Transportation Management Plan
Lake Avenue and West Street
Danbury, CT

June, 2013

Prepared For:
Housatonic Valley Council of Elected Officials (HVCEO)
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Brookfield, CT 06804
Phone (203) 740-9167

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EXECUTIVE SUMMARY

The Lake Avenue / West Street corridor used to be designated as part of two United States routes which handled considerable volumes of interregional trips through downtown Danbury and served as the main route for the City with areas to the west. Lake Avenue and West Street are no longer designated as numbered routes, and the construction of I-84 has shifted the majority of interregional traffic out of the corridor. However, it is still an important link in the regional network, connecting I-84 interchange 4 with Danbury's central business district and providing access to a variety of land uses in between. This study reviewed a number of transportation characteristics in the corridor and considered the wide range of functions that the corridor serves in identifying issues and making recommendations for improvements.

Three other recently completed reports were reviewed as part of this study effort. These included the 2005 Danbury Transportation Plan, the 2009 Central Business District Traffic Signal Operation Improvements Study, and the 2010 Downtown Danbury Study. Each of these studies considered some aspect or portion of the corridor and some of the findings and recommendations were reevaluated in this report.

For this report, existing conditions information was obtained and reviewed including accident data, land use, and traffic volumes. The accident histories at a number of priority locations in the corridor were reviewed to identify safety issues and to determine if any contributing factors could be corrected. The corridor is fully developed and so existing land uses were observed, along with historical patterns of growth and anticipated future developments in the region. Traffic volume data from the past 12 years was reviewed in order to project existing traffic volumes in the corridor to the future 2032 design year for additional analysis.

An evaluation of the roadway network was also performed which included capacity analysis and a review of roadway geometry and traffic control devices. The signalized intersections in the corridor were evaluated using SYNCHRO and estimated delays, volume to capacity ratios, and Levels of Service were reported for existing, 2032 "no-build" and 2032 "recommended" scenarios. Various locations in the corridor were observed for conformance with sight distance criteria, and roadway and traffic design standards. Based on our review and analysis, recommendations included in previous studies to widen West Street were re-evaluated. The existing signage for the low clearance railroad bridge was also reviewed and recommendations for improvements were made.

The low clearance railroad bridge, located over West Street just east of Benedict Avenue contributes to major operational, safety, drainage, and maintenance issues in the corridor. The bridge was constructed in 1930 and is owned by the Housatonic Railroad Company. The existing bridge clearance over West Street is 10 feet 7 inches, which prohibits several types of vehicles from traveling on that section of roadway. For the three-year accident history reviewed, the railroad bridge was the sight of 19 traffic accidents, most of which were overhead collisions with the bridge structure. A low point in the West Street profile is located under the railroad bridge and the Still River also runs under the railroad bridge adjacent to West Street at the crossing. The area is subject to frequent flooding, requiring the road to be closed and traffic detoured. Solutions to alleviate some or all of the issues at this location were considered and discussed. Options to fund a bridge replacement project were also investigated.

Access management was another point of consideration for this study. It was found that the presence of continuous or poorly placed driveways in the corridor is contributing to operational and safety problems. The existing driveway layout also creates particularly hazardous areas for pedestrians and bicyclists. Access management strategies were recommended for application in the corridor and a specific plan for their implementation was developed. Pedestrian, transit, and bicycle accommodations were also reviewed and recommendations were made for improvements to improve mobility in the corridor for all modes of transportation.

Aesthetics of the corridor were another consideration for this study. Streetscaping options were evaluated for suitability within each segment of the corridor and typical streetscapes were developed which are proposed for various sections of the corridor. Along with streetscaping enhancements, concept plans were presented for some locations within the corridor where landscaping and the addition of other features can enhance visibility and functionality of the existing underutilized areas of community space.

All of the issues and improvements proposed for the Lake Avenue / West Street corridor were considered as part of an intergrated system. The recommended improvements discussed throughout the report are grouped by location and summarized with corresponding information on implementation time frame, cost, and priority level. Recommendations to address safety, functionality, and aesthetics were all selected to complement each other and provide an updated vision for the corridor.

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1 INTRODUCTION AND BACKGROUND

The Lake Avenue / West Street corridor between I-84 and Main Street was historically the main route between the center of Danbury and areas to the west. Before I-84 was constructed, the corridor was designated as Routes 6 and 202 and carried interregional trips through downtown Danbury. Today, Lake Avenue and West Street are both classified as principal arterials, are part of the highest federal level of roadways known as the "National Highway System," and are City roads. The corridor is still an important part of the regional roadway network. It provides connectivity between I-84 interchange 4 at the west end and Danbury's central business district and Main Street at the east end. The Lake Avenue / West Street corridor has also been designated as an emergency diversion route for passenger vehicles as part of the 2010 I-84 Expressway Closure Emergency Diversion Plan. Although the plan shows cars being routed along the length of the Lake Avenue / West Street corridor, trucks would be diverted to an alternate route due to a low clearance bridge that is just west of Beaver Street and is owned by the Housatonic Railway Company.

There are several goals for this study including:

- To evaluate and develop measures for improving traffic flow and safety
- To review previous recommendations and update, coordinate, and re-prioritize them
- To evaluate the need for widening sections of West Street to four lanes.
- To develop an improvement plan to provide pedestrian amenities throughout the corridor.
- To review and update improvement concepts at the existing rail bridge between Westville Avenue and Beaver Street.
- To evaluate traffic and safety issues at the intersections of West Street at Beaver Street and West Street at Division Street.

Much of the corridor consists of a two lane typical section, with auxiliary lanes at some intersections. Sections of West Street closer to Main Street have areas of parallel on-street parking. Most of the corridor has edge striping with a two-foot shoulder and curbing. West of Abbot Avenue, the sidewalk disappears, curbing is low profile and there are large areas of continuous access to parking for businesses. There are posted speed limits in the corridor of 25 miles per hour in some sections and 30 miles per hour in other sections. Pedestrian accommodations in the corridor are not comprehensive. The sidewalks are discontinuous (particularly in the Lake Avenue section) and some are in poor condition, curb ramps are not always provided, and crosswalks and pushbuttons are not always present at signalized

intersections. There are a number of crosswalks at unsignalized locations in the eastern portion of West Street. The western (Lake Avenue) portion of the corridor includes primarily residential land uses along with a large office building close to the interchange with I-84 and an area of neighborhood commercial development between Lawncrest Road and Merrimac Street. The City would like to maintain the existing characteristics of this neighborhood. The eastern (West Street) portion of the corridor transitions to urban central business district land uses and streetscape. Congestion is frequently experienced in the corridor, particularly during morning and evening peak periods. The Housatonic Area Regional Transit District (HARTransit) provides local bus service with two routes along the corridor. The corridor also serves a significant number of pedestrians, particularly in the eastern (West Street) portion. There are also large numbers of school buses that operate through the corridor and several stops are made along their route. Consequently, there are significant numbers of schoolchildren in the corridor, waiting for buses in the morning and walking in the afternoon.

There is an existing narrow and low clearance (10 feet 7 inches) railroad bridge over West Street between Benedict Avenue and Beaver Street which is negatively impacting traffic safety and operation. There are height sensors linked to advanced warning flashers over Lake Avenue approaching Crofut Street for eastbound traffic (flashing yellow signals only) and over West Street approaching Division Street for westbound traffic (flashing yellow signals with signs). There is also additional signage alerting vehicles on both approaches at several locations in advance of the low structure, as well as warning flashers on both sides of the bridge. Experienced truck drivers with knowledge of the area are likely already avoiding the Lake Avenue / West Street corridor and westbound truck drivers are specifically directed by signage to use Division Street as an alternate route. However, the railroad bridge was still the location of 15 overhead collisions with the structure during the three-year period of accident reports that was reviewed for this study. This crossing is also the site of drainage problems due to its proximity to and only slightly higher elevation than the Still River. In addition to the safety and

Damage to railroad bridge from vehicle collisions

traffic operational problems experienced at the low clearance crossing, it is also not uncommon for the City to close the roadway when flooding occurs at this location.

There are five City-owned traffic signals that are within the limits of this study corridor. They are located at the following intersections:

- Lake Avenue at Abbott Avenue
- Lake Avenue at Westville Avenue / Oil Mill Road
- West Street at Beaver Street
- West Street at Division Street
- West Street at New Street / Deer Hill Avenue

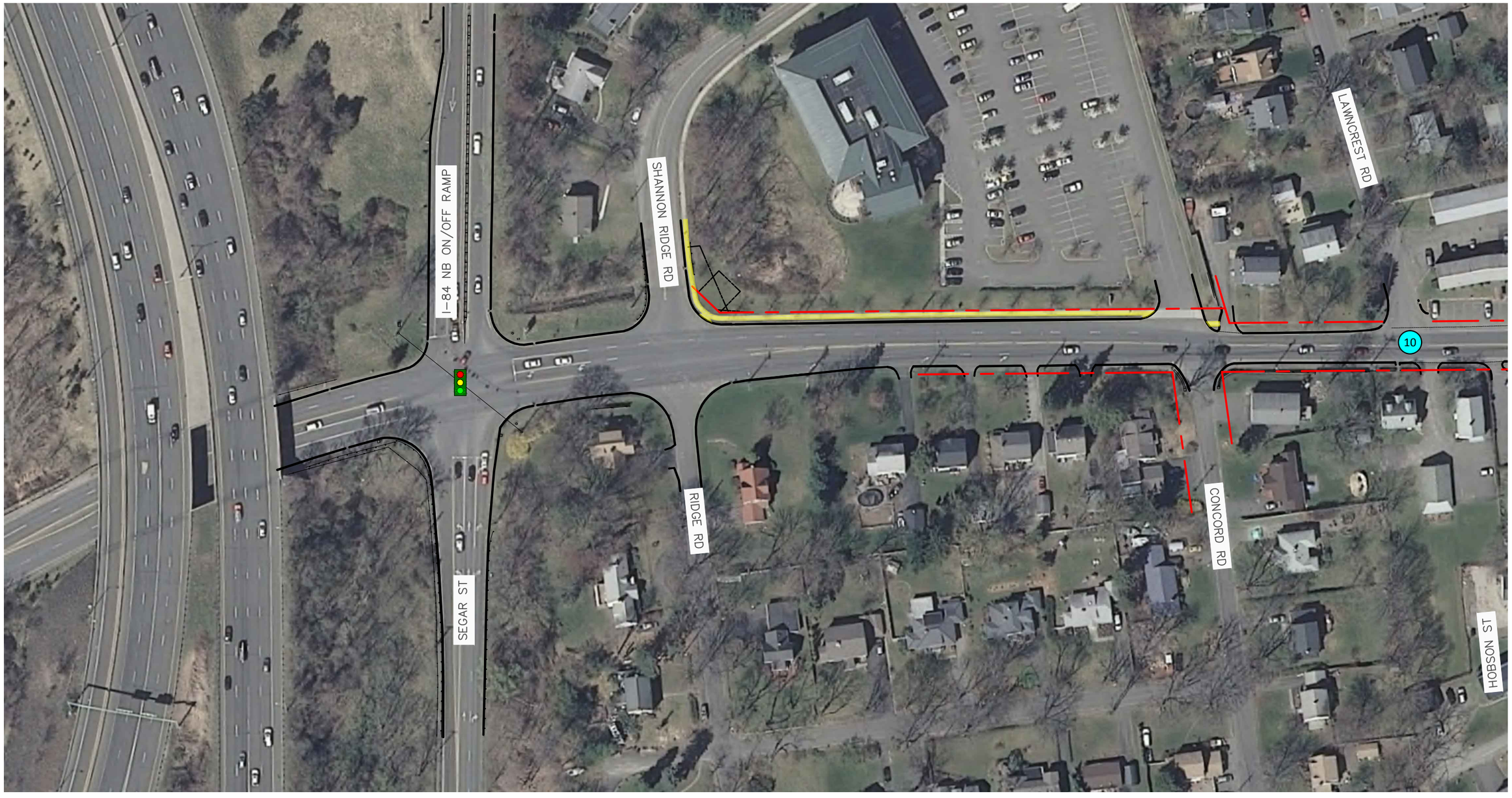
The existing north-south stop-controlled intersection of Lake Avenue at Shannon Ridge Road and Ridge Road will soon be signalized by the City as part of the Connecticut Department of Transportation (CTDOT) Local Road Accident Reduction Program. This intersection is approximately 225 feet east of the signalized Lake Avenue at Segar Street / I-84 northbound on / off ramps intersection. There have been a significant number of accidents at the intersection involving southbound left-turns from Shannon Ridge Road.

There are also a large number of unsignalized intersections with side streets in the corridor in addition to many access driveways. Existing conditions in the Lake Avenue / West Street corridor are illustrated **Figure 1**

A large number of issues were considered for this study including roadway geometry, roadway capacity, traffic operations, crash history, pedestrian accommodations, the low-clearance railroad bridge, transit facilities and operations, beautification, improvement costs, and previous studies and recommendations. The corridor was thoroughly examined from several perspectives and documented throughout this report in various sections.

2 PREVIOUS STUDIES

A number of studies have been completed which have considered portions of this corridor in accordance with a variety of study objectives. Three documents that are particularly relevant to this study effort are: the *2005 Danbury Transportation Plan*, the *2010 Downtown Danbury Issues and Recommendations Report*, and the *Central Business District Traffic Signal Operational Improvements*. Portions of these reports have been summarized as they pertain to the Lake Avenue / West Street study corridor.



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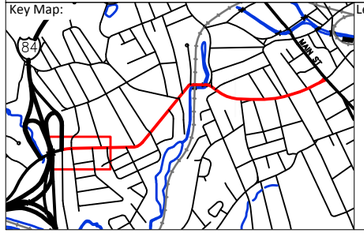


Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- 29 — NUMBER OF ACCIDENTS AT INTERSECTION
- 86 — NUMBER OF ACCIDENTS MID-BLOCK
- SIGNALIZED INTERSECTION
- CROSSWALK
- EXISTING SIDEWALK
- EXISTING RIGHT OF WAY

N

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; Seal of the City of Danbury, Incorporated 1889

Prepared By: VN Engineers, Inc.

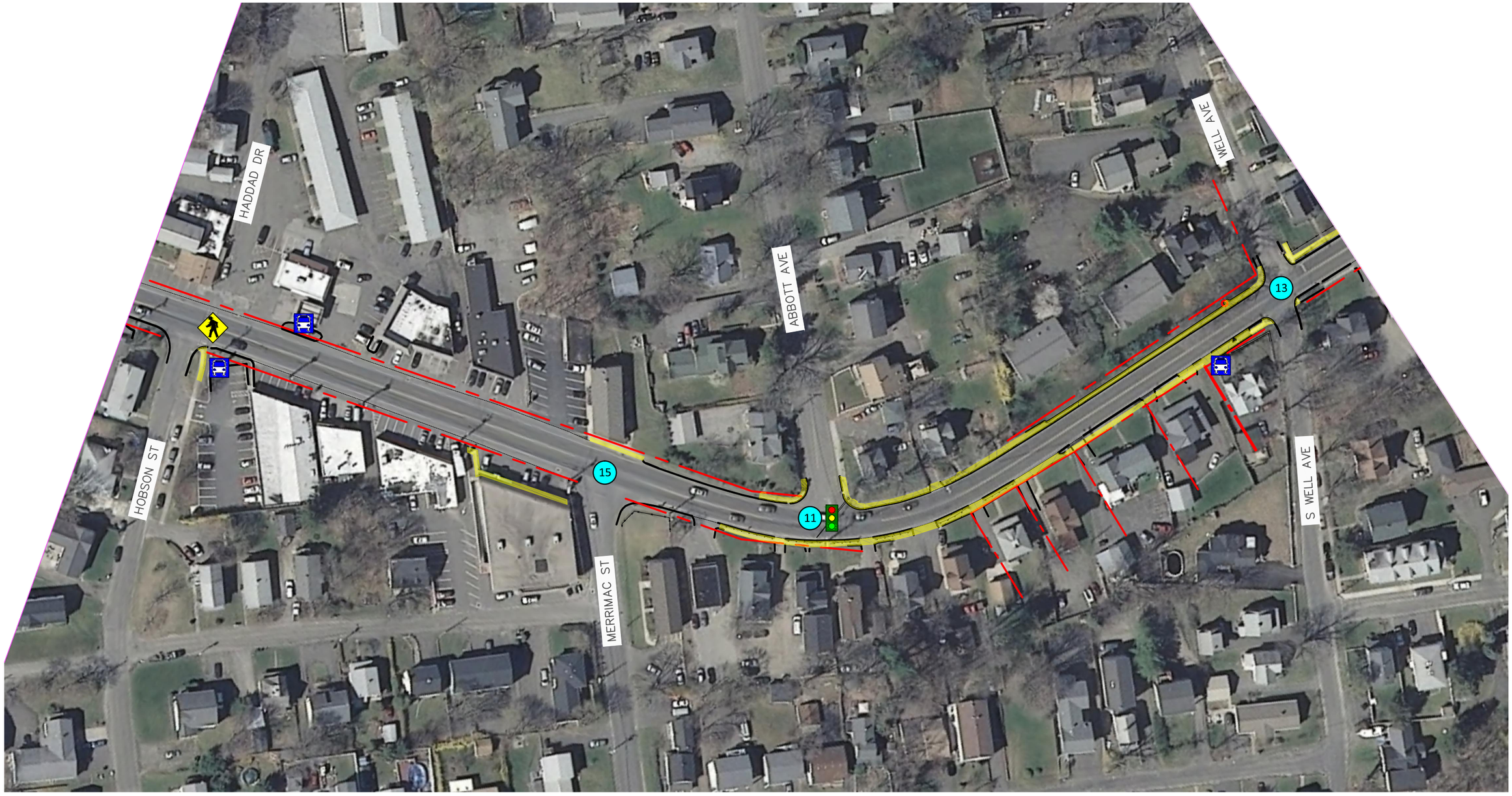
In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: EXISTING CONDITIONS (1 of 6)

Figure Number: 1A



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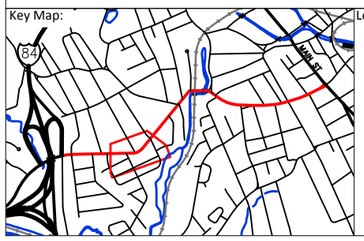

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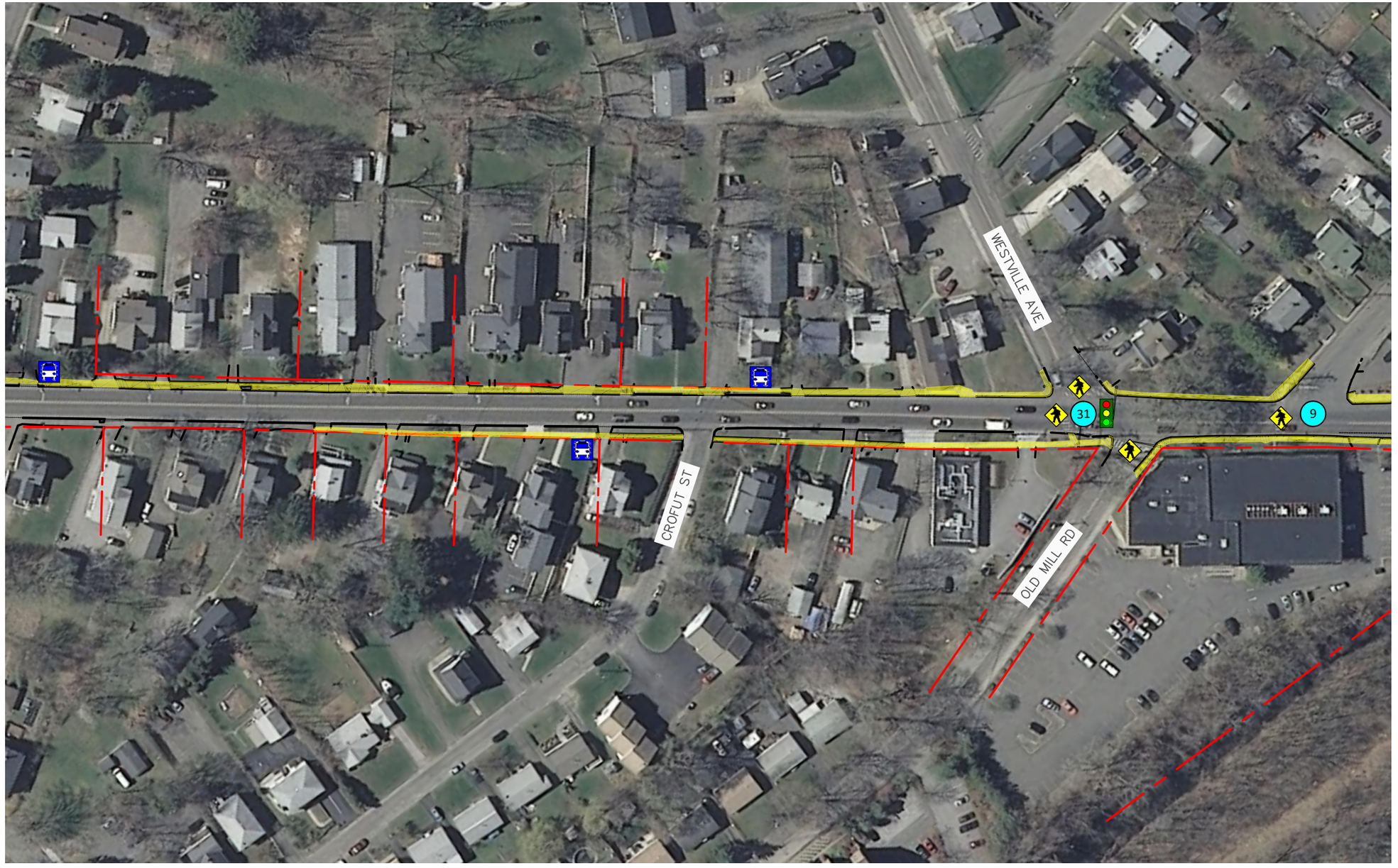
Location: DANBURY, CT

Figure Title: EXISTING CONDITIONS (2 of 6)

Figure Number: 1B



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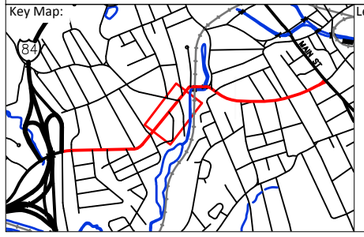

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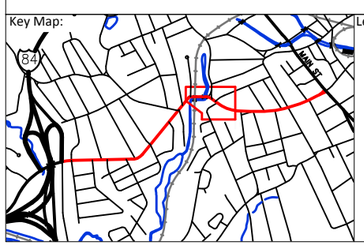
Location: DANBURY, CT

Figure Title: EXISTING CONDITIONS (3 of 6)

Figure Number: 1C

Key Map:



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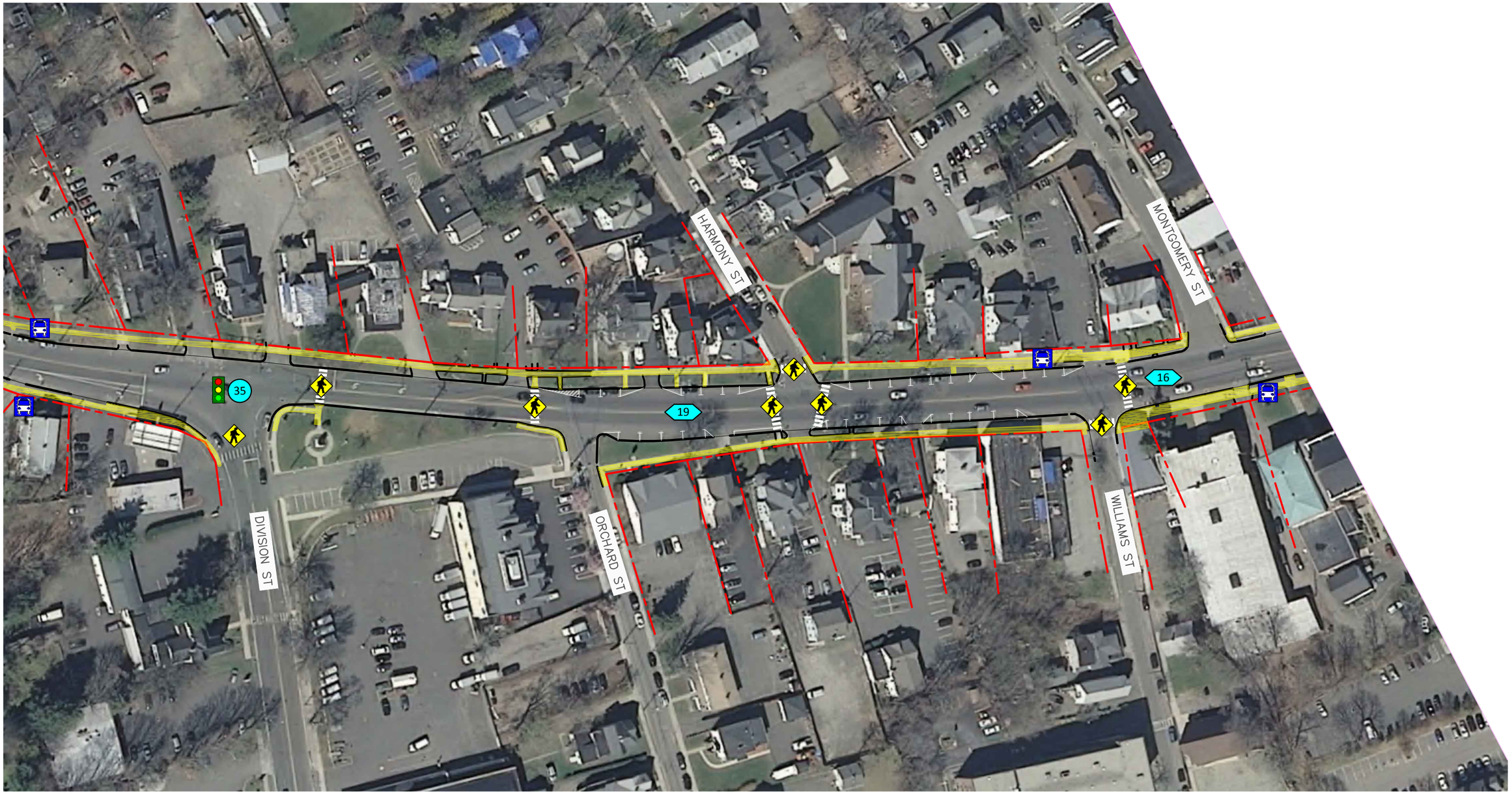
Location: DANBURY, CT

Figure Title: EXISTING CONDITIONS (4 of 6)

Figure Number: 1D



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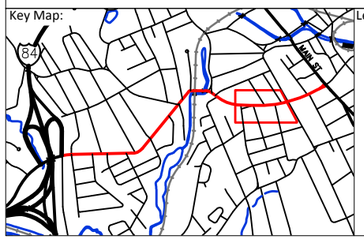

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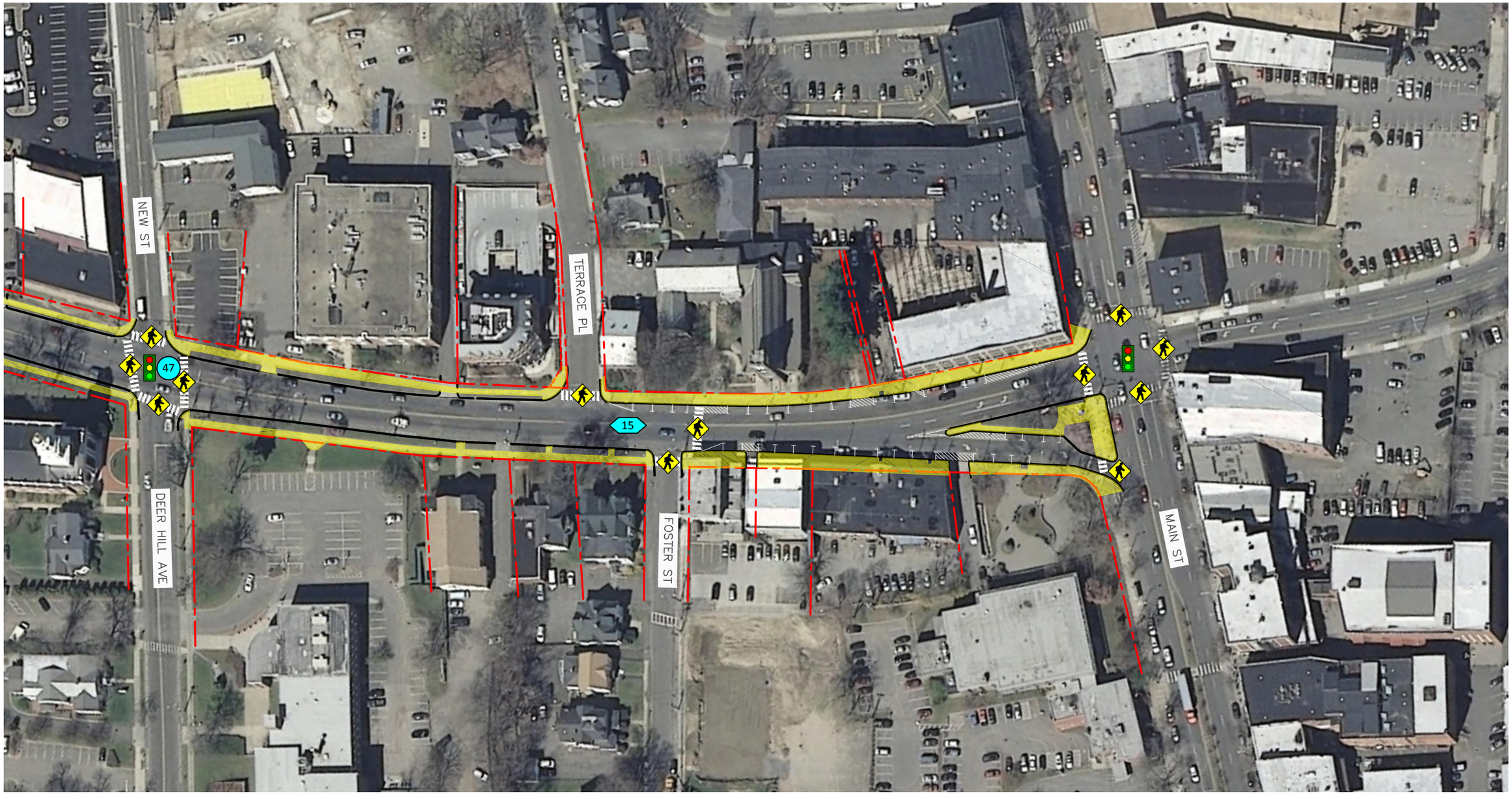
Location: DANBURY, CT

Figure Title: EXISTING CONDITIONS (5 of 6)

Figure Number: 1E



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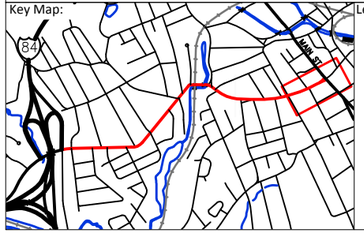

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Figure Title: EXISTING CONDITIONS (6 of 6)

Figure Number: 1F

2.1 2010 Downtown Danbury

A task force was appointed to study downtown Danbury and prepare a report designed to strengthen its social and economic position within the City and surrounding region. This report provides a vision of what the downtown can become. The report identified issues and proposed recommendations for the revitalization of downtown Danbury by: fashioning vision and setting objectives for the future of the downtown; establishing planning principles to guide decision makers; analyzing issues and presenting recommendations to promote and enhance economic development, urban design, historic preservation, and public improvements, and devising an organizational structure for its implementation. The study area for the report encompasses the core of the central business district of the City, a walkable area with concentrated development, historic buildings, and a diversity of uses, including retail stores and services, offices, banks, churches, restaurants and entertainment, public facilities and housing. The corridor of West Street from Main Street to New Street / Deer Hill Avenue is included into the scope of this report. Topics of concern include:

Source: Newstimes.com

<u>Sidewalk and Streetscape Improvements:</u> **"**Achievement of a walkable downtown depends on adequate and appealing sidewalks, for sidewalks not only provide pedestrian access to downtown stores and services, they also constitute the major form of downtown public space." Desired streetscape elements for the City include the following:

- Replacement of sidewalks with scored paving patterns
- Decorative pavers to accent intersection crosswalks
- Granite curbing, as needed
- Street trees and appropriate landscaping
- Ornamental lighting
- Handicap ramps
- Street furniture, including benches and waste receptacles, where appropriate
- Placement of utility lines underground

West Street at New Street / Deer Hill Avenue: The Downtown Danbury report also reviewed and considered the *2009 Central Business District Traffic Signal Operation Improvements Report* performed by Vanasse Hangen Brustlin, Inc. (VHB). Improvements at the intersection of West Street at New Street / Deer Hill Avenue were judged by VHB to be critically needed. Long-term intersection improvement recommendations included the widening of West Street to three lanes on both the eastbound and westbound approaches to the intersection: one left-turn lane, one through lane, and one shared through / right-turn lane. The study also recommended that West Street be widened to include two through lanes in both directions beyond the intersections and noted that widening would most likely result in the elimination of the parking along West Street.

2.2 2009 Central Business District Traffic Signal Operation Improvements

The City of Danbury conducted this study as part of an effort to update traffic signal timing and to maximize the operating conditions of traffic signals throughout the business district. This report looked at 38 intersections and proposed both short and long-term improvements. The following intersections along West Street and Lake Avenue were analyzed in the report:

West Street at New Street / Deer Hill Avenue

All intersection approaches operate at acceptable LOS D or better.

Short Term Improvements: To optimize the efficiency of the current operating conditions, this intersection should operate in Zone 109 (one of the City's signal groups that operate in a coordinated manner). Zone 109 includes seven signalized intersections along Lake Avenue Extension, Lake Avenue, and West Street between Mill Ridge Road and New Street / Deer Hill Avenue.

Long Term Improvements: To mitigate future growth traffic impacts at the intersection, it is recommended to provide additional through lanes to each of the West Street approaches.

West Street at Division Street

All intersection approaches operate at acceptable LOS C or better. However, the northbound approach of Division Street operates at LOS E during the PM peak period.

Short Term Improvements: The poor LOS E for the northbound approach of the intersection can be improved to an acceptable LOS D by increasing Green time. This intersection should operate in Zone 109.

Long Term Improvements: Future growth may be accommodated by providing additional through lanes to each West Street approach.

West Street at Beaver Street

Under the current operating conditions, both the weekday AM and PM peak hour traffic periods at the intersection of West Street at Beaver Street operate at an acceptable LOS A and D respectively. However, during the PM peak period, the eastbound left-turn and southbound left-turn movements operate at LOS E.

Short Term Improvements: To optimize the efficiency of the current operating conditions, this intersection should operate in Zone 109.

Long Term Improvements: Future growth may be accommodated by providing additional through lanes to each West Street approach. The intersection should operate in Zone 109.

Lake Avenue at Westville Avenue / Oil Mill Road

Under the current operating conditions the weekday AM and PM peak traffic hour periods at the intersection operate at an acceptable LOS of B. However, the southbound approach of the intersection operates at an unacceptable LOS F during the PM peak period.

Short Term Improvements: To optimize the efficiency of the current operating conditions, this location should operate in Zone 109.

Long Term Improvements: Future growth may be accommodated by providing an exclusive left-turn lane to the eastbound approach of Lake Avenue.

2.3 2005 Danbury Transportation Plan

The Transportation Plan is an effort to provide local officials and the public with a complete inventory and analysis of the transportation needs in the City of Danbury. Rapid rates of population growth and increased mobility have had a marked affect on transportation in the City and the region as public improvements struggle to keep pace with soaring demands. The Transportation Plan covers four major sections of transportation: (1) streets and highways, (2)

public transportation, (3) pedestrian, bicycle, and air travel, and (4) state and regional transportation planning issues. This expands on the Plan of Conservation and Development (PCD), which was adopted in 2002.

The following recommendations were provided for the Lake Avenue / West Street corridor:

1. West Street should be widened as feasible from Terrace Place to Division Street, with a left-turn lane added into New Street and streetscape improvements added, all for the purpose of relieving congestion, improving safety and enhancing pedestrian travel.
2. The City needs to gain State funding for the timely improvements of bridges in poor condition.
3. Sidewalks should be extended along major arteries and throughout the urban core to improve pedestrian safety; streetscape improvements should be provided along West Street from Main Street to Division Street to enhance the downtown pedestrian travel.
4. Improve bus stop signage and inter-modal transportation information dissemination.

None of the recommendation made in 2005 have been incorporated into the Lake Avenue / West Street study area corridor.

3 Accident History

Reports on recent traffic accidents for Lake Avenue and West Street were obtained from the City of Danbury for the latest available three-year period (November 2009 to November 2012). Data was obtained from the Police Department and was in the form of individual accident reports (PR-1 forms). Working with City engineering staff we prioritized locations for requesting data to focus on known problem areas in the corridor. Crash data for the following locations was requested: 1-7 Abbott Avenue, 1-9 Beaver Street, 151-155 Deer Hill Avenue, 50-60 Division Street, 30-38 Foster Street, 1-79 Lake Avenue (I-84 southbound off ramps to Haddad Drive), 58-64 Oil Mill Road, 1-19 New Street, 1-5 Terrace Place, 1-9 Westville Avenue, 26-152 West Street (Oil Mill Road to Foster Street).

