New England Central railroad provides local and through freight service to the New London area. No passenger service currently exists on this line in Connecticut. It reaches Union Station (Amtrak station) in New London where it connects with the Amtrak Northeast Corridor. The former Hartford, Providence, and Fishkill line is only

currently in operation between Hartford and Manchester. Between Willimantic and Manchester, much of the track has been removed and portions of the right-of way are being used as a hiking trail. This segment is described as the Hop River State Park Trail and has been identified as a possible link in the East Coast Greenway.

- ! Amtrak Route via New Haven - consists of the Amtrak Northeast Corridor (“Shore Line”) plus the Amtrak Northeast Corridor Springfield line. The “Shore Line”, currently undergoing electrification, is owned and maintained by Amtrak with local freight service provided by the Connecticut Southern Railroad. Frequent Amtrak and “Shore Line East” passenger service exists on this line.

Existing Pedestrian and Bicycle Facilities: The *Connecticut Bicycle Map* provides a guide for bicyclists traveling Connecticut roadways. This map, published by ConnDOT, shows *Recommended Routes*, *Cross State Routes*, *Loop Rides*, and major roadways on which bicycle travel is *Not Recommended*. The Route 82/85/11 study area contains two *Recommended Routes* that connect with longer distance *Cross State Routes*. Route 82 between Hadlyme and Norwich is a *Recommended Route*. A second *Recommended Route* intersects with Route 82 and follows in a southerly direction along Old New London Road and Route 161. It is connected by a short stretch of Route 85 between Salem Turnpike Road and the junction of Route 161 in Chesterfield. This route provides links with a *Cross State Route* at Route 1 in Flanders and *Recommended Routes* along the shoreline.

The *Connecticut Bicycle Map* provides a guide for bicyclists traveling Connecticut roadways... Route 82 between Hadlyme and Norwich, is a “*Recommended Route*”. A second “*Recommended Route*” intersects with Route 82 and follows in a southerly direction along Old New London Road and Route 161. This route provides links with a “*Cross State Route*” at Route 1 in Flanders and “*Recommended Routes*” along the shoreline... Route 85 is designated as “*Not Recommended*”...

Route 85 is designated as *Not Recommended*, except for that portion mentioned between Salem Turnpike Road and Chesterfield, which is recommended due to the non-existence of a suitable alternate roadway. Route 85 does not provide consistent shoulder widths suitable for bicycle use considering the vehicle speeds and volumes experienced on this major arterial.

Pedestrian facilities, such as sidewalks and crosswalks, are not present along the state roadways in the predominately rural, northern portion of the corridor. Sidewalks are present in the southerly, more commercially developed areas such as the Crystal Mall and “Business Triangle” in Waterford, and Flanders in East Lyme. Walking/bridal trials in the forested areas west of Route 85 are primarily held in private ownership.

Regional Emergency Management Plans: Various types of natural or human-caused catastrophes could necessitate a mass evacuation of residents, workers, and visitors from part or all of the study area. The Connecticut Office of Emergency Management coordinates emergency planning among state agencies, businesses (such as Northeast Utilities for its nuclear facilities), and local communities. Events which might require some degree of evacuation could include severe storms, floods, chemical spills, or a nuclear plant emergency.

The Route 82/85/11 corridor plays a role in the evacuation plans for southeastern Connecticut. The Emergency Planning Zone (EPZ) for Millstone in Waterford, approximately a ten-mile radius, includes Waterford and Montville, which are currently designated to use the corridor for evacuation to their respective host communities.

Although Waterford's current evacuation scenario includes utilization of Routes 85 and 82, the State of Connecticut, Northeast Utilities, and Town of Waterford are actively exploring evacuation routes that do not rely on Route 85 north of the I-395 intersection. If a formal redesignation occurs, much of Waterford's evacuation traffic would be diverted from the study corridor.

In August of 1997, Northeast Utilities commissioned a study to estimate evacuation times from the EPZ for Millstone. The study evaluated the evacuation network under a variety of scenarios, including both fair weather and adverse weather for a winter weekday, a winter weeknight, and a summer weekend. Although the modeling showed over twenty intersections where vehicle delays might warrant traffic management personnel to minimize back-ups, only two were in the Route 82/85/11 study area. These were the intersections of Route 85 and Cross Road, and of Route 85 and I-395, both in Waterford. Although the southern end of the study corridor does contain two intersections where delays would be expected, the corridor does not appear to be a weak link in the emergency evacuation network.