On-Call I-95 Construction Planning Agreement
Assignment Three

Traffic Mitigation for Selected Roadways in the New Haven Area

Executive Summary

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Submitted to
South Central Regional Council of Governments

Submitted by
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EXECUTIVE SUMMARY

On-Call I-95 Construction Planning Agreement
Assignment Three – Traffic Mitigation for
Selected Roadways in the New Haven Area

Introduction

During the next 5 to 10 years, there will be traffic diversions in the New Haven area resulting from the I-95 construction and other major roadway and bridge projects. Under contract to the South Central Regional Council of Governments (SCRCOG), Urbitran Associates performed the 2006 On-Call I-95 Construction Planning Agreement. This phase of the assignment identified a number of short-range actions to improve the traffic carrying capability of potential diversion routes during Contracts "B" and "E" of the I-95 New Haven Harbor Crossing (NHHC) Corridor Improvement program.

Work tasks for this assignment included:

- Identification of study corridors and priority intersections
- Traffic data collection
- Development of base and future transportation networks
- Sensitivity analysis of potential diversion routes
- Identification of improvement options

The focus of the study was on the area bounded by Quinnipiac Avenue to the east, State Street to the west, Middletown Avenue / Foxon Boulevard (Route 80) to the north and US Route 1 (US1) (Water Street / Forbes Avenue) to the south, as shown in Figure ES-1. Within this study area, four primary corridors were identified for further analysis:

- US1 Corridor - Forbes Avenue from East Haven town line to Water Street at Union Avenue / State Street
- Middletown Avenue / State Street Corridor from I-91 Exit 8 to Water Street
- Grand Avenue Corridor from Quinnipiac Avenue to State Street
- Chapel Street Corridor from Quinnipiac Avenue to State Street

Analysis Methodology

As a major part of this assignment, Urbitran Associates performed a traffic diversion sensitivity analysis, using SYNCHRO software, for weekday peak hours, with incremental traffic growth added to critical intersections along the selected corridors. SYNCHRO was used to reallocate traffic signal timing, determine offsets, and perform capacity analysis. SYNCHRO also was used to identify locations that may not operate as well as projected as a result of the backup of queued vehicles exceeding the storage length available.

The analysis identified the incremental volume that could be accommodated before operations reached an unacceptable level of congestion as established for this analysis. (Mid-range of Level of Service (LOS) E -- about 65 to 70 seconds of delay per vehicle -- for turning movements; and

the lower range of LOS E -- about 55 to 60 seconds of delay per vehicle -- for through movements.)[1]

The existing base transportation network represents typical peak-hour traffic conditions in the year 2005 with the Ferry Street Bridge over the Quinnipiac River closed to traffic. Table ES-1 summarizes the cumulative incremental volumes that may be achieved by implementing the low-cost mitigation measures identified for the intersections in each of the corridors. The potential incremental volumes are highest on US1 for both the AM and PM peak hours in 2008 and 2012.

Figure ES-2 and ES-3 present a summary of the existing conditions for the AM and PM peak hours, respectively, for the US1 corridor. These figures indicate information on the Level of Service and the delay in seconds per vehicle (s/v) for each lane group at each of the six study intersections. During both the AM and PM peak hours, all lane groups operate at LOS D or better, which is generally considered acceptable for urban areas. A more detailed presentation of technical results is provided in Section 7 of the study report.

Traffic Analysis by Corridor

US 1 Corridor

2008 Conditions and Potential Mitigation

The westbound US1 corridor is projected to be able to accommodate an incremental volume in 2008 of 600 vehicles and 270 vehicles, respectively, in the AM peak hour and PM peak hour, if improvements are made to signal operations. Figures ES-4 and ES-5 identify the mitigation measures used and the resultant Levels of Service during the AM and PM peak hours to handle the incremental volume. The types of signal improvements include implementing signal actuation at intersections that already have detectors, reallocating green time, adjusting cycle lengths (based on nearby signals), and refining the offset (based on adjacent signals).

2012 Conditions and Potential Mitigation

The mitigation measures for the AM and PM peak hours in 2012 are essentially the same as were applied for 2008. The maximum cumulative increments in the AM and PM peak hours, respectively, are 640 vehicles and 290 vehicles.