Over the past three years there were a total of 276 accidents within the areas requested. Rear end collisions were the greatest portion of these accidents (42%) followed by turning movements (21%). There were six accidents which involved a pedestrian or bicycle, however there were another six accidents which were reported under a different category, but also involved a pedestrian or bicycle. A summary of accident severity and collision type by corridor location is shown in **Table 1**. It should be noted that for many intersection locations, crashes

Table 1: Accident Summary

LOCATION: Lake Avenue / West Street at	ACCIDENT SEVERITY			TYPE OF COLLISION													
	INJURY	PROPERTY DAMAGE ONLY	**TOTAL**	TURNING	OVER HEAD RR BRIDGE	PILLAR OF RR BRIDGE	REAR-END	BACKING	ANIMAL	ANGLE	OVERTURN	SIDE SWIPE	PEDESTRIAN / BICYCLIST	PARKING	FIXED OBJECT	**TOTAL**	**PERCENTAGE**
Lawncrest Rd.	3	7	**10**	1			2			2		3	2			**10**	**4%**
Merrimac St.	1	14	**15**	1			8	2				1	1	1	1	**15**	**5%**
Abbott Ave.	2	9	**11**	4			2				1				4	**11**	**4%**
Well Ave. / S. Wells Ave.	4	9	**13**	1			6	1	1	4						**13**	**5%**
Westville Ave. / Oil Mill Ave.	9	22	**31**	4			24					2			1	**31**	**11%**
Morris St.	3	6	**9**	5			1					2			1	**9**	**3%**
RR Bridge / Benedict Ave.	2	17	**19**		15	2	1			1						**19**	**7%**
Beaver St.	5	31	**36**	9			18					4	1		4	**36**	**13%**
Division St.	8	27	**35**	15			7	6		1		3	1		2	**35**	**13%**
Harmony St. / Orchard St.	4	15	**19**	3			13					3				**19**	**7%**
William St. / Montgomery St.	3	13	**16**	3			9			3		1				**16**	**6%**
Deer Hill Ave. / New St.	14	33	**47**	8			20	1		16		1	1			**47**	**17%**
Foster St. / Terrace Pl.	2	13	**15**	4			6					5				**15**	**5%**
TOTAL	**60**	**216**	**276**	21%	5%	1%	42%	4%	0%	10%	0%	9%	2%	0%	5%	**276**	

Source: Danbury Police Department (Data from November 2009 to November 2012)

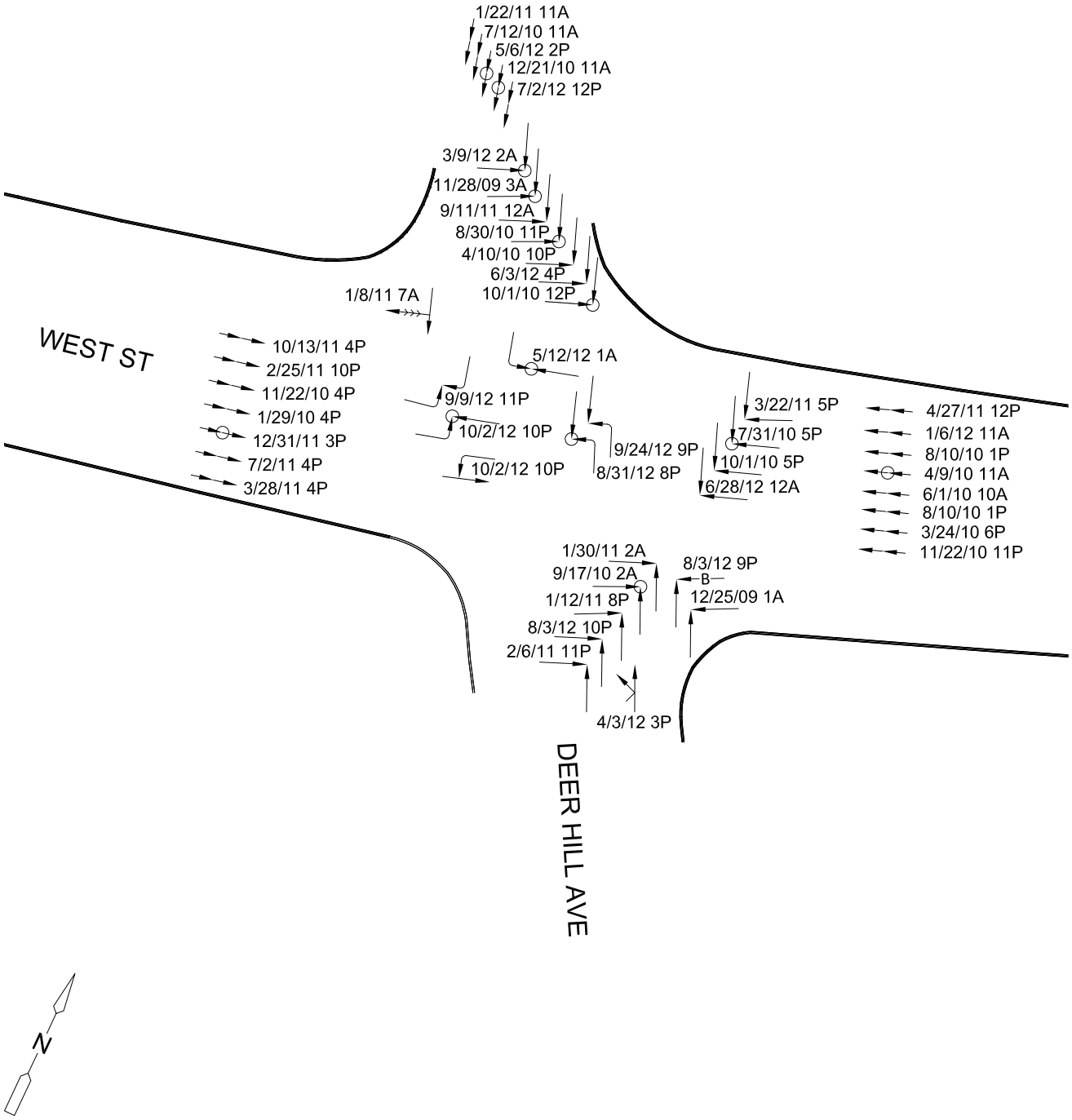
were tabulated in the summary table that did not occur at the intersection itself, but occurred at a location that is in close proximity to the intersection (such as at unsignalized intersections or driveways). This is considered in the detailed analysis. There are six locations within the corridor that the City has deemed very critical:

1. West Street at New Street / Deer Hill Avenue
2. West Street at Division Street
3. West Street at Beaver Street / Pleasant Street / Stevens Street
4. Lake Avenue at Westville Avenue / Oil Mill Road / Crofut Street
5. West Street at Housatonic RR Bridge
6. West Street at Orchard Street / Harmony Street

Analysis of accident histories at these locations is discussed in the sections below. For each of these locations, tables were developed by the City of Danbury detailing each accident. These are included in **Appendix A**.

West Street at New Street / Deer Hill Avenue - The intersection of West Street at New Street / Deer Hill Avenue has the highest number of accidents of all the corridor locations examined. A collision diagram for this intersection is shown in **Figure 2**. Forty-seven accidents occurred here during the three-year period reviewed. Twenty were rear end crashes, 16 were angle crashes, and eight were turning crashes. The high number of angle crashes indicates that a contributing factor or factors are likely. Upon review of the individual traffic reports for the intersection, it was found that 13 of the 16 angle crashes occurred while the signal was in flash mode. According to the existing traffic control signal plan, obtained from the City of Danbury, the traffic signal operates in flash mode daily from 10:00 PM to 6:00 AM. During flash mode, signal heads for the eastbound and westbound West Street approaches "blink" yellow, while signal heads for the northbound Deer Hill Avenue and southbound New Street approaches "blink" red. Studies have documented that crash rates can increase at signalized intersections that during late night / early morning hours when the signal is operating in flash mode. The flashing operation seems to be a contributing factor to the angle crashes,

Southbound New Street approach to West Street



Legend:

Accident Severity: Fatality; Personal Injury; Property Damage

Collision Types: Rear End; Side Swipe; Parked; Straight; Out Of Control; Left Turn; Right Turn; U-Turn; Backing; Stopped; Pedestrian; Bicycle; DUI; Unknown

Object Types: General; Signal; Tree; Animal; Pole; Fixed Object

Prepared For: HVCEO; City of Danbury

Prepared By: VN Engineers, Inc.

In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: WEST ST AT NEW ST/ DEER HILL AVE COLLISION DIAGRAM

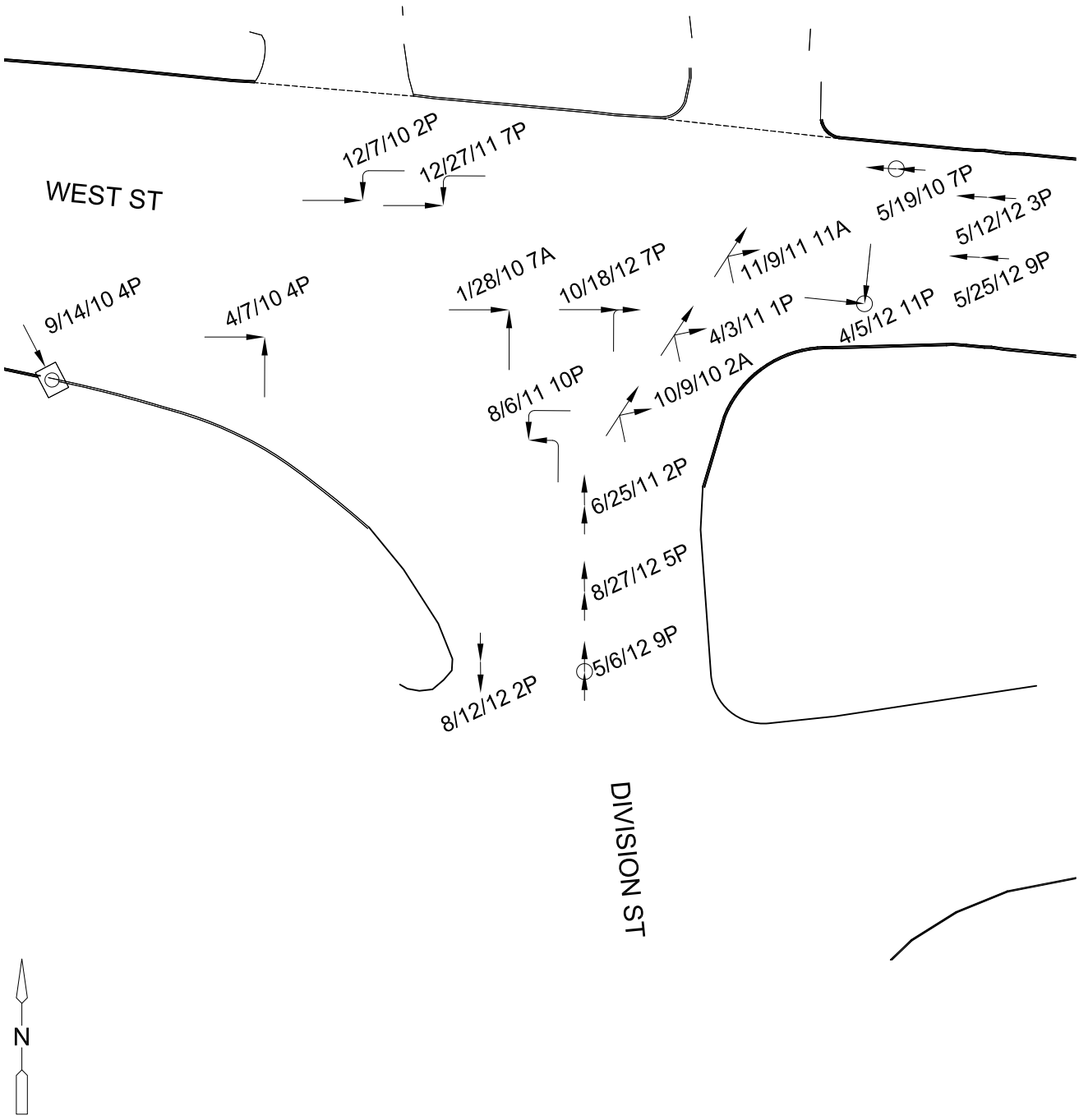
Figure Number: 2

but was also a likely factor in one turning accident. There is not an obvious pattern to turning crashes at the intersection except that seven of the eight turning crashes occurred between a left-turning vehicle and an opposing through-moving vehicle during a permitted left-turn phase. Three occurred between northbound left-turning and southbound vehicles. There is an exclusive turn lane for northbound vehicles, but no protected phase for that movement. There is one lane on the southbound approach and there is an advanced phase for the southbound movements before the northbound / southbound signal phase. There may be some confusion caused by this lane configuration and phasing combination. None of the turning crashes occurred during peak periods and thus congestion is less likely to have been a contributing factor. There is not a distinct pattern to the rear end crashes that was discerned by reviewing the traffic reports. Seven occurred on the West Street westbound approach, eight occurred on the West Street eastbound approach, four on the New Street southbound approach, and one on the Deer Hill Avenue northbound approach. The stop and go nature of traffic flow near the traffic signal combined with drivers following too closely and being distracted in their vehicles are typical explanations.

West Street at Division Street - The summary table shows 35 accidents at the intersection of West Street and Division Street over the past three years. On closer review of the accident reports, seventeen of these crashes are associated with nearby access driveways or private property. (Fifteen of these are associated with the Citgo driveways to Division Street or West Street or occurred within the parking lot itself.) These seventeen accidents include all six of the backing accidents, one of the fixed object accidents, and ten of the turning accidents listed in the table.

Looking northbound at Citgo access to Division Street

Of the remaining 18 accidents associated with the intersection, seven were rear end accidents, five were turning accidents, and 3 were sideswipes. A collision diagram depicting these 18 accidents is shown in **Figure 3**. There was also one pedestrian accident that resulted in minor injuries, although the pedestrian was found at fault for crossing when he did not have a signal.



Legend:

Accident Severity: Fatality; Personal Injury; Property Damage

Collision Types: Rear End; Side Swipe; Parked; Straight; Out Of Control; Left Turn; Right Turn; U-Turn; Backing; Stopped; Pedestrian; Bicycle; DUI; Unknown; Fixed Object

Object Types: General; Signal; Tree; Animal; Pole

Prepared For: HVCEO; City of Danbury

Prepared By: VN Engineers, Inc.

In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

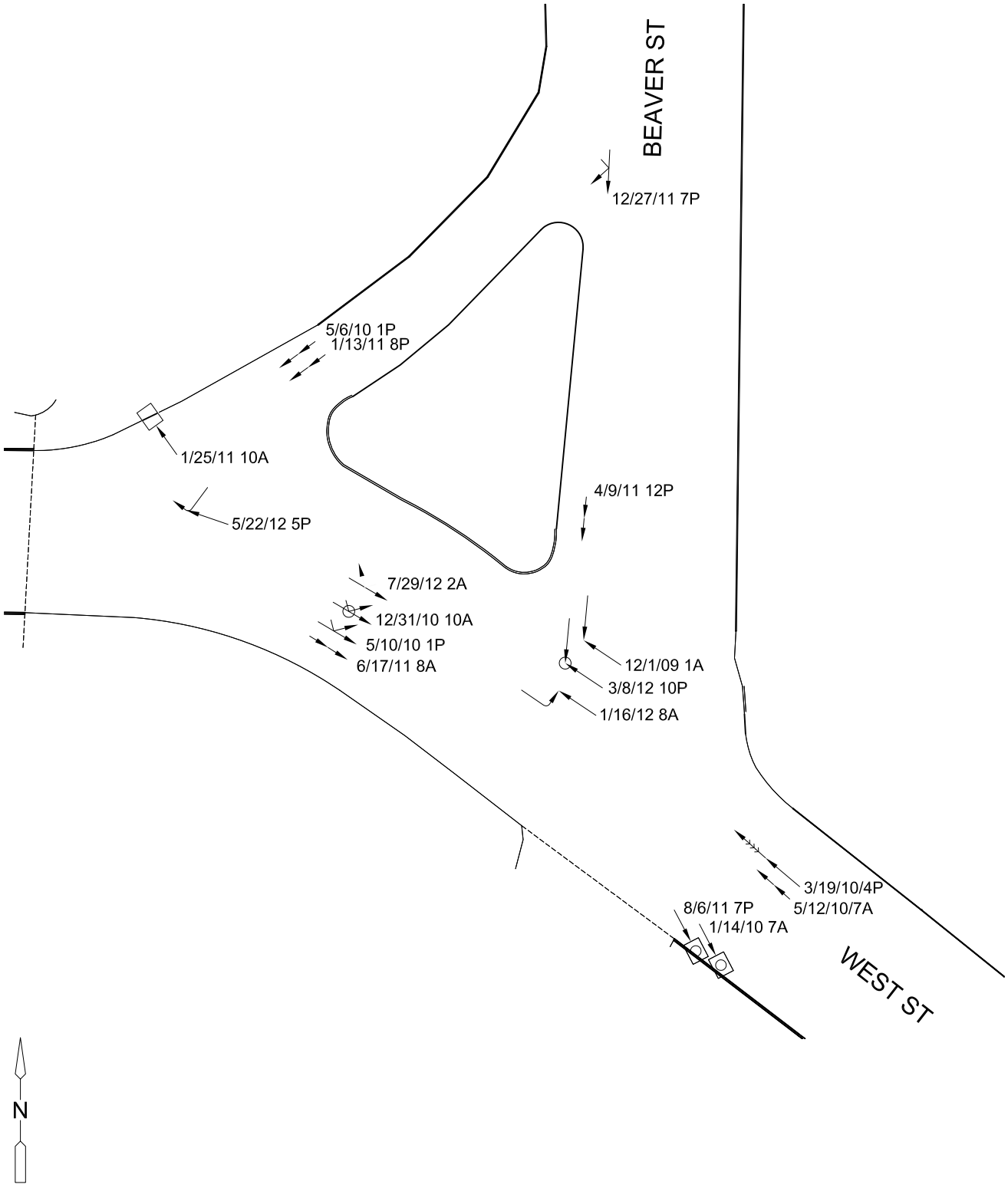
Figure Title: WEST ST AT DIVISION ST COLLISION DIAGRAM

Figure Number: 3

The rear end and turning accidents do not exhibit a particular pattern of movements or locations. However, the sideswipe accidents all occurred between two northbound right-turning vehicles. The Division Street approach has recently been resurfaced and restriped (in the past year or so) to the current configuration of one exclusive left-turn lane and one exclusive right-turn lane. Prior to this configuration, there was one approach lane with a wide shoulder striped with a solid edge line, which could have contributed to confusion about the lane assignments and led right-turning vehicles to use the shoulder as a turn lane. This seems to have been corrected with the current pavement markings as there have been no accidents of this type since 2011.

West Street at Beaver Street - The intersection of West Street and Beaver Street had 36 accidents in the three-year period considered. Upon closer review of the accident records, only 17 of these were located at the intersection itself, while the other 19 were at nearby driveways and unsignalized intersections. A collision diagram of this location depicting the 17 accidents at the intersection is shown in **Figure 4**. Of the 19 other accidents that occurred at other nearby locations, there were several associated with the access to 130 West Street, including four rear end accidents and three turning accidents. This location is particularly hazardous because of the continuous access with front in parking along West Street which allows for many conflict points between through traffic and vehicles pulling in or out of the driveway. The continuous access also creates a large area where friction can occur along West Street as vehicles stop or slow for others turning in or out. There were also accidents which occurred at the intersection with Pleasant Street (including a pedestrian accident) and the intersection with Stevens Street. Both of these unsignalized intersection locations are in very close proximity to Beaver Street. Eighteen of the 36 accidents in the vicinity of the West Street at Beaver Street intersection were rear end crashes. Three of these occurred on the southbound approach, eight occurred on the westbound approach, and seven occurred on the eastbound approach. Only eight of the 18 were directly associated with the West Street at Beaver Street intersection. It is likely that there are several factors that are contributing to crashes in this area including the proximity and layout of nearby driveways and intersections, as well as sharp horizontal curves

Continuous access at 130 West Street



Legend:

Accident Severity: Fatality; Personal Injury; Property Damage

Collision Types: Rear End; Side Swipe; Parked; Straight; Out Of Control; Left Turn; Right Turn; U-Turn; Backing; Stopped; Pedestrian; Bicycle; DUI; Unknown; Fixed Object

Object Types: General; Signal; Tree; Animal; Pole

Prepared For: HVCEO; City of Danbury

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In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: WEST ST AT BEAVER ST COLLISION DIAGRAM

Figure Number: 4

on West Street and the close proximity to the railroad bridge which can limit visibility while driving through the area. Additionally, four of the turning accidents that occurred at the West Street at Beaver Street intersection involved southbound left-turning and westbound through moving vehicles. One of those accidents occurred when the signal was in flash mode, but clearance intervals (yellow and all red times) that are being used for the signal phases should be checked for adequacy to see if they could be a contributing factor for the others.

West Street at Westville / Oil Mill Road - There were 31 accidents that occurred in the vicinity of the West Street at Westville Avenue / Oil Mill Road intersection. Twenty-four of these accidents were rear end collisions, and 17 of the rear end collisions involved vehicles stopped for traffic (caused by queuing or turning vehicles) or stopped for a red light at the traffic signal. All but one of the rear end accidents occurred on West Street, 18 were in the eastbound direction and five were in the westbound, and 17 of the 24 occurred between 12:00 pm and 8:00 pm. The two sideswipe accidents involved cars trying to get around turning vehicles. The four turning accidents included four different combinations of movements (southbound and westbound, northbound and westbound, eastbound and northbound, and eastbound and southbound). There are a few factors that could be contributing to higher numbers of crashes between eastbound vehicles. One could be the congestion at the intersection, in conjunction with the single-lane eastbound approach. Another could be a long tangent section on the eastbound approach which could be allowing drivers to travel at speeds faster than the 30 mile per hour speed limit. And lastly, the residential nature of Lake Street west of the intersection may make the presence of a traffic signal unexpected.

West Street at Housatonic railroad bridge - Nineteen accidents occurred at the low clearance railroad bridge over West Street location during the three-year period evaluated. Fifteen out of 19 accidents involved overhead collisions with the bridge. For 12 of the 15 overhead collisions, vehicles were traveling westbound, while for the other three vehicles were traveling eastbound. Ten of the fifteen drivers had out-of-state licenses. The types of vehicles involved in the overhead collisions included two campers, a motor home, three utility trucks with buckets, a flatbed truck carrying a forklift, and eight box trucks (three of which were rentals). Signage for westbound traffic should be re-evaluated to reduce crashes involving westbound vehicles. Although signage on the eastbound and westbound approaches is similar, it could be that the proximity of Benedict Avenue to the low clearance crossing allows eastbound vehicles an alternative for avoiding a collision without too much difficulty by turning onto that street after they have seen the bridge. It should be noted that in addition to the accidents that occurred when vehicles struck the bridge, the number of times that vehicles had to stop and back up or

turn around to take another route has not been documented. These situations would also result in operational and safety problems and may require City assistance to stop or redirect traffic while a truck is backing or turning. A bridge with adequate clearance would eliminate all of these types of accidents at this location. There were also two accidents at this location that involved collisions with bridge piers. Both of these accidents involved eastbound vehicles traveling downhill on the approach to the bridge, leaving their lane as they entered the horizontal curve, and striking the bridge pier on the north side of the road. This roadway design issue could perhaps be mitigated with chevron signs and warning signs to alert drivers to the upcoming curve.

West Street at Harmony Street / Orchard Street - Nineteen crashes occurred in this area during the three year period reviewed. Thirteen of these were rear end accidents that occurred in one of these two scenarios: six rear end accidents occurred when one vehicle was struck while yielding to a pedestrian in a crosswalk, while seven occurred in stop and go traffic conditions. The section of roadway between the Division Street and New Street / Deer Hill Avenue intersections is approximately 1,200 feet long with wide through lanes and parking lanes that are not being utilized much during certain times of the day. It is plausible that vehicles are traveling at higher speeds in this section which results in higher numbers of rear end crashes as vehicles stop for queued traffic ahead. Slowing vehicles could reduce the number of rear end crashes or at least reduce their severity. Additionally, crosswalks in this area should be consolidated into a fewer number and visibility should be improved. To reduce vehicular speeds, improve visibility for pedestrians and drivers, and shorten crossing distances, curb extensions could be added at certain locations in this section. The three sideswipe accidents that occurred in this area involved parked cars (two accidents) or a car pulling out of a parking spot (one accident). Curb extensions would also define parking areas in this section which would help both parking and through moving vehicles to anticipate parking maneuvers.

Looking westbound at West Street at Harmony Street intersection

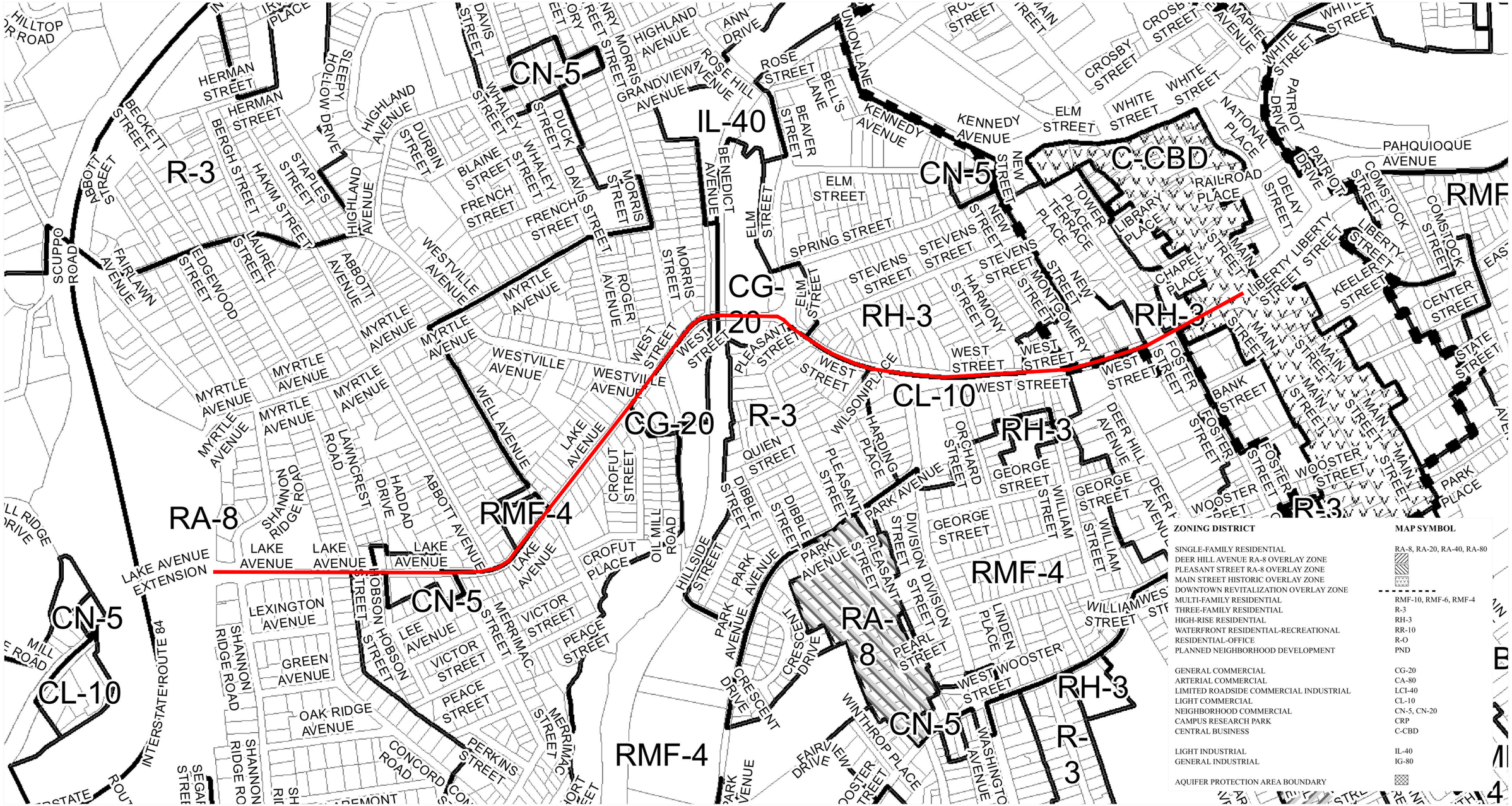
The critical intersections evaluated within the Lake Avenue / West Street corridor all have unique physical and operational characteristics and therefore a variety of factors that contribute to crashes at each location. Other issues related to safety, operations, and geometry have been evaluated and discussed, and recommendations have been made in Section 6.

4 LAND USE

The Lake Avenue / West Street corridor is surrounded by dense urban land uses that include more residential areas in the western section and transition to central business district areas at the east end of West Street. There are also some sporadic areas of commercial development just east of Shannon Ridge Road, between Lawncrest Road and Merrimac Street, and between Oil Mill Road and Beaver Street. Further east are areas of light commercial and high-rise residential land uses and portions of the corridor east of Montgomery Street on the north side of the roadway and east of Foster Street on the south side of the roadway are included in the downtown revitalization zone. **Figure 5** shows a portion of the City of Danbury Zoning Map that depicts existing zoning for the corridor.

Looking West toward the Lake Avenue at I-84 Ramps / Segar Street intersection at Western limit of the corridor

Looking east toward the West Street at Main Street intersection at the Eastern limit of the corridor



SOURCE: CITY OF DANBURY ZONING MAP 12/31/2011

ZONING DISTRICT	MAP SYMBOL
SINGLE-FAMILY RESIDENTIAL	RA-8, RA-20, RA-40, RA-80
DEER HILL AVENUE RA-8 OVERLAY ZONE	
PLEASANT STREET RA-8 OVERLAY ZONE	
MAIN STREET HISTORIC OVERLAY ZONE	
DOWNTOWN REVITALIZATION OVERLAY ZONE	
MULTI-FAMILY RESIDENTIAL	RMF-10, RMF-6, RMF-4
THREE-FAMILY RESIDENTIAL	R-3
HIGH-RISE RESIDENTIAL	RH-3
WATERFRONT RESIDENTIAL-RECREATIONAL	RR-10
RESIDENTIAL-OFFICE	R-O
PLANNED NEIGHBORHOOD DEVELOPMENT	PND
GENERAL COMMERCIAL	CG-20
ARTERIAL COMMERCIAL	CA-80
LIMITED ROADSIDE COMMERCIAL INDUSTRIAL	LCI-40
LIGHT COMMERCIAL	CL-10
NEIGHBORHOOD COMMERCIAL	CN-5, CN-20
CAMPUS RESEARCH PARK	CRP
CENTRAL BUSINESS	C-CBD
LIGHT INDUSTRIAL	IL-40
GENERAL INDUSTRIAL	IG-80
AQUIFER PROTECTION AREA BOUNDARY	

Key Map:

Legend:

N

1" = 100'

50' 0 100'

Prepared For:

Prepared By: VN Engineers, Inc.

In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: EXISTING ZONING

Figure Number: 5

Existing traffic generators in the corridor include the:

- AAA building just east of Ridge Road
- Morris Street School (north of West Street on Morris Street)
- Salame Plaza which houses the Western Connecticut Health Network Research Institute and other businesses at 131 West Street just east of the railroad bridge
- Family and Children's Aid Child Guidance Center at 80 West Street near Division Street
- Danbury City Hall at 155 Deer Hill Avenue at West Street
- Head Start preschool program just south of West Street on Foster Street

Salame Plaza at 131 West Street

The AAA building and the Family and Children's Aid Center were recently completed projects in the corridor. They were completed in 2002 and 2011 respectively. With these projects completed, the study corridor is effectively built out with all parcels developed and seemingly in use. According to the City of Danbury planning director, there are no major changes anticipated for the corridor.

There are some development projects planned or underway for nearby areas of Danbury. One is the construction of WCSU's new $97 million dollar Visual and Performing Arts Center which is scheduled for completion in March 2014 and will house a 350-seat concert hall, a 350-seat theater, and art gallery, as well as classroom, rehearsal, and studio space. This building is located on WCSU's Westside campus west of the study area off of University Boulevard. Another project is the proposed $200,000 revamping of Kennedy Park, an existing 1-acre City park south of the Main Street and Kennedy Avenue intersection north of the site in downtown Danbury that currently serves as an informal meeting spot for day laborers and provides a home to a local farmer's market on Fridays during the summer and fall. Danbury hospital, about a mile northeast of the study area, is also undergoing an expansion that will include a new 12-story tower to include a new expanded emergency department, a new critical care unit, and a new neonatal intensive care unit, as well as more patient rooms and improved parking. The expected completion for this project is summer, 2014. Their impact on the corridor is difficult to estimate for this study and outside of the scope for this project.

5 TRAFFIC VOLUMES

CTDOT manages a traffic-monitoring program that collects traffic count data at point locations throughout the state. Counts are collected in three-year cycles at specific locations and Average Daily Traffic maps are produced for each municipality. Historical traffic counts are available at some locations back to 2000. CTDOT has collected traffic counts at five locations within the study corridor for the previous two cycles, and some additional counts are available from 2004 and 2001. All of the available daily traffic count data is shown in **Table 2** and arranged from west to east through the study area.

Table 2: Average Daily Traffic Volumes

Location		2001	2004	2007	2011
Lake Ave / West St	East of Shannon Ridge Rd.	--	--	15500	16300
	East of Concord Rd.	16700	16600	14900	16000
	East of Merrimac St.	--	--	14000	15000
	At Railroad crossing	--	--	17100	18200
	East of Harmony St.	--	17100	16000	17900

Source: CTDOT

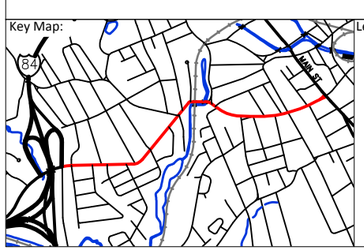
Data shows that recently, traffic volumes in the corridor have been increasing. From 2007 to 2011, annualized growth rates at the corridor's count station locations ranged from 1.3% just east of Shannon Ridge Road to 2.85% east of Harmony Street. Although all locations have experienced increases in traffic volumes recently, growth has not been steady for the past decade according to the count data obtained east of Concord Road. The 2011 daily traffic volume at that location was less in 2011 than it was in 2001. As is shown from the data, traffic volumes decreased from 2001 to 2007 and then increased to 2011. The traffic data for just east of Harmony Street also indicated the lowest daily traffic volume was in 2007. These trends are not explained by development patterns in the study area, since the corridor has had minimal development activity in the last decade since it is effectively built out. The volume decreases and increases are more likely due to regional growth and decline.

The City of Danbury also collected daily traffic counts in the fall of 2012 at several corridor locations. The 2012 daily count data obtained from the City of Danbury included hourly traffic volumes for the twenty-four hour collection period. This allowed for the clear identification of peak periods in the corridor. At most locations, the morning peak hour occurs from 8:00 to 9:00 AM and the evening peak hour occurs from 5:00 to 6:00 PM. These peaking characteristics were

observed and confirmed in the field. It should be noted that the mix of traffic in the corridor varied between the morning and evening peak periods. The percentages of cars and trucks appeared similar, however there is a larger number of school transportation vehicles in the morning (busses, mini busses, vans, cars) than in the afternoon. Conversely, there are larger numbers of pedestrians in the afternoon than in the morning. We also obtained peak hour turning movement volumes for signalized intersections in the corridor (as part of SYNCHRO models) from the City of Danbury Engineering Department. These volumes are shown in **Figure 6**. Volumes were only available for the signalized intersections in the corridor and are not balanced. The turning movements indicate that in the western (Lake Avenue) portion of the corridor, westbound volumes are higher than eastbound volumes during both the AM and PM peak periods. In the eastern (West Street) portion of the corridor, eastbound volumes are slightly higher than westbound volumes during the AM peak hour and westbound volumes are slightly higher during the PM peak hour.

The Connecticut State Data Center projects City population growth corresponding to a 0.5% annual growth with an expected increase from 80,958 persons in 2010 to 89,602 in 2030. Based on the historical traffic data, population projections, and consultation with the City of Danbury Planning Department, an annual growth rate of 1.5% was used to estimate traffic volumes in the corridor for a 20-year planning horizon. Projected 2032 turning movement volumes are shown in **Figure 7**.

Key Map:



Legend:

475 AM PEAK HOUR TURNING MOVEMENT VOLUMES

590 PM PEAK HOUR TURNING MOVEMENT VOLUMES

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1" = 600'

300' 0 600'

Prepared For:

HVCEO Housatonic Valley Council of Elected Officials

Prepared By:

VN Engineers, Inc.

In association with:

dala

Project Title:

TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:

DANBURY, CT

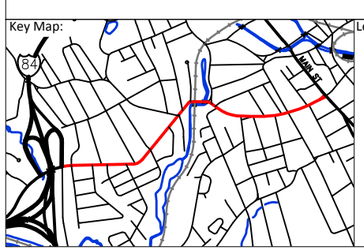
Figure Title:

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES

Figure Number:

6

Key Map:



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Location:

DANBURY, CT

Figure Title:

PROJECTED 2032 TURNING MOVEMENT VOLUMES

Figure Number:

7

6 ROADWAY NETWORK

The Lake Avenue / West Street corridor roadway section varies considerably within the study limits. Capacity analysis was conducted for all of the signalized intersections in the corridor. Also, individual intersections were evaluated based on their safety, geometric, and operational characteristics. Previous studies have recommended widening West Street to four lanes in the eastern portion of the corridor. In this study, this recommendation was discussed and the feasibility of widening was examined. Additionally, signing for the low clearance crossing was reviewed. And finally, a detailed evaluation of many of the issues related to the railroad bridge crossing was undertaken. We used a roadway survey of the corridor that was prepared by the City 2012 and 2013. We also obtained existing traffic control signal plans and existing SYNCHRO models. All of our analysis, however, was informed by a series of field reviews that we conducted between December, 2012 and March, 2013.

6.1 Capacity Analysis

Existing conditions SYNCHRO models were provided by the City of Danbury for the AM and PM peak periods. The signalized intersections of Lake Avenue at Abbot Avenue, Lake Avenue at Westville Avenue / Oil Mill Road, West Street at Beaver Street, West Street at Division Street and West Street at New Street / Deer Hill Avenue are included in the model and operate as a coordinated system controlled by Danbury's traffic control center in City Hall. According to the SYNCHRO models, all of these traffic signals operate with an 80-second cycle length during the AM peak period and a 100-second cycle length during the PM peak period. Delays, Levels of Service, and Volume to Capacity (V / C) ratios were extracted from the models and are shown in **Table 3**. Detailed SYNCHRO reports are included in **Appendix B**. We also observed the peak period traffic operational conditions in March, 2013.

Westbound West Street approach to the New Street / Deer Hill Avenue intersection during the PM peak hour

The SYNCHRO analysis indicates that during the AM and PM peak hours, all signalized intersections in the study corridor are currently operating at an overall Level of

Table 3: Existing Conditions Level of Service Analysis

	2012					
	AM			PM		
	Avg. Delay (spv)	LOS	V/C	Avg. Delay (spv)	LOS	V/C
Lake Avenue at Abbott Avenue						
EB TL	3.5	A	0.37	4.0	A	0.49
WB TR	4.7	A	0.52	5.2	A	0.64
SB LR	8.8	A	0.14	13.9	B	0.20
Overall	**4.3**	**A**	**0.52**	**5.0**	**A**	**0.64**
Lake Avenue at Westville Avenue / Oil Mill Road						
EB LTR	69.7	E	1.02	22.3	C	0.75
WB LT	69.2	E	1.02	23.0	C	0.94
WBR	2.1	A	0.16	0.4	A	0.23
NB LTR	31.0	C	0.40	62.1	E	0.61
SB LTR	173.9	F	1.26	63.7	E	0.84
Overall	**80.8**	**F**	**1.26**	**25.4**	**C**	**0.94**
West Street at Beaver Street						
EB L	4.6	A	0.38	66.4	E	0.96
EB T	7.5	A	0.44	9.7	A	0.52
WB TR	17.7	B	0.67	61.8	E	1.07
SB L	45.7	D	0.73	77.4	E	0.90
SB R	0.2	A	0.16	0.4	A	0.23
Overall	**14.5**	**B**	**0.73**	**42.0**	**D**	**1.07**
West Street at Division Street						
EB T	3.6	A	0.39	17.9	B	0.52
EB R	1.1	A	0.10	1.5	A	0.21
WB L	2.5	A	0.31	3.6	A	0.50
WB T	2.2	A	0.28	3.5	A	0.52
NB L	39.1	D	0.52	73.7	E	0.91
NB R	4.5	A	0.30	9.6	A	0.54
Overall	**6.0**	**A**	**0.52**	**15.4**	**B**	**0.91**
West Street at New Street / Deer Hill Avenue						
EB L	4.6	A	0.16	14.4	B	0.44
EB TR	24.0	C	0.79	45.9	D	0.95
WB L	8.7	A	0.24	63.3	E	0.89
WB TR	16.4	B	0.49	41.2	D	0.90
NB L	46.5	D	0.69	33.3	C	0.49
NB TR	22.6	C	0.44	32.3	C	0.69
SB LTR	36.3	D	0.74	55.2	E	0.90
Overall	**24.0**	**C**	**0.79**	**43.2**	**D**	**0.95**

Service D or better except one. The intersection of Lake Avenue at Oil Mill Road / Westville Avenue is operating at an overall Level of Service F during the AM peak period, with eastbound, westbound, and southbound approach lanes operating at Level of Service E or worse. During our March, 2013 site visit, this intersection was the only area in the study corridor where sustained congestion and queuing was observed. All of the approaches to this intersection have a single lane only except the westbound approach, which has a shared left-turn / through lane and an exclusive right-turn lane. The existing lane configurations, in conjunction with the geometric offset of Westville Avenue and Oil Mill Road allow for limited phasing options to serve the large volumes of turning vehicles at this intersection.