Middletown Avenue / State Street Corridor from I-91 Exit 8 Interchange to Water Street

2008 Conditions and Potential Mitigation

The westbound Middletown Avenue/State Street corridor is projected to be able to accommodate a cumulative incremental volume of 250 vehicles in the AM peak hour in 2008. An additional traffic increment could be accommodated if drivers can continue on southbound I-91 to Exit 6 (Blatchley Avenue) and bypass the controlling intersection of State Street and Ferry Street. They would enter the corridor via the southbound right-turn from Willow Street onto State Street. An

[1] Level of service (LOS) is a measure in the *Highway Capacity Manual* of traffic operating conditions. Six levels of service are defined using delay as the measure of effectiveness, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each LOS represents a range of operating conditions.

additional 140 vehicles (250 cumulative increment) could be accommodated in this manner with the controlling intersection then becoming State Street and Grove Street/Olive Street.

The following improvements would be needed to accommodate these incremental volumes:

- Middletown Avenue -- No mitigation needed
- Upper State Street
  1. Use a uniform cycle length of 90 seconds and reallocate green time as necessary to balance intersection operations.
  2. Improve signal coordination by giving unused pedestrian time (and minor movement time for the intersections that are actuated) to the major movements. This will require new signal hardware.
  3. Set offsets to achieve progression in the peak direction.
- Lower State Street
  1. Use a uniform cycle length of 90 seconds (most intersections are already set at 90 seconds) and reallocate green time as necessary to balance intersection operations.
  2. Improve signal coordination by giving unused pedestrian time and minor movement time to the southbound movement (this condition already exists for most of these intersections).
  3. Set offsets to optimize progression along State Street. The offsets also should be set to allow coordination with the southbound right-turn at Grove Street and the next signal at Orange Street.
  4. Restripe southbound State Street north and south of Audubon Street to provide for two lanes of through traffic.

The closing of the Grand Avenue Bridge during the year 2008 is expected to have significant impacts along lower State Street during the PM period. In particular, eastbound and westbound Grand Avenue traffic will be diverted to either State Street at Grove Street/Olive Street to the north, or State Street at Chapel Street to the south. Without mitigation, these two intersections are projected to operate beyond the established thresholds, even without any incremental volume. The adverse effects could be alleviated by prohibiting parking during the PM peak period (on the south side) and providing two eastbound approach lanes on Chapel Street and on Grove Street. With these measures, along with the mitigation noted for the AM peak hour, a cumulative increment of 50 vehicles can be accommodated in the PM peak hour. Beyond that, the threshold would be reached at the controlling intersection of State Street and Grove Street/Olive Street.

2012 Conditions and Potential Mitigation

The westbound Middletown Avenue/State Street corridor is projected to be able to accommodate a cumulative incremental volume of 240 vehicles in the AM peak hour in 2012. The network was analyzed for the 2012 volumes with the same mitigation measures for 2008 applied. Once again, the controlling intersection was State Street and Ferry Street. With additional reallocation of green time from the 2008 settings, the practical limit was reached at a cumulative increment of 100 vehicles, 40 less than during the year 2008. An additional increment of 140 vehicles (240 cumulative increment) during the AM peak hour in 2012 can be achieved by using Exit 6 instead of Exit 8 as described for the year 2008. The controlling intersection for this additional increment would be State Street and Blatchley Avenue. This represents a change from 2008 when the controlling intersection was State Street and Grove Street/Olive Street. The opening of the Grand

Avenue Bridge is expected to bring some relief to this intersection of State Street and Grove Street/Olive Street. A cumulative increment of 80 vehicles can be accommodated during the PM peak hour. The controlling intersection is State Street and Ferry Street.

Grand Avenue Corridor from Quinnipiac Avenue to State Street

In 2008, the replacement of the Grand Avenue Bridge over Amtrak (State Project 092-0412) will require full closure during the construction period. This will create a discontinuity in the Grand Avenue corridor that will constrain the traffic volume that could be accommodated. As a result, there is no incremental volume projected for this corridor in 2008. The traffic analysis to identify the incremental volume was focused on 2012, by which time the construction on the Grand Avenue Bridge will have been completed.