Although all the study intersections operate at an overall Level of Service D or better during the PM peak period, there are individual lanes that operate at Level of Service E at the intersections of Lake Avenue at Westville Avenue / Oil Mill Road, West Street at Beaver Street, West Street at Division Street, and West Street at New Street / Deer Hill Avenue. During our March 2013 site visit, we observed congestion and queuing at a few locations in the study corridor during the PM peak hour including: the intersection of the West Street / Deer Hill Avenue on the eastbound and southbound approaches, at the intersection of West Street at Beaver Street on the westbound approach, and at the intersection of Lake Avenue at Westville Avenue / Oil Mill Road on the westbound approach.

After reviewing existing traffic conditions and signal operations, SYNCHRO models were developed for the projected 2032 traffic volumes in the corridor. Two scenarios were developed. Scenario A includes phasing and timing changes only (that are appropriate for the existing lane arrangements). This can be considered a “no-build” scenario and used as a basis for comparison to Scenario B. Scenario B includes phasing and timing changes as well as roadway improvements (additional auxiliary lanes) at some locations. These improvements were selected based on the operational analysis at each location as well as the existing land use (developed urban setting) and potential feasibility of improvements. In some cases, Levels of Service for individual movements or for an intersection during a peak period are expected to operate at E or worse. However, more extensive roadway improvements are not recommended due to the urban and fully developed nature of the corridor, combined with the close to acceptable operation expected with the improvements included in Scenario B. Specific details of the scenarios are as follows as compared to existing conditions:

2032 Scenario A

- AM cycle length was changed to 100 seconds
- PM cycle length was changed to 120 seconds
- Lake Ave at Abbot Ave – AM cycle length was changed to 50 seconds, PM cycle length was changed to 120 seconds
- Lake Ave at Oil Mill / Westville- removed lagging westbound phase
- West Street at New Street / Deer Hill Avenue- removed advanced southbound phase
- Optimized intersection offsets

2032 Scenario B

- AM cycle length was changed to 100 seconds
- PM cycle length was changed to 120 seconds
- Lake Ave at Abbot Ave – AM cycle length was changed to 50 seconds, PM cycle length was changed to 120 seconds
- Lake Ave at Oil Mill / Westville -Added southbound right-turn lane, Added eastbound left-turn lane
- West Street at Beaver Street – Added westbound right-turn lane
- West Street at New Street / Deer Hill Avenue- Added southbound left-turn lane, added eastbound right-turn lane, added westbound right-turn lane, changed north / south left-turn phasing to protected / permitted
- Optimized intersection offsets

The results of Level of Service analysis for Scenario A and Scenario B are included in **Table 4** and detailed reports are included in **Appendix B**. As is evident from the analysis results, if only timing and phasing changes are implemented (Scenario A) and projected traffic volumes are realized, Levels of Service, particularly for the PM peak period indicate serious operational problems that will impact a significant portion of the corridor. Delays are so high for some individual lanes that queues would be expected to propagate and impact operations all along West Street (from Westville Avenue / Oil Mill Road) to Main Street, as well as on side streets such as Westville Avenue, Beaver Street, and New Street. With the addition of auxiliary lanes at selected locations in the corridor (Scenario B) there are still isolated lanes that would be expected to operate at Level of Service E or worse, but all signalized intersections during all peak periods (except one) would be expected to operate at an overall Level of Service D or better. The intersection of West Street at Beaver Street would be expected to operate at an overall Level of Service E.

It is recommended to implement the improvements included in Scenario B. These improvements should be initiated in the short term, since they will address existing as well as expected future operational issues. Another improvement to consider is the reconstruction of Oil Mill Road to be aligned with Westville Avenue at the intersection with Lake Avenue. The

Table 4: 2032 Level of Service Analysis

	2032 – Scenario A						2032 – Scenario B					
	AM			PM			AM			PM		
	Avg. Delay (spv)	LOS	V/C	Avg. Delay (spv)	LOS	V/C	Avg. Delay (spv)	LOS	V/C	Avg. Delay (spv)	LOS	V/C
Lake Avenue at Abbott Avenue												
EB TL	5.0	A	0.53	7.1	A	0.75	5.0	A	0.53	7.1	A	0.75
WB TR	15.4	B	0.74	15.4	B	0.84	16.0	B	0.74	9.0	A	0.84
SB LR	12.3	B	0.23	49.3	D	0.55	12.3	B	0.23	49.3	D	0.55
Overall	**11.1**	**B**	**0.74**	**13.0**	**B**	**0.84**	**11.4**	**B**	**0.74**	**9.5**	**A**	**0.84**
Lake Avenue at Westville Avenue / Oil Mill Road												
EB L	-	-	-	-	-	-	11.1	B	0.23	43.4	D	0.78
EB (L)TR	290.5	F	1.58	18.3	B	0.84	17.7	B	0.66	18.4	B	0.74
WB LT	45.0	D	1.01	91.7	F	1.15	65.9	E	1.06	94.4	F	1.17
WBR	1.5	A	0.18	1.6	A	0.29	1.5	A	0.18	0.4	A	0.30
NB LTR	52.7	D	0.61	111.6	F	0.89	52.7	D	0.61	89.9	F	0.79
SB LT(R)	314.7	F	1.60	145.3	F	1.15	94.1	F	1.00	75.1	E	0.81
SB R	-	-	-	-	-	-	27.0	C	0.36	27.9	C	0.41
Overall	**167.6**	**F**	**1.60**	**61.9**	**E**	**1.15**	**46.5**	**D**	**1.06**	**54.5**	**D**	**1.17**
West Street at Beaver Street												
EB L	29.5	C	0.77	271.3	F	1.50	10.9	B	0.60	270.5	F	1.50
EB T	8.6	A	0.61	6.4	A	0.68	6.3	A	0.61	8.7	A	0.68
WB T(R)	43.8	D	0.96	177.3	F	1.33	23.0	C	0.72	76.9	E	1.09
WB R	-	-	-	-	-	-	7.2	A	0.19	7.7	A	0.26
SB L	53.8	D	0.80	199.1	F	1.29	53.8	D	0.80	199.1	F	1.29
SB R	0.3	A	0.21	0.6	A	0.32	0.3	A	0.21	0.6	A	0.32
Overall	**27.4**	**C**	**0.96**	**120.4**	**F**	**1.50**	**16.6**	**B**	**0.80**	**74.8**	**E**	**1.50**
West Street at Division Street												
EB T	11.9	B	0.50	50.3	D	0.97	11.0	B	0.50	53.0	D	0.97
EB R	0.4	A	0.13	6.2	A	0.32	0.8	A	0.13	5.1	A	0.32
WB L	6.7	A	0.50	36.5	D	0.93	4.2	A	0.50	49.5	D	0.93
WB T	6.7	A	0.37	16.3	B	0.79	3.6	A	0.37	21.1	C	0.79
NB L	51.1	D	0.64	54.5	D	0.81	51.1	D	0.64	54.7	D	0.81
NB R	5.3	A	0.39	21.6	C	0.62	5.3	A	0.39	21.6	C	0.62
Overall	**11.2**	**B**	**0.64**	**30.3**	**C**	**0.97**	**9.7**	**A**	**0.64**	**33.7**	**C**	**0.97**
West Street at New Street / Deer Hill Avenue												
EB L	7.4	A	0.34	44.6	D	0.79	8.9	A	0.32	37.6	D	0.77
EB T(R)	68.7	E	1.06	144.1	F	1.25	31.9	C	0.86	46.0	D	0.99
EB R	-	-	-	-	-	-	8.7	A	0.23	8.9	A	0.20
WB L	25.9	C	0.58	132.3	F	1.13	24.5	C	0.59	86.4	F	0.98
WB T(R)	23.4	C	0.67	113.7	F	1.16	20.8	C	0.58	37.2	D	0.89
WB R	-	-	-	-	-	-	8.9	A	0.09	11.7	B	0.17
NB L	96.3	F	0.96	72.9	E	0.86	66.2	E	0.86	105.3	F	1.01
NB T(R)	29.3	C	0.51	58.0	E	0.93	36.7	D	0.38	52.6	D	0.74
NB R	-	-	-	-	-	-	11.4	B	0.25	29.9	C	0.51
SB L	-	-	-	-	-	-	24.8	C	0.15	37.1	D	0.40
SB (L)TR	68.7	E	0.96	859.5	F	2.84	73.3	E	0.95	122.7	F	1.12
Overall	**51.8**	**D**	**1.06**	**216.4**	**F**	**2.84**	**33.1**	**C**	**0.95**	**54.7**	**D**	**1.12**

more significant costs and Right-of-Way impacts would need to be weighed against the benefits of improved signal operation at that location. As improvements to this intersection proceed to a preliminary engineering phase, this option can be considered in more detail.

6.2 Intersections

In addition to evaluating capacity at signalized intersections, other factors were considered at intersections throughout the corridor including roadway layout, site distances, traffic control devices, and other factors that may impact travel or safety. Several intersection locations were evaluated in detail and findings and recommendations are provided in the following sections.

6.2.1 Lake Avenue at Abbott Avenue

The review of accident data and capacity analysis did not identify any major safety or operational issues at this location. There are some site distance concerns at this location, however for the westbound and southbound approaches. On the westbound approach to the intersection, the terrain is uphill with a sharp curve followed directly by a signalized intersection. On the north side of the roadway there is a retaining wall as well as some large trees. During summer months when the trees are overgrown it appears that site lines to the traffic signal heads could be obstructed. Per AASHTO guidelines, with a design speed of 30 miles per hour the stopping sight distance for a 9% upgrade is 179 feet. During field observations the site lines appeared adequate, however no leaves were on the trees. The site distance on the southbound Abbott Avenue approach to the intersection to westbound traffic is obstructed by the existing retaining wall on the northeast corner of the intersection. There are also deficiencies in pedestrian

Westbound approach to the Lake Avenue at Abbott Avenue intersection

accommodations at the intersection. The presence of guardrail along the south side of the roadway limits pedestrian access to the intersection. Also, there are no curb ramps, crosswalks, push buttons, or pedestrian signal heads. Recommendations to address pedestrian deficiencies are addressed in Section 8 Otherwise the following improvements are proposed:

- Install a supplementary post-mounted signal head for the westbound approach on the south side of the roadway near side.
- Prohibit right turns on red for the southbound approach.

6.2.2 West Street at Benedict Avenue

A review of the accident history near the intersection of West Street at Benedict Avenue and the railroad bridge revealed that there were two collisions that involved eastbound vehicles impacting the bridge piers on the north side of the road. There is a sharp horizontal curve on West Street between Morris Street and the railroad bridge, where the intersection of Benedict Avenue is located. The CTDOT Highway Design Manual requires a minimum radius of 275 feet for a horizontal curve with a 30 mile per hour design speed. The existing curve at Benedict Avenue does not meet the minimum standard set by the state. A desktop review actually has the radius less than 200 feet. This design feature, along with the steep slope downhill on the eastbound approach is likely a contributing factor to those accidents. Also, per AASHTO, the minimum at grade stopping site distance is 196.7 feet. Due to the radius of the curve, Benedict Avenue does not meet this minimum standard. Additionally, there is no stop sign or stop bar on the Benedict Avenue approach and both curb ramps at the intersection direct pedestrians toward West Street instead of parallel to it. The following improvements are recommended at the West Street at Benedict Avenue intersection:

Westbound approach to the West Street at Benedict Avenue intersection

- Install curve warning signs and chevrons throughout the substandard curve in accordance with MUTCD sections 2C.07 to 2C.10.
- Install a stop sign and stop bar for the Benedict Avenue approach to West Street
- Install new curb ramps similar to CTDOT standard diagonal sidewalk ramp Type 4C.

6.2.3 West Street at Beaver Street

The intersection of Beaver Street and Lake Avenue has some of the highest traffic volumes within the project corridor and is a location where a considerable number of accidents have occurred. Therefore, there is a great need to improve safety for both motorists and pedestrians along with improving traffic operation at this intersection. Some of the other issues at this location include a substandard horizontal alignment, a need to implement access management strategies, and elements that need to be maintained or replaced.

Chapin Restaurant with continuous access along the channelized southbound right-turn lane

The intersection of West Street at Beaver Street is located in the middle of a sharp curve in the West Street horizontal alignment. Per the CTDOT Highway Design Manual, the minimum radius for a curve with a 30 mile per hour design speed is 275 feet. We conducted a desktop review that estimated the curve radius at less than 200 feet and so the existing curve does not meet the minimum standard. The traffic signal design accommodates this deficiency for the eastbound approach with a supplementary signal head mounted on the mast arm pole on the northwest corner of the intersection. The presence of this supplementary signal head is critical, particularly during summer months when trees can obstruct views of the signal heads on the mast arm from the eastbound approach. No sight distance issues are evident on the westbound approach.

It was indicated by reviewing reports of accidents that occurred in the vicinity of the West Street at Beaver Street intersection that some of the driveway locations and configurations in the area are contributing to high numbers of accidents (See Section 3). There are also other

driveways that could be problematic, although there is no recent history of crashes at those locations. Specific access management strategies and recommendations are included in Section 7. Generally though, improved access management near signalized intersections can reduce the potential for serious conflicts and strategies for the following driveways should be considered:

- The shopping center at 130 West Street with approximately 140 feet of continuous access to West Street just east of the railroad bridge.
- The Salame Plaza at 131 West Street with three adjacent access driveways
- The Chapin restaurant at 123 West Street with continuous access along the channelized southbound right-turn lane at the intersection of West Street at Beaver Street
- Danbury metal finishing which has two driveways: one is unsignalized but located in the middle of the West Street at Beaver Street intersection and the other is set back a few feet back from the stop bar on the eastbound approach

The last major issue for the intersection involves deterioration of existing infrastructure. There are existing safety features that are broken (a handrail on the bridge and guardrail at one of the Danbury Metal Finishing driveways), pedestrian facilities are in poor condition (sidewalks and curb ramps), and a utility a pole is leaning into the intersection. Proposed improvements for this location are as follows:

- Replace sidewalks at the intersection and replace existing curb ramps with those that are ADA compliant. Move the crosswalk and curb ramp on the northeast corner of the so they do not lead into a driveway. Other pedestrian issues are discussed in Section 8.
- Replace the damaged handrail on the northwest corner of the bridge over the Still River, just east of the driveway for the Salame Plaza along the bridge west of the intersection.
- Replace the broken guardrail in the Danbury Metal Finishing parking lot directly south of the West Street at Beaver Street intersection. The crash cushion has fallen off the post and is lying on the ground.
- Work with the utility companies to replace the leaning pole, to move poles out of the minimum limits for horizontal clearance, and relocate utility wires out of sight lines to traffic signal mast arm.

Note that capacity issues have been addressed for this intersection in Section 6.1, access management issues are discussed more in Section 7, and pedestrian issues are detailed more in Section 8.

6.2.4 West Street at Division Street

The Division Street intersection is another priority location within the corridor for addressing operational and safety issues. SYNCHRO analysis indicates that there are no major operational issues at this intersection. There are a large number of accidents that have occurred in the vicinity of the intersection, approximately half of which were related to driveways for nearby properties (the vast majority of those involved the Citgo property). Another access issue is the two unsignalized driveways (at 91 and 93 West Street) on the north side of West Street within the intersection limits. The driveways are approximately 80 feet apart and not centered in the intersection. Additionally, stop bars for the eastbound and westbound West Street approaches are set far back from the intersection to accommodate the near-side signal head placement as well as to limit encroachment over the centerline of turning trucks and transit buses. The stop bar for the northbound Division Street approach is also set far back to accommodate turning movements of large vehicles. This makes the intersection excessively large and difficult for pedestrians to move through. The crosswalk over the east leg of the intersection is also set back from the intersection, just in front of the stop bar. The pedestrian phase for this crossing is concurrent with the northbound signal phase. On observation in the field, this is particularly dangerous since visibility of the crosswalk from the northbound approach is limited. The eastbound approach is another reason the intersection is so large. The eastbound right-turn lane is flared and the curb radius on the southwest corner is very large (approximately 100 feet). These issues would probably cause more problems for pedestrians if pedestrian volumes were higher at this intersection. However, due to the lack of accommodations, pedestrians seem to be seeking alternate routes around this intersection. Note that in general there are issues with profile grades and cross slopes within this intersection that have required the placement of the high curbing and retaining walls on the southerly size of the intersection. During intersection redesign, grading issues

Eastbound approach to West Street at Division Street intersection

should be addressed so that normal curbing can be used and appropriate grades for crosswalks can be provided. This may require regrading along the edge of the Division Street Island area, but these changes seem feasible. To address the issues identified for this intersection, the following recommendations are being made:

- Reconstruct the eastbound approach to keep the eastbound right-turn lane parallel with the alignment and reconstruct the curb radius on the southwest corner of intersection to be smaller to encourage lower speeds and reduce crossing distances for pedestrians.
- Redesign the Division Street profile and cross slopes in the vicinity of the intersection to ensure crosswalks and standard height curbs can be used. Also, construct, repair or reconstruct sidewalks in the vicinity of the intersection.
- Redesign the traffic signal to provide "far-side" heads for eastbound and westbound intersection approaches.
- After reconstruction of curbs and reconfiguration of driveways add crosswalks over all legs of the intersection with curb ramps, push buttons, and pedestrian signal heads. Make the intersection "smaller" by placing stop bars and crosswalks closer in.
- Create one shared driveway where the access to 93 West Street is currently located and interconnect the parking areas for 91 and 93 West Street. Signalize the driveway approach to ensure safe intersection operation and install video detection to call the driveway phase.

Note that access management issues are discussed more in Section 7 and pedestrian issues are further detailed in Section 8.

6.2.5 West Street at New Street / Deer Hill Avenue

The intersection of West Street at New Street / Deer Hill Avenue has some of the most problematic safety and capacity issues of all the signalized intersections in the corridor as indicated by the review of accident data and SYNCHRO analysis. There are no apparent issues with the intersection geometry, site distances, or traffic signal design. There are sidewalks along all four legs of the intersection along with push buttons, pedestrian signal heads, curb ramps, and crosswalks. One issue that was clearly identified in reviewing reports for accidents that occurred at this location was the flash mode that the signal operates in during overnight hours (that has recently been eliminated). The flash mode seemed to be contributing to high numbers of angle crashes at this location. Also, there is a concurrent pedestrian phase at this intersection with high pedestrian and vehicular volumes. From observations of this location, the existing pedestrian phasing creates a difficult crossing environment for pedestrians who need to be aware of turning vehicles for movements that are operating at or over capacity. The concurrent pedestrian phasing may also decrease efficiency of vehicle operations as drivers in the

intersection need to yield to pedestrians and drivers further back in a queue have to stop for cars in front of them. There are significant numbers of pedestrians at this intersection and although an exclusive phase could improve safety for pedestrians and efficiency for other signal phases, it would also increase vehicular delays. Also, the City has been working to convert signal phasing throughout the City to concurrent pedestrian phasing. City staff noted that approximately 95% of City signals now include concurrent pedestrian phases. Concurrent pedestrian phases should be understood and expected in the City, and switching to an exclusive phase would introduce a "non-standard" operational pattern for the area. Recommendations for this intersection are as follows:

- Remove flash mode pattern. To minimize delays during overnight hours the intersection could run free, or operate with a short cycle length. *City staff has indicated that this change was recently implemented (in late 2012).*

Refer to Section 6.1 for recommendations to address capacity issues.

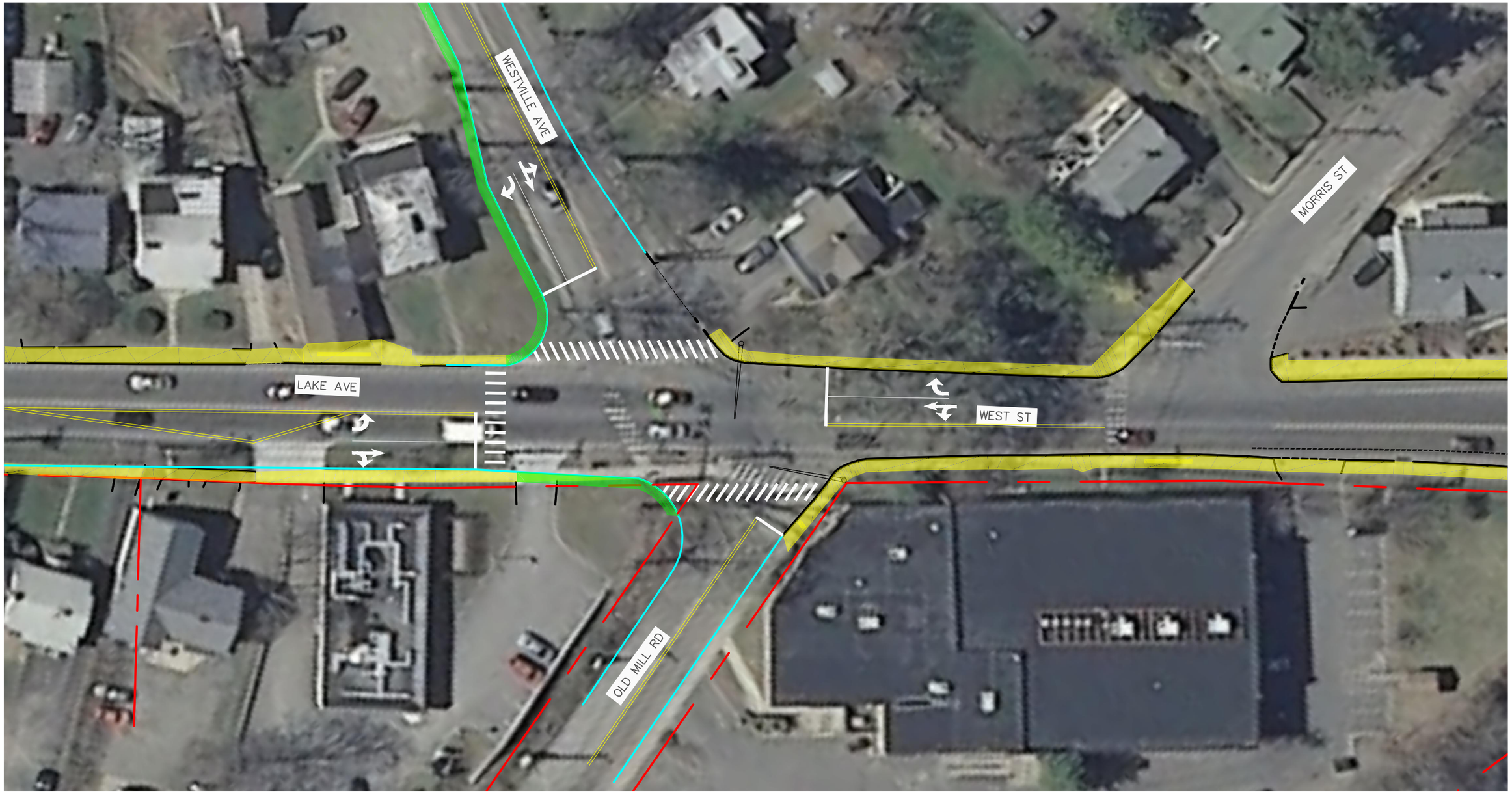
6.2.6 Concept Plans

To illustrate roadway improvements recommended for individual locations, concept plans showing roadway improvements for the intersections of Lake Avenue at Westville Avenue / Oil Mill Road, West Street at Beaver Street, West Street at Division Street and West Street at New Street / Deer Hill Avenue were developed and are shown in **Figure 8**. They incorporate recommendations from Sections 6.1 and / or 0 as appropriate.

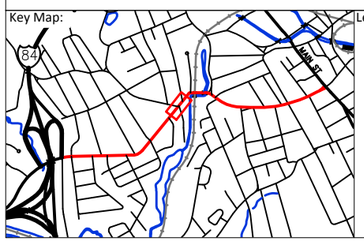
6.3 Consideration of Widening West Street

The 2005 Danbury Transportation Plan called for widening of West Street with additional lanes, as feasible, from Division Street east to Terrace Place. The 2009 Central Business District Traffic Signal Operation Improvements Study proposed widening West Street to four through lanes with eastbound and westbound left-turn lanes at the intersection of West Street and New Street/Deer Hill Road. Note that there is existing metered on-street parking between Orchard Street and Main Street and the City prefers that the existing on street parking be maintained since it is a critical component for revenue and revitalization of the downtown area. This was taken into account as the feasibility of widening was considered. The City has also indicated that a two-lane roadway should be maintained on all other sections of West Street.

The existing design of West Street from Division Street to Terrace Place consists of one through lane and one left-turn lane with parallel parking in various sections. Operational analysis of



Key Map:



Legend:

- RIGHT OF WAY
- EXISTING EDGE OF PAVEMENT
- EXISTING SIDEWALK
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED WHITE PAVEMENT MARKINGS
- PROPOSED YELLOW PAVEMENT MARKINGS
- PROPOSED PAVEMENT MARKING SYMBOLS
- PROPOSED CROSSWALKS

N

1" = 40'

20' 0 40'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; Seal of the City of Danbury, Incorporated 1889

Prepared By: VN Engineers, Inc.

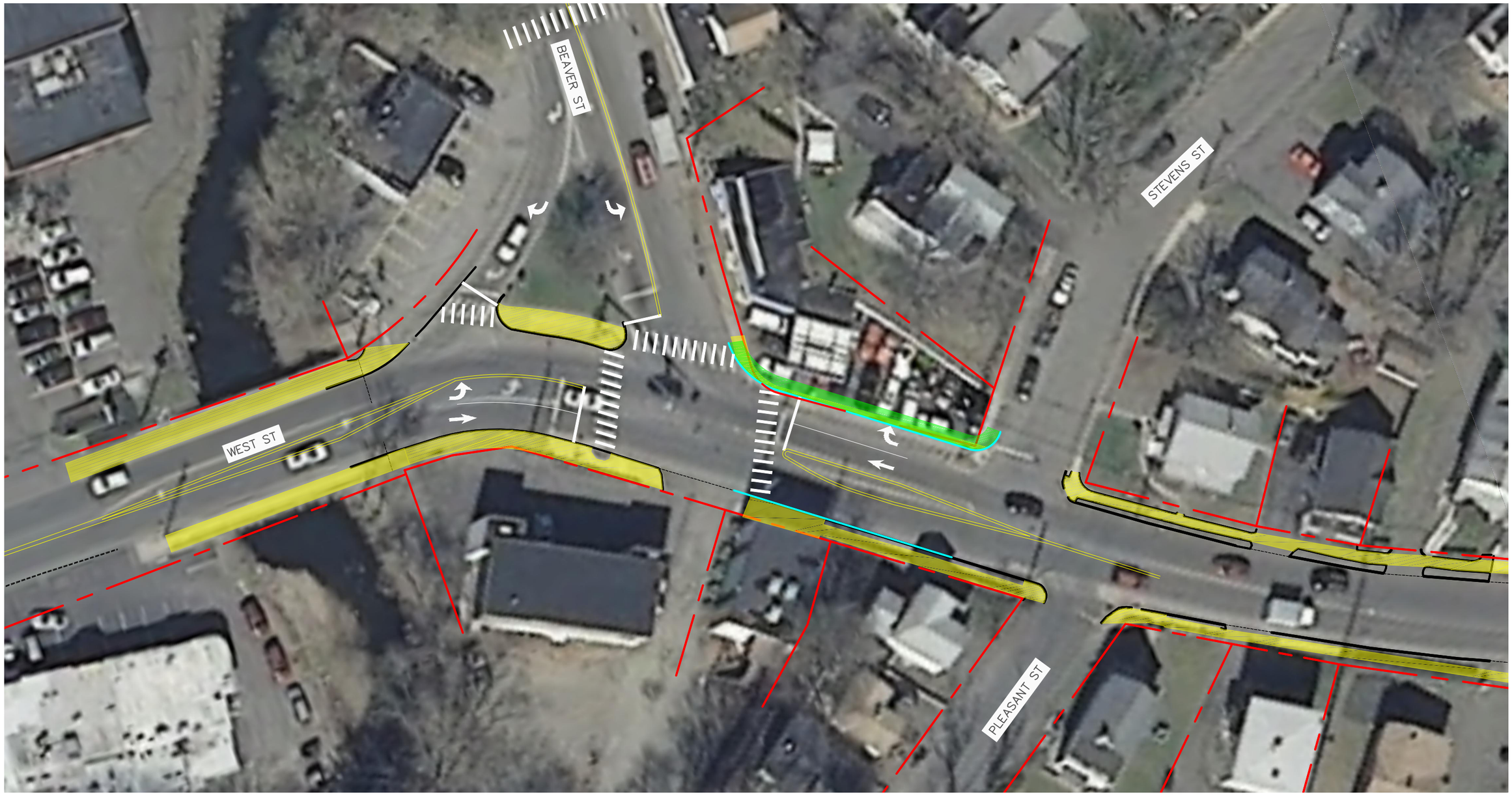
In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: CONCEPT PLAN FOR WEST ST/LAKE AVE AT WESTVILLE AVE/OIL MILL RD

Figure Number: 8A



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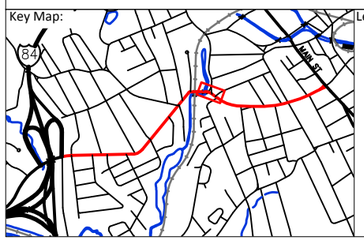

Legend:

- RIGHT OF WAY
- EXISTING EDGE OF PAVEMENT
- EXISTING SIDEWALK
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED WHITE PAVEMENT MARKINGS
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Prepared By: VN Engineers, Inc.

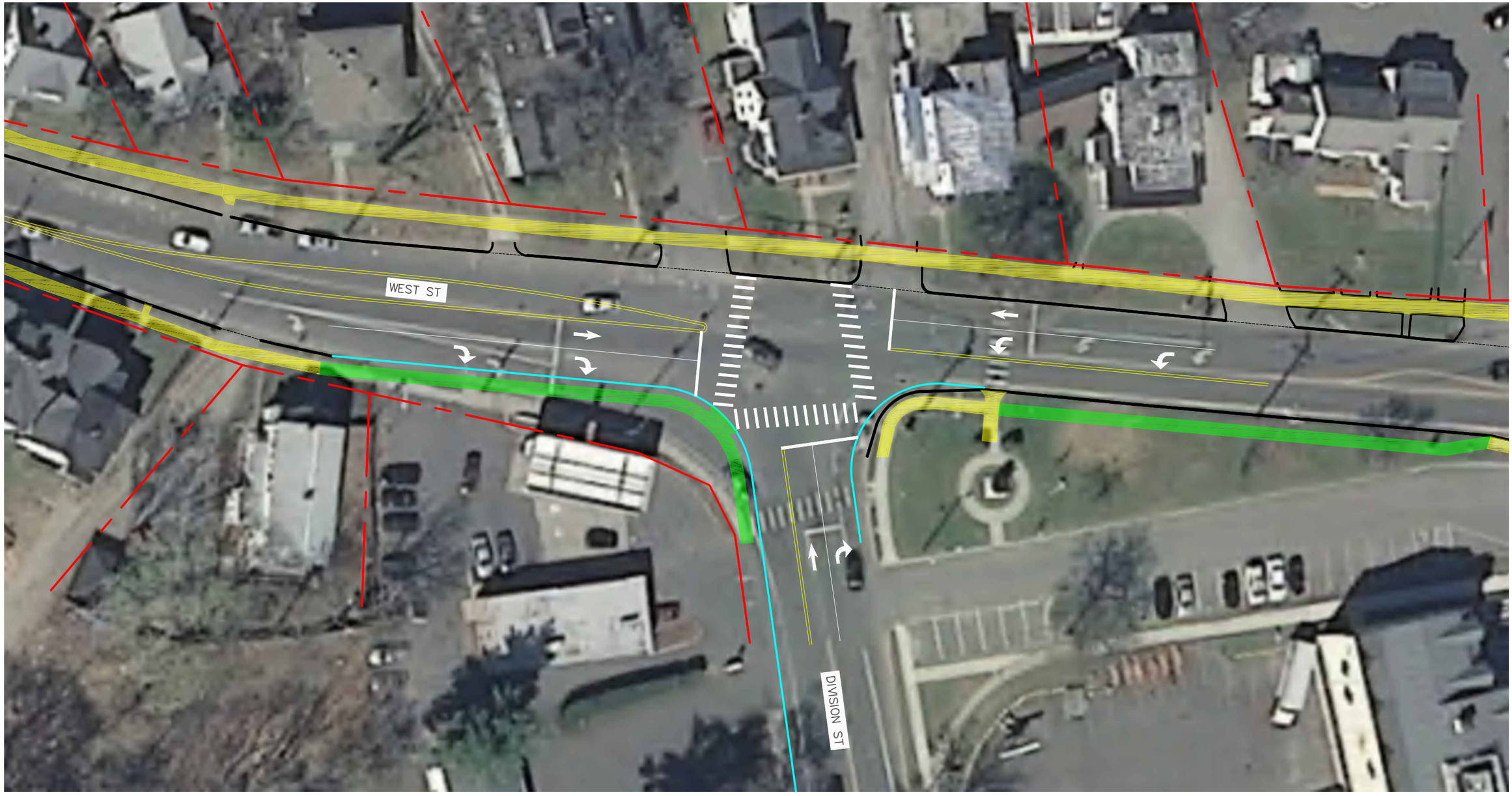
In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

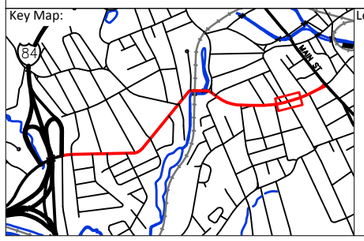
Location: DANBURY, CT

Figure Title: CONCEPT PLAN FOR WEST ST AT BEAVER ST

Figure Number: 8B



Key Map:



Legend:

- RIGHT OF WAY
- EXISTING EDGE OF PAVEMENT
- EXISTING SIDEWALK
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED WHITE PAVEMENT MARKINGS
- PROPOSED YELLOW PAVEMENT MARKINGS
- PROPOSED PAVEMENT MARKING SYMBOLS
- PROPOSED CROSSWALKS

N

1" = 40'

20' 0 40'

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Prepared By: VN Engineers, Inc.

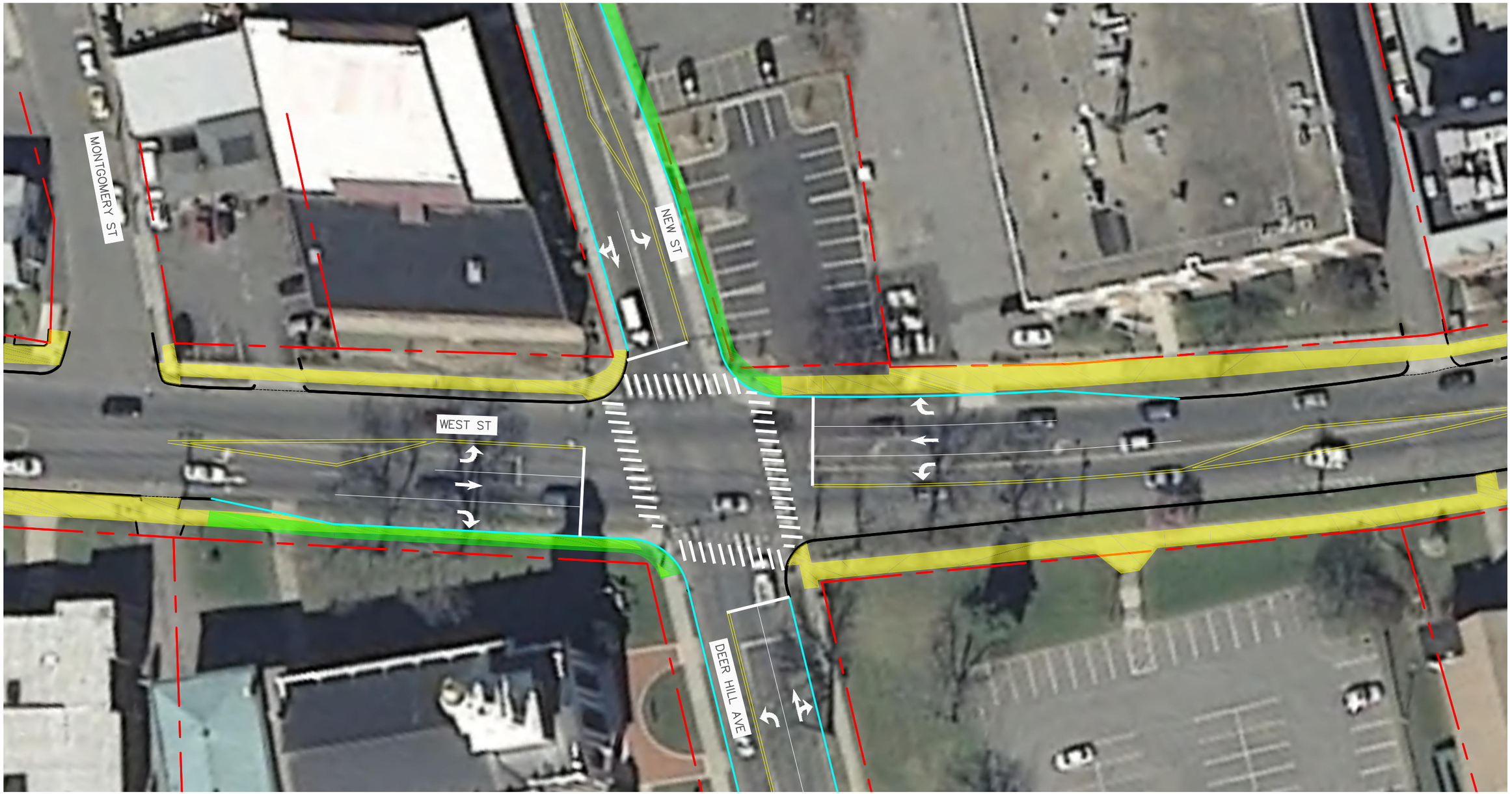
In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

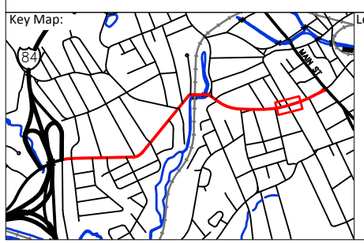
Location: DANBURY, CT

Figure Title: CONCEPT PLAN FOR WEST ST AT DIVISION ST

Figure Number: 8C



Key Map:



Legend:

- RIGHT OF WAY
- EXISTING EDGE OF PAVEMENT
- EXISTING SIDEWALK
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED WHITE PAVEMENT MARKINGS
- PROPOSED YELLOW PAVEMENT MARKINGS
- PROPOSED PAVEMENT MARKING SYMBOLS
- PROPOSED CROSSWALKS

N

1" = 40'

20' 0 40'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; Seal of the City of Danbury, Incorporated 1684

Prepared By: VN Engineers, Inc.