2012 Conditions and Potential Mitigation

The cumulative incremental volume that this corridor can accommodate during the AM peak hour in 2012 is estimated to be 310 vehicles. Low-cost mitigation measures generally involve adjustments to the green time, while maintaining the current cycle length and offset. There was one location-specific mitigation measure at Grand Avenue and East Street, involving the striping of a left-turn lane in the eastbound direction. This would be a low-cost mitigation measure, but would necessitate removing parking in the immediate area of the intersection, and could possibly require a bus stop relocation. This improvement would need to be integrated into plans for upgrading the nearby at-grade railroad crossing. The controlling intersection that reaches its practical limit during the AM peak hour in 2012 is Grand Avenue at Ferry Street. Other intersections that are very close to reaching their practical limit are at the entry to the corridor – Foxon Boulevard at Quinnipiac Avenue, and Grand Avenue at Quinnipiac Avenue.

Using similar mitigation measures that were identified for the AM peak hour, the cumulative incremental volume that this corridor can accommodate during the PM peak hour in 2012 is estimated to be 170 vehicles. The controlling intersection is Grand Avenue and East Street. Also near their practical limit are the intersections of Foxon Boulevard at Quinnipiac Avenue, Grand Avenue at Ferry Street, and Grand Avenue at State Street.

It is important to note that the cumulative incremental volumes for the Middletown Avenue / State Street corridor and the Grand Avenue corridor were determined independently. Since there are common intersections in these two corridors, the cumulative incremental volumes that are given are for either one corridor or the other, not both. Both corridors together could accommodate only part of the stated cumulative incremental volumes.

Chapel Street Corridor from Quinnipiac Avenue to State Street

2008 Conditions and Potential Mitigation

During the year 2008, the Ferry Street Bridge and the Grand Avenue Bridge are expected to be closed. It is recommended that the signals along the Chapel Street corridor be considered for upgrading to provide for coordinated-actuated capabilities, similar to what exists on Grand Avenue. This will help to prepare for the traffic that may divert when the Grand Avenue Bridge is closed.

The cumulative incremental volume that the Chapel Street corridor can accommodate during the AM peak hour is 150 vehicles. The controlling intersection that reaches its practical limit is Grand Avenue at Front Street. For most intersections, low-cost mitigation measures involved reallocating the green time without changing the cycle length. However, one location-specific mitigation measure was at Chapel Street and Hamilton Street where eastbound Chapel Street was restriped to provide a left-turn lane. The left-turn volume here is substantial, since it leads to I-91. This would be a low-cost mitigation measure, but would necessitate removing parking in the area of the intersection, and could possibly require that a bus stop be relocated. In addition, the provision of a northbound left-turn lane from Hamilton Street to the northbound I-91 entrance ramp at Ives Place is recommended.

During the PM peak hour, restriping to enable passing of left-turning vehicles on the eastbound and westbound Chapel Street approaches to East Street would enable an incremental volume of 70 vehicles in the corridor. Removal of parking on the Chapel Street approaches would be needed. There currently exists protected left-turn signal phasing in the westbound direction, even though there is no left-turn lane. Without this action, there can be no incremental volume without exceeding the established thresholds. Front Street and Grand Avenue would then be the controlling intersection.

2012 Conditions and Potential Mitigation

During the year 2012, the Ferry Street Bridge and Grand Avenue Bridge are expected to be open. The opening of the Ferry Street Bridge during the year 2012 will add considerable volume to the intersection of Ferry Street and Chapel Street. It is recommended to lengthen the cycle to 90 seconds to provide additional capacity, as well as allocating more green time to the north-south movements.

The cumulative incremental volume that the Chapel Street corridor can accommodate during the AM peak hour is 230 vehicles. This increment would require the addition of the eastbound left-turn lane on Chapel Street at Hamilton Street as previously noted.

The cumulative incremental volume that the Chapel Street corridor could accommodate during the PM peak hour is 150 vehicles. This increment would require the addition of a right-turn lane on the eastbound Chapel Street approach to Ferry Street. The controlling intersection would then be Chapel Street at East Street.

Results and Findings

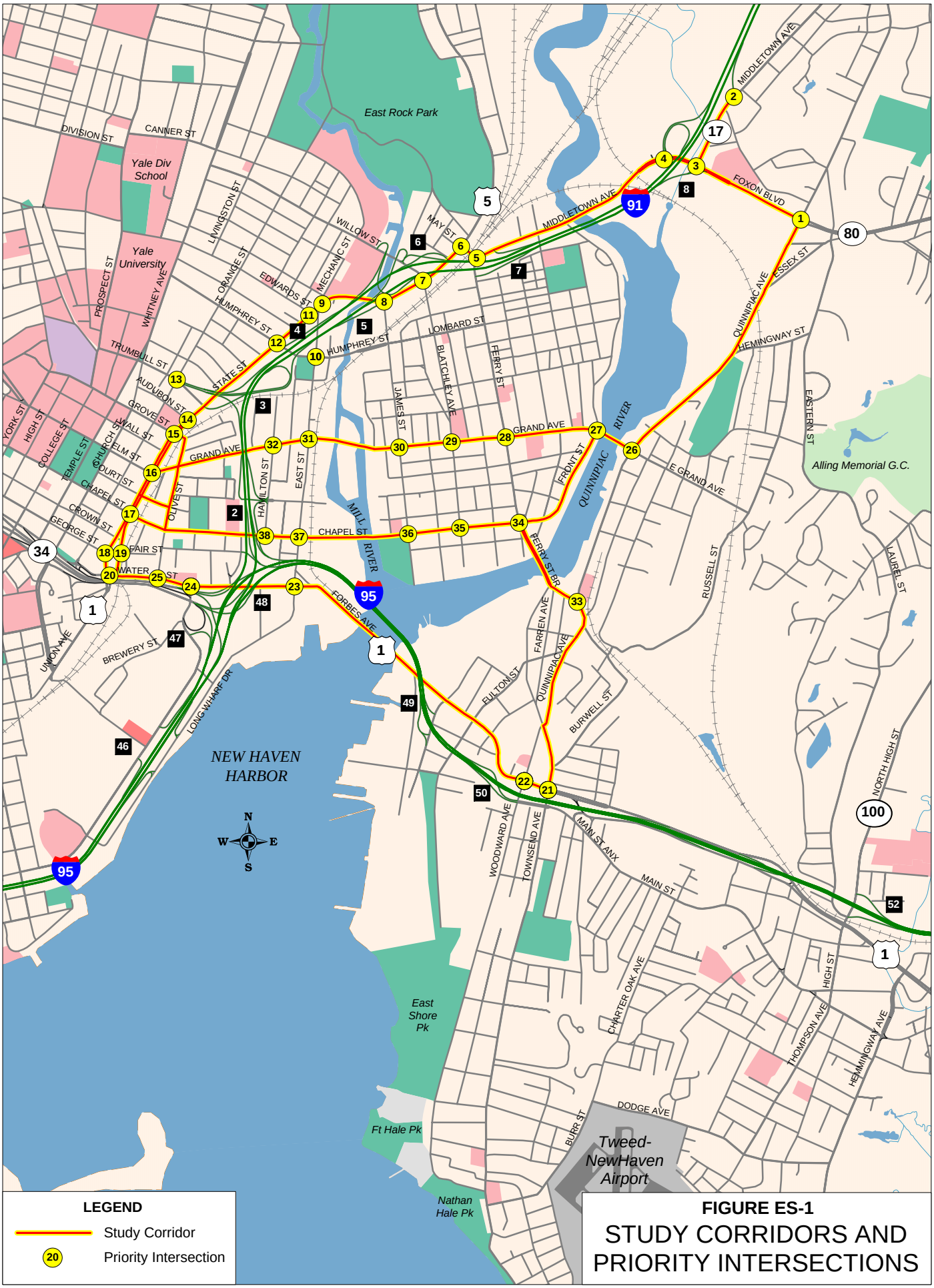
The analysis results suggest a focus on upgrading the signalization on US1 and State Street corridors to make them better able to accommodate changing traffic conditions and demands that may result from the long-term I-95 construction and related impacts on I-91. The US1 corridor offers opportunities for both short-term mitigation identified above, as well as future opportunities for long-term improvements between East Street and Brewery Street, that could result in better conditions during the I-95 construction program. This segment of US1 is shown as being widened in Phase 17 of Contract E (the redesign of the I-95/I-91/Route 34 interchange). Phase 17 is scheduled to be implemented towards the end of Contract E construction. Additional traffic along this segment of US1 could be accommodated if the widening was to be done earlier in the contract E schedule, when disruptions to I-95 traffic are possible.