In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: CONCEPT PLAN FOR WEST ST AT NEW ST/DEER HILL RD

Figure Number: 8D

signalized intersections and field observations have shown that some movements at signalized intersections operate at or slightly above capacity during certain times of the day. It seems that the recommendation to widen West Street that was presented in previous studies was based on operational analysis of the intersections. Indeed, the Level of Service at the intersection of West Street at New Street / Deer Hill Road would improve if there were two additional through lanes on West Street. To supplement the intersection analysis conducted in this and other reports, an arterial analysis was done using Highway Capacity Software (HCS+) Arterials Version 5.5. The analysis was done using the existing roadway geometry and an estimated daily traffic volume for 2032. The future volume was calculated using the 2011 ADT for the roadway segment east of Harmony Street (shown in **Table 2**) and applying a 1.5% annual growth rate. For the urban street section between Division Street and Main Street, the future Level of Service was estimated to be D. The detailed Level of Service report is included in **Appendix C**.

Note that the capacity analysis does not provide strong support for the idea of widening West Street. The intersection analysis detailed in Section 6.1 for Scenario B shows that for projected 2032 peak hour traffic volumes, all intersections in the corridor could operate at a Level of Service D or better overall except for the intersection of West Street at Beaver Street during the PM peak hour (which would be expected to operate at Level of Service E). Scenario B only includes the addition of auxiliary lanes at specific intersections along with phasing and timing changes. Additionally, the arterial analysis also estimates that the corridor will operate at Level of Service D in 2032, an acceptable Level of Service for an urban arterial.

Note that we reviewed the existing conditions for West Street from Division Street to Terrace Place and determined that it could be feasible to widen. West Street can accommodate a five-lane section in this area with 4 11-foot through lanes, 1 10-foot turn lane and 2 8 foot parallel parking lanes. There appears to be sufficient right-of-way along both the north and south ends of the roadway to accommodate this design, but most of the buffer areas between the roadway and the sidewalk would have to be eliminated.

Although it could be feasible to widen West Street which could provide some benefit for traffic operation in the corridor, we do not recommend widening. It is HVCEO's policy to consider the context of a corridor (in this case an urban area) and to not base decisions to widen on volume / capacity issues alone. In coming to our conclusion to recommend not widening West Street, we considered West Street as part of a larger roadway network in the City and we considered the negative impacts widening would have on "alternative" transportation modes and other uses for the corridor.

West Street is part of a larger roadway network. During our field visits we observed traffic conditions on a number of area roadways, many of which were also congested. In particular, the delays along Main Street were much greater than those in the Lake Avenue / West Street corridor. So if improvements are not made elsewhere to add capacity to the roadway network, it is unlikely that large increases in peak hour traffic volumes will be realized. Even if the corridor were to be widened, the proposed western limit would be at Division Street. There are capacity issues west of Division Street and transferring higher traffic volumes further west will have a greater impact on the congested intersection of West Street at Beaver Street and the residential areas along Lake Avenue.

There are also negative impacts of widening to consider, in particular the impacts to "alternative" modes of transportation, and aesthetics. If West Street were to be widened, the corridor would be considerably less hospitable to pedestrians and there would not be room to provide many streetscaping amenities besides a sidewalk. Crossing distances would also increase and crossing at unsignalized locations would be more hazardous as vehicles may travel at faster speeds. A widened roadway section would also be less hospitable to bicyclists who would be expected to share a narrow travel lane with motorized vehicles that is directly adjacent to parallel parking. Because most of this portion of West Street is considered part of the Central Business District of Danbury, it would be preferable to develop the potential of the corridor in other ways to encourage pedestrian and transit oriented development, the use of alternative modes of transportation, and allow more opportunities for beautification and enhancement.

6.4 Signing

The CTDOT allowable clearance for any bridge is currently set at 13 feet 6 inches. Since the existing clearance of railroad bridge is 10 feet 7 inches Low Clearance Signage (W12-2) is required to warn motorists of the height restriction in advance of the bridge in accordance with the 2009 Manual of Uniform Traffic Control Devices (MUTCD). On the eastbound approach, the last intersection for a viable detour route is Lake Avenue at Westville Avenue / Oil Mill Road. On the westbound approach, the last intersection before the bridge is West Street at Beaver Street. At both of these intersections W12-2 (low clearance) signs are located on the existing mast arms with supplemental W16-9P ("ahead") plaques. Currently the locations for all Low Clearance signs in the corridor are as follows:

Existing W12-2 signs on eastbound approach to railroad bridge:

1. Post mounted just east of the I-84 on-off ramps / Segar Street intersection West of Ridge Road
2. Post-mounted just east of Merrimac Street
3. On the mast arm at the Abbott Avenue intersection
4. On the mast arm at the Westville Avenue / Oil Mill Road intersection.
5. Post mounted just east of Westville Avenue

There are also warning flashers over eastbound Lake Avenue on the approach to Crofut Street (with no accompanying signs) and warning flashers with a W12-2 sign mounted on the bridge itself.

Existing warning flashers on eastbound approach to railroad bridge

Existing W12-2 signs on westbound approach to railroad bridge:

1. Mounted overhead with warning flashers on the approach to Division Street
2. Post-mounted on the approach to Stevens Street
3. On the mast arm at the Beaver Street intersection
4. Mounted on a utility pole in advance of the driveway to 131 West Street.

There is also a W12-2 sign mounted on the bridge itself with warning flashers.

Existing warning flashers on westbound approach to railroad bridge

The current amount of signage exceeds minimum standards, and all signs appear to meet the correct size and retro-reflectivity requirements. However, note that there are no signs warning of the low clearance crossing on the Division Street approach to West Street or the Beaver Street approach to West Street (these are two of the higher volume cross streets in the corridor). Following is a list of recommendations related to signing for the low clearance crossing:

- Verify the existing bridge clearance to confirm that it is accurately represented on warning signage in accordance with MUTCD 2C.27.05.
- Add signage to accompany the warning flashers on the eastbound approach to the bridge similar to what is shown on the westbound approach ("Vehicle overheight when flashing" "Truck Detour" "Low Clearance").

Westbound approach to bridge with object markers added

- Add Object markers on bridge piers on both sides of the roadway as well as overhead to increase visibility (OM3-L, OM3-R)
- There are existing W16-9p ("Ahead") plaques that are mounted on the mast arms at the Lake Avenue at Westville Avenue / Oil Mill Road and West Street at Beaver Street intersections. Replace these with distance plaques W16-2aP ("500 ft") to provide more specific information to drivers in accordance with MUTCD 2C.27.03.

Truck detour signage

- Add signage "Truck Detour ←" "Low Clearance" signs on the southbound Beaver Street approach to West Street in advance of the southbound right-turn lane
- Add signage "Truck Detour →" "Low Clearance" signs on the mast arm for the Division Street approach to the Division Street at West Street traffic signal.
- Replace or repair damaged signs, such as the W12-2 on the eastbound approach to the bridge, which is crooked. Consider replacing existing W12-2 signs on the bridge with horizontal type signs with legend "LOW CLEARANCE 10 feet 7 inches.

6.5 Rail Crossing

There is an existing low clearance railroad bridge that carries two tracks over West Street just east of Benedict Avenue. The railroad bridge is owned by the Housatonic Railroad Company, was built in 1930, and has never undergone reconstruction. The Housatonic freight railroad line operates in New York, Connecticut, and Massachusetts, where it connects to the national CSX Freight Transportation System. The southwesterly portion of the line extends from the Danbury Train Station to Beacon, New York through Brewster, Fishkill, East Fishkill, and Hopewell junction. The northerly portion runs from the Kent, Connecticut freight yards to Sheffield, Massachusetts through Pittfield, Lenox, Lee, Stockbridge, Housatonic, and Great Barrington.

The railroad company is currently considering options for adding passenger travel to the line including commuter and seasonal tourist type uses. The line also serves as a facility available for emergency use if needed for military mobilization, civilian evacuation, or railroad equipment transfers. For example in March of 2011, heavy rain washed out a section of the Danbury Branch just south of Bethel stranding five engines and 25 rail cars in the Danbury rail yard. Metro North transferred the passenger equipment over the Housatonic rail line in Danbury to just north of Brewster, New York where it was put back into passenger service.

This low clearance crossing has been the focus of previous studies dating back to 1981, and at various times the City has considered structural improvement options, resolutions to the flooding problems, and other partial solutions. The high cost of improvements has so far precluded the implementation of any possible solutions. As described above, the rail line is a major asset with great future potential. Therefore, bridge removal is not a feasible option, since its removal would eliminate the southwesterly railroad link between Connecticut and New York and would be tremendously costly in terms of lost opportunities. Additionally, State of Connecticut General Statute 13b-268 prohibits the creation of new at grade crossings (unless authorized by an act of the General Assembly), which eliminates that option as a possible solution. Elevation of the rail line and replacement of the bridge is another option that has been considered. However, the responsibility for bridge replacement would typically fall on the bridge owner, the Housatonic Railway Company, but since the bridge over West Street adequately serves their needs at this time its replacement is not a priority.

Truck collision with railroad bridge in February, 2012
Source: newstimes.com

The existing clearance under the railroad bridge is 10 feet 7 inches, which precludes usage of the crossing by most types of trucks including single unit, delivery-type trucks (11-13.5 feet tall), and tractor trailer type trucks (13.5 feet tall). The provided bridge clearance conflicts with

Connecticut State Statue 14-264 which allows for all vehicles up to 13 feet 6 inches in height to operate in the state (greater heights could possibly be accommodated with a waiver from the CTDOT). It should also be noted that the CTDOT Highway Design Manual requires a minimum clearance of 16 feet 3 inches for a new or replacement bridge over an arterial unless a design exception is sought.

As mentioned in Section 3, a number of accidents have occurred in the vicinity of the bridge in spite of the warning signs and flashers in advance of the crossing and the signs and warning flashers mounted on the bridge. Also, as noted in previous sections there are some deficiencies with the horizontal alignment of the roadway in the vicinity of the railroad bridge. Horizontal curves are substandard near the intersection with Benedict Avenue and near the intersection with Beaver Street. Two HARTransit bus routes are currently routed under this bridge. Most of the vehicles in the current HARTransit fleet can travel under the bridge, although there are a few that cannot.

In addition to traffic operational issues at the crossing, this location is also subject to periodic flooding due to two issues 1) the inadequate roadway drainage system and 2) the outfall to the adjacent Still River that becomes submerged when the River is in a flood stage. Although this corridor serves as an important part of the City's transportation network, when the roadway is flooded, the City closes it and detours traffic to alternate routes in order to maintain public safety.

Flooding under railroad bridge in September, 2011
Source: CTPost.com

The existing drainage system at this location consists of catch basins that collect roadway runoff with a trunk line that conveys runoff to an outfall at the Still River. The 24-inch Box Culvert outfall is located along the south side of West Street just west of the bridge. There is a catch basin on the north side of the road at an existing low point at the Benedict Avenue intersection which primarily captures runoff from the area between Morris Street and Beaver Street. West Street west of Benedict Avenue has an uphill slope of about 8%. Benedict Avenue north of West Street also has an uphill slope of about

8%. From the low point east, West Street is flat for about 150 feet where it changes to a slope of 1% uphill.

There is a 12-inch pipe from the south curb of West Street to the endwall just east of the bridge. That is the only existing drainage structure between the bridge and Beaver Street. The 150 feet of flat roadway section along with the adjacent section with a 1% slope does not properly convey the runoff to the catch basins west of the bridge, but rather the water ponds in the roadway. The distance between existing catch basins here is almost 400 feet. An existing conditions drainage plan was prepared by the City of Danbury in 2010 which is included in **Appendix D**.

Sidewalk failure above box culvert outfall to Still River

Existing catch basin at outfall

The existing drainage system does not appear to function satisfactorily as evidenced by the damage at the existing outfall and the reports of frequent flooding. During a field review of the project, a hazardous separation between the existing sidewalk and the endwall at the outfall was observed. Additionally, the failure of sidewalk concrete was observed above the 24-inch box culvert at the outfall. At the existing catch basin that connects to the 24-inch box culvert (similar to a Type C-L double grate Type I inlet), the top of a pipe has been exposed at the curb line. Concrete failures indicate either settlement of drainage structures or failed pipe joints that have enabled leaking water to undermine the soils that support the pipes.

We have developed a series of short-term, medium-term, and long-term solutions that address various issues at the railroad bridge crossing. They are as follows:

<u>Short-Term</u>

- Rehabilitate existing drainage structures and sidewalks and replace the existing inlet that connects to the outfall box culvert with a Type C catch basin with a double grate

Type I. These changes will improve the drainage system function and efficiency as well safety for road users, particularly pedestrians, and decrease liability for City.

- On a regular basis, remove existing debris and silt that has accumulated in the drainage structures in the vicinity of the existing outfall. This will minimize the impact of minor storm events on the roadway.
- Install a check valve at the existing 24-inch box culvert outfall at endwall. This will prevent high water elevations in the river from flowing back into the drainage system and flooding the roadway.

Medium-Term

- Install flanking inlets along the flat section of West Street to limit spread in the low-grade area and relieve the inlet at the low point if it becomes clogged (per the CTDOT Drainage Manual Section 11.8.5). Additionally, re-grade the roadway to increase slopes to move water to inlets.
- Add catch basins along West Street east and west of the existing outfall and create new, higher-elevation outfalls. Note that this would likely require obtaining drainage easements across private property or potentially acquiring right-of-way. Working with the existing outfall, this option would limit ponding under the crossing during flood stages by reducing the contributing drainage area to the existing outfall.
- Install a new catch basin at the low point under the bridge. Connect to a lift station that could be located under the existing sidewalk between the rail bridge and the existing outfall. The lift station would outfall to the river. This would mitigate drainage issues on the roadway and reduce the number and duration of roadway closures that would be required due to flooding.

Long-Term

- Jack a new culvert under the rail line to relocate the river and move it away from the roadway. This would provide space for a detention area next to the roadway and eliminate flooding that occurs when the river exceeds the roadway elevation. There would also be an opportunity to evaluate the potential for lowering the roadway to increase clearance under bridge. Note that this reconfiguration would require an environmental permit and considerable railroad coordination.
- Remove or lower the dam downstream near the intersection of Beaver Street at Elm Street to reduce tailwater elevation for the existing roadway drainage system. This will reduce roadway flooding caused by high water elevation in the river flowing back into the drainage system and flooding the roadway.
- Raise the existing railroad tracks and replace the bridge structure. This would eliminate clearance issues and could allow for horizontal and vertical roadway alignment improvements to address traffic flow and drainage issues.

6.5.1 Project Funding

Replacing the railroad bridge is a long-term solution to the operational and safety problems caused by the existing structure. This solution has not had much traction to date for a number of reasons, one of which is ownership. Infrastructure and operations for Class I freight railway lines are funded almost entirely by the freight railway company with income from its operations. Improvements to smaller lines and regional railroads, such as the Class III Housatonic Railway Company, are often funded privately, but are also more commonly funded with state and local funds. Since the State of Connecticut does not own the railroad bridge over West Street or West Street itself, options for using State funds are more limited. In speaking with members of several groups within the Connecticut Department of Transportation, no specific funding options could be identified for replacing the West Street railroad bridge. A low-clearance single-track Housatonic railroad bridge over Route 6 (Church Hill Road) in Newtown was replaced in 2002 with an estimated cost of $4 million plus for a bridge. An agreement was reached with the railway company and federal funds were used for that project.

Recently replaced Housatonic Railway Bridge over Route 6 (Church Hill Road) in Newtown

The HVCEO director indicated that municipal allocations of STP-Urban funds could be used to fund the replacement of the railroad bridge over West Street if the City were to prioritize it and formalize an agreement with the Housatonic Railway Company. The STP-Urban program is intended to fund projects that are not part of the interstate or national highway systems. These funds can be used for a wide range of projects including roadway and transit, and the Regional Planning Agency (rather than the State) has the primary responsibility for determining how funds will be used.

There is no dedicated federal funding source for rail transportation. Funding programs that are rail oriented are discretionary and awarded on a competitive nationwide basis, which means that there is no guarantee that a state will be awarded federal rail funding. One program which might be an appropriate funding source for the replacement of the railroad bridge over West

Street is the Rail Line Relocation and Improvement Capital Grant Program. This program funds local rail relocation and improvement projects to assist in mitigating adverse effects of rail infrastructure. States, counties, and cities are eligible for program funding. Awards are made for construction projects that improve the rail line route or structure and 1) mitigate the adverse effects of rail traffic on safety, motor vehicle traffic flow, community quality of life or economic development or 2) Involve a lateral or vertical relocation of any portion of the rail line. Grants cover construction costs as well as pre-construction activities including design and NEPA compliance, although planning and feasibility studies are not included.

One of the City's reasons for believing bridge improvements should be funded with State or Federal sources is rooted in West Street's designation as an I-84 Diversion Route. "The Traffic Diversion Plan for I-84 and Parts of US Route 7 and CT Route 8" is intended to facilitate quick response and clearance of incidents on I-84 and to guide state and local first responders before, during, and after emergency situations. The selection of individual diversion routes considered the following roadway characteristics: capacity, geometry, bridge clearances, movement prohibitions, and weight restrictions. In some cases, as with the diversion plan for I-84 eastbound from Exit 4 to Exit 5 and I-84 westbound from Exit 5 to Exit 4, which include West Street, a secondary diversion route is identified to accommodate trucks if there is a geometric, weight, or clearance restriction along the primary route. City staff argues that the infrastructure deficiencies in the vicinity of the bridge, combined with the limited excess capacity along the corridor, make West Street an ineffective and unreliable route for diverted I-84 traffic. The City therefore believes responsibility for replacing the railroad bridge could lie with State and Federal governments, potentially funded as a Homeland Security project.

6.5.2 Traffic Calming

Some planners have deemed the West Street Bridge a "traffic calming device" for the predominantly residential Lake Avenue corridor. According to the Institute of Transportation Engineers, traffic calming involves changes in street alignment and installation of physical measures to reduce traffic speeds and / or cut-through traffic volumes to improve safety, livability, and other public purposes (such as crime prevention or redevelopment). It does not include measures such as roadside environment, speed limit changes and

enforcement, all-way stops, or pavement markings to narrow lanes. There is a standard process to follow to implement traffic calming measures, which includes identifying traffic problems through speed studies, traffic counts, accident analysis, and other studies, considering alternatives, identifying preferred measures, funding and constructing projects, and then evaluating the measures for effectiveness after installation. Traffic calming devices, when properly planned and designed, should reduce the number and severity of traffic accidents. If standard processes are not followed, even if typical traffic calming measures are implemented, then unintended consequences and liability issues can result.

The West Street railroad bridge has a substandard design that contributes to accidents where it crosses the study corridor and prevents large trucks from utilizing that section of roadway. This does not meet the industry standard definition of traffic calming. Although there may be some benefit to reducing the number of large trucks in a residential neighborhood, it is likely that the safety problems that result from the bridge's design are greater than any benefits that could be realized. The railroad bridge crossing is a location in the corridor that experiences a large number of crashes, mostly due to over height vehicles colliding with the top of the bridge. These accidents can cause operational problems and delays compounding safety issues. There are also issues with trucks reaching the bridge and deciding to back up or turn around before colliding with the bridge, causing issues similar to when crashes occur. Trucks may also detour through other residential streets trying to find new routes to their destinations. And although many large trucks are not able to operate in the corridor, some emergency vehicles and other service vehicles are not either. If there is any opportunity to replace the bridge to meet current standards it should be pursued.

7 Access Management

Safety risks and traffic friction for all road users increase in areas with closely spaced driveways, continuous access, and / or angle parking. Traffic can flow more smoothly and conflict points are reduced when access management

Lake Avenue commercial area between Lawncrest Road and Merrimac Street

strategies are implemented. Access management is a systematic effort to organize access to adjacent properties along a corridor in order to reduce impacts to traffic flow and safety. Access management strategies that address driveways include identifying optimal locations, specifying appropriate spacing, providing standards for design, and limiting operations to specific movements. Access management strategies for the roadway include properly locating and designing traffic signals, auxiliary lanes, and medians. These strategies are used to provide a balance between adjacent properties and mobility on the transportation system that is appropriate for the roadway classification and land use. Access management can also be used to support local community goals for development or redevelopment. In addition to the engineering design, implementation of an access management plan requires planning and regulatory involvement. Goals should be reinforced in the Danbury's Plan of Conservation and Development, the Danbury Transportation Plan, zoning regulations, development codes, and local ordinances.

Unsignalized access driveway in the West Street at Division Street intersection

As was documented in the accident history section of this report, driveway locations and configurations in the corridor have been a contributing factor to many accidents in the corridor, including turning and rear end collisions in particular.

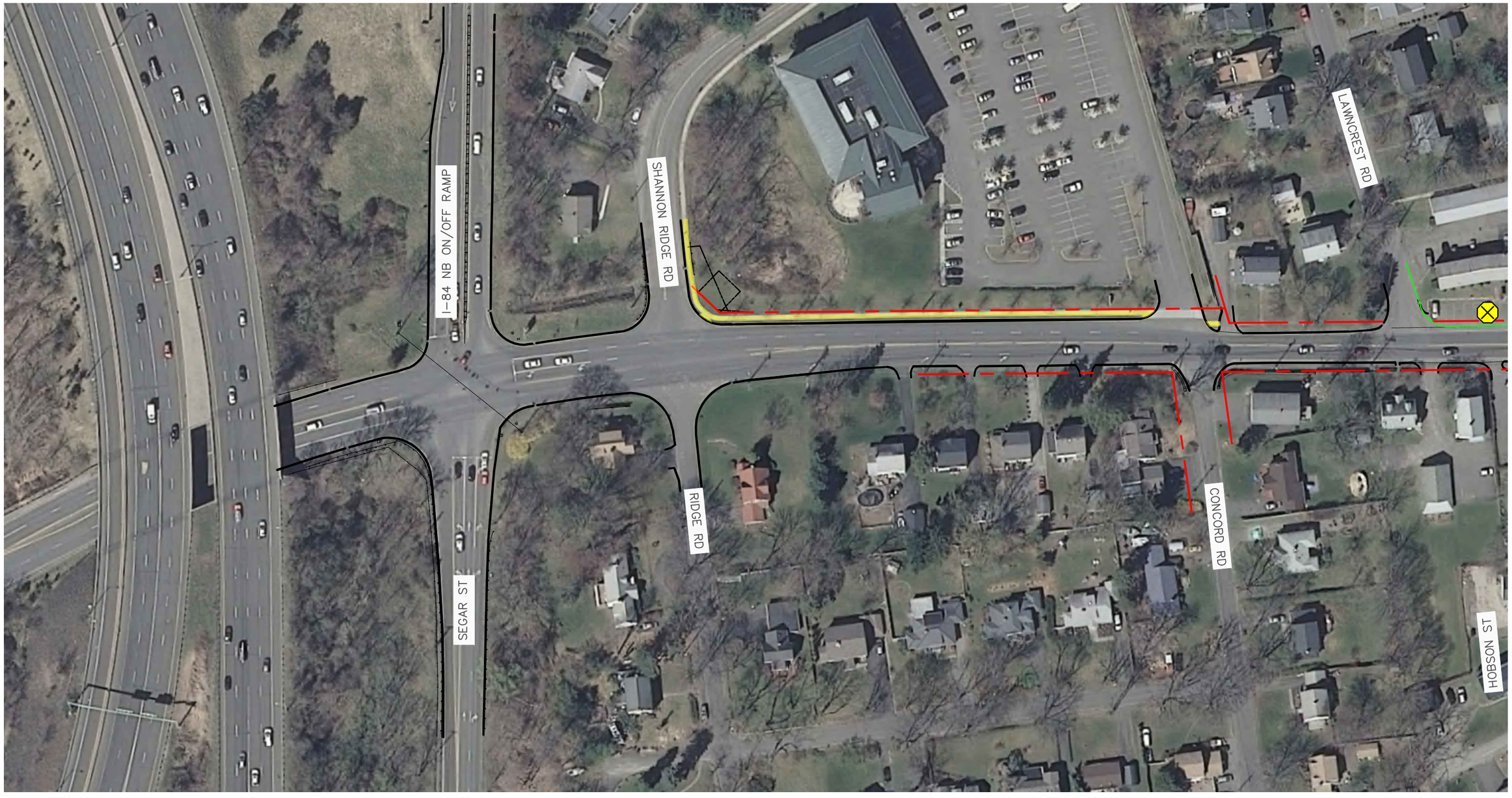
Several characteristics were considered in evaluating the existing access configurations in the Lake Avenue / West Street corridor including driveway width, angle of driveway, number of driveways, driveway spacing, sight distance, signal impact, driveway corner clearance, shared access. The following types of access management strategies are recommended in the corridor:

- **Close Driveways** - Close existing driveways to reduce the number of driveways for a single parcel or for two or more interconnected parcels, particularly where there are redundant driveways or a high concentration of driveways in the area

- **Define Driveways** - Narrow existing driveways to a standard width through installation of curbing and / or removal of existing pavement. Clarify for all drivers where to anticipate turns to and from a property.
- **Create Shared Driveway** - Create a single shared driveway at or near the property line to serve two or more abutting properties, especially where lots have narrow frontages or adjacent parking areas, to minimize the number of driveways in close proximity to one another.
- **Relocate / Realign Access** – Reconfigure access to achieve better spacing, proximity to signalized intersections, or alignment with driveways on the other side of a roadway.
- **Maximize Sight Lines** – Improve what motorists can see down the road so they can better perceive oncoming traffic and safely exit driveway. If sight line improvements are impossible or impractical as a result of roadway geometry, consider relocating driveway within parcel or creating shared access with adjacent parcel.
- **Restrict Movements** – Convert existing driveway to right-turn entrance or exit only, or prohibit left-turn entrance or exit movements. This can be achieved through signing, pavement markings and geometry changes. The geometry changes should realign the driveway to make it intuitive to the user what the function of the driveway is.
- **Create One-Way Driveways** – Convert existing two-way driveway to one-way entrance or exit through the installation of signing and pavement markings.
- **Provide Vehicular Interconnection** – Provide a vehicular connection between parcels to facilitate the sharing of a single driveway by multiple locations, allowing for the closure of redundant driveways, particularly where there is a high concentration of driveways close to one another.
- **Continue Sidewalk Across Driveway –** Install continuous sidewalk across driveway as a visual cue for drivers of the potential for pedestrians crossing the driveway.

Location specific conceptual access management recommendations are shown in **Figure 9**. These proposed changes are intended to assist the City as they work with existing property owners to make modifications, and / or implement changes during future redevelopment. They should be considered in association with an engineering review of all standards and regulations when a property is developed, redeveloped, or changes or intensifies use. The general strategies and specific plans should be reinforced in the Danbury's Plan of Conservation and Development, the Danbury Transportation Plan, zoning regulations, development codes, and / or local ordinances as appropriate.

The curb cut management plan includes changes to the Lake Avenue neighborhood commercial area between Lawncrest Road and Merrimac Street, changes in the vicinity of the West Street at Beaver Street intersection, and changes to driveways near the West Street at Division Street intersection. The curb cut plan also shows recommended closures of three driveways that are either within existing signalized intersections or are in very close proximity. These driveways are



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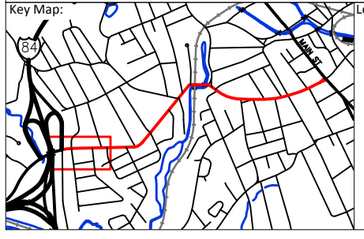


Legend:

- ACCESS MODIFICATION
- EXISTING CURB CUTS
- SIDEWALK
- CONTINUE SIDEWALK ACROSS DRIVEWAY
- ACCESS CLOSURE
- DEFINE ENTRANCE
- CREATE SHARED DRIVEWAY
- RELOCATE/REALIGN ACCESS
- MAXIMIZE SIGHT LINES
- RIGHT-TURN ONLY
- ONE-WAY
- PROVIDE VEHICULAR INTERCONNECTION

N

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; Seal of the City of Danbury, Incorporated 1889

Prepared By: VN Engineers, Inc.

In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: CURB CUT MANAGEMENT PLAN (1 of 6)

Figure Number: 9A

HADDAD DR

HOBSON ST

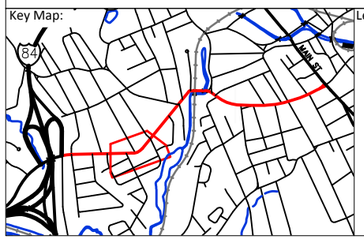
ABBOTT AVE

WELL AVE

S WELL AVE

MERRIMAC ST

Key Map:



Legend:

- ACCESS MODIFICATION
- EXISTING CURB CUTS
- SIDEWALK
- CONTINUE SIDEWALK ACROSS DRIVEWAY
- ACCESS CLOSURE
- DEFINE ENTRANCE
- CREATE SHARED DRIVEWAY
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- MAXIMIZE SIGHT LINES
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- PROVIDE VEHICULAR INTERCONNECTION

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Prepared For:

HVCEO Housatonic Valley Council of Elected Officials

SEAL OF THE CITY OF DANBURY INCORPORATED 1889

Prepared By:

VN Engineers, Inc.

In association with:

dala

Project Title:

TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:

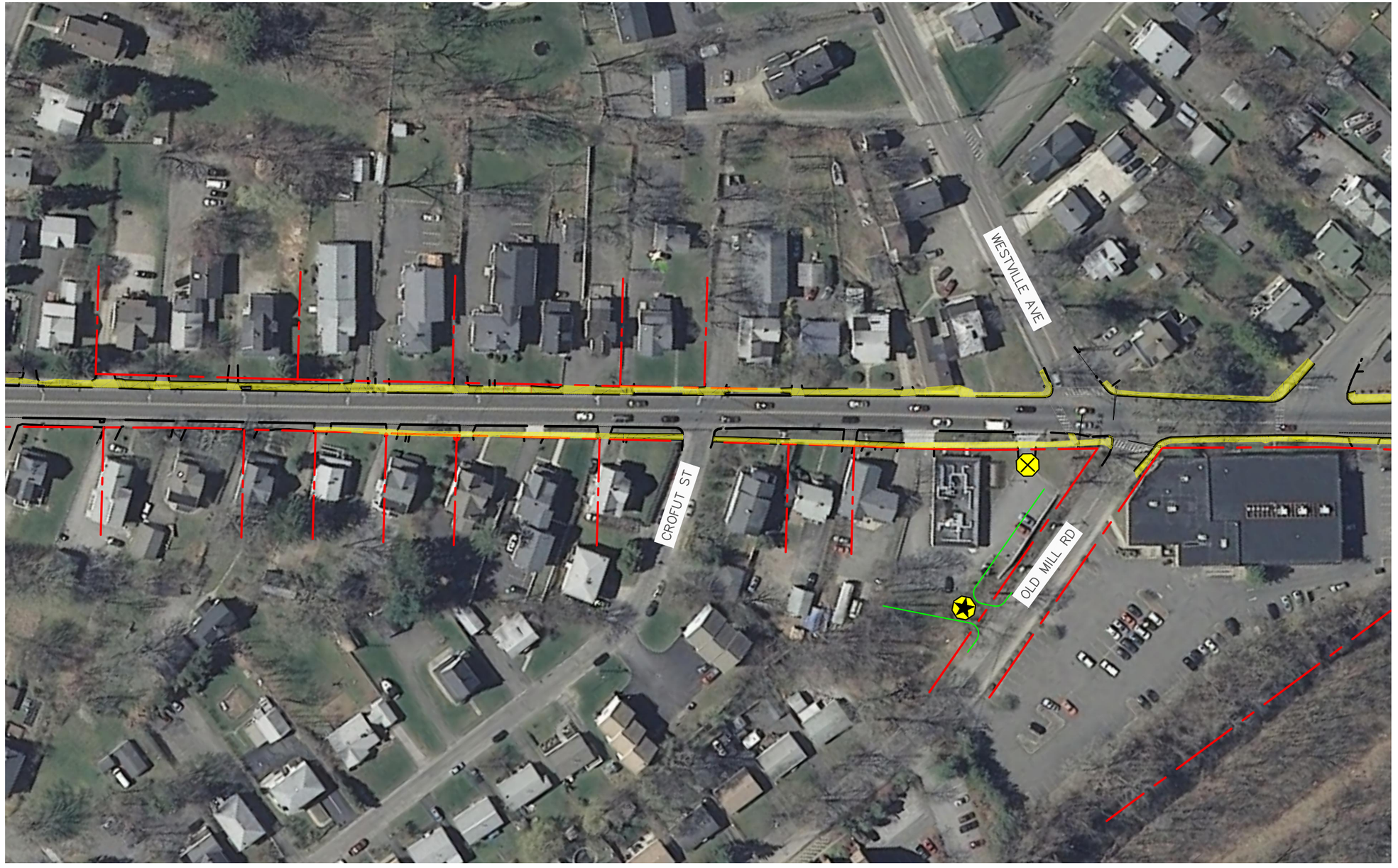
DANBURY, CT

Figure Title:

CURB CUT MANAGEMENT PLAN
(2 of 6)

Figure Number:

9B



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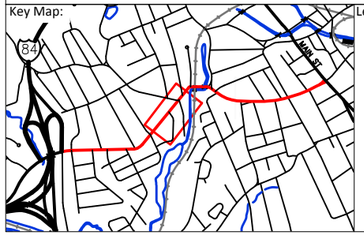

Legend:

- ACCESS MODIFICATION
- EXISTING CURB CUTS
- SIDEWALK
- CONTINUE SIDEWALK ACROSS DRIVEWAY
- ACCESS CLOSURE
- DEFINE ENTRANCE
- CREATE SHARED DRIVEWAY
- RELOCATE/REALIGN ACCESS
- MAXIMIZE SIGHT LINES
- RIGHT-TURN ONLY
- ONE-WAY
- PROVIDE VEHICULAR INTERCONNECTION

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Prepared For:

HVCEO Housatonic Valley Council of Elected Officials

Prepared By:

VN Engineers, Inc.

In association with:

dala

Project Title:

TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:

DANBURY, CT

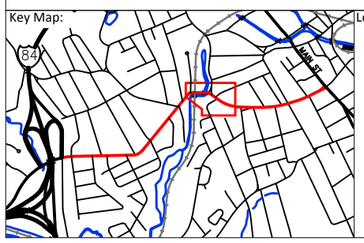
Figure Title:

CURB CUT MANAGEMENT PLAN
(3 of 6)

Figure Number:

9C

Key Map:



Legend:

- ACCESS MODIFICATION
- EXISTING CURB CUTS
- SIDEWALK
- CONTINUE SIDEWALK ACROSS DRIVEWAY
- ACCESS CLOSURE
- DEFINE ENTRANCE
- CREATE SHARED DRIVEWAY
- RELOCATE/REALIGN ACCESS
- MAXIMIZE SIGHT LINES
- RIGHT-TURN ONLY
- ONE-WAY
- PROVIDE VEHICULAR INTERCONNECTION

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1" = 100'

50' 0 100'

Prepared For:

Prepared By:

VN Engineers, Inc.

In association with:

dala

Project Title:

TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:

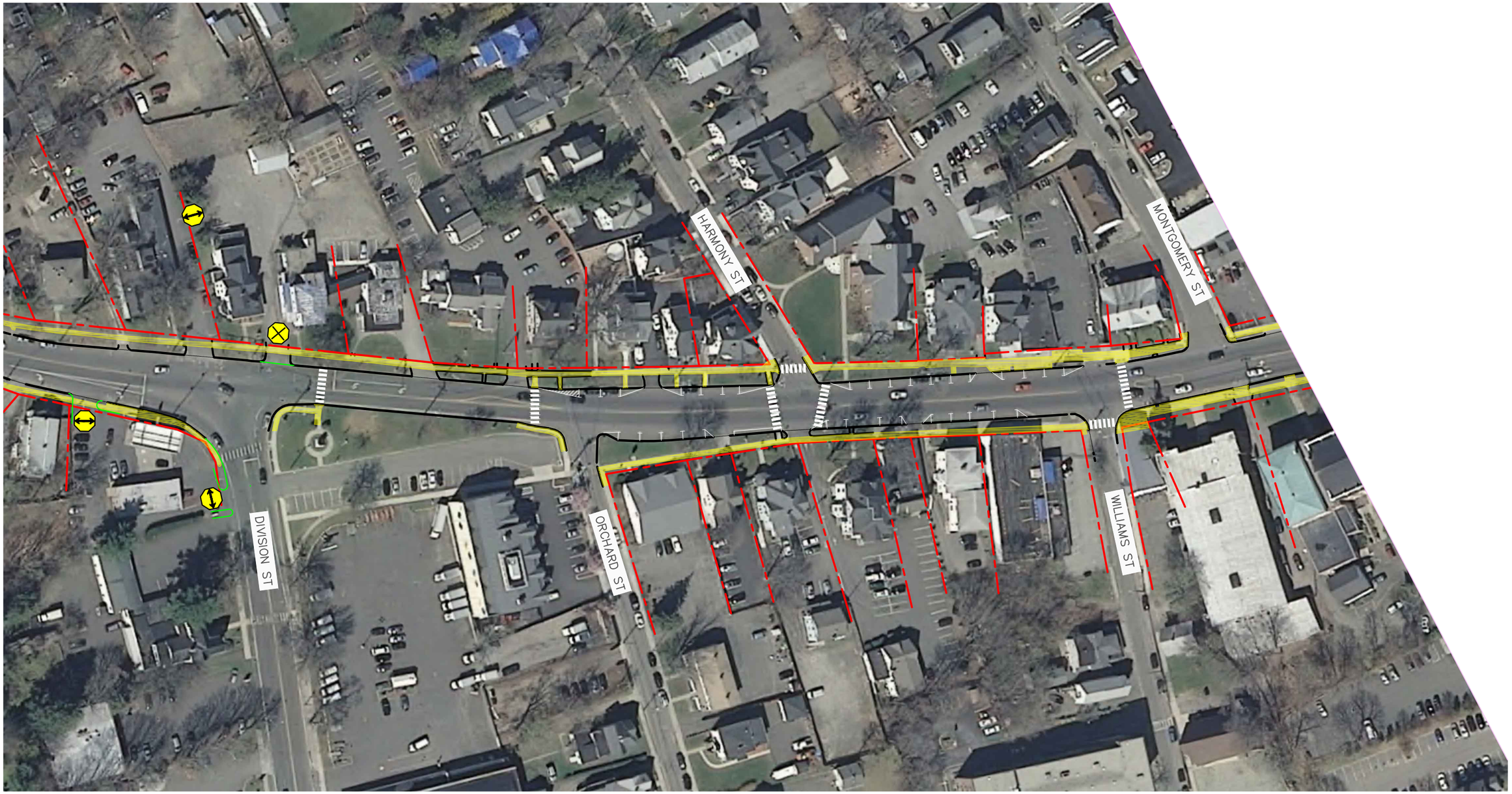
DANBURY, CT

Figure Title:

CURB CUT MANAGEMENT PLAN
(4 of 6)

Figure Number:

9D



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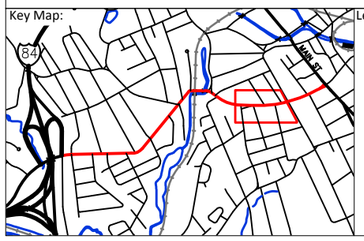

Legend:

- ACCESS MODIFICATION
- EXISTING CURB CUTS
- SIDEWALK
- CONTINUE SIDEWALK ACROSS DRIVEWAY
- ACCESS CLOSURE
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- CREATE SHARED DRIVEWAY
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- MAXIMIZE SIGHT LINES
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- PROVIDE VEHICULAR INTERCONNECTION

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Prepared For:

HVCEO Housatonic Valley Council of Elected Officials

Prepared By:

VN Engineers, Inc.