There are benefits and system flexibility that could be achieved by upgrading the traffic signalization along the US1 and State Street corridors to be traffic responsive. This would be especially useful when there are lane closures on I-95 and potential traffic diversions to US1or lane closures on I-91 and potential traffic diversions to State Street.

The segment of US1 to the east is on ConnDOT's closed loop system. It is anticipated that the traffic signals on US 1 at Woodward Avenue and at Townsend Avenue, currently under ConnDOT jurisdiction, will become part of the City of New Haven system. The closed loop system on US1 should be extended into New Haven. Consideration should also be given to consolidating the management and operation of the US1 traffic signals to one agency to facilitate a more rapid response to changing travel conditions.

Traffic signal coordination along Upper State Street will require upgrades to the signal hardware. Although traffic signal coordination along Lower State Street could be provided using existing equipment, hardware would be needed to provide more system flexibility and achieve a demand-responsive system. The upgrading of the signal equipment along both Upper and Lower State Street to provide for a system that could respond to changing traffic demands would enable the City of New Haven to better deal with traffic diversions related to the I-95 construction.

Provision for a traffic control center for monitoring traffic and adjusting signal timing on US1 and State Street based on actual conditions would be beneficial to responding to changes related to the I-95 construction program.


East Rock Park
Yale Div School
Yale University
DIVISION ST
CANNER ST
LIVINGSTON ST
PROSPECT ST
WHITNEY AVE
ORANGE ST
EDWARDS ST
MECHANIC ST
WILLOW ST
MAY ST
MIDDLETOWN AVE
FOXON BLVD
ESSEX ST
QUINNIPIAC AVE
HEMINGWAY ST
LOMBARD ST
HUMPHREY ST
TRUMBULL ST
AUDUBON ST
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FARREN AVE
QUINNIPIAC AVE
RUSSELL ST
LAUREL ST
UNION AVE
BREWERY ST
LONG WHARF DR
NEW HAVEN HARBOR
FULTON ST
BURWELL ST
WOODWARD AVE
TOWNSEND AVE
MAIN ST ANX
MAIN ST
NORTH HIGH ST
CHARTER OAK AVE
HIGH ST
THOMPSON AVE
HEMMINGWAY AVE
East Shore Pk
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Nathan Hale Pk
DODGE AVE
BURR ST
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91
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80
17
34
1
100
52
LEGEND
Study Corridor
Priority Intersection
FIGURE ES-1
STUDY CORRIDORS AND PRIORITY INTERSECTIONS

FIGURE ES-2

LEVEL OF SERVICE AND DELAY

Corridor: US1
Peak Hour: AM
Year: 2005 Existing Condition

FIGURE ES-3

LEVEL OF SERVICE AND DELAY

Corridor: US1
Peak Hour: PM
Year: 2005 Existing Condition


WATER ST & EAST ST (CONTROLLING LOCATION)
Mitigation is needed when cumulative incremental volume reaches 180 vehicles (Condition E)
MITIGATION MEASURES:
1. Implement actuation.
2. Reallocate green time to allow maximum to eastbound/westbound phase.
3. Consider early scheduling of planned Water Street widening.
LOS WHEN CUMULATIVE INCREMENTAL VOLUME REACHES 270 VEHICLES (CONDITION F):
EB-Through/Right: LOS E (58 s) NB-Left/Through/Right: LOS D (51 s)
SB-Left/Through/Right: LOS D (53 s)
All other lane groups LOS C or better.
WATER ST & BREWERY ST
Mitigation is needed when cumulative incremental volume reaches 60 vehicles (Condition C).
MITIGATION MEASURES:
1. Implement actuation.
2. Reallocate green time to allow maximum for eastbound/westbound phase.
3. Consider early scheduling of of planned Water Street widening.
LOS WHEN CUMULATIVE INCREMENTAL VOLUME REACHES 270 VEHICLES (CONDITION F):
NB-Left: LOS D (54 s) NB-Right: LOS D (44 s)
All lane groups LOS C or better.
WATER ST & OLIVE ST
No mitigation is needed.
LOS WHEN CUMULATIVE INCREMENTAL VOLUME REACHES 270 VEHICLES (CONDITION F, 140 EB-Through and 130 SB-Left):
All lane groups LOS C or better.
STATE ST & WATER ST
Mitigation is needed when cumulative incremental volume reaches 40 vehicles (Condition B).
MITIGATION MEASURES:
1. Reallocate green time to allow maximum for eastbound/westbound phase.
LOS WHEN CUMULATIVE INCREMENTAL VOLUME REACHES 140 VEHICLES (CONDITION D, E AND F):
WB-Left: LOS D (44 s) WB-Through/Right: LOS D (44 s)
NB-Left: LOS D (45 s) NB-Through/Right: LOS E (57 s) SB-Left: LOS E (64 s)
All other lane groups LOS C or
FORBES AVE & WOODWARD AVE, FORBES AVE & TOWNSEND AVE
Mitigation is needed at Base Condition (Condition A).
MITIGATION MEASURES:
1. Coordinate two intersections by setting cycle lengths to 76 sec.
2. Set offset to favor westbound direction.
3. Implement actuation.
4. Reallocate green time to allow maximum for eastbound/westbound phase.
LOS WHEN CUMULATIVE INCREMENTAL VOLUME REACHES 270 VEHICLES (CONDITION F):
SB-Left/ThroughRight at Woodward & Forbes: LOS D (48 s)
All lane groups LOS C or better.
FIGURE ES-4
MITIGATION MEASURES AT PRIORITY INTERSECTIONS
Corridor: US1
Peak Hour: AM
Direction: Inbound
Year: 2008