In association with:

dala

Project Title:

TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:

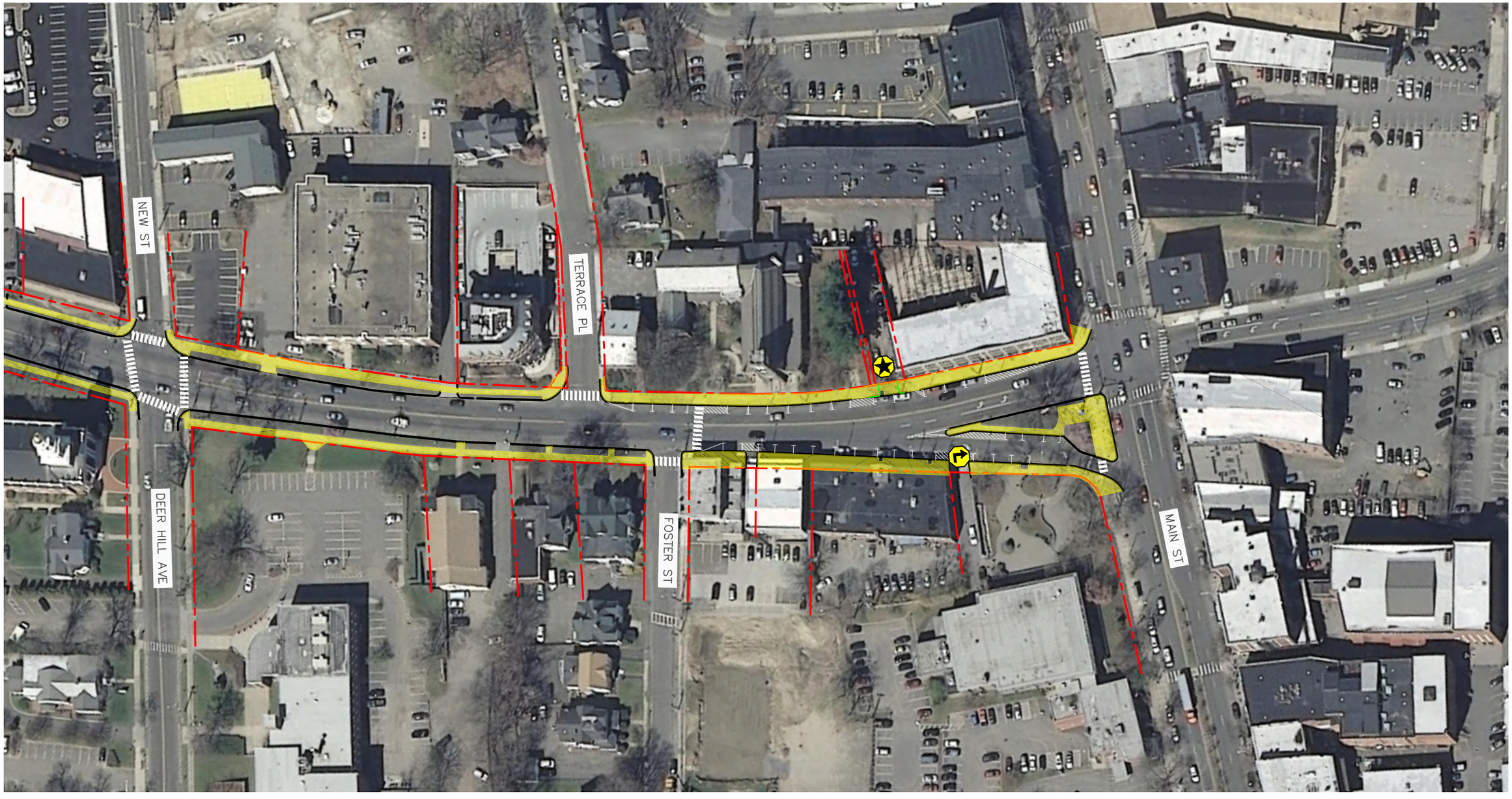
DANBURY, CT

Figure Title:

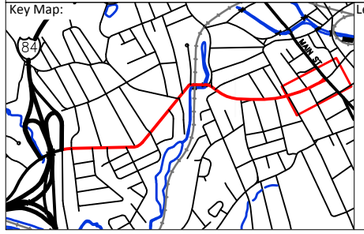
CURB CUT MANAGEMENT PLAN
(5 of 6)

Figure Number:

9E



Key Map:



Legend:

- ACCESS MODIFICATION
- EXISTING CURB CUTS
- SIDEWALK
- CONTINUE SIDEWALK ACROSS DRIVEWAY
- ACCESS CLOSURE
- DEFINE ENTRANCE
- CREATE SHARED DRIVEWAY
- RELOCATE/REALIGN ACCESS
- MAXIMIZE SIGHT LINES
- RIGHT-TURN ONLY
- ONE-WAY
- PROVIDE VEHICULAR INTERCONNECTION

N

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; Seal of the City of Danbury, Incorporated 1847

Prepared By: VN Engineers, Inc.

In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: CURB CUT MANAGEMENT PLAN (6 of 6)

Figure Number: 9F

at the Lake Avenue at Westville Avenue / Oil Mill Road, West Street at Beaver Street, and West Street at Division Street intersections. There are also a few other isolated changes that are shown.

8 PEDESTRIAN FACILITIES

There are three main components to the pedestrian space of a downtown corridor. They are the sidewalk, the buffer space and streetscape amenities. Sidewalks of appropriate width that are in good condition are critical to pedestrian movement in a downtown location. A five-foot wide sidewalk is a fairly standard width that will allow a wheelchair user to move past a pedestrian or group of pedestrians without either of them having to leave the sidewalk. The condition of the sidewalk is also very important from both a safety and ease of use standpoint. Cracked and heaving sidewalks are tripping hazards and can create accessibility issues. Aesthetically, it is best if a consistency of material is adhered to so that the full corridor has a similar appearance throughout. Walkways that continuously change from one material to another are usually distracting, harder to maintain and not always accessible since heaving often occurs at the point where two different types of pavement meet. Accessible crossings at road intersections are important to providing access throughout the entire corridor. Properly designed curb ramps with detectable warning pads and visually apparent, well-lit crosswalks will provide the required access. The main purpose of the buffer area is to create a barrier between pedestrians and the cars and also to beautify the streetscape. The buffer area of a streetscape is the space between the sidewalk or main pedestrian route and the roadway. Pedestrians must feel safe when walking in proximity to the roadway, especially on busy urban roads or they will not use the sidewalks, no matter how beautiful they may be. A well-designed buffer area will create a feeling of safety and increase pedestrian traffic along the corridor. Buffer areas are typically two to eight feet wide and are created between the sidewalk and edge of the road. Buffer areas can be grass, pavers or plant beds and contain various amenities such as trees, benches, bollards, low plantings, decorative street lights, etc. These amenities have practical purposes (benches for sitting, lights to provide safe night use) but can also beautify an area and give it character and interest. When these characteristics are included in a streetscape's design, they will encourage pedestrian use, improve the appearance of the streetscape and create a cohesive design throughout the corridor.

8.1 Existing Pedestrian Accommodations

The corridor was observed and a number of physical and operational issues were identified that could inhibit safe and efficient movement of pedestrians through the study corridor. The following characteristics have a negative impact on pedestrian safety and mobility:

- **Numerous driveways, areas of continuous access, and angle parking.** Pedestrians are highly exposed in these areas since pedestrian space is not defined, travel paths for vehicles are not always clear, and there are a number of possible vehicular turning movements. These conditions create large conflict areas for motor vehicles and pedestrians. In the study corridor, these areas include the neighborhood commercial zone between Lawncrest Road and Merrimac Street, and a shopping center and restaurant in the vicinity of the West Street at Beaver Street intersection.

Absence of pedestrian accommodations at Lake Avenue at Abbott Avenue intersection

- **Low pedestrian priority at intersections.** At most signalized intersections in the corridor, pedestrian accommodations are incomplete. Sidewalks that lead to curb ramps and crosswalks over all legs of an intersection are preferable in conjunction with push buttons and pedestrian signal heads. The intersections of Lake Avenue at Abbott Avenue and West Street at Division Street are particularly lacking pedestrian accommodations.
- **Undesirable vehicle speeds for context of area.** Wide travel lanes and / or long straight sections of roadway result in high vehicular speeds in some locations, which is particularly problematic in areas with high pedestrian volumes or limited pedestrian facilities. There is a long straight section of Lake Avenue through a residential area between Abbott Avenue and Westville Avenue / Oil Mill Road where travel speeds appeared high. There is also a section of West Street between Orchard Street and William Street where lanes are very wide, which is also a section of the corridor that includes a number of unsignalized crosswalks.
- **Large crossing distances.** Multiple, wide travel lanes, turning lanes, and large curb-return radii contribute to uncomfortably large crossing distances at many locations. This is a hazard for pedestrians who often share the crossing phase with turning vehicles. The long crossing distances also require longer phases, which contribute to vehicular delay at some locations. The curb radius on the southwest corner of the West Street at Division Street intersection is particularly large. Crossing distances over West Street are particularly large, since there are wide travel lanes as well as on street parking lanes,

between Orchard Street and William Street. This is also a roadway section where there are a number of unsignalized crosswalks.

- **Poor visibility at crosswalks.** Pedestrian danger is increased if drivers and pedestrians cannot see each other well at crossing locations. On-street parking and poorly located crosswalks were frequently found to limit visibility between pedestrians and drivers, particularly along West Street between Orchard Street and Main Street and across the east leg of the West Street at Division Street intersection.
- **Narrow sidewalk width.** In some locations only a narrow sidewalk width is provided directly adjacent to the roadway. This can contribute to a feeling of insecurity for pedestrians and it can limit mobility when there are any significant numbers of walkers. This is the case for the sections of Lake Avenue between Abbott Avenue and Crofut Street and West Street between Westville Avenue and the railroad bridge.
- **Incomplete sidewalk networks.** Pedestrian exposure to vehicles is increased where sections of sidewalk are missing. In many of these locations, pedestrians use landscaped areas, private property, or off-street parking areas to travel along a corridor. There are a number of areas along Lake Avenue where sidewalks are discontinuous between the western limit of the study corridor and Abbott Avenue. There is also no sidewalk along the south side of West Street between Division Street and Orchard Street.

Sidewalk on south side of Lake Avenue

Most of the project corridor includes sidewalks, although they are of varying widths, conditions, and material. From the I-84 ramps east to Merrimac Street, sidewalks are largely non-existent with the exception of the frontage of the AAA building. The area of commercial development between Lawncrest Road and Merrimac Street also has no sidewalks, although there is existing pavement from the edge of the road right up to the building fronts. While this area lends itself to sidewalks from a structural standpoint, there are many driveways along this section as well as off street parking areas located along the building fronts. Both of these conditions create safety concerns for pedestrians. Continuing east, sidewalks exist for almost the entire corridor. Between Merrimac Street and Division Street, most of the sidewalks are in fair to poor condition with several short stretches of walks in good condition. Many of the sidewalks in this section currently have buffer space that consists of lawn or dirt strips and that include utility poles and other appurtenances spaced intermittently. On the south side of West Street

between Division Street and Orchard Street there is no sidewalk directly adjacent to the roadway. Otherwise the corridor between Division Street and Main Street has sidewalks on both sides of the street and almost all are in good condition, although they are a mix of materials. This includes the median island at West Street and Main Street. Existing sidewalk conditions are illustrated in **Figure 10**. There are no amenities such as decorative street lights, benches, etc. within the project corridor. All transit stops consist of a simple bus stop sign marking a pickup / drop off area, with no shelters currently existing within the project corridor.

8.2 Suitability for Pedestrian Facilities

There are pedestrian accommodations provided throughout most of this corridor, although quality and consistency vary considerably. The western (Lake Avenue) portion of the corridor developed with a more auto-centric focus, although there are sidewalks throughout most of that section. Implementing some relatively minor improvements to complete and improve the existing system of pedestrian facilities can help make the corridor safer and more accessible for all transportation system users, encourage more use by non-motorized travelers, promote patronage of neighborhood businesses, encourage more use of public transit, and allow for improved transit facilities. There are some isolated parcels that will require long-term site layout changes to reconfigure access and parking layouts which will improve pedestrian safety and mobility. In the near term, however, there are a number of changes that can be made to improve pedestrian safety and accessibility in the corridor.

- **Providing more pedestrian accommodations at intersections.** Establishing consistent pedestrian facilities through intersections is critical for providing continuous routes for pedestrian travel in this corridor. The intersections of Lake Avenue at Abbott Avenue and West Street at Division Street, in particular, would benefit from the addition of accommodations such as crosswalks across all intersection legs, ADA compliant curb ramps, push buttons, and pedestrian signal heads for all approaches.
- **Add curb extensions** to reduce crossing distances, increase pedestrian-driver visibility, and reduce vehicular travel speeds. Curb extensions (also called bulb outs, neck downs or knuckles) extend the curb into the travelled way, reducing the width of the street, and encouraging drivers to reduce their speeds. They are commonly used at intersections, but can also be used at mid-block locations to define parking areas, a bus stop or a loading zone. Another option for reducing crossing distances in this corridor would be the adjustment of curb return radii (on the southwest corner of the West Street at Division Street intersection) as discussed in Section 6.2.4. Implementing these recommendations would improve pedestrian safety by lowering travel speeds at pedestrian-vehicle conflict points, enhancing pedestrian-driver visibility, and encouraging and facilitating pedestrian crossings at preferred locations. Note that

N

Key Map:

Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- EXISTING SIDEWALK - GOOD CONDITION
- EXISTING SIDEWALK - FAIR CONDITION
- EXISTING SIDEWALK - POOR CONDITION
- EXISTING LAWN
- EXISTING BUILDING
- HANDICAP RAMPS LOCATION
- EXISTING PARKING AREA

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials

Prepared By: VN Engineers, Inc.

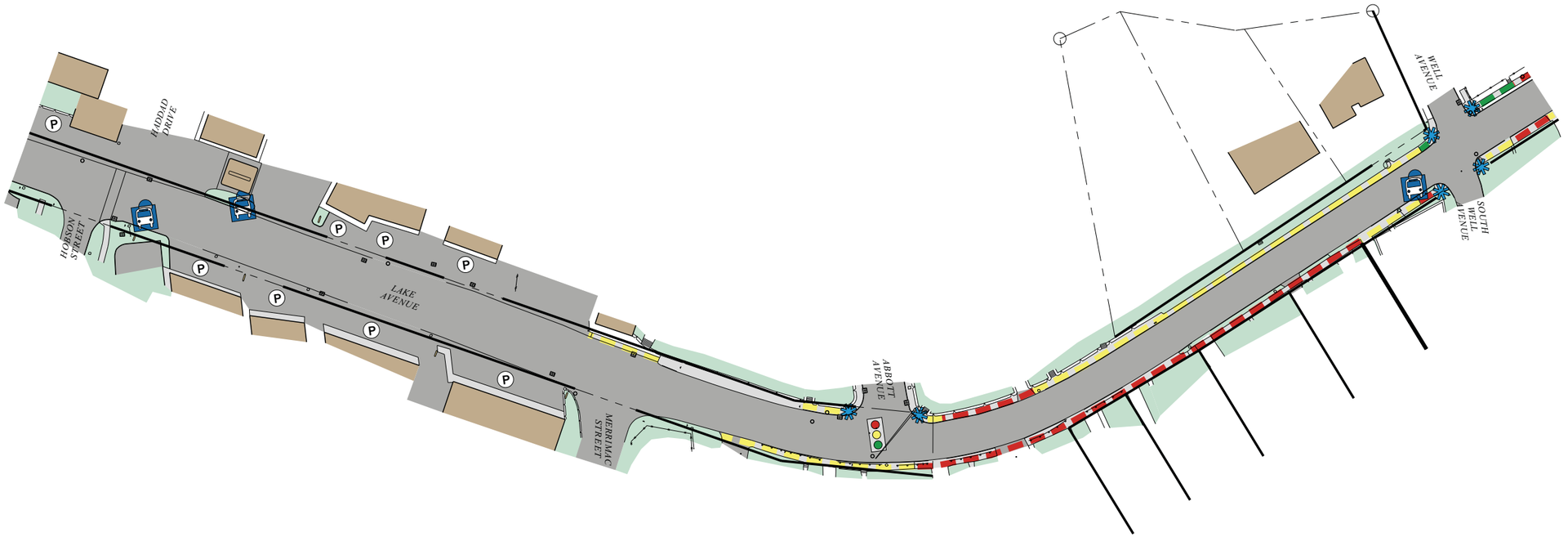
In association with: dala

Project Title:
TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:
DANBURY, CT

Figure Title:
EXISTING SIDEWALK CONDITIONS ANALYSIS
I84 RAMP/LAWNCREST ROAD AREA

Figure Number:
10A



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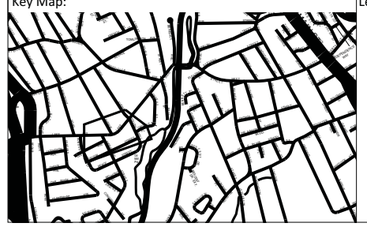


Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- EXISTING SIDEWALK - GOOD CONDITION
- EXISTING SIDEWALK - FAIR CONDITION
- EXISTING SIDEWALK - POOR CONDITION
- EXISTING LAWN
- EXISTING BUILDING
- HANDICAP RAMPS LOCATION
- (P) EXISTING PARKING AREA

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; City of Danbury

Prepared By: VN Engineers, Inc.

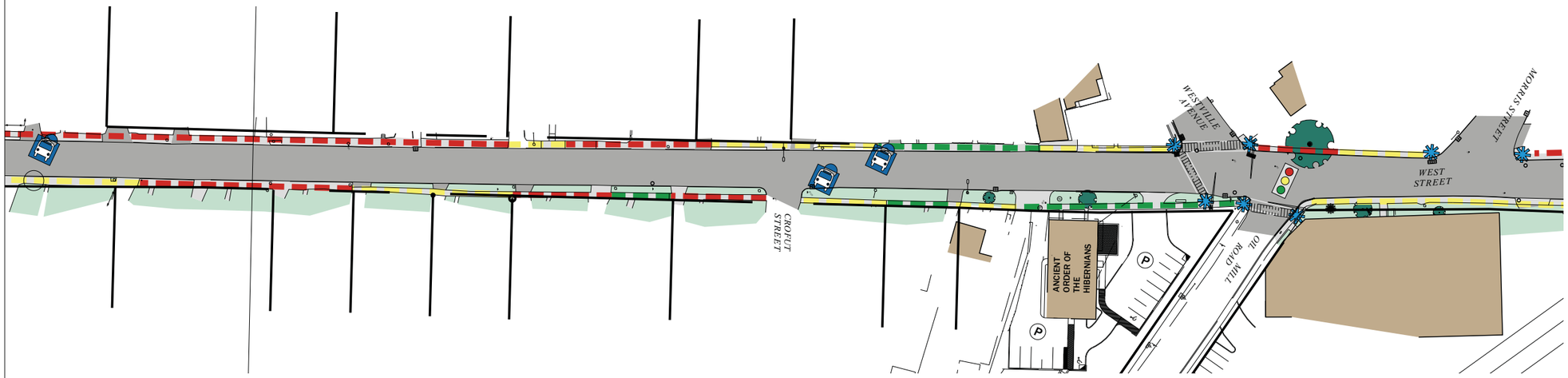
In association with: dala Diana Associates Landscape Architects, LLC

Project Title:
TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:
DANBURY, CT

Figure Title:
EXISTING SIDEWALK CONDITIONS ANALYSIS
LAWNCREST ROAD/WELL AVE. AREA

Figure Number:
10B



Key Map:

Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- EXISTING SIDEWALK - GOOD CONDITION
- EXISTING SIDEWALK - FAIR CONDITION
- EXISTING SIDEWALK - POOR CONDITION
- EXISTING LAWN
- EXISTING BUILDING
- HANDICAP RAMPS LOCATION
- (P) EXISTING PARKING AREA

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials

Prepared By: VN Engineers, Inc.

In association with: dala

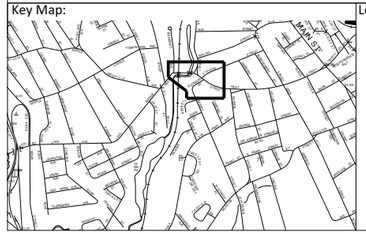
Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: EXISTING SIDEWALK CONDITIONS ANALYSIS WELL AVENUE/MORRIS STREET AREA

Figure Number: 10C

Key Map:



Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- EXISTING SIDEWALK - GOOD CONDITION
- EXISTING SIDEWALK - FAIR CONDITION
- EXISTING SIDEWALK - POOR CONDITION
- EXISTING LAWN
- EXISTING BUILDING
- HANDICAP RAMPS LOCATION
- (P) EXISTING PARKING AREA

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; City of Danbury

Prepared By: VN Engineers, Inc.

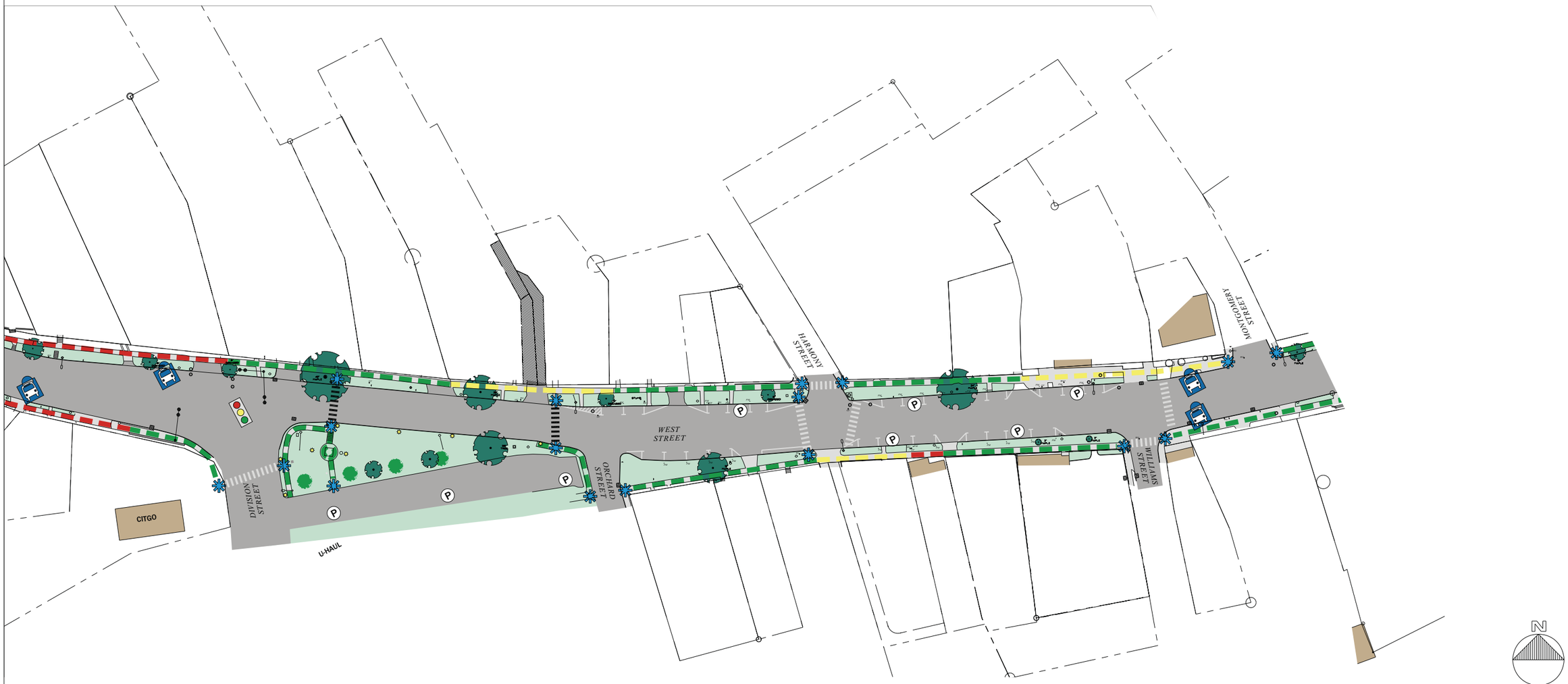
In association with: dala Diana Associates Landscape Architects, LLC

Project Title:
TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:
DANBURY, CT

Figure Title:
EXISTING SIDEWALK CONDITIONS ANALYSIS
MORRIS STREET/BEAVER STREET AREA

Figure Number:
10D



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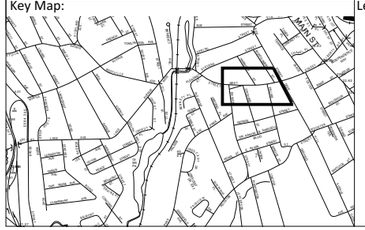


Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- EXISTING SIDEWALK - GOOD CONDITION
- EXISTING SIDEWALK - FAIR CONDITION
- EXISTING SIDEWALK - POOR CONDITION
- EXISTING LAWN
- EXISTING BUILDING
- HANDICAP RAMPS LOCATION
- EXISTING PARKING AREA

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; City of Danbury

Prepared By: VN Engineers, Inc.

In association with: dala Diduna Associates Landscape Architects, LLC

Project Title:
TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:
DANBURY, CT

Figure Title:
EXISTING SIDEWALK CONDITIONS ANALYSIS
DIVISION ST./MONTGOMERY ST. AREA

Figure Number:
10E

Key Map:

Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- EXISTING SIDEWALK - GOOD CONDITION
- EXISTING SIDEWALK - FAIR CONDITION
- EXISTING SIDEWALK - POOR CONDITION
- EXISTING LAWN
- EXISTING BUILDING
- HANDICAP RAMPS LOCATION
- (P) EXISTING PARKING AREA

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; City of Danbury

Prepared By: VN Engineers, Inc.

In association with: dala Diana Associates Landscape Architects, LLC

Project Title:
TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:
DANBURY, CT

Figure Title:
EXISTING SIDEWALK CONDITIONS ANALYSIS
DEERHILL AVE./MAIN STREET AREA

Figure Number:
10F

although curb extensions provide great safety benefits, they may require some extra effort for snow removal. Installation of curb extensions in the corridor would be particularly effective from Orchard Street to just east of Foster Street.

- **Limit the number of unsignalized crossings and increase their visibility.** There are a number of unsignalized crosswalks in the corridor between Orchard Street and Main Street. Pedestrian travel patterns should be studied in more detail to identify if and where crossings are truly needed. In particular, one of the crosswalks at Harmony could be removed. Additionally, if sidewalk is added on the south side of West Street between Division Street and Orchard Street, then the crosswalk over West Street at Orchard Street could be removed. When needed locations are identified, then additional accommodations can be provided such as curb extensions, stamped pavement, warning flashers, or in pavement lights.
- ***Completing pedestrian travel networks.*** Connecting sidewalk networks where they are discontinuous is critical for improving pedestrian safety and encouraging more pedestrian activity in these corridors.

An important criterion for the development or redevelopment of sidewalk facilities is the suitability of the corridor for pedestrian use. Items to take into account are adequate space, pedestrian safety, conflicts between different user types (pedestrian, vehicular, commercial, and residential, etc.) and need for pedestrian facilities. Almost the entire project corridor is well suited for sidewalk installation with the exceptions being the few areas of storefront parking between Lawncrest Road and Merrimac Street and also the shopping plaza and Salame Plaza just east of the railroad bridge. While both of these areas are suitable for sidewalks from a topographic and infrastructure standpoint, the storefront parking does create some safety issues that need to be addressed in the design. Refer to **Figure 11** for more detailed suitability analysis.

Example pedestrian improvements at continuous access

N

Key Map:

Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- GOOD SUITABILITY FOR STREETSCAPE
- FAIR SUITABILITY FOR STREETSCAPE
- POOR SUITABILITY FOR STREETSCAPE
- EXISTING LAWN
- EXISTING BUILDING

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; Mayor of the City of Danbury

Prepared By: VN Engineers, Inc.

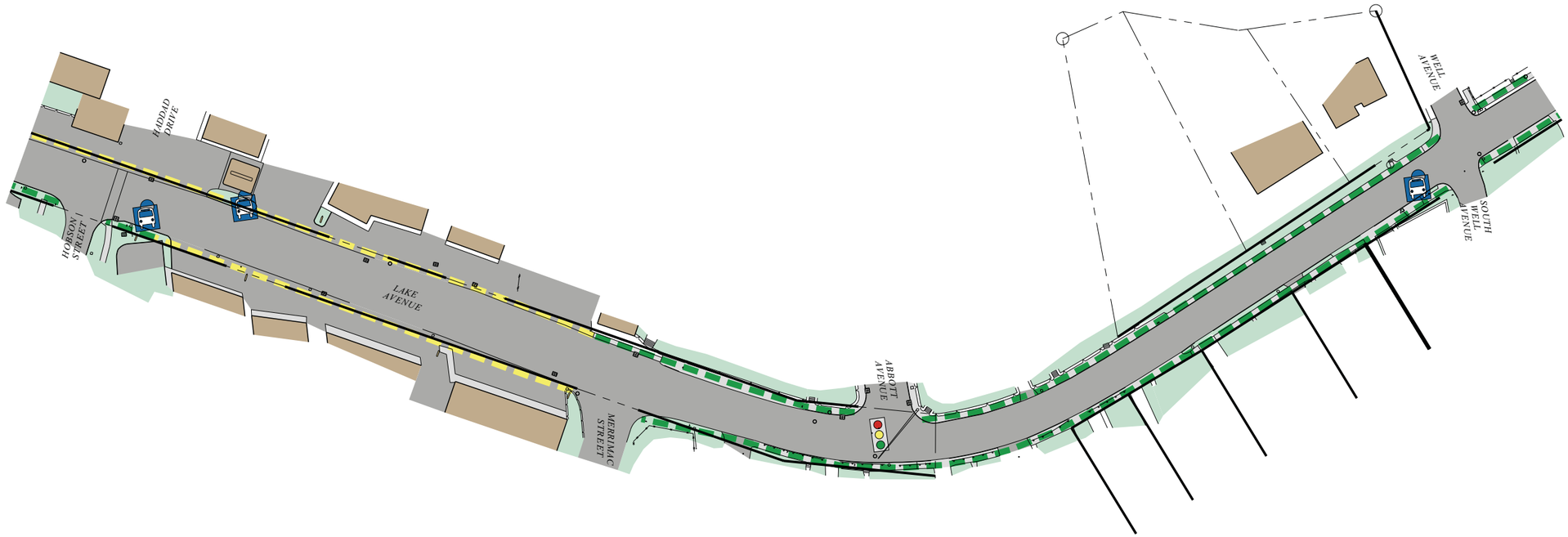
In association with: dala Diedna Associates Landscape Architects, LLC

Project Title:
TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:
DANBURY, CT

Figure Title:
STREETSCAPE SUITABILITY ANALYSIS
I84 RAMP/LAWNCREST ROAD AREA

Figure Number:
11A



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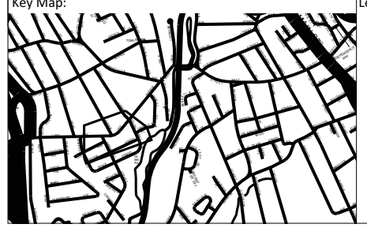


Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- GOOD SUITABILITY FOR STREETSCAPE
- FAIR SUITABILITY FOR STREETSCAPE
- POOR SUITABILITY FOR STREETSCAPE
- EXISTING LAWN
- EXISTING BUILDING

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; City of Danbury

Prepared By: VN Engineers, Inc.

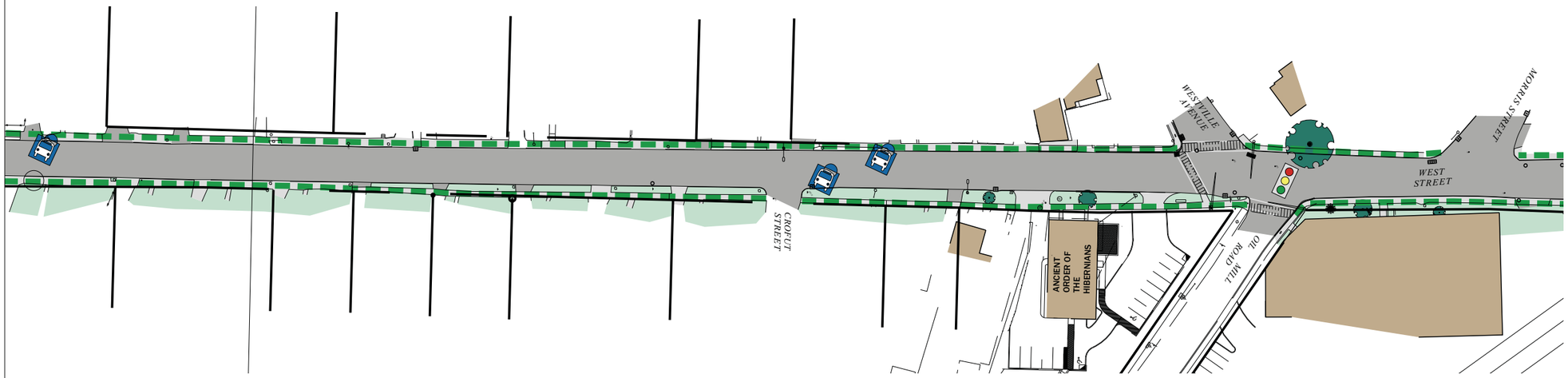
In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: STREETSCAPE SUITABILITY ANALYSIS LAWNCREST ROAD/WELL AVE. AREA

Figure Number: 11B



Key Map:

Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- GOOD SUITABILITY FOR STREETSCAPE
- FAIR SUITABILITY FOR STREETSCAPE
- POOR SUITABILITY FOR STREETSCAPE
- EXISTING LAWN
- EXISTING BUILDING

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; Mayor of the City of Danbury

Prepared By: VN Engineers, Inc.

In association with: dala Diodora Associates Landscape Architects, LLC

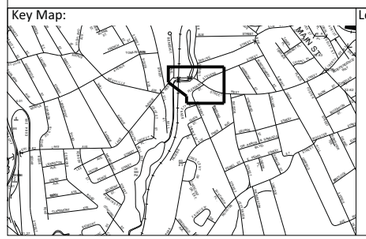
Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: STREETSCAPE SUITABILITY ANALYSIS WELL AVENUE/MORRIS STREET AREA

Figure Number: 11C

Key Map:



Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- GOOD SUITABILITY FOR STREETSCAPE
- FAIR SUITABILITY FOR STREETSCAPE
- POOR SUITABILITY FOR STREETSCAPE
- EXISTING LAWN
- EXISTING BUILDING

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; City of Danbury

Prepared By: VN Engineers, Inc.

In association with: dala Diedona Associates Landscape Architects, LLC

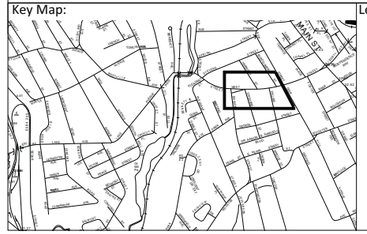
Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: STREETSCAPE SUITABILITY ANALYSIS MORRIS STREET/BEAVER STREET AREA

Figure Number: 11D

Key Map:



Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- GOOD SUITABILITY FOR STREETSCAPE
- FAIR SUITABILITY FOR STREETSCAPE
- POOR SUITABILITY FOR STREETSCAPE
- EXISTING LAWN
- EXISTING BUILDING

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; City of Danbury

Prepared By: VN Engineers, Inc.

In association with: dala Diodna Associates Landscape Architects, LLC

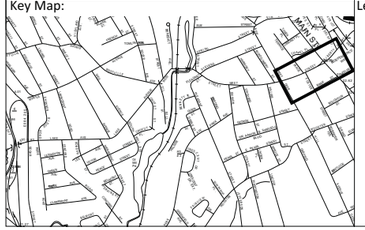
Project Title:
TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:
DANBURY, CT

Figure Title:
STREETSCAPE SUITABILITY ANALYSIS
DIVISION ST./MONTGOMERY ST. AREA

Figure Number:
11E

Key Map:



Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- GOOD SUITABILITY FOR STREETSCAPE
- FAIR SUITABILITY FOR STREETSCAPE
- POOR SUITABILITY FOR STREETSCAPE
- EXISTING LAWN
- EXISTING BUILDING

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; City of Danbury

Prepared By: VN Engineers, Inc.

In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

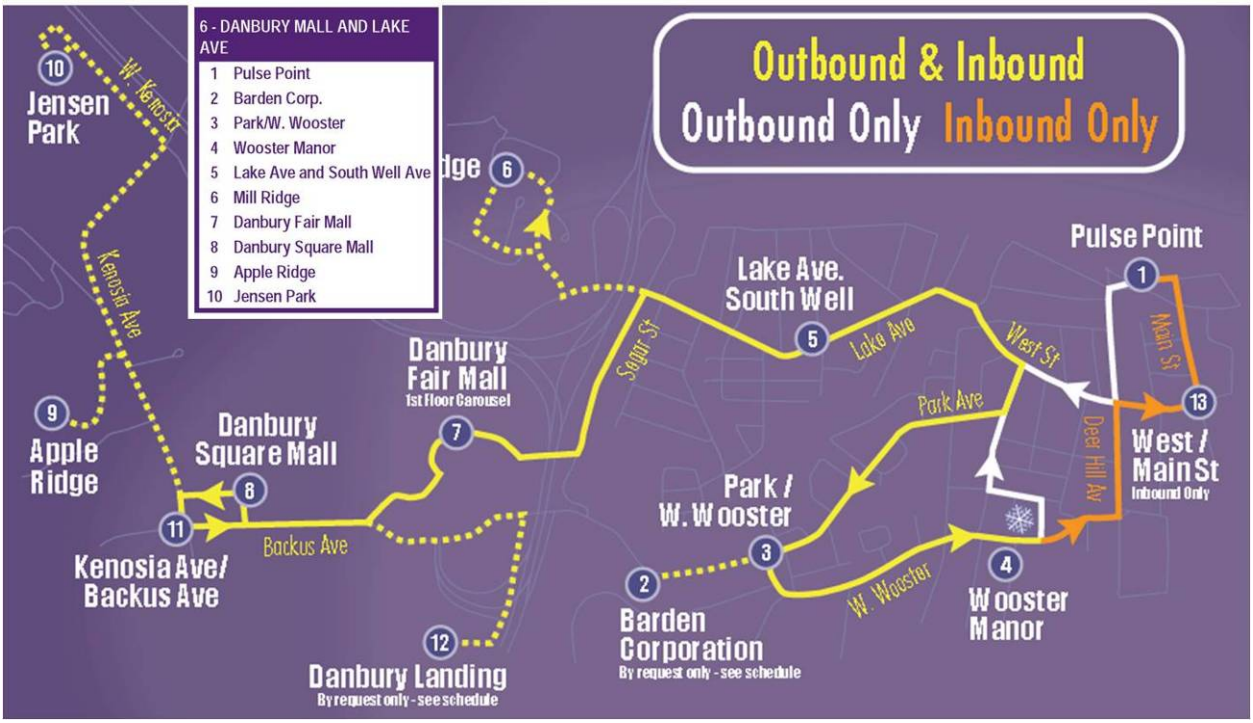
Figure Title: STREETSCAPE SUITABILITY ANALYSIS DEERHILL AVE./MAIN STREET AREA

Figure Number: 11F

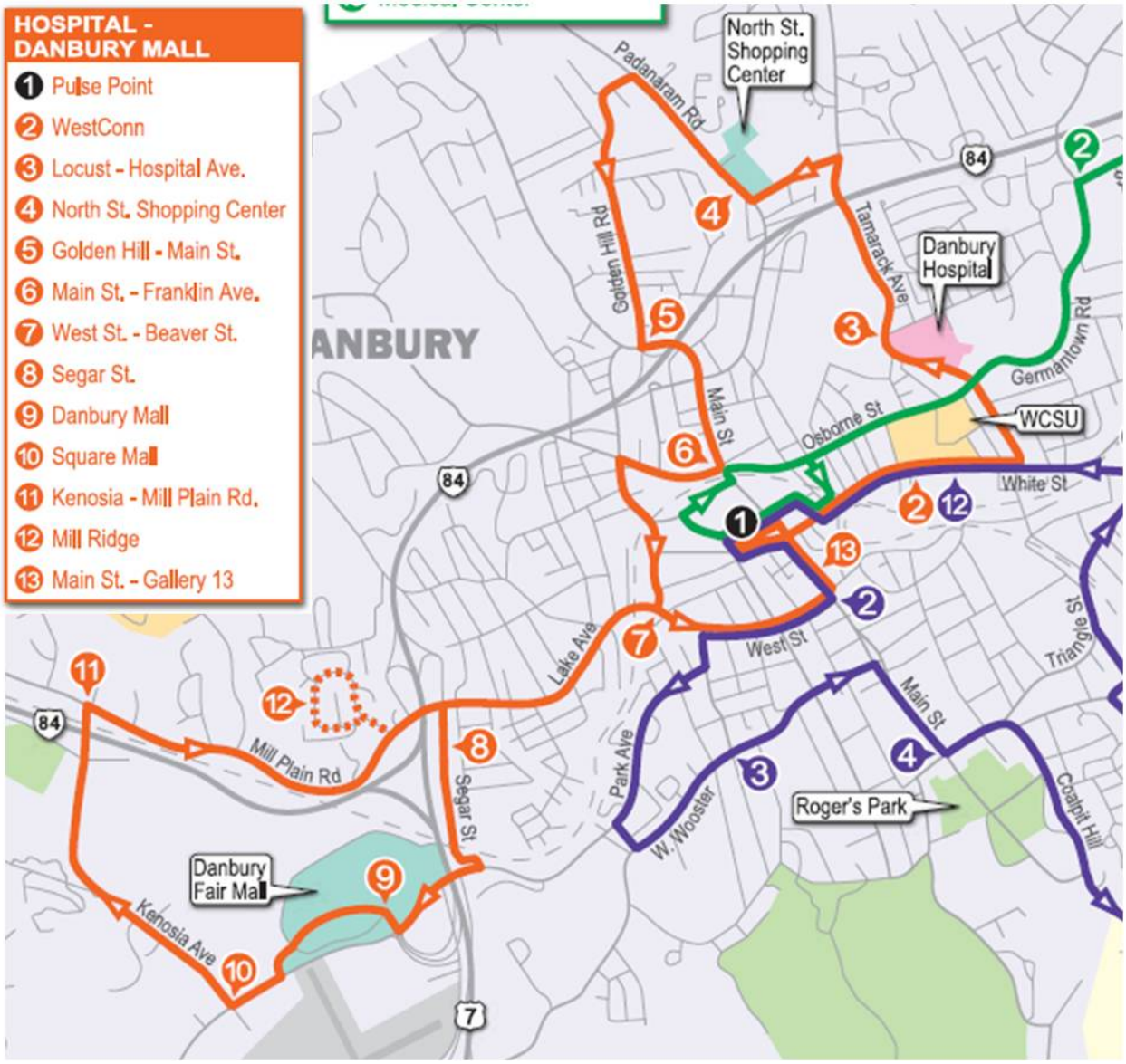
9 TRANSIT FACILITIES

HARTransit is the fixed bus service provider in the study area. HARTransit operates two routes that travel the entire length of the corridor: HART 6 and the Mall-Hospital Loop. Two other routes serve a portion of the corridor (between Main Street and Division Street): Newtown Road-South Street Loop and the Danbury-Norwalk Link. Service, schedule, and ridership data for all four routes serving the study corridor are shown in **Table 5**. The HARTransit Director of Service Development indicated that many of the trips in the corridor are passengers riding to and from the mall.

HARTransit bus



HARTransit Route 6 Service Map



HARTransit Mall-Hospital Loop Service Map

The HART 6 route operates using a 35-foot bus, and the Mall-Hospital Loop operates using a 30-foot bus. For the current fleet of HARTransit buses, there are issues with the low clearance at the Housatonic railroad bridge for their 40-foot New Flyer and Trolley buses. Currently HARTransit staff indicates that they keep these models away from the railroad bridge due to clearance concerns. Another issue to note is that many transit agencies are acquiring alternative fuel vehicles for their fleets including hybrid electric buses. Although not currently under consideration, this is a possibility for the future for HARTransit and hybrid electric bus would not have sufficient clearance under the existing railroad bridge.

There are a number of HARTransit stops in the study corridor which are detailed in **Table 6**. HARTransit reports that stop usage is pretty well dispersed with light but regular use throughout the service periods, but that the Lake Avenue at South Well Avenue stop (#6043) and the West Street at Dear Hill Avenue stop (#6049) near the City Hall both seem to be more heavily used than the other locations. It was also noted that the South Well Avenue stop is not particularly safe, since the sidewalk in this location is narrow and close to the edge of the roadway. In general, HARTransit indicated that current stop locations along Lake Avenue and West Street are adequate.

Table 5: HARTransit Routes Operating in Study Corridor

ROUTE NAME	TOWNS SERVED	POPULAR DESTINATIONS SERVED	OPERATING SCHEDULE	APPROXIMATE RIDERSHIP (TRIPS)
HART 6	Danbury	Danbury Fair Mall Danbury Square Mall Wooster manor Jensen Park	6:00AM to 6:00PM M-F 8:00AM to 5:00PM Sat	325 / weekday 280 / Saturday
LOOP: Mall-Hospital	Danbury	Danbury Fair Mall Danbury Hospital North Street Shopping Center Mill Ridge	6:30PM to 10:30PM M-F 5:30PM to 10:30PM Sat 9:00AM to 7:00PM Sun / Hol	60 / weeknight 60 / Sat night 160 / Sun 200 / Holiday
LOOP: South Street and Newtown Road	Bethel Danbury	Berkshire Shopping Center Main Street Danbury Barnum Square Target	6:30PM to 10:30PM M-F 5:30PM to 10:30PM Sat 9:00AM to 7:00 PM Sun / Hol	70 / weeknight 60 / Sat night 155 / Sun 150 / Holiday
Route 7 Link: Danbury - Norwalk	Danbury Norwalk Redding Ridgefield Wilton	Cartus Wilton Center Merritt 7 Norwalk WHEELS hub	6:00AM to 11:50AM, 3:00PM to 7:30 PM M-F	220 / day

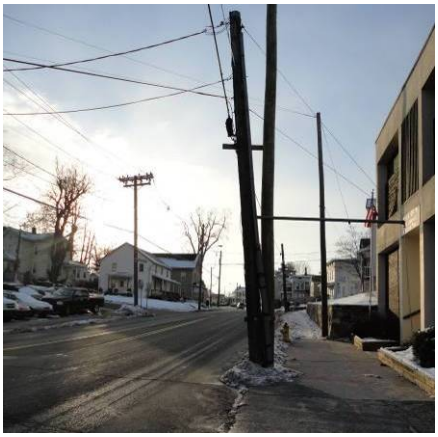
Source: HARTransit Ridership data obtained December, 2012

There are two operational issues within the study corridor that HARTransit staff have reported. The first issue is the curb on the southeast corner of the intersection of West Street at Division Street. The concern is that making a right-turn movement from northbound Division Street onto West Street could cause damage to buses since the curb is unusually tall at that location. Therefore, routes have been planned to avoid that movement. The second issue is a utility pole just east of the intersection with Beaver Street adjacent to the eastbound travel lane. At this location a utility pole is placed very close to the curb and leans slightly toward the roadway. To avoid problems in this location, the HARTransit training supervisor routinely points it out to

new drivers. Note that this location was also the site of two fixed object accidents that involved vehicles colliding with the pole.

When asked about desired improvements for service to the study area the HARTransit Director of Service Development indicated that the HART 6 route needed to be streamlined due to run time issues, that more service was needed to the Apple Ridge Road area which is where two major corporations are located, that half hour service all day would be beneficial, that offering earlier service Sunday would be desirable, as would extended evening service. These improvement priorities are operationally focused, however, and would not require physical changes to the corridor.

Curbing at southeast corner of West Street at Division Street



Existing utility pole just east of the Beaver Street intersection

That being said, transit shelters can address various needs and provide services beyond creating a safe, comfortable place to access public transit. **Figure 12** shows an existing transit shelter on Main Street just south of West Street. A transit shelter can include space for public notices or information regarding upcoming events, either on the shelter itself or with the inclusion of a separate, standalone kiosk. High use transit shelters are well suited to the kiosk model as they typically have more space available and are also located in areas of high activity where a kiosk will be seen by more users (pedestrians, cyclists, etc.) who may not realize that the information posted directly on the shelter may not be exclusively for transit users. Space for public artwork is also a possibility at transit stops that are located on larger parcels of property. The artwork can create a sense of place at the transit shelter and help to integrate it into the local neighborhood and provide a comfortable gathering space for residents to meet and form community bonds. Although transit shelters have many benefits, currently there are no staff members at HARTransit or the City that can install or maintain a new shelter. It would be beneficial if a management plan could be developed to determine how shelters would be constructed and maintained. Or, alternatively, a structure requiring less maintenance, such as a bench or a roof / cover (with no sides) could be considered.

HARTransit has indicated that the current stop locations are adequate throughout the corridor, however we have identified several locations where transit shelters could be installed based on available area. These locations are the two existing stops on West Street near Williams Street and Montgomery Street and on West Street at the east corner of the City Hall property. As installation and maintenance issues are resolved and transit use increases in the corridor, HARTransit should consider the installation of shelters or other amenities at some stops along West Street to benefit transit users and the greater community.

Figure 12: Existing Transit Shelter on Main Street in Front of the Library

Table 6: HARTransit Bus Stops in Study Corridor

STOP NO.	DIRECTION	LOCATION	STOP TYPE	SITE FEATURES	LAND USE	TRAFFIC CONTROL
6002	O/B	West St. at Montgomery St. Front of Cor's Diner	Mid-block	Sidewalk	Commercial	None
6016	O/B	In front of 93 West St.	Mid-block	Curb, sidewalk	Residential	None
6017	O/B	West St. at Beaver St. at Salame Plaza	Far-side	Sidewalk	Commercial	Traffic Signal
6018	O/B	Lake Ave. at Westville Ave. Front of 11 Lake Ave.	Far-side	Curb, sidewalk	Residential	Traffic Signal
6019	O/B	Lake Ave. at Well Ave. Front of 33 Lake Ave.	Near-side	Curb, sidewalk	Residential	None
6020	O/B	Lake Ave. at Haddad Dr. at Sunoco Station	Near-side	Paved lot	Commercial	None
6042	I/B	Lake Ave. at Hobson St. 40 feet east of Hobson St.	Far-side	Curb, sidewalk	Commercial	None
6043	I/B	Lake Ave. at South Well Ave. 50 feet west of South Well Ave.	Near-side	Curb, sidewalk	Residential	None
6044	I/B	Lake Ave. at Crofut St. 30 feet east of Crofut St.	Far-side	Curb, sidewalk	Residential	Traffic Signal
6045	I/B	West St. at Benedict Ave. Opposite 143 West St.	Mid-block	Curb, sidewalk	Commercial	None
6046	I/B	West St., opposite Salame Plaza	Mid-block	Paved lot	Commercial	Traffic Signal
6047	I/B	West St. at Division St. 85 feet west of Division St.	Near-side	Curb, sidewalk	Commercial	Yield Sign
6049	I/B	West St. at Deer Hill Ave. 50 feet east of Deer Hill Ave.	Far-side	Sidewalk	Commercial	Traffic Signal

Source: HARTransit

10 BICYCLE CONSIDERATIONS

Within the Lave Avenue / West Street corridor, the physical and operational characteristics differ considerably from the suburban and residential areas in the western half to the urban and central business district areas in the eastern half. A number of physical and operational issues were identified that are likely impacting safety for bicyclists in the corridor and discourage use by other potential bicyclists. This corridor has no existing on-street bike infrastructure, such as exclusive bike lanes, shared lanes, signage, or any bike boxes at signalized intersections. In many locations, steep grades and/or higher vehicular speeds combine with this lack of infrastructure to create intimidating environments for cyclists. Additionally, there are numerous driveways, areas of continuous access, and angle parking. Bicyclists (and pedestrians) are highly exposed in these large conflict areas since use of the space is not defined, travel paths for vehicles are not always clear, and there are a number of possible vehicular turning movements.

A Bicycle Master Plan is currently being developed for the region to identify preferable routing and potential improvements. Any improvements for accommodating bicyclists in the corridor should be coordinated with that Plan. As improvement projects for the corridor advance to the design stage, the inclusion of bicycle accommodations should be considered. Many of the potential improvements to better accommodate bicyclists can be implemented at minimal cost, and would ultimately benefit all road users. In addition to implementing access management strategies (as discussed in Section 7) to better accommodate bicyclists in this corridor the following improvements can be considered:

Bikebox

Sharrow

- Establishing bike facilities at signalized intersections such as bike boxes and detection equipment that can detect bicycles. Bike boxes help improve visibility of cyclists, confirm their appropriate location waiting for a red light, and improve safety for bicyclists

making turning movements. Improvements at intersections would help to provide a continuous route for bicyclists through the corridor.

- Designating roadway space for bicycles with the use of bike lanes or shared lane markings (sharrows). Where there is adequate roadway width, bike lanes can be striped to indicate the preferential or exclusive use of road space for bicyclists. In areas with lower vehicular speeds, sharrows can be striped to indicate a shared lane environment for bicycles and vehicles. Sharrows improve safety and functionality by indicating the correct positioning in the lane to cyclists and reinforcing the legitimacy of bicycle traffic on the street to drivers.

11 ENHANCEMENT AND BEAUTIFICATION

Upon completion of the analysis tasks, general enhancement and beautification recommendations were determined for the various areas of the project corridor. These recommendations were broken down into the following six categories:

Example Gateway Signage

1. Gateway Area
   - Gateway sign
   - Planting
   - Lighting
2. Streetscape at Storefront Parking
   - Heavy duty concrete walk pavement with 5 foot panel score pattern
   - Painted crosswalks
3. Neighborhood Streetscape
   - Concrete walk pavement with 5 foot panel score pattern – heavy duty concrete pavement at driveway crossings
   - Lawn strip between walk and road where space is available
   - Street trees
   - Painted crosswalks
4. Pedestrian Park
   - Concrete walk pavement with 18 inch x 18 inch score pattern.
   - Lawn strip between walk and road
   - Decorative streetlights and waste receptacles
   - Planting areas and street trees
   - Imprinted bituminous concrete crosswalks
5. Downtown Streetscape with Lawn
   - Concrete walk pavement with 18 inch x 18 inch score pattern – heavy duty concrete pavement at driveway crossings

- Decorative streetlights and waste receptacles
- Planting areas and street trees with permeable paver tree pits
- Imprinted bituminous concrete crosswalks
- Lawn strip between walk and road

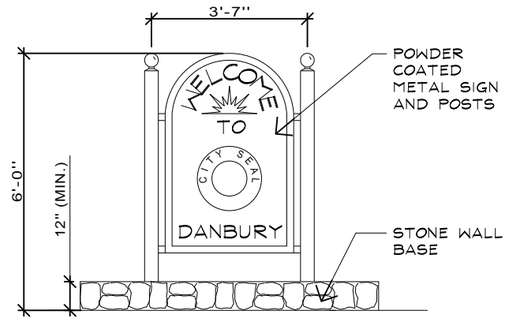
6. Downtown Streetscape
    - Concrete walk pavement with 18 inch x 18 inch score pattern – heavy duty concrete pavement at driveway crossings
    - Decorative streetlights and waste receptacles
    - Planting areas and street trees with permeable paver tree pits
    - Imprinted bituminous concrete crosswalks

Figure 13 illustrates general locations of each of the proposed streetscape categories.

The project corridor from the I-84 ramps to Lawncrest Road and Hudson Street are well suited to the "Neighborhood Streetscape" model. From these points east to Merrimac Street is the location of the first group of storefront parking areas. As previously noted, there are some safety concerns for pedestrian facilities in these areas, however with proper design these could be addressed. These areas have been keyed out to be the "Streetscape at Store Front Parking" design. The next section of the project corridor, from Merrimac Street to Division Street consists primarily of residential uses with some small areas of commercial use mixed throughout. As such, it is recommended that the "Neighborhood Streetscape" model be installed along this section with the exception of the small shopping plaza and Salame Plaza, just east of the railroad bridge, which would be constructed per the "Streetscape at Store Front Parking" model.

Just east of Division Street is the first of two pocket parks in the corridor. This park currently has several statues, a perimeter walkway, and several old trees. All of the elements of the "Pedestrian Park" model could be installed here and would recreate this park as a gathering space for the neighborhood and increase its prominence in the proposed streetscape. Division Street marks the beginning of the downtown / Main Street area and here is where the streetscape designs become more detailed. The concrete walk pavement will now be an 18 inch x 18 inch score pattern, decorative street lighting and waste receptacles along with street trees and permeable paver tree pits. The corridor from Division Street to Terrace Place / Foster Street would be constructed per the "Downtown Streetscape with Lawn" model and the rest of the corridor up to Main Street would be the "Downtown Streetscape" model. The last piece of the

PROPOSED STREETSCAPE STYLE	STREETSCAPE ELEMENTS
NEIGHBORHOOD STREETSCAPE	• CONCRETE WALK PAVEMENT WITH 5' PANEL SCORE PATTERN - HEAVY DUTY PAVEMENT AT DRIVEWAY CROSSINGS • LAWN STRIP BETWEEN WALK AND ROAD WHERE POSSIBLE • STREET TREES • PAINTED CROSSWALKS
STREETSCAPE AT STORE FRONT PARKING	• HEAVY DUTY CONCRETE WALK PAVEMENT WITH 5' PANEL SCORE PATTERN • PAINTED CROSSWALKS
GATEWAY AREA	• GATEWAY SIGN • PLANTING • LIGHTING



STANDARD DANBURY GATEWAY SIGN

NOT TO SCALE

N

Key Map:

Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- NEIGHBORHOOD STREETSCAPE
- STREETSCAPE AT ON-STREET PARKING
- EXISTING LAWN
- EXISTING BUILDING
- GATEWAY AREA

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials

Prepared By: VN Engineers, Inc.

In association with: dala

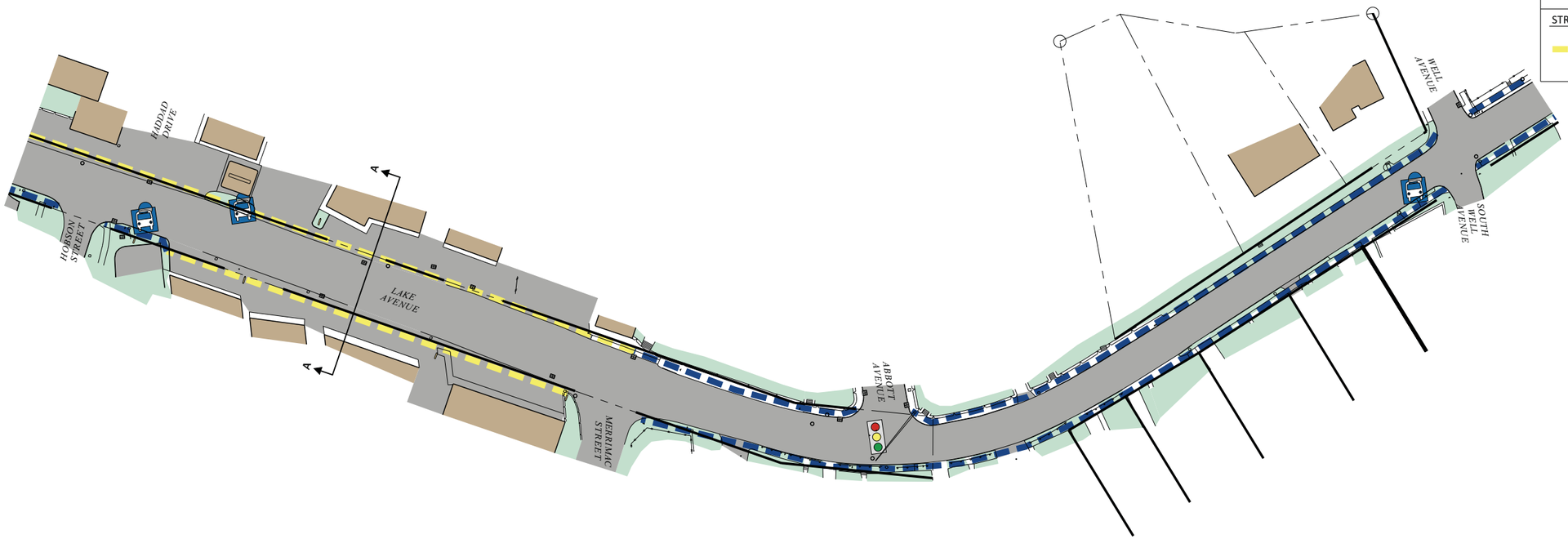
Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

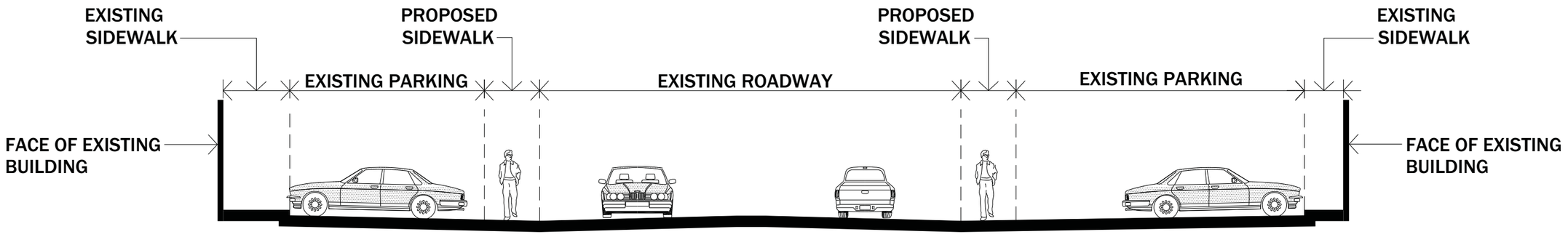
Location: DANBURY, CT

Figure Title: PROPOSED STREETSCAPE STYLE I84 RAMP/LAWNCREST ROAD AREA

Figure Number: 13A

PROPOSED STREETSCAPE STYLE	STREETSCAPE ELEMENTS
NEIGHBORHOOD STREETSCAPE	• CONCRETE WALK PAVEMENT WITH 5' PANEL SCORE PATTERN - HEAVY DUTY PAVEMENT AT DRIVEWAY CROSSINGS • LAWN STRIP BETWEEN WALK AND ROAD WHERE POSSIBLE • STREET TREES • PAINTED CROSSWALKS
STREETSCAPE AT STORE FRONT PARKING	• HEAVY DUTY CONCRETE WALK PAVEMENT WITH 5' PANEL SCORE PATTERN • PAINTED CROSSWALKS





SECTION A-A

NOT TO SCALE

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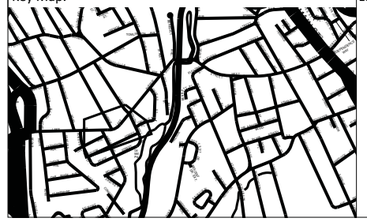


Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- NEIGHBORHOOD STREETSCAPE
- STREETSCAPE AT ON-STREET PARKING
- EXISTING LAWN
- EXISTING BUILDING

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; City of Danbury

Prepared By: VN Engineers, Inc.

In association with: dala

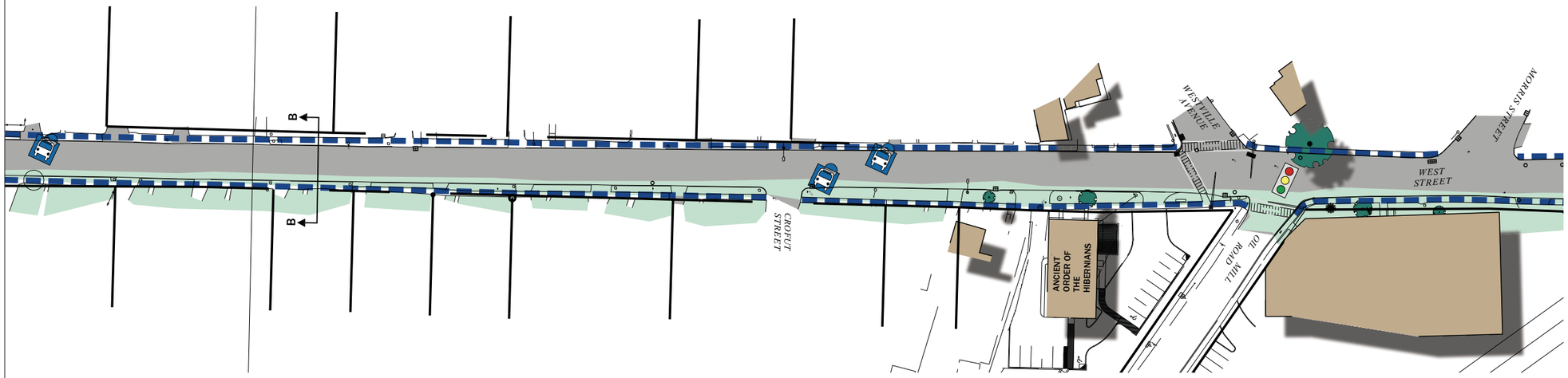
Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

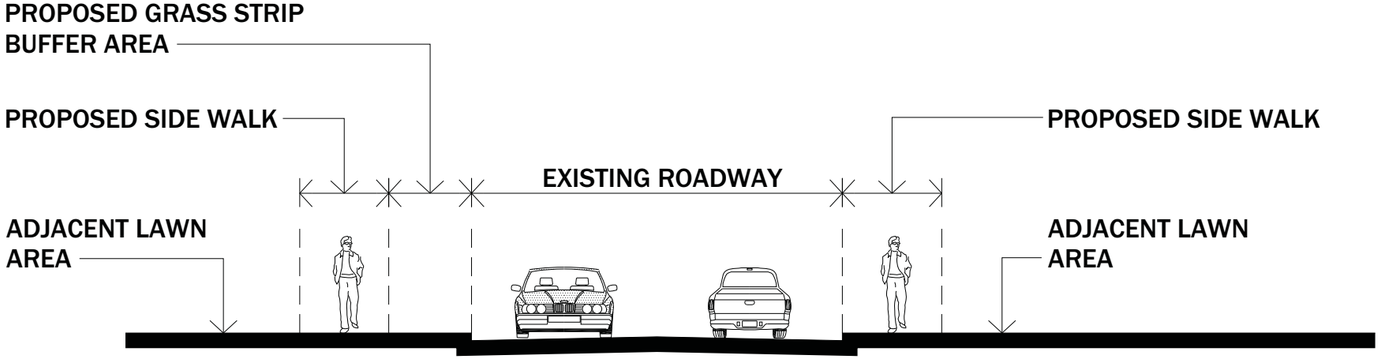
Location: DANBURY, CT

Figure Title: PROPOSED STREETSCAPE STYLE LAWNCREST ROAD/WELL AVE. AREA

Figure Number: 13B

PROPOSED STREETSCAPE STYLE	STREETSCAPE ELEMENTS
NEIGHBORHOOD STREETSCAPE	• CONCRETE WALK PAVEMENT WITH 5' PANEL SCORE PATTERN - HEAVY DUTY PAVEMENT AT DRIVEWAY CROSSINGS • LAWN STRIP BETWEEN WALK AND ROAD WHERE POSSIBLE • STREET TREES • PAINTED CROSSWALKS

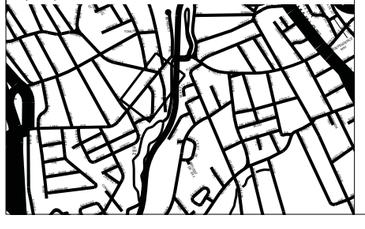




SECTION B-B

NOT TO SCALE

Key Map:



Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- NEIGHBORHOOD STREETSCAPE
- EXISTING LAWN
- EXISTING BUILDING

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials

Prepared By: VN Engineers, Inc.

In association with: dala DIGIOVA ASSOCIATES LANDSCAPE ARCHITECTS, LLC

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

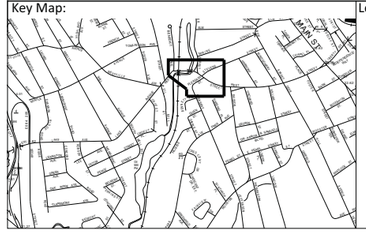
Location: DANBURY, CT

Figure Title: PROPOSED STREETSCAPE STYLE WELL AVENUE/MORRIS STREET AREA

Figure Number: 13C

PROPOSED STREETSCAPE STYLE	STREETSCAPE ELEMENTS
NEIGHBORHOOD STREETSCAPE	• CONCRETE WALK PAVEMENT WITH 5' PANEL SCORE PATTERN - HEAVY DUTY PAVEMENT AT DRIVEWAY CROSSINGS • LAWN STRIP BETWEEN WALK AND ROAD WHERE POSSIBLE • STREET TREES • PAINTED CROSSWALKS
STREETSCAPE AT STORE FRONT PARKING	• HEAVY DUTY CONCRETE WALK PAVEMENT WITH 5' PANEL SCORE PATTERN • PAINTED CROSSWALKS

Key Map:



Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- NEIGHBORHOOD STREETSCAPE
- STREETSCAPE AT ON-STREET PARKING
- EXISTING LAWN
- EXISTING BUILDING

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; City of Danbury

Prepared By: VN Engineers, Inc.

In association with: dala

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

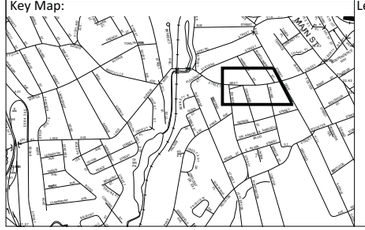
Location: DANBURY, CT

Figure Title: PROPOSED STREETSCAPE STYLE MORRIS STREET/BEAVER STREET AREA

Figure Number: 13D

PROPOSED STREETSCAPE STYLE	STREETSCAPE ELEMENTS
DOWNTOWN STREETSCAPE WITH LAWN	• CONCRETE WALK PAVEMENT WITH 18"x18" SCORE PATTERN - HEAVY DUTY PAVEMENT AT DRIVEWAY CROSSINGS • LAWN STRIP BETWEEN WALK AND ROAD • DECORATIVE STREET LIGHTS • STREET TREES AND PLANTING AREAS • IMPRINTED BITUMINOUS CONCRETE CROSSWALKS
PEDESTRIAN PARK	• CONCRETE WALK PAVEMENT WITH 18"x18" SCORE PATTERN • LAWN STRIP BETWEEN WALK AND ROAD • DECORATIVE STREET LIGHTS • BENCHES, STATUES • STREET TREES AND PLANTING AREAS • IMPRINTED BITUMINOUS CONCRETE CROSSWALKS
NEIGHBORHOOD STREETSCAPE	• CONCRETE WALK PAVEMENT WITH 5' PANEL SCORE PATTERN - HEAVY DUTY PAVEMENT AT DRIVEWAY CROSSINGS • LAWN STRIP BETWEEN WALK AND ROAD WHERE POSSIBLE • STREET TREES • PAINTED CROSSWALKS

Key Map:



Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- DOWNTOWN STREETSCAPE WITH LAWN
- PEDESTRIAN PARK
- NEIGHBORHOOD STREETSCAPE
- EXISTING LAWN
- EXISTING BUILDING

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; City of Danbury

Prepared By: VN Engineers, Inc.

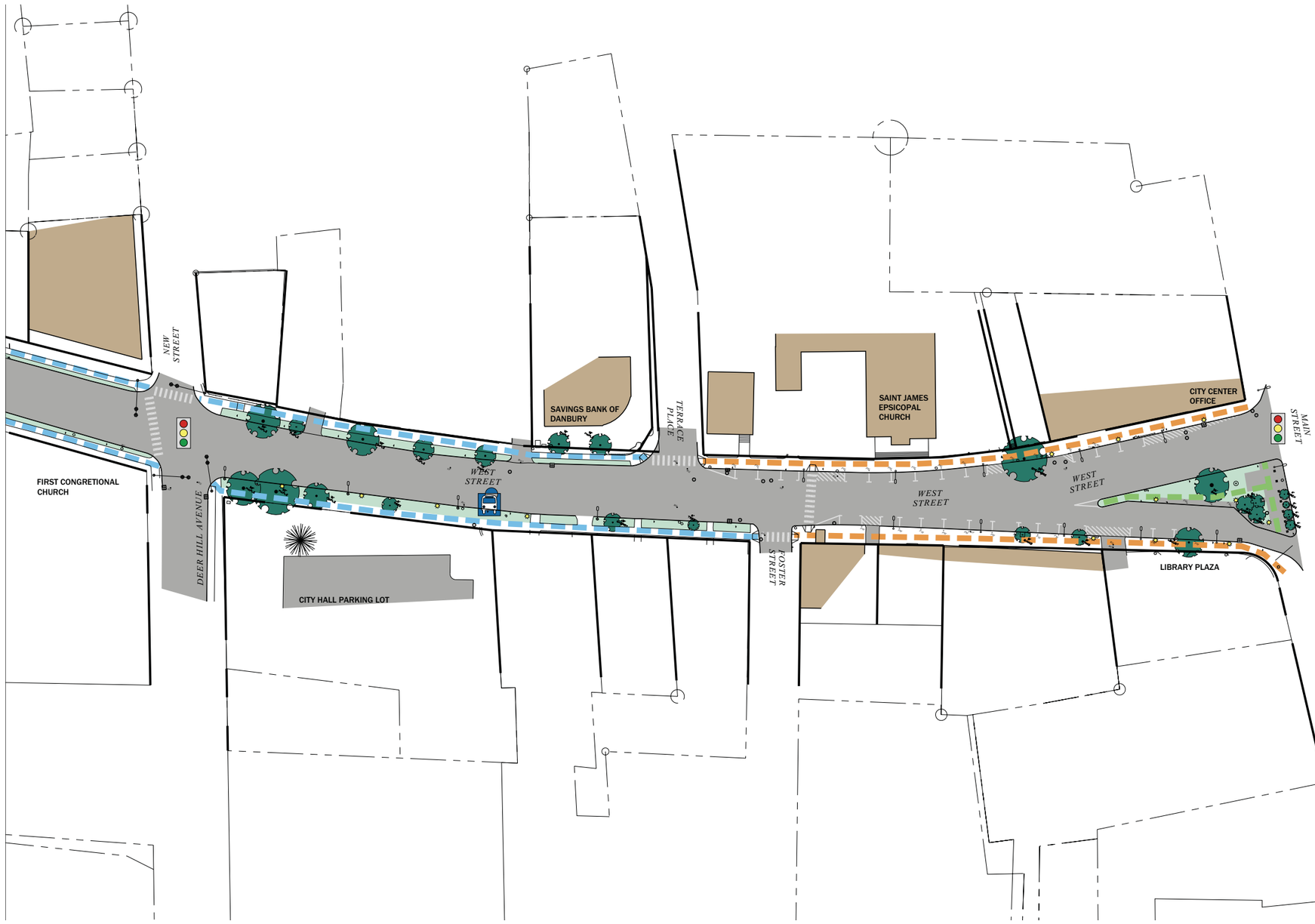
In association with: dala Diodna Associates Landscape Architects, LLC

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

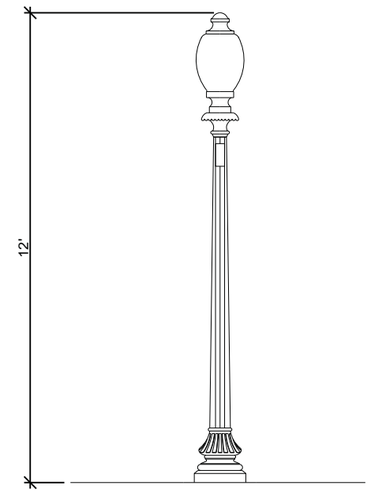
Location: DANBURY, CT

Figure Title: PROPOSED STREETSCAPE STYLE DIVISION ST./MONTGOMERY ST. AREA

Figure Number: 13E



PROPOSED STREETSCAPE STYLE	STREETSCAPE ELEMENTS
DOWNTOWN STREETSCAPE	• CONCRETE WALK PAVEMENT WITH 18"x18" SCORE PATTERN - HEAVY DUTY PAVEMENT AT DRIVEWAY CROSSINGS • DECORATIVE STREET LIGHTS • STREET TREES AND PLANTING AREAS • IMPRINTED BITUMINOUS CONCRETE CROSSWALKS
DOWNTOWN STREETSCAPE WITH LAWN	• CONCRETE WALK PAVEMENT WITH 18"x18" SCORE PATTERN - HEAVY DUTY PAVEMENT AT DRIVEWAY CROSSINGS • LAWN STRIP BETWEEN WALK AND ROAD • DECORATIVE STREET LIGHTS • STREET TREES AND PLANTING AREAS • IMPRINTED BITUMINOUS CONCRETE CROSSWALKS
PEDESTRIAN PARK	• CONCRETE WALK PAVEMENT WITH 18"x18" SCORE PATTERN • LAWN STRIP BETWEEN WALK AND ROAD • DECORATIVE STREET LIGHTS • BENCHES, STATUES • STREET TREES AND PLANTING AREAS • IMPRINTED BITUMINOUS CONCRETE CROSSWALKS



STANDARD DANBURY DECORATIVE LAMP POST

NOT TO SCALE

Key Map:

Legend:

- HOUSATONIC AREA REGIONAL TRANSIT BUS STOP
- SIGNALIZED INTERSECTION
- DOWNTOWN STREETSCAPE
- DOWNTOWN STREETSCAPE WITH LAWN
- PEDESTRIAN PARK
- EXISTING LAWN
- EXISTING BUILDING

1" = 100'

50' 0 100'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials; Town of the City of Danbury Incorporated 1802

Prepared By: VN Engineers, Inc.