Cumulative Incremental Volume: 600 vehicles
Volume estimated to exit corridor via Water St (530 veh) and Olive St (70 veh).
WATER ST
FORBES AVE
MILL RIVER
QUINNIPIAC RIVER
CHAPEL ST
RIVER ST
FERRY ST
FERRY ST
OXFORD ST
QUINNIPIAC AVE
LEXINGTON AVE
FARREN AVE
LANCRAFT ST
FAIRMONT AVE
WARWICK ST
GOODWIN ST
FULTON ST
WHEELER ST
LAURA ST
CHAMBERLAIN PL
BELLEVUE ST
JUDITH TER
CROFTON ST
CABOT ST
OVERLOOK ST
MILTON ST
PEAT MEADOW RD
BURWELL ST
CHESTER ST
IRVINGTON ST
ASHLAND PL
BROWN PL
KENDALL ST
EDGEMERE RD
FULTON TER
ALBIA ST
STILES ST
ALABAMA ST
COLORADO AVE
CONNECTICUT AVE
ALLEN PL
FAIRVIEW PL
I-95
FORBES AVE
GOVERNOR JOHN
MINOTT ST
OAKLEY ST
WOODWARD AVE
PARK
GEORGE ST
STATE ST
OLIVE ST
ACADE
WO
WARREN ST
DEFALMA CT
BROWN ST
CHESTNUT ST
S WALLACE ST
EAST S
FAIR ST
N FRONTAGE RD
S AVE
CHURCH ST S
TOWER LN
DEDIEGO CT
LITTLE GREEN CT
GREAT GREEN CT
COLUMBUS AVE
JOSE MARTI CT
UNION AVE
LOOP RD
LONG WHARF ST
BREWERY ST
HAMILTON ST
CANAL DOCK RD
RAMP
CHURCH STREET EXT
LONG WHARF DR
JACKSON DR
HALLOCK AVE
TH ST
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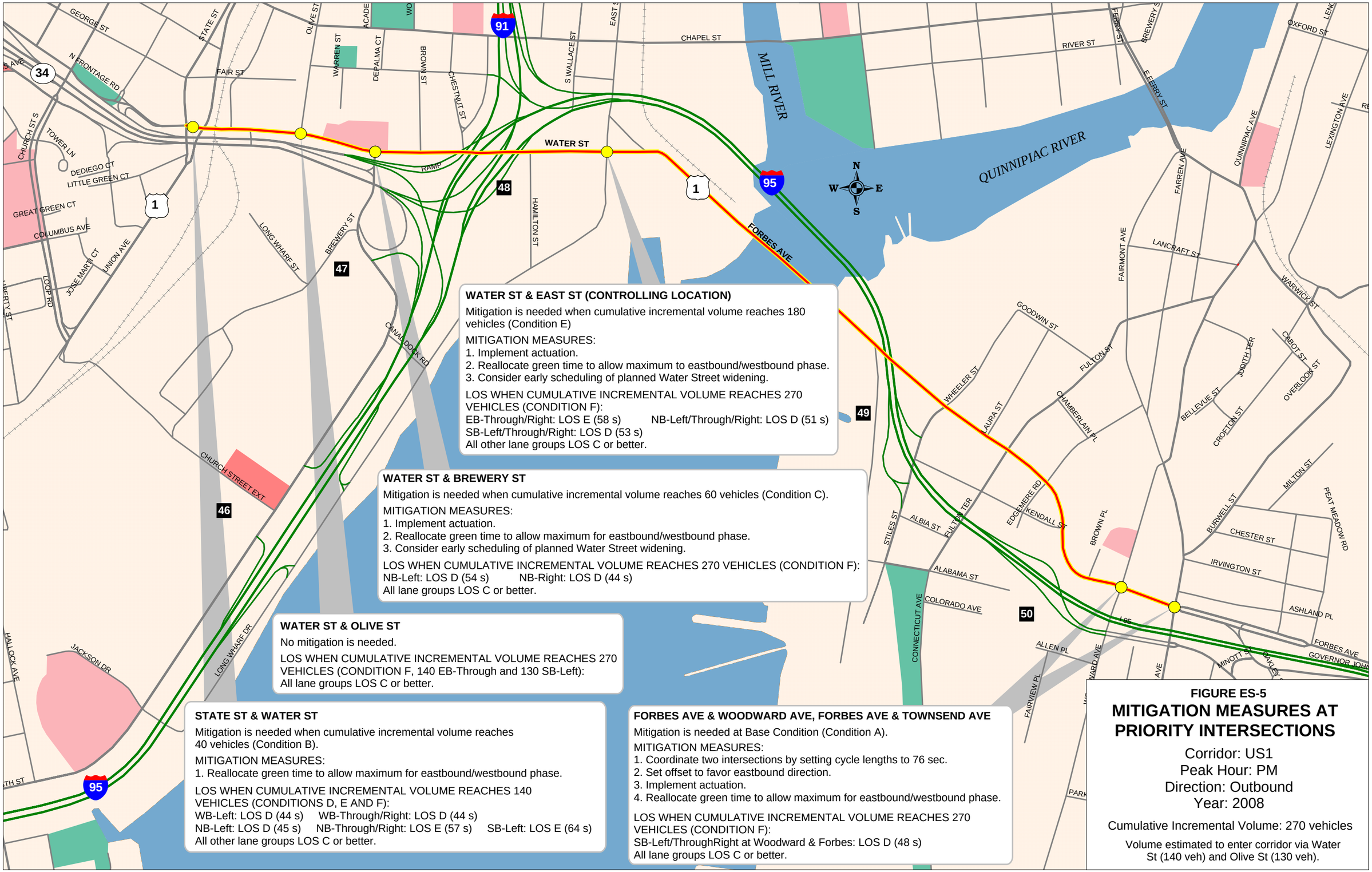
WATER ST & EAST ST (CONTROLLING LOCATION)
Mitigation is needed when cumulative incremental volume reaches 180 vehicles (Condition E)
MITIGATION MEASURES:
1. Implement actuation.
2. Reallocate green time to allow maximum to eastbound/westbound phase.
3. Consider early scheduling of planned Water Street widening.
LOS WHEN CUMULATIVE INCREMENTAL VOLUME REACHES 270 VEHICLES (CONDITION F):
EB-Through/Right: LOS E (58 s) NB-Left/Through/Right: LOS D (51 s)
SB-Left/Through/Right: LOS D (53 s)
All other lane groups LOS C or better.
WATER ST & BREWERY ST
Mitigation is needed when cumulative incremental volume reaches 60 vehicles (Condition C).
MITIGATION MEASURES:
1. Implement actuation.
2. Reallocate green time to allow maximum for eastbound/westbound phase.
3. Consider early scheduling of planned Water Street widening.
LOS WHEN CUMULATIVE INCREMENTAL VOLUME REACHES 270 VEHICLES (CONDITION F):
NB-Left: LOS D (54 s) NB-Right: LOS D (44 s)
All lane groups LOS C or better.
WATER ST & OLIVE ST
No mitigation is needed.
LOS WHEN CUMULATIVE INCREMENTAL VOLUME REACHES 270 VEHICLES (CONDITION F, 140 EB-Through and 130 SB-Left):
All lane groups LOS C or better.
STATE ST & WATER ST
Mitigation is needed when cumulative incremental volume reaches 40 vehicles (Condition B).
MITIGATION MEASURES:
1. Reallocate green time to allow maximum for eastbound/westbound phase.
LOS WHEN CUMULATIVE INCREMENTAL VOLUME REACHES 140 VEHICLES (CONDITIONS D, E AND F):
WB-Left: LOS D (44 s) WB-Through/Right: LOS D (44 s)
NB-Left: LOS D (45 s) NB-Through/Right: LOS E (57 s) SB-Left: LOS E (64 s)
All other lane groups LOS C or better.
FORBES AVE & WOODWARD AVE, FORBES AVE & TOWNSEND AVE
Mitigation is needed at Base Condition (Condition A).
MITIGATION MEASURES:
1. Coordinate two intersections by setting cycle lengths to 76 sec.
2. Set offset to favor eastbound direction.
3. Implement actuation.
4. Reallocate green time to allow maximum for eastbound/westbound phase.
LOS WHEN CUMULATIVE INCREMENTAL VOLUME REACHES 270 VEHICLES (CONDITION F):
SB-Left/ThroughRight at Woodward & Forbes: LOS D (48 s)
All lane groups LOS C or better.
FIGURE ES-5
MITIGATION MEASURES AT PRIORITY INTERSECTIONS
Corridor: US1
Peak Hour: PM
Direction: Outbound
Year: 2008
Cumulative Incremental Volume: 270 vehicles
Volume estimated to enter corridor via Water St (140 veh) and Olive St (130 veh).
WATER ST
CHAPEL ST
RIVER ST
FORBES AVE
MILL RIVER
QUINNIPIAC RIVER
N
W
E
S
91
95
34
1
48
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46
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50
GEORGE ST
STATE ST
OLIVE ST
WARREN ST
DEPALMA CT
BROWN ST
CHESTNUT ST
S WALLACE ST
FERRY ST
BREWERY ST
E FERRY ST
OXFORD ST
QUINNIPIAC AVE
LEXINGTON AVE
FARREN AVE
N FRONTAGE RD
FAIR ST
CHURCH ST S
TOWER LN
DEDIEGO CT
LITTLE GREEN CT
GREAT GREEN CT
COLUMBUS AVE
UNION AVE
JOSE MARTI CT
LOOP RD
LIBERTY ST
RAMP
HAMILTON ST
LONG WHARF ST
BREWERY ST
CANAL DOCK RD
CHURCH STREET EXT
LONG WHARF DR
HALLOCK AVE
JACKSON DR
LANCRAFT ST
FAIRMONT AVE
WARWICK ST
GOODWIN ST
FULTON ST
WHEELER ST
LAURA ST
CHAMBERLAIN PL
BELLEVUE ST
JUDITH TER
CROFTON ST
CABOT ST
OVERLOOK ST
STILES ST
ALBIA ST
FULTON TER
EDGEMERE RD
KENDALL ST
BROWN PL
BURWELL ST
MILTON ST
PEAT MEADOW RD
CHESTER ST
IRVINGTON ST
ASHLAND PL
ALABAMA ST
COLORADO AVE
CONNECTICUT AVE
ALLEN PL
FAIRVIEW PL
MINOTT ST
I-95
GOVERNOR JOHN

TABLE ES-1

CUMULATIVE INCREMENTAL VOLUMES*

CORRIDOR	AM PEAK HOUR**		PM PEAK HOUR**	
	2008	2012	2008	2012
US1	600	640	270	290
Middletown Ave/State St	250	240	50	80
Grand Ave	NA	310	NA	170
Chapel St	150	230	70	150

* Based on providing low-cost mitigation measures.

** Inbound to New Haven in the AM and outbound from New Haven in the PM.

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