In association with: dala Diogna Associates Landscape Architects, LLC

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: PROPOSED STREETSCAPE STYLE DEERHILL AVE./MAIN STREET AREA

Figure Number: 13F

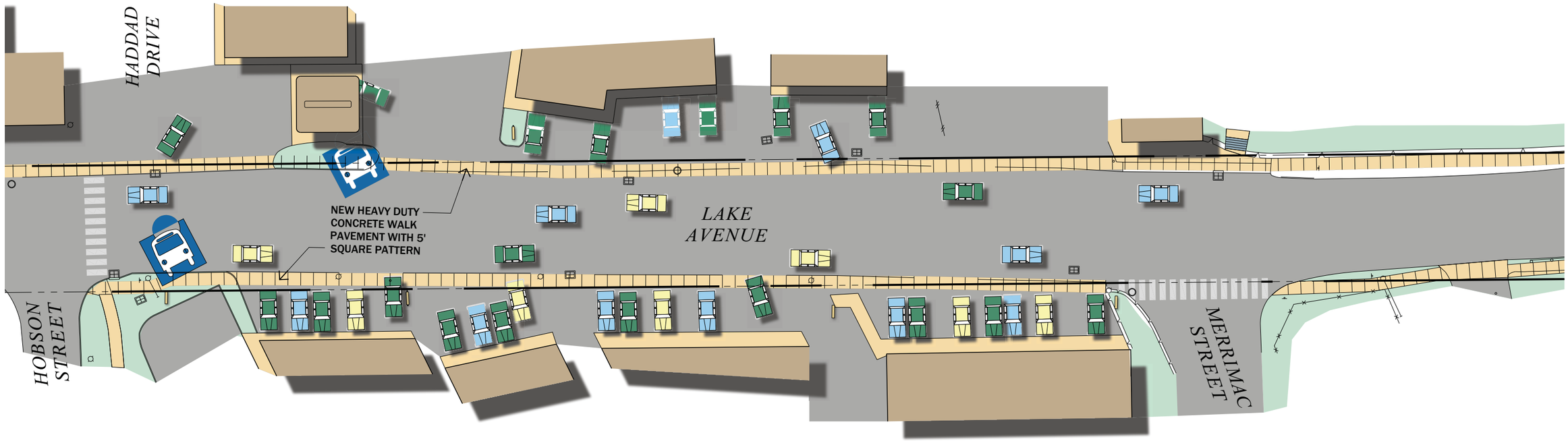
corridor streetscape is the large island at the east end of West Street. This island has long been a fixture at this prominent intersection which includes street trees, a large civil war monument, and flagpole. While it is recommended that these prominent fixtures remain, the park should be renovated with the "Pedestrian Park" model.

Some areas of the corridor were evaluated in greater detail and recommendations were developed and illustrated in proposed concept plans.

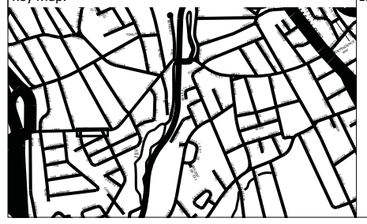
Lake Avenue Retail Area - The "Streetscape at Store Front Parking" model proposed for the area between Lawncrest Road and Merrimac Street is illustrated in **Figure 14**. As the figure shows, there is enough space to install a sidewalk in some locations. Although the walk would be fairly close to the parked vehicles, the installation of a sidewalk would help alert drivers that they are crossing a pedestrian way and cause them to slow down before leaving the roadway as well as be more vigilant for pedestrians in this area. Restriping the crosswalks in this area so they are more prominent would also alert drivers that they are entering an area where pedestrian traffic is occurring.

West Street Island at Division Street – Proposed renovations for the island at the southeast corner of Division Street at West Street intersection are shown in **Figure 15**. The proposed design follows the parameters of the "Pedestrian Park" model, with the elements of the streetscape beginning to take on the more detailed aspects of the downtown streetscape further east. The most prominent element of this park is the War Memorial statue which would remain in its present location. A new paver walk and planting would encircle the statue with benches and decorative lighting added to increase pedestrian use. The existing flagpole would be relocated so it provides a backdrop to the statue from West Street. New steps to the War Memorial statue, and a concrete walk with 18 inch x 18 inch score pattern will complete the pedestrian way. There is a second statue on the island of President James Garfield, currently located near the eastern end of the island. This smaller statue is lost in the streetscape at its present location and would be relocated to a more prominent location on the west end of the island. This location adjacent to the Division Street / West Street

War Memorial on West Street Island at Division Street



Key Map:



Legend:

1" = 40'

20' 0 40'

Prepared For:

HVCEO Housatonic Valley Council of Elected Officials

Prepared By:

VN Engineers, Inc.

In association with: dala DIGIOVA ASSOCIATES LANDSCAPE ARCHITECTS, LLC

Project Title:

TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:

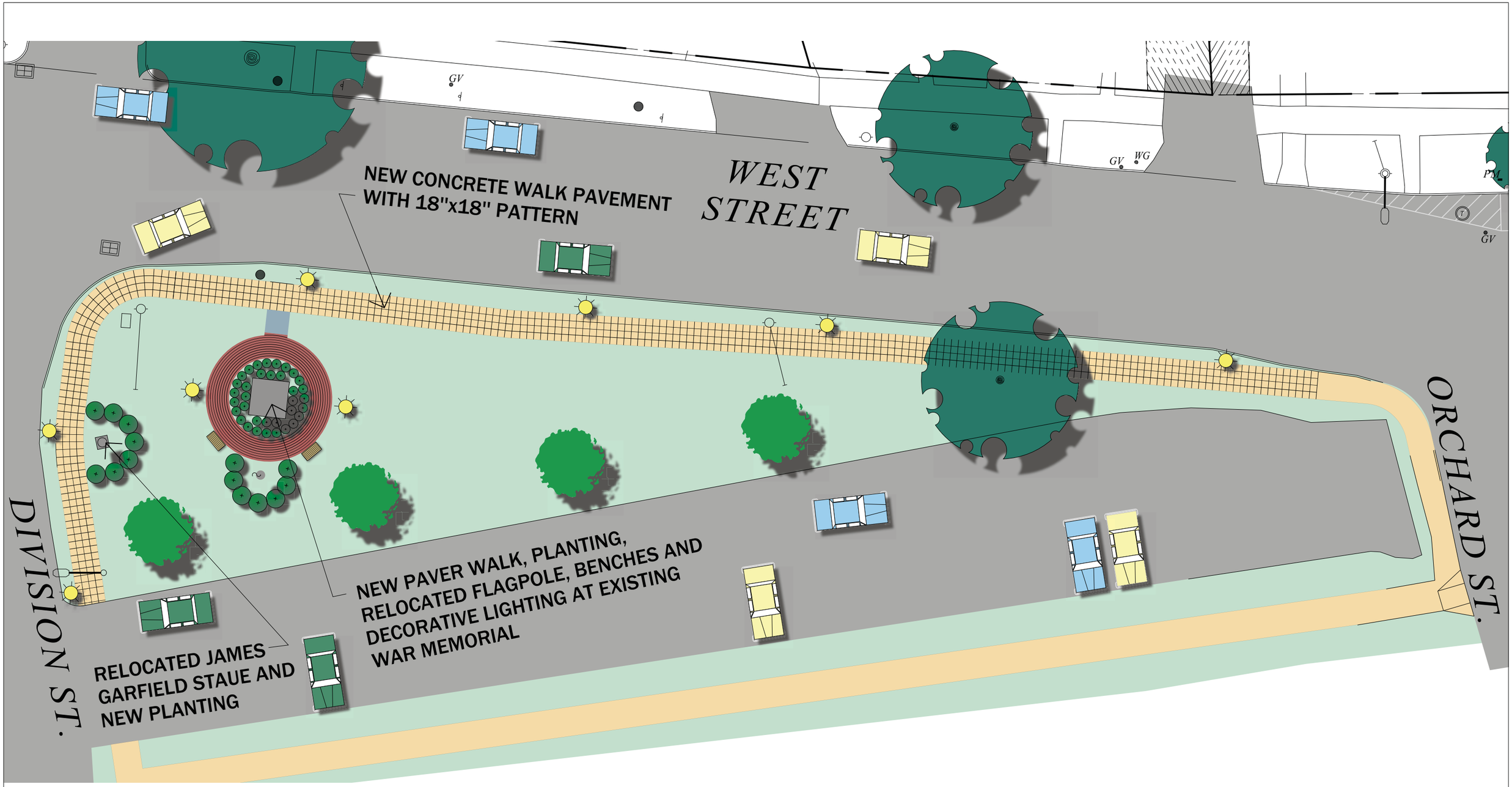
DANBURY, CT

Figure Title:

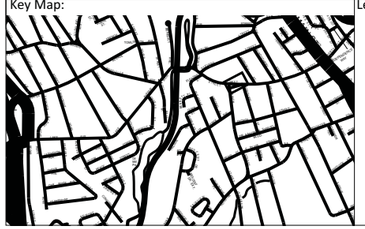
PROPOSED DETAIL PLAN
LAKE AVENUE RETAIL AREA

Figure Number:

14



Key Map:



Legend:

1" = 20'

10' 0 20'

Prepared For:

HVCEO Housatonic Valley Council of Elected Officials

Prepared By:

VN Engineers, Inc.

In association with: dala DIGIOVA ASSOCIATES LANDSCAPE ARCHITECTS, LLC

Project Title:

TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:

DANBURY, CT

Figure Title:

PROPOSED DETAIL PLAN
DIVISION STREET ISLAND

Figure Number:

15

intersection, will increase this statue's visibility and once again make it an integral part of the park. New flowering street trees will complete the renovation of this park at the beginning of the "Main Street" area of the project corridor.

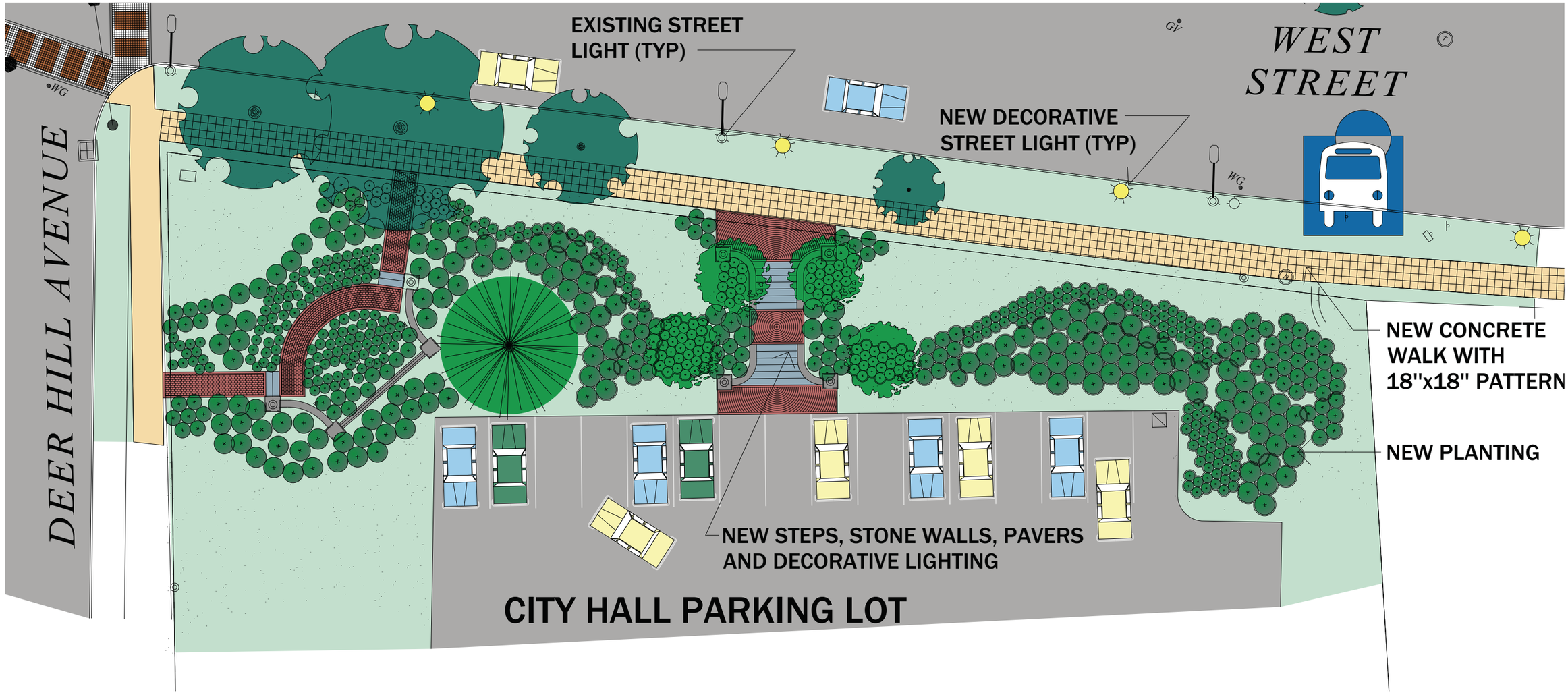
Danbury City Hall - The Danbury City Hall is located on the southeast corner of the intersection of West Street and New Street / Deer Hill Avenue. While this is a very prominent location in the project corridor, the current streetscape is very nondescript and does nothing to showcase the important building at this site. **Figure 16** illustrates the proposed design to increase the visibility of the City Hall property and return it to its deserved place in the streetscape.

Danbury City Hall

A new sign and stone wall at the corner of the intersection will guide people to the property and make it easier for motorists to find it. New paver walkways, concrete walkways, steps and site lighting will also increase this location's prominence and ease of pedestrian use. Tying the entire composition together will be new decorative plantings along the entire frontage. As much of this frontage is sloped towards West Street, the new planting will be a very visible element of the composition.

West Street Island at Main Street - The eastern end of the project corridor terminates at its intersection with Main Street. This particular intersection is often referred to as the main intersection in downtown due to the high level of both pedestrian and vehicular use of the intersecting roads. The terminus of West Street is highlighted by the large traffic island located there. The island's current configuration includes a decorative concrete walkway along its Main Street end and concrete walkways that go to the west end of the island, several trees and open lawn areas. The island is anchored by a large statue memorializing the local soldiers that fought in the Civil War and a flagpole.

The design illustrated in **Figure 17** follows the "Pedestrian Park" model and maintains the statue and flagpole locations and also retains the decorative walk and bollards along Main



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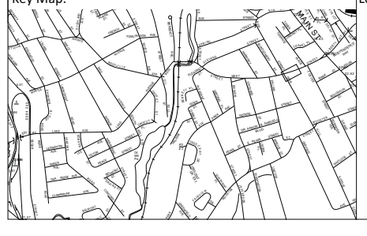


Legend:

1" = 20'

10' 0 20'

Prepared For: HVCEO Housatonic Valley Council of Elected Officials

Prepared By: VN Engineers, Inc.

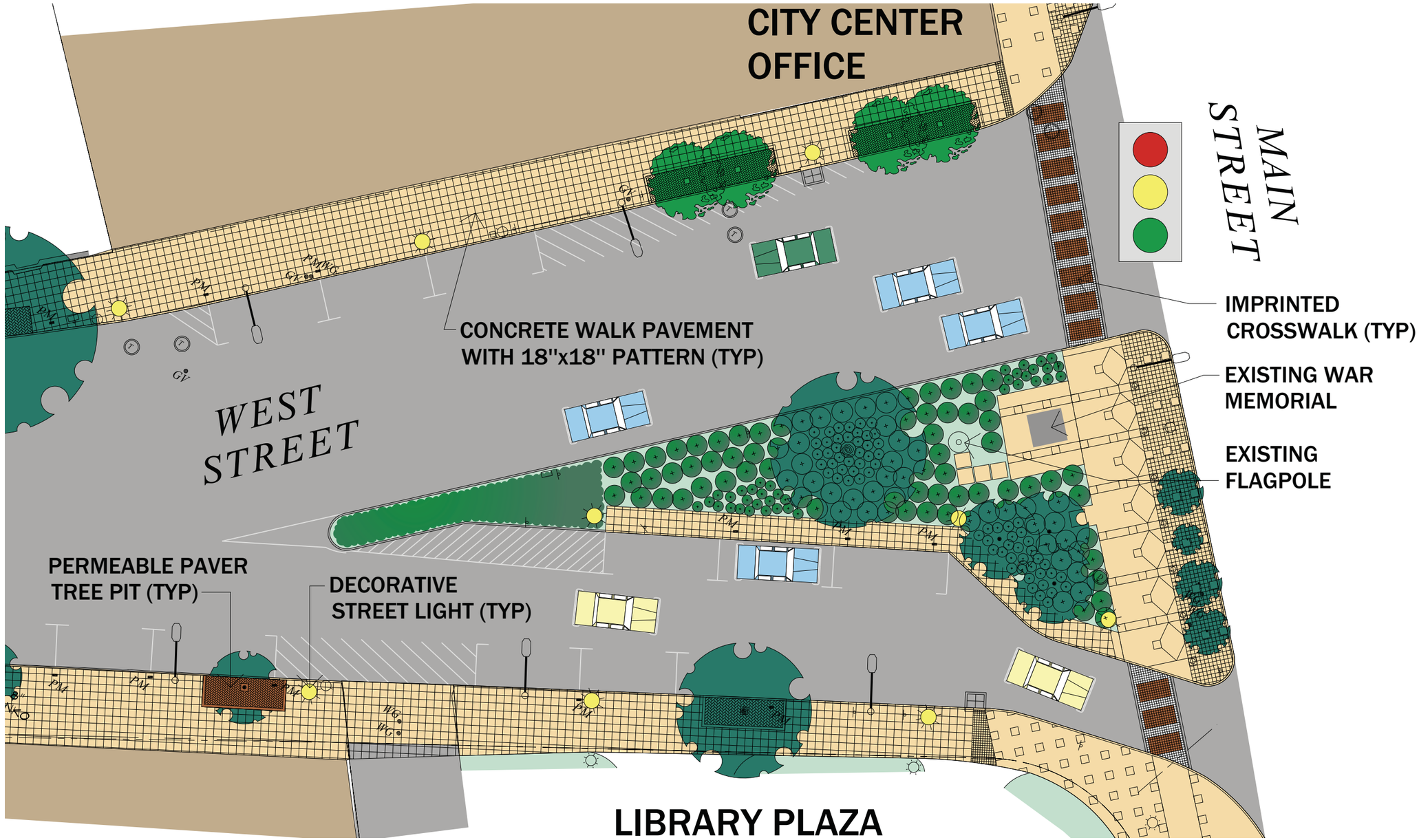
In association with: dala DIGNA ASSOCIATES LANDSCAPE ARCHITECTS, LLC

Project Title: TRANSPORTATION PLAN FOR LAKE AVENUE AND WEST STREET

Location: DANBURY, CT

Figure Title: PROPOSED DETAIL PLAN CITY HALL

Figure Number: 16



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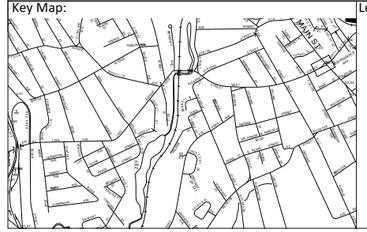


Legend:

1" = 20'

10' 0 20'

Prepared For:

HVCEO Housatonic Valley Council of Elected Officials

Prepared By:

VN Engineers, Inc.

In association with: dala

Project Title:

TRANSPORTATION PLAN FOR
LAKE AVENUE AND WEST STREET

Location:

DANBURY, CT

Figure Title:

PROPOSED DETAIL PLAN
WEST ST. & MAIN ST. INTERSECTION

Figure Number:

17

Street. The biggest change proposed is to the balance of the concrete walks and the lawn areas. This island is the entry to the project corridor's east end and aside from the items being retained it does not have the punch that such an important location requires. This issue will be addressed by simplifying the existing walk system which will allow for decorative plantings to replace these walks and lawn areas. New decorative site lighting and imprinted bituminous concrete crosswalks will tie this island in with the rest of the corridor and set the stage for the corridor as users enter from this location. All new sidewalks on the island as well as those on the sides of West Street will be constructed with the same 18 inch x 18 inch score pattern proposed for other new concrete sidewalks that the users will see while moving along the corridor. Another detail that will be seen on the West Street sidewalks is permeable paver tree pits. Constructed with structural soil and decorative permeable pavers, these tree pits will provide protection for the roots, allow water and air to get to the roots to improve and maintain plant health, and create a decorative detail in the streetscape of this very important intersection.

West Street Island at Main Street

12 Improvement Cost and Implementation

A table was developed to summarize all of the recommendations provided in various sections throughout this transportation management plan for Lake Avenue/West Street. Three time frames were used to estimate implementation time for each improvement. They take into account planning, funding, design, acquisitions, relocations, coordination, approvals, and construction, etc. The time frames are as follows:

- Short-term: Less than 3 years
- Medium term: 3 to 10 years
- Long-term: More than 10 years

Three priority categories were also used to classify each potential improvement as follows:

- High: Action should be taken as soon as feasible to move forward
- Medium: Improvement is important but not critical in the short term
- Low: Option is desirable, may require additional study

Cost estimates provided are rough and it should be noted that if any of the proposed recommendations were to be developed, they would have to be brought to final design with comprehensive analysis and evaluation and utility and right-of-way impacts would need to be fully detailed. The summary of recommended improvements is show in **Table 7.**

Table 7: *Summary of Recommended Improvements*

Report Section	Improvement	Location	Time to Implement	Approx. Cost	Priority
6.1	Modify signal phasing, timing, cycle length, and offsets to accommodate changing traffic volumes	Signalized intersections throughout Corridor	Ongoing	-	High
7	Reinforce goals of access management plan in Danbury's Plan of Conservation and Development, the Danbury Transportation Plan, zoning regulations, development codes, and local ordinance as appropriates	Corridor-wide	Medium	-	High
10	Study options to add bike accommodations at signalized intersections	Signalized intersections throughout Corridor	Medium	$10K	Medium
10	Study options to add bike lanes or sharrows where appropriate	Corridor-wide	Medium	$10K	Medium
6.2.1	Install supplementary post-mounted signal head for the westbound approach	Lake Avenue at Abbott Avenue intersection	Medium	$10K	Medium
6.2.1	Prohibit southbound right turns	Lake Avenue at Abbott Avenue intersection	Short	$200	High
8.2	Install crosswalks, curb ramps, push buttons, and ped heads to allow crossing all intersection legs	Lake Avenue at Abbott Avenue intersection	Medium	$25K	High
6.4	Add signage to advance warning flashers	On eastbound approach to railroad bridge near Crofut Street	Short	$200	High
6.1	Add southbound right-turn lane and eastbound left-turn lane	Lake Avenue at Westville Avenue/ Oil Mill Road intersection	Medium	$200K	Medium

Table 7: *Summary of Recommended Improvements (Continued)*

Report Section	Improvement	Location	Time to Implement	Approx. Cost	Priority
6.4	Replace W16-9p signs with W16-2ap signs	Lake Avenue at Westville Avenue/ Oil Mill Road intersection	Short	$400	Medium
6.2.2	Install stop sign and stop bar	Benedict Avenue approach to West Street	Short	$1K	High
6.2.2	Replace existing curb ramps with CTDOT Type 4C	West Street at Benedict Avenue intersection (for north leg)	Medium	$2K	Medium
6.2.2	Install chevron and curve warning signs for eastbound West Street for the horizontal curve	Just west of the railroad bridge	Short	$1K	Medium
6.4	Verify existing bridge clearance	railroad bridge	Short	$200	High
6.4	Replace or repair damaged sign	On railroad bridge for eastbound approach	Short	$400	Medium
6.4	Add object markers	On railroad bridge	Short	$1K	High
6.5	Rehabilitate existing drainage structure and sidewalks	At outfall near railroad bridge	Short	$20K	High
6.5	Remove debris and silt from drainage structures on a regular basis	In vicinity of outfall near railroad bridge	Short	$2.5K per operation	High
6.5	Install check valve	At box culvert outfall at endwall	Short	$4K	High
6.5	Install flanking outlets	Along flat section of West Street in the vicinity of the railroad bridge	Medium	$55K	Medium
6.5	Add catch basins and create new outfalls to reduce drainage area to low point	Along West Street east and west of existing outfall	Medium	$76K	Medium
6.5	Install new catch basin and lift station	Between the existing outfall and the railroad bridge	Medium	$144K	Medium
6.5	Jack a culvert under the rail line and move the Still River away from the roadway	About 200 feet south of West Street railroad bridge	Long	$1M	Medium
6.5	Remove or lower downstream Still River dam	West of Beaver Street at Elm Street intersection	Long	$500K	Low

Table 7: *Summary of Recommended Improvements (Continued)*

Report Section	Improvement	Location	Time to Implement	Approx. Cost	Priority
6.5	Raise the existing railroad tracks and replace the bridge structure	Existing railroad bridge crossing	Long	$4.5M	Low
3	Check clearance intervals to ensure controller is programmed with adequate yellow and all red times.	West Street at Beaver Street intersection	Short	-	High
6.2.3	Replace damaged handrail	Northwest corner of the bridge over the Still River	Short	$25K	High
6.2.3	Replace damaged guardrail	Danbury Metal Finishing parking lot directly south Beaver Street	Short	$2K	High
6.2.3	Work with utility companies to replace or relocate poles and wires	In the vicinity of the West Street at Beaver Street intersection	Short	$10K	High
6.1	Add westbound right-turn lane	Beaver	Medium	$100K	Medium
6.4	Replace W16-9p signs with W16-2ap signs	West Street at Beaver Street intersection	Short	$400	Medium
6.4	Add truck detour signage	On southbound approach to Beaver street	Short	$1K	Medium
6.2.4	Reconstruct eastbound approach	West Street at Division Street intersection	Medium	$100K	Medium
6.2.4	Reconstruct Division Street profile and crossslopes	West Street at Division Street intersection	Medium	$150K	Medium
6.2.4	Redesign the traffic signal with far side heads for eastbound and westbound approaches	West Street at Division Street intersection	Medium	$100K	Medium
6.2.4	Install crosswalks, curb ramps, push buttons, and ped heads to allow crossing all intersection legs	West Street at Division Street intersection	Medium	$20K	Medium
6.2.4	Create a shared driveway and signalize it	North leg of West Street at Division Street intersection	Medium	$80K	Medium
6.4	Add truck detour signage	On the Division Street approach mast arm	Short	$1K	Medium
8.2	Add curb extensions	Between Orchard Street and Foster Street	Medium	$15K each	Medium

Table 7: *Summary of Recommended Improvements (Continued)*

Report Section	Improvement	Location	Time to Implement	Approx. Cost	Priority
8.2	Study options to limit the number of unsignalized crossings and increase visibility of pedestrians	Between Orchard Street and Main Street	Medium	$20K	High
6.1	Add southbound left-turn lane, add eastbound right-turn lane, add westbound right-turn lane, change north / south left-turn phasing to protected / permitted	New St. / Deer Hill	Medium	$310K	Medium
6.2.5	Remove flash mode pattern from signal operation	West Street at New Street / Deer Hill Avenue	Recently Completed		
9	Develop maintenance plan and install transit shelters or other amenities at bus stops	Near City Hall and at existing bus stops on West Street near Williams Street and Montgomery Street	Medium	$10K each	Medium
11	Gateway feature	Lake Avenue east of I-84	Medium	*$25K	Medium
11	Streetscape at storefront parking style	Between Lawncrest and Merrimac and between railroad bridge and Beaver	Medium	*$135K	Short (between Lawncrest and Merrimac) Medium (between bridge and Beaver)
11	Neighborhood Streetscape style	Between Ridge and Lawncrest, between Merrimac and the railroad bridge, between Beaver and Division	Medium	*$2.2M	Short (where no existing sidewalks) Medium (where replacing sidewalks)
11	Downtown Streetscape with lawn style	Between Orchard and Foster	Medium	*$800K	Medium
11	Pedestrian Park at Division Street	Southeast corner of West Street at Division Street intersection	Medium	*$215K	Short
11	Enhancements at City Hall	West Street frontage to City Hall property at Deer Hill Avenue	Medium	*$120K	Medium

Table 7: *Summary of Recommended Improvements (Continued)*

Report Section	Improvement	Location	Time to Implement	Approx. Cost	Priority
11	Downtown Streetscape Style and Pedestrian Park at Main Street	Between Foster and Main including the island	Medium	*$450K	Medium

* See **Appendix E** for detailed enhancement and beautification cost estimates

APPENDIX A:
TABULATIONS OF ACCIDENT DATA BY LOCATION

CITY OF DANBURY - WEST STREET ACCIDENT DATA SUMMARY

LAKE AVENUE AT LAWNCREST ROAD					
No.	**Date**	**Damage / Injury**	**Direction**	**Location**	**Type**
1	3/6/11	PDO	EB vs. EB	Lawncrest Road	Rear End
2	11/16/10	PDO	EB vs. EB	Lawncrest Road	Rear End
3	7/9/11	PDO	EB vs. EB	#79 Lake Avenue	Side Swipe
4	10/30/12	PDO	WB vs. WB	#75 Lake Avenue	Side Swipe
5	9/12/11	PDO	EB vs. EB	Hobson Street	Side Swipe
6	2/26/10	PDO	SB vs. WB	Lawncrest Road	Angle
7	10/3/11	PDO / PI	SB vs. WB	Haddad Place	Angle
8	5/10/10	PI	WB vs. PED	Lawncrest Road	Pedestrian
9	5/6/11	PI	Parking Lot	Haddad Place	Pedestrian
10	11/25/11	PDO	EB vs. WBLT	Hobson Street	Turning
LAKE AVENUE AT MERRIMAC STREET					
1	11/18/09	PDO	EB vs. EB	Merrimac Street	Rear End
2	4/26/10	PDO	EB vs. EB	Merrimac Street	Rear End
3	8/6/12	PDO	EB vs. EB	Merrimac Street	Rear End
4	4/27/12	PDO	EB vs. EB	Merrimac Street	Rear End
5	5/11/12	PDO	WB vs. WB	Merrimac Street	Rear End
6	1/25/12	PDO	WB vs. WB	Merrimac Street	Rear End
7	11/17/11	PDO	WB vs. WB	Merrimac Street	Rear End
8	11/24/10	PDO	EB vs. EB	Merrimac Street	Rear End
9	5/19/10	PDO	NB vs. EB	# 72 Lake Avenue	Backing
10	11/23/11	PDO	NB vs. EB	# 76 Lake Avenue	Backing
11	2/6/11	PI	EB vs. SB	Merrimac Street	Pedestrian
12	1/6/12	PDO	N/A	Parking Lot	Parking
13	11/15/09	PDO	WB vs. NB	Merrimac Street	Turning
14	8/1/12	PDO	EB vs. EB	Merrimac Street	Side Swipe
15	7/27/12	PDO	EB	Merrimac Street	Fixed Object - utility line
LAKE AVENUE AT WELL AVENUE AND SOUTH WELL AVENUE					
1	11/17/11	PDO	NB vs. EB	Well Avenue at Lake Avenue	Backing
2	10/18/11	PDO	WB vs. Animal	#48 Lake Avenue	Animal
3	12/1/11	PDO / PI	WB vs. NB	Lake Avenue at South Well Avenue	Right Angle
4	11/18/11	PDO / PI	EB vs. SB	Well Avenue at Lake Avenue	Right Angle
5	3/31/10	PDO / PI	EB vs. SB	Well Avenue at Lake Avenue	Right Angle
6	10/4/11	PDO	EB vs. SB	Lake Avenue at South Well Avenue	Right Angle
7	6/29/10	PDO	EB vs. EB	Lake Avenue at South Well Avenue	Rear End
8	7/27/12	PDO	WB vs. WB	Well Avenue at Lake Avenue	Rear End
9	12/16/09	PDO	EB vs. EB	#20 Lake Avenue	Rear End
10	11/20/12	PDO	WB vs. WB	#33 Lake Avenue	Rear End
11	9/2/11	PDO	WB vs. WB	Well Avenue at Lake Avenue	Rear End
12	10/23/12	PDO / PI	EB vs. EB	Lake Avenue at South Well Avenue	Rear End
13	1/7/11	PDO	EB vs. SB	Well Avenue at Lake Avenue	Turning
PDO - Property Damage Only					
PI - Personal Injury					

CITY OF DANBURY - WEST STREET ACCIDENT DATA SUMMARY

WEST STREET AT BEAVER STREET INTERSECTION					
No.	**Date**	**Damage / Injury**	**Direction**	**Location**	**Type**
1	5/6/10	PDO	SB vs. SB	Intersection	Rear End
2	4/9/11	PDO	SB vs. SB	Intersection	Rear End
3	5/12/10	PDO	WB vs. WB	Intersection	Rear End
4	3/19/10	PDO	WB vs. WB	Stevens Street	Rear End
5	4/10/10	PDO / PI	EB vs. EB	Pleasant Street	Rear End
6	5/25/12	PDO	WB vs. WB	Stevens Street	Rear End
7	5/10/10	PDO	EB vs. EB	Intersection	Rear End
8	8/1/10	PDO	WB vs. WB	Stevens Street	Rear End
9	6/17/11	PDO	EB vs. EB	Intersection	Rear End
10	1/13/11	PDO	SB vs. SB	Intersection	Rear End
11	8/18/11	PDO / PI	EB vs. EB	#130 West Street	Rear End
12	12/8/11	PDO	WB vs. WB	Intersection	Rear End
13	11/5/12	PDO	EB vs. EB	#130 West Street	Rear End
14	11/20/12	PDO	EB vs. EB	#130 West Street	Rear End
15	10/22/12	PDO	WB vs. WB	#131 West Street	Rear End
16	12/30/09	PDO	EB vs. EB	Intersection	Rear End
17	6/30/12	PDO	WB vs. WB	Intersection	Rear End
18	8/28/10	PDO	WB vs. WB	#130 West Street	Rear End
19	12/27/11	PDO	SB vs. SB	Intersection	Side Swipe
20	7/29/12	PDO	EB vs. WB	Intersection	Side Swipe - Opposite
21	12/31/10	PDO	EB vs. EB	Intersection	Side Swipe
22	6/18/11	PDO	WB	#101 West Street	Side Swipe
23	1/14/10	PDO	EB	Intersection	Fixed Object - Pole
24	7/17/11	PDO	EB	East of Pleasant Street	Fixed Object - Pole
25	8/6/11	PDO	EB	Intersection	Fixed Object - Pole
26	1/25/11	PDO	WB	Intersection	Fixed Object - Snowbank
27	5/22/12	PDO	SBLT vs. WBTH	Intersection	Turning
28	9/24/11	PDO / PI	SBLT vs. WBTH	Stevens Street	Turning
29	1/16/12	PDO	EBLT vs. WBTH	Intersection	Turning
30	1/29/11	PDO	WBTH vs. NBLT	#130 West Street	Turning
31	1/26/12	PDO	SB vs. EBTH	#130 West Street	Turning
32	3/8/12	PDO / PI	SBLT vs. WBTH	Intersection	Turning
33	12/1/09	PDO	SBLT vs. WBTH	Intersection	Turning
34	11/3/10	PDO	WBLT vs. EBTH	#130 West Street - Amigos Driveway	Turning
35	10/4/11	PDO	SBRT vs. WBTH	#131 West Street - Driveway	Turning
36	10/19/12	PDO / PI	EB	Pleasant Street	Pedestrian / Vehicle
PDO - Property Damage Only					
PI - Personal Injury					

CITY OF DANBURY - WEST STREET ACCIDENT DATA SUMMARY

WEST STREET AT WILLIAM STREET AND MONTGOMERY STREET INTERSECTION					
No.	**Date**	**Damage / Injury**	**Direction**	**Location**	**Type**
1	9/15/11	PDO	EB vs. EB	Intersection	Side Swipe
2	11/17/11	PDO	EB vs. EB	Montgomery Street	Rear End
3	12/7/11	PDO	EB vs. EB	Intersection	Rear End
4	10/19/10	PDO	WB vs. WB	Intersection	Rear End
5	3/15/11	PDO	EB vs. EB	Intersection	Rear End
6	8/11/11	PDO	EB vs. EB	Intersection	Rear End
7	10/13/11	PDO	EB vs. EB	Intersection	Rear End
8	2/17/10	PDO	EB vs. EB	Intersection	Rear End
9	2/4/10	PDO	EB vs. EB	Intersection	Rear End
10	11/12/09	PDO	EB vs. EB	Intersection	Rear End
11	7/20/11	PI	NB vs. Bicycle	William Street Crosswalk	Angle - Bicycle
12	8/25/12	PDO / PI	SB vs. Bicycle	William Street Crosswalk	Angle - Bicycle
13	1/9/12	PI	NB vs. Bicycle	# 66 West Street	Angle - Bicycle
14	2/9/12	PDO	SBRT vs. WBTH	Montgomery Street	Turning
15	3/29/12	PDO	NB LT vs. EBTH	William Street	Turning
16	12/7/11	PDO	WBLT vs. EBTH	William Street	Turning
WEST STREET AT RR BRIDGE AND BENEDICT AVENUE					
1	11/14/09	PDO	WB	West Street - RR Bridge	Over Head - RR Bridge
2	11/11/09	PDO	WB	West Street - RR Bridge	Over Head - RR Bridge
3	10/10/12	PDO	WB	West Street - RR Bridge	Over Head - RR Bridge
4	1/3/10	PDO	WB	West Street - RR Bridge	Over Head - RR Bridge
5	11/7/11	PDO	WB	West Street - RR Bridge	Over Head - RR Bridge
6	10/7/10	PDO	WB	West Street - RR Bridge	Over Head - RR Bridge
7	6/30/11	PDO	WB	West Street - RR Bridge	Over Head - RR Bridge
8	11/19/11	PDO	WB	West Street - RR Bridge	Over Head - RR Bridge
9	1/25/10	PDO	WB	West Street - RR Bridge	Over Head - RR Bridge
10	2/15/12	PDO	WB	West Street - RR Bridge	Over Head - RR Bridge
11	7/5/11	PDO	WB	West Street - RR Bridge	Over Head - RR Bridge
12	12/13/10	PDO	WB	West Street - RR Bridge	Over Head - RR Bridge
13	12/5/10	PDO	EB	West Street - RR Bridge	Over Head - RR Bridge
14	1/21/10	PDO	EB	West Street - RR Bridge	Over Head - RR Bridge
15	5/11/12	PDO	EB	West Street - RR Bridge	Over Head - RR Bridge
16	12/9/09	PDO	EB	West Street - RR Bridge	Pillar - RR Bridge
17	3/5/11	PDO / PI	EB	West Street - RR Bridge	Pillar - RR Bridge
18	1/16/12	PDO	WB / EB	Benedict Avenue	Angle - Slide
19	2/7/12	PDO / PI	EB / EB	East of Benedict Avenue	Rear End
PDO - Property Damage Only					
PI - Personal Injury					

CITY OF DANBURY - WEST STREET ACCIDENT DATA SUMMARY

WEST STREET AT DEER HILL AVENUE AND NEW STREET INTERSECTION					
No.	**Date**	**Damage / Injury**	**Direction**	**Location**	**Type**
1	3/28/11	PDO	WB vs. WB	West Street	Rear End
2	4/27/11	PDO	EB vs. EB	West Street	Rear End
3	1/22/11	PDO	SB vs. SB	New Street	Rear End
4	1/6/12	PDO	EB vs. EB	West Street	Rear End
5	7/2/11	PDO	WB vs. WB	West Street	Rear End
6	7/12/10	PDO	SB vs. SB	New Street	Rear End
7	8/10/10	PDO	EB vs. EB	West Street	Rear End
8	12/31/11	PDO / PI	WB vs. WB	West Street	Rear End
9	5/6/12	PDO / PI	SB vs. SB	New Street	Rear End
10	1/29/10	PDO	WB vs. WB	West Street	Rear End
11	4/9/10	PDO / PI	EB vs. EB	West Street	Rear End
12	6/1/10	PDO	EB vs. EB	West Street	Rear End
13	11/22/10	PDO	WB vs. WB	West Street	Rear End
14	2/25/11	PDO	WB vs. WB	West Street	Rear End
15	12/21/10	PDO / PI	SB vs. SB	New Street	Rear End
16	10/13/11	PDO	WB vs. WB	West Street	Rear End
17	7/2/12	PDO	SB vs. SB	Deer Hill Avenue	Rear End
18	8/10/10	PDO	EB vs. EB	West Street	Rear End
19	3/24/10	PDO	EB vs. EB	West Street	Rear End
20	11/22/10	PDO	EB vs. EB	West Street	Rear End
21	10/1/10	PI	SB vs. PED	New Street	Pesestrian
22	1/8/11	PDO	WB vs. NB	Intersection	WB Backing
23	6/24/12	PDO	NBTH vs. NB RT	New Street	Illegal Turn
24	3/10/10	PDO / PI	SB vs. NBLT	Intersection	Turning
25	9/24/12	PDO	NBLT vs. SBTH	Intersection	Turning
26	9/9/12	PDO	EBLT vs. SBRT	Intersection	Turning
27	8/31/12	PDO / PI	NBLT / SBTH	Intersection	Turning
28	5/12/12	PDO / PI	SBLT vs. WBTH	Intersection	Turning
29	10/2/12	PDO	WBLT vs. EBTH	Intersection	Turning
30	2/20/10	PDO / PI	EBLT vs. WBTH	Intersection	Turning
31	3/22/11	PDO	SBTH vs. WBTH	Intersection	Angle
32	6/3/12	PDO	SBTH vs. EBTH	Intersection	Angle
33	2/6/11	PDO	NB vs. EB	Intersection	Angle
34	3/9/12	PDO / PI	SB vs. EB	Intersection	Angle
35	1/30/11	PDO	NB vs. EB	Intersection	Angle
36	11/28/09	PDO / PI	SB vs. EB	Intersection	Angle
37	9/17/10	PDO / PI	NB vs. EB	Intersection	Angle
38	9/11/11	PDO	SB vs. EB	Intersection	Angle
39	7/31/10	PDO / PI	SB vs. WB	Intersection	Angle
40	8/30/10	PDO / PI	SB vs. EB	Intersection	Angle
41	1/12/11	PDO	NB vs. EB	Intersection	Angle
42	10/1/10	PDO	WB vs. SB	Intersection	Angle
43	4/10/10	PDO	SB vs. EB	Intersection	Angle
44	12/25/09	PDO	WB vs. NB	Intersection	Angle
45	6/28/12	PDO	SB vs. WB	Intersection	Angle
46	8/3/12	PDO	NB vs. EB	Intersection	Angle - Bicycle
47	4/3/12	PDO	NB vs. NB	Deer Hill Avenue	Side Swipe
PDO - Property Damage Only			PI - Personal Injury		

CITY OF DANBURY WEST ST/LAKE AVENUE CORRIDOR ACCIDENTS HISTORY SUMMARY

LAKE AVENUE AT ABBOTT AVENUE INTERSECTION

No.	Date	Location/Proximity	Type	Severity	Direction
1	09/18/10	Abbott Ave	FO - Metal Beam Rail	PDO	EB
2	08/21/11	Abbott Ave	FO - Metal Beam Rail	PDO/PI	EB
3	05/13/12	Abbott Ave	FO - Metal Beam Rail	PDO	EB
4	01/28/10	Abbott Ave	Sodeswipe - Opposite	PDO	EBST/WBST
5	09/08/11	Abbott Ave	FO - Utility line cables	PDO	NB
6	08/30/11	Abbott Ave	Rear End	PDO/PI	WB/WB
7	08/20/11	Abbott Ave	Rear End	PDO	EB/EB
8	11/20/11	Abbott Ave	Turning	PDO	SB/WBRT
9	08/22/12	Abbott Ave	Turning	PDO	EBLT/WB
10	01/05/10	#75 Lake Ave Driveway	Turning	PDO	EBLT/SB
11	11/30/10	Abbott Ave	Turning	PDO	SB/EBLT

LAKE AVENUE AT MORRIS STREET INTERSECTION

No.	Date	Location/Proximity	Type	Severity	Direction
1	07/21/10	Intersection	FO - Curbing	PDO	SBLT
2	10/27/10	Intersection	Rear End	PDO	EB/EB
3	06/01/10	Intersection	Sideswipe - Same	PDO	WBRT/WBRT
4	07/13/12	Intersection	Sideswipe - Same	PDO/PI	WBRT /WBRT
5	10/03/12	Intersection	Turning	PDO	WB/EBLT
6	01/24/12	Intersection	Turning	PDO	SBLT/WB
7	05/20/10	Intersection	Turning	PDO	EB/SBLT-BICYCLE
8	06/08/11	#152 West St Driveway	Turning	PDO/PI	WBLT/EB-Motorcycle
9	04/26/12	#152 West St	Turning	PDO/PI	WBRT/WB-Bicycle

PDO : Property Damage Only

PI: Personal Injury

CITY OF DANBURY WEST ST/LAKE AVENUE CORRIDOR ACCIDENTS HISTORY SUMMARY

LAKE AVENUE AT WESTVILLE AND OIL MILL AVENUE INTERSECTION

No.	Date	Location/Proximity	Type	Severity	Direction
1	10/09/12	Intersection	FO - Utility Pole	PDO	EB/EB
2	11/17/09	Intersection	Rear End	PDO/PI	EB/EB
3	12/23/09	Intersection	Rear End	PDO	EB/EB
4	04/09/10	Crofut St	Rear End	PDO/PI	EB/EB
5	10/17/10	Crofut St	Rear End	PDO	WB/WB
6	08/15/10	Crofut St	Rear End	PDO	EB/EB
7	09/18/12	Crofut St	Rear End	PDO	EB/EB
8	10/26/12	Intersection	Rear End	PDO/PI	WB/WB
9	11/29/11	Intersection	Rear End	PDO	WB/WB
10	07/19/10	Crofut St	Rear End	PDO	WB/WB
11	10/13/10	Intersection	Rear End	PDO	EB/EB
12	08/25/12	Intersection	Rear End	PDO	EB/EB
13	03/02/12	Intersection	Rear End	PDO	EB/EB
14	12/10/10	Intersection	Rear End	PDO/PI	EB/EB
15	11/11/10	Intersection	Rear End	PDO	EB/EB
16	09/17/11	#8 Lake Ave.	Rear End	PDO/PI	EB/EB
17	09/14/12	Intersection	Rear End	PDO/PI	EB/EB
18	02/10/10	Intersection	Rear End	PDO/PI	EB/EB
19	04/05/12	#6 Westville Ave	Rear End	PDO	NB/NB
20	12/15/11	Intersection	Rear End	PDO	EB/EB
21	03/04/12	Intersection	Rear End	PDO/PI	WB/WB
22	07/01/11	Intersection	Rear End	PDO	EB/EB
23	07/23/10	Intersection	Rear End	PDO	EB/EB
24	12/23/10	Intersection	Rear End	PDO	EB/EB
25	07/01/10	Intersection	Rear End	PDO	EB/NB
26	12/22/09	Intersection	Sideswipe	PDO	EB/EB
27	02/11/10	Intersection	Sidesswipe	PDO	SB/SB
28	03/20/12	Intersection	Turning	PDO	SBRT/WB
29	02/13/11	**Westville Ave@ Roger Ave**	Turning	PDO	NB/WBRT
31	11/25/10	Intersection	Turning	PDO/PI	EB/NBRT
32	03/06/11	Intersection	`Turning	PDO	EB/SBRT

PDO: Property Damage Only

PI: Personal Injury

CITY OF DANBURY WEST ST/LAKE AVENUE CORRIDOR ACCIDENTS HISTORY SUMMARY

WEST STREET AT DIVISION STREET INTERSECTION

No.	Date	Location/Proximity	Type	Severity	Direction
1	01/28/10	Intersection	Angle	PDO	EB/NB-Skidding
2	03/05/10	#112 West St - Driveway	Backing	PDO	Parking Lot
3	02/20/12	Division St CITGO - Driveway	Backing	PDO	EB/NB
4	02/25/11	Division St CITGO - Driveway	Backing	PDO	NBLT/EB-Parking
5	06/06/11	CITGO Parking Lot	Backing	PDO	N/A
6	08/17/11	CITGO Parking Lot	Backing	PDO	N/A
7	10/22/12	Division St CITGO - Driveway	Backing - In Parking Lot	PDO/PI	NBLT - Parking
8	09/14/10	West St CITGO - Driveway	FO - Traffic Mast Arm	PDO	EB
9	04/18/11	West St CITGO - Driveway	FO - Utility Pole	PDO	EB
10	04/05/12	Intersection Crosswalk	Pedestrian	PI	EB-Pedestrian
11	05/12/12	West St	Rear End	PDO	WB/WB
12	05/25/12	Intersection	Rear End	PDO/PI	WB/WB
13	05/19/10	Intersection	Rear End	PDO/PI	WBLT/WBLT
14	05/06/12	Intersection	Rear End	PDO/PI	NB/NB
15	08/27/11	Intersection	Rear End	PDO	EB/EB
16	06/25/11	Division St	Rear End	PDO	SB/SB
17	08/12/12	Intersection	Rear End	PDO	EBRT/EBRT
18	10/09/10	Intersection	Sideswipe (SS)	PDO	NBRT/NBRT
19	04/03/11	Intersection	SS - Illegal Turning	PDO	NBRT/NBRT
20	11/09/11	Intersection	SS - Illegal Turning	PDO	NBRT/NBRT
21	12/27/11	Intersection	Turning	PDO	EB/WBLT
22	01/31/11	Division St CITGO - Driveway	Turning	PDO/PI	EB/NB
22	01/31/11	Division St CITGO - Driveway	Turning	PDO/PI	EB/NB
23	12/07/10	Intersection	Turning	PDO	EB/WBLT
24	04/07/10	Intersection	Turning	PDO	EB/NBLT
25	02/15/10	West St CITGO - Driveway	Turning	PDO	EB/NB
26	10/18/12	Intersection	Turning	PDO	EB/NBRT
27	12/05/11	West St Citgo Dr	Turning	PDO	EB/NBLT
28	09/18/11	Division St CITGO - Driveway	Turning	PDO	SB/NBLT
29	08/06/11	Intersection	Turning	PDO	NBLT/WBLT
30	07/27/11	90 West St.	Turning	PDO/PI	EB/NBLT
31	01/10/11	West St CITGO - Driveway	Turning	PDO	EB/WBLT
32	05/20/11	#85 West St - Driveway	Turning	PDO	WB/SB
33	04/21/10	#87 West St - Driveway	Turning	PDO	WB/EBLT
34	03/22/10	Division St CITGO - Driveway	Turning	PDO	SB/EB

PDO:Property Damage Only

PI: Personal Injury

CITY OF DANBURY WEST ST/LAKE AVENUE CORRIDOR ACCIDENTS HISTORY SUMMARY

WEST ST AT FOSTER ST AND TERRACE PLACE INTERSECTION

No.	Date	Location/Proximity	Type	Severity	Direction
1	11/12/10	Terrace Pl	Rear End	PDO	NB/NB-Parking
2	12/28/10	Foster St	Rear End	PDO	NB/NB
3	01/25/12	Terrace Pl	Rear End	PDO	WB/WB
4	04/02/10	Foster St	Rear End	PDO	EB/EB
6	05/04/12	Foster St	Rear End	PDO	EB/EB
7	01/24/11	Foster St	Rear End	PDO	EB/EB
8	11/03/09	Foster St	Sisesswipe	PDO	EB/EBRT
9	11/20/12	Foster St	SS	PDO/PI	WB/WB
10	04/14/12	Terrace Pl	SS-Parking	PDO	WB/WB-Parking
11	02/08/11	Terrace Pl	SS-Parking	PDO	NB/NB-Parking
12	02/19/12	Terrace Pl	SS-Parking	PDO	WB/WB-Parking
13	06/08/10	Foster St	Turning	PDO/PI	NB/WBLT
14	06/30/12	Terrace Pl	Turning	PDO	WB/SB
15	09/06/11	Foster St	Turning	PDO	EB/WBLT
16	10/15/12	Terrace Pl	Turning	PDO	WB/SBLT

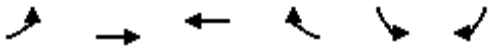
WEST STREET AT HARMONY AND ORCHARD STREET INTERSECTIONS

No.	Date	Location/Proximity	Type	Severity	Direction
1	08/22/11	Harmony St	SS-Parking	PDO	EB-Parking
2	12/06/09	Harmony St	SS-Parking	PDO	WB-Parking
3	08/16/12	Harmony St	RE	PDO	WB/WB
4	08/20/10	Orchard St	RE	PDO	WB/WB
5	11/12/10	Harmony St	RE	PDO	EB/EB
6	09/27/10	Harmony St	RE	PDO	EB/EB
7	10/09/10	Harmony St	RE	PDO	EB/EB
8	05/13/11	Harmony St	RE	PDO	WB/WB
9	11/01/11	Harmony St	RE	PDO/PI	EB/EB
10	02/21/12	Harmony St	RE	PDO	EB/EB
11	11/07/09	Harmony St	RE	PDO	SB/SB
12	01/26/11	Harmony St	RE	PDO	EB/EB
13	10/10/12	Orchard St	RE	PDO	WB/WB
14	03/19/10	Orchard St	RE	PDO/PI	WB/WB
15	11/19/12	#74 West St	RE	PDO	EB/EB
16	06/15/10	Harmony St	SS	PDO/PI	EB/EB
17	04/20/10	Harmony St	Turning	PDO/PI	WBRT/EBRT
18	01/15/10	#74 West St	Turning @ DR	PDO	EB/NB
19	10/04/12	#81 West St	Turning -@ DR	PDO	SB/WB

PDO: Property Damage Only

PI: Personal Injury

APPENDIX B:
SYNCHRO REPORTS FOR EXISTING CONDITIONS AND 2032 ANALYSIS

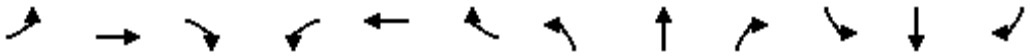


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	155	475	450	105	195	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	185
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.974			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	1676	1633	0	1593	1425
Flt Permitted	0.280				0.950	
Satd. Flow (perm)	469	1676	1633	0	1593	1425
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			22			228
Link Speed (mph)		30	30		30	
Link Distance (ft)		1010	800		285	
Travel Time (s)		23.0	18.2		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	516	489	114	212	228
Shared Lane Traffic (%)						
Lane Group Flow (vph)	168	516	603	0	212	228
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	0
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	0
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt					Free
Protected Phases	1	6	2		4	
Permitted Phases	6					Free
Detector Phase	1	6	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	
Minimum Split (s)	8.0	22.0	22.0		22.0	
Total Split (s)	12.0	58.0	46.0	0.0	22.0	0.0
Total Split (%)	15.0%	72.5%	57.5%	0.0%	27.5%	0.0%
Maximum Green (s)	8.0	53.0	41.0		17.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	1.0	2.0	2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)		1.0	1.0		1.0	
Flash Dont Walk (s)		1.0	1.0		1.0	
Pedestrian Calls (#/hr)		0	0		0	
Act Effct Green (s)	56.5	55.5	43.9		14.5	80.0
Actuated g/C Ratio	0.71	0.69	0.55		0.18	1.00
v/c Ratio	0.38	0.44	0.67		0.73	0.16
Control Delay	3.5	5.7	17.7		45.7	0.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	3.5	5.7	17.7		45.7	0.2
LOS	A	A	B		D	A
Approach Delay		5.2	17.7		22.2	
Approach LOS		A	B		C	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 76 (95%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 13.9		Intersection LOS: B	
Intersection Capacity Utilization 66.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: West St & Beaver St.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	560	130	65	370	55	110	110	75	40	180	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	110		0	150		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.972			0.981			0.939			0.967	
Flt Protected	0.950			0.950			0.950				0.993	
Satd. Flow (prot)	1770	1811	0	1770	1827	0	1770	1749	0	0	1789	0
Flt Permitted	0.402			0.172			0.384				0.928	
Satd. Flow (perm)	749	1811	0	320	1827	0	715	1749	0	0	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			12			38			21	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1240			1263			221			196	
Travel Time (s)		28.2			28.7			5.0			4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	609	141	71	402	60	120	120	82	43	196	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	750	0	71	462	0	120	202	0	0	315	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt			pm+pt			Perm			pm+pt		
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		7	4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0		5.0	10.0	
Minimum Split (s)	9.0	22.0		9.0	22.0		21.0	21.0		9.0	21.0	
Total Split (s)	9.0	41.0	0.0	9.0	41.0	0.0	21.0	21.0	0.0	9.0	30.0	0.0
Total Split (%)	11.3%	51.3%	0.0%	11.3%	51.3%	0.0%	26.3%	26.3%	0.0%	11.3%	37.5%	0.0%
Maximum Green (s)	5.0	35.0		5.0	35.0		16.0	16.0		5.0	25.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	5.0	5.0	4.0	4.0	5.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		1.0			1.0		1.0	1.0			1.0	
Flash Dont Walk (s)		1.0			1.0		1.0	1.0			1.0	
Pedestrian Calls (#/hr)		0			0		0	0			0	
Act Effct Green (s)	48.3	41.3		48.1	41.2		19.6	19.6			19.6	
Actuated g/C Ratio	0.60	0.52		0.60	0.52		0.24	0.24			0.24	
v/c Ratio	0.16	0.79		0.24	0.49		0.69	0.44			0.74	
Control Delay	4.6	23.7		8.7	16.4		46.5	22.6			36.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	4.6	23.7		8.7	16.4		46.5	22.6			36.3	
LOS	A	C		A	B		D	C			D	
Approach Delay		21.7			15.4			31.5			36.3	
Approach LOS		C			B			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 29 (36%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 23.9		Intersection LOS: C	
Intersection Capacity Utilization 84.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: West St & New St

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	400	120	200	360	115	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		200	125		200	0
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.419		0.950	
Satd. Flow (perm)	1863	1583	780	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		130				179
Link Speed (mph)	30			30	30	
Link Distance (ft)	800			1240	448	
Travel Time (s)	18.2			28.2	10.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	130	217	391	125	179
Shared Lane Traffic (%)						
Lane Group Flow (vph)	435	130	217	391	125	179
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type		custom	pm+pt			custom
Protected Phases	2	2	1	6	4	4
Permitted Phases		4	6			1
Detector Phase	2	2	1	6	4	4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	1.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	11.0	20.0	20.0	20.0
Total Split (s)	43.0	43.0	15.0	58.0	22.0	22.0
Total Split (%)	53.8%	53.8%	18.8%	72.5%	27.5%	27.5%
Maximum Green (s)	38.0	38.0	11.0	53.0	18.0	18.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	1.0	1.0		1.0	1.0	1.0
Flash Dont Walk (s)	1.0	1.0		1.0	1.0	1.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	47.8	62.7	61.1	60.1	10.9	23.2
Actuated g/C Ratio	0.60	0.78	0.76	0.75	0.14	0.29
v/c Ratio	0.39	0.10	0.31	0.28	0.52	0.30
Control Delay	3.6	1.1	2.5	2.2	39.1	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.6	1.1	2.5	2.2	39.1	4.5
LOS	A	A	A	A	D	A
Approach Delay	3.0			2.3	18.7	
Approach LOS	A			A	B	

Intersection Summary	
Area Type:	Other
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 76 (95%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 6.0	Intersection LOS: A
Intersection Capacity Utilization 49.3%	ICU Level of Service A
Analysis Period (min) 15	

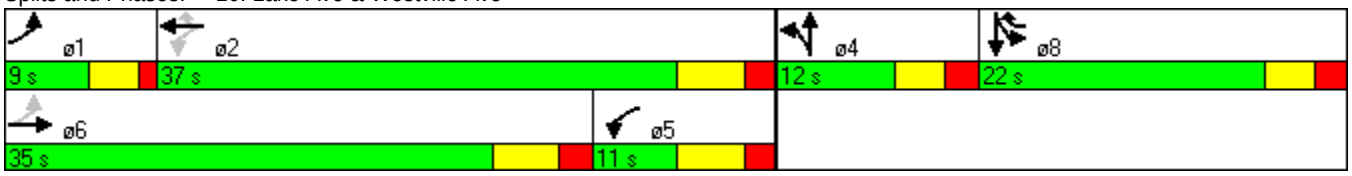
Splits and Phases: 3: West St & Division St.

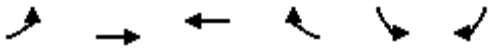
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	490	20	20	640	140	40	0	25	220	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		110	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850		0.948			0.964	
Flt Protected		0.997			0.998			0.970			0.965	
Satd. Flow (prot)	0	1848	0	0	1859	1583	0	1713	0	0	1733	0
Flt Permitted		0.403			0.976			0.970			0.965	
Satd. Flow (perm)	0	747	0	0	1818	1583	0	1713	0	0	1733	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				133		27			21	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1610			1010			288			312	
Travel Time (s)		36.6			23.0			6.5			7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	533	22	22	696	152	43	0	27	239	0	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	588	0	0	718	152	0	70	0	0	326	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt			pm+pt		pm+ov	Split			Split		
Protected Phases	1	6		5	2	8	4	4		8	8	
Permitted Phases	6			2		2						
Detector Phase	1	6		5	2	8	4	4		8	8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.0	24.0		11.0	24.0	22.0	12.0	12.0		22.0	22.0	
Total Split (s)	9.0	35.0	0.0	11.0	37.0	22.0	12.0	12.0	0.0	22.0	22.0	0.0
Total Split (%)	11.3%	43.8%	0.0%	13.8%	46.3%	27.5%	15.0%	15.0%	0.0%	27.5%	27.5%	0.0%
Maximum Green (s)	5.0	29.0		5.0	31.0	17.0	7.0	7.0		17.0	17.0	
Yellow Time (s)	3.0	4.0		4.0	4.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Max	C-Max		Max	C-Max	None	None	None		None	None	
Walk Time (s)		1.0			1.0	1.0	1.0	1.0		1.0	1.0	
Flash Dont Walk (s)		1.0			1.0	1.0	1.0	1.0		1.0	1.0	
Pedestrian Calls (#/hr)		0			0	0	0	0		0	0	
Act Effct Green (s)		32.0			31.0	49.4		7.0			16.4	
Actuated g/C Ratio		0.40			0.39	0.62		0.09			0.20	
v/c Ratio		1.53			1.02	0.15		0.40			0.88	
Control Delay		275.7			69.2	1.4		31.0			54.7	
Queue Delay		0.0			0.0	0.0		0.0			0.0	
Total Delay		275.7			69.2	1.4		31.0			54.7	
LOS		F			E	A		C			D	
Approach Delay		275.7			57.4			31.0			54.7	
Approach LOS		F			E			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 33 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.53			
Intersection Signal Delay: 125.1		Intersection LOS: F	
Intersection Capacity Utilization 82.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 10: Lake Ave & Westville Ave



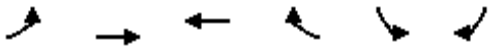


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	5	535	755	5	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999		0.899	
Flt Protected					0.988	
Satd. Flow (prot)	0	1863	1861	0	1655	0
Flt Permitted		0.995			0.988	
Satd. Flow (perm)	0	1853	1861	0	1655	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			1		33	
Link Speed (mph)		30	30		30	
Link Distance (ft)		332	1610		228	
Travel Time (s)		7.5	36.6		5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	582	821	5	11	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	587	826	0	44	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm					
Protected Phases		2	6		4	
Permitted Phases	2					
Detector Phase	2	2	6		4	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0		7.0	
Minimum Split (s)	20.0	20.0	20.0		12.0	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (s)	28.0	28.0	28.0	0.0	12.0	0.0
Total Split (%)	70.0%	70.0%	70.0%	0.0%	30.0%	0.0%
Maximum Green (s)	24.0	24.0	24.0		8.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	1.0	1.0	1.0		1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Max	C-Max	C-Max		None	
Walk Time (s)	1.0	1.0	1.0		1.0	
Flash Dont Walk (s)	1.0	1.0	1.0		1.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)		33.9	33.9		7.1	
Actuated g/C Ratio		0.85	0.85		0.18	
v/c Ratio		0.37	0.52		0.14	
Control Delay		3.5	4.7		8.8	
Queue Delay		0.0	0.0		0.0	
Total Delay		3.5	4.7		8.8	
LOS		A	A		A	
Approach Delay		3.5	4.7		8.8	
Approach LOS		A	A		A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 40			
Actuated Cycle Length: 40			
Offset: 31 (78%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 4.3		Intersection LOS: A	
Intersection Capacity Utilization 52.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 13: Lake Ave & Abbott Ave

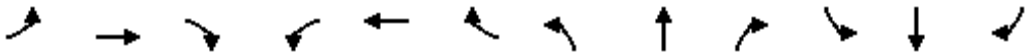


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	220	590	780	160	220	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	0	210
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.977			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	1676	1638	0	1593	1425
Flt Permitted	0.065				0.950	
Satd. Flow (perm)	109	1676	1638	0	1593	1425
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			18			332
Link Speed (mph)		30	30		30	
Link Distance (ft)		1010	800		285	
Travel Time (s)		23.0	18.2		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	641	848	174	239	332
Shared Lane Traffic (%)						
Lane Group Flow (vph)	239	641	1022	0	239	332
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	0
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	0
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt					Free
Protected Phases	1	6	2		4	
Permitted Phases	6					Free
Detector Phase	1	6	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	
Minimum Split (s)	8.0	22.0	22.0		22.0	
Total Split (s)	15.0	78.0	63.0	0.0	22.0	0.0
Total Split (%)	15.0%	78.0%	63.0%	0.0%	22.0%	0.0%
Maximum Green (s)	11.0	73.0	58.0		17.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	1.0	2.0	2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)		1.0	1.0		1.0	
Flash Dont Walk (s)		1.0	1.0		1.0	
Pedestrian Calls (#/hr)		0	0		0	
Act Effct Green (s)	74.4	73.4	58.0		16.6	100.0
Actuated g/C Ratio	0.74	0.73	0.58		0.17	1.00
v/c Ratio	0.96	0.52	1.07		0.90	0.23
Control Delay	66.4	9.7	61.8		77.4	0.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	66.4	9.7	61.8		77.4	0.4
LOS	E	A	E		E	A
Approach Delay		25.1	61.8		32.6	
Approach LOS		C	E		C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 80 (80%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 42.0	Intersection LOS: D
Intersection Capacity Utilization 95.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: West St & Beaver St.

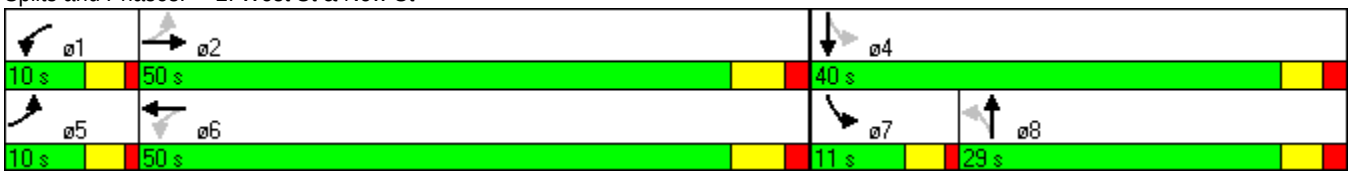


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	600	105	150	600	100	120	240	160	50	205	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	140		0	170		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.978			0.979			0.940			0.962	
Flt Protected	0.950			0.950			0.950				0.993	
Satd. Flow (prot)	1770	1822	0	1770	1824	0	1770	1751	0	0	1779	0
Flt Permitted	0.095			0.088			0.405				0.661	
Satd. Flow (perm)	177	1822	0	164	1824	0	754	1751	0	0	1184	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			11			32			22	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1240			1263			387			313	
Travel Time (s)		28.2			28.7			8.8			7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	82	652	114	163	652	109	130	261	174	54	223	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	766	0	163	761	0	130	435	0	0	386	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt			pm+pt			Perm			pm+pt		
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		7	4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0		5.0	10.0	
Minimum Split (s)	9.0	22.0		9.0	22.0		21.0	21.0		9.0	21.0	
Total Split (s)	10.0	50.0	0.0	10.0	50.0	0.0	29.0	29.0	0.0	11.0	40.0	0.0
Total Split (%)	10.0%	50.0%	0.0%	10.0%	50.0%	0.0%	29.0%	29.0%	0.0%	11.0%	40.0%	0.0%
Maximum Green (s)	6.0	44.0		6.0	44.0		24.0	24.0		7.0	35.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	5.0	5.0	4.0	4.0	5.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		1.0			1.0		1.0	1.0			1.0	
Flash Dont Walk (s)		1.0			1.0		1.0	1.0			1.0	
Pedestrian Calls (#/hr)		0			0		0	0			0	
Act Effct Green (s)	52.0	44.0		52.8	46.0		35.0	35.0			35.0	
Actuated g/C Ratio	0.52	0.44		0.53	0.46		0.35	0.35			0.35	
v/c Ratio	0.44	0.95		0.89	0.90		0.49	0.69			0.90	
Control Delay	14.4	45.9		63.3	41.2		33.3	32.3			55.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	14.4	45.9		63.3	41.2		33.3	32.3			55.2	
LOS	B	D		E	D		C	C			E	
Approach Delay		42.9			45.1			32.5			55.2	
Approach LOS		D			D			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 43.2		Intersection LOS: D	
Intersection Capacity Utilization 105.0%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 2: West St & New St

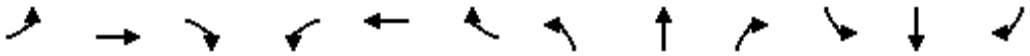


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	535	255	255	660	260	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		140	160		230	0
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.317		0.950	
Satd. Flow (perm)	1863	1583	590	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		277				297
Link Speed (mph)	30			30	30	
Link Distance (ft)	800			1240	448	
Travel Time (s)	18.2			28.2	10.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	582	277	277	717	283	380
Shared Lane Traffic (%)						
Lane Group Flow (vph)	582	277	277	717	283	380
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type		custom	pm+pt			custom
Protected Phases	2	2	1	6	4	4
Permitted Phases		4	6			1
Detector Phase	2	2	1	6	4	4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	1.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	11.0	20.0	20.0	20.0
Total Split (s)	63.0	63.0	15.0	78.0	22.0	22.0
Total Split (%)	63.0%	63.0%	15.0%	78.0%	22.0%	22.0%
Maximum Green (s)	58.0	58.0	11.0	73.0	18.0	18.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	1.0	1.0		1.0	1.0	1.0
Flash Dont Walk (s)	1.0	1.0		1.0	1.0	1.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	59.6	81.2	74.4	73.4	17.6	31.4
Actuated g/C Ratio	0.60	0.81	0.74	0.73	0.18	0.31
v/c Ratio	0.52	0.21	0.50	0.52	0.91	0.54
Control Delay	17.9	1.5	3.6	3.5	73.7	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.9	1.5	3.6	3.5	73.7	9.6
LOS	B	A	A	A	E	A
Approach Delay	12.6			3.5	37.0	
Approach LOS	B			A	D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 67.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: West St & Division St.



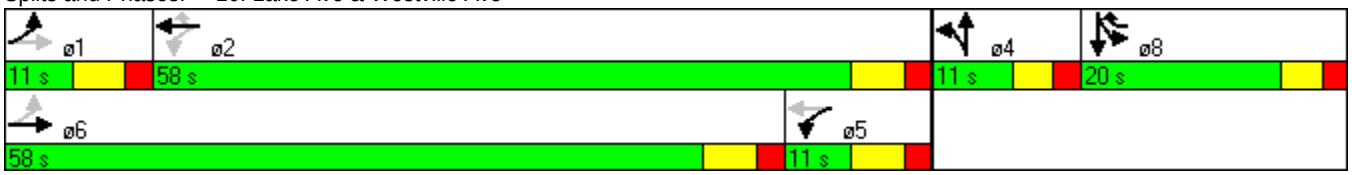
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	590	30	15	825	245	50	0	15	130	0	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		110	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.969			0.950	
Flt Protected		0.994			0.999			0.963			0.969	
Satd. Flow (prot)	0	1840	0	0	1861	1583	0	1738	0	0	1715	0
Flt Permitted		0.000			0.000			0.963			0.969	
Satd. Flow (perm)	0	0	0	0	0	1583	0	1738	0	0	1715	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				177		11			25	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1610			1010			338			362	
Travel Time (s)		36.6			23.0			7.7			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	641	33	16	897	266	54	0	16	141	0	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	761	0	0	913	266	0	70	0	0	223	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	1		1	1	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	110		20	100	100	20	0		20	0	
Trailing Detector (ft)	0	0		0	0	0	0	5		0	5	
Detector 1 Position(ft)	0	0		0	0	0	0	5		0	5	
Detector 1 Size(ft)	20	6		20	6	100	20	-5		20	-5	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		104			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	pm+pt			pm+pt		pm+ov	Split			Split		
Protected Phases	1!	6		5!	2	8	4	4		8	8	
Permitted Phases	6	1!		2	5!	2						
Detector Phase	1	6		5	2	8	4	4		8	8	

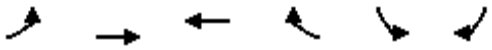
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0	7.0	6.0	6.0		7.0	7.0	
Minimum Split (s)	11.0	24.0		11.0	24.0	17.0	11.0	11.0		17.0	17.0	
Total Split (s)	11.0	58.0	0.0	11.0	58.0	20.0	11.0	11.0	0.0	20.0	20.0	0.0
Total Split (%)	11.0%	58.0%	0.0%	11.0%	58.0%	20.0%	11.0%	11.0%	0.0%	20.0%	20.0%	0.0%
Maximum Green (s)	5.0	52.0		5.0	52.0	15.0	6.0	6.0		15.0	15.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Max	C-Max		Max	C-Max	None	None	None		None	None	
Walk Time (s)		1.0			1.0	1.0	1.0	1.0		1.0	1.0	
Flash Dont Walk (s)		1.0			1.0	1.0	1.0	1.0		1.0	1.0	
Pedestrian Calls (#/hr)		0			0	0	0	0		0	0	
Act Effct Green (s)		55.0			52.0	68.2		6.0			14.2	
Actuated g/C Ratio		0.55			0.52	0.68		0.06			0.14	
v/c Ratio		0.75			0.94	0.23		0.61			0.84	
Control Delay		22.3			23.0	0.4		62.1			63.7	
Queue Delay		0.0			0.0	0.0		0.0			0.0	
Total Delay		22.3			23.0	0.4		62.1			63.7	
LOS		C			C	A		E			E	
Approach Delay		22.3			17.9			62.1			63.7	
Approach LOS		C			B			E			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 88 (88%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 25.4	Intersection LOS: C
Intersection Capacity Utilization 108.1%	ICU Level of Service G
Analysis Period (min) 15	

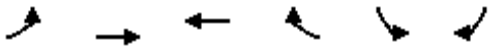
! Phase conflict between lane groups.

Splits and Phases: 10: Lake Ave & Westville Ave





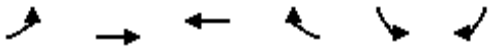
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	25	675	900	50	25	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.993		0.932	
Flt Protected		0.998			0.976	
Satd. Flow (prot)	0	1859	1850	0	1694	0
Flt Permitted		0.957			0.976	
Satd. Flow (perm)	0	1783	1850	0	1694	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			10		27	
Link Speed (mph)		30	30		30	
Link Distance (ft)		332	1610		362	
Travel Time (s)		7.5	36.6		8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	734	978	54	27	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	761	1032	0	54	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm					
Protected Phases		2	6		4	
Permitted Phases	2					
Detector Phase	2	2	6		4	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0		7.0	
Minimum Split (s)	20.0	20.0	20.0		12.0	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (s)	35.0	35.0	35.0	0.0	15.0	0.0
Total Split (%)	70.0%	70.0%	70.0%	0.0%	30.0%	0.0%
Maximum Green (s)	31.0	31.0	31.0		11.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	1.0	1.0	1.0		1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Max	C-Max	C-Max		None	
Walk Time (s)	1.0	1.0	1.0		1.0	
Flash Dont Walk (s)	1.0	1.0	1.0		1.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)		43.7	43.7		7.3	
Actuated g/C Ratio		0.87	0.87		0.15	
v/c Ratio		0.49	0.64		0.20	
Control Delay		4.0	5.2		13.9	
Queue Delay		0.0	0.0		0.0	
Total Delay		4.0	5.2		13.9	
LOS		A	A		B	
Approach Delay		4.0	5.2		13.9	
Approach LOS		A	A		B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 16 (32%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 5.0		Intersection LOS: A	
Intersection Capacity Utilization 68.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 13: Lake Ave & Abbott Ave

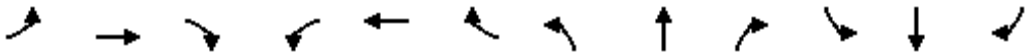


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	210	640	610	140	260	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			0	0	185
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.975			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	1676	1635	0	1593	1425
Flt Permitted	0.108				0.950	
Satd. Flow (perm)	181	1676	1635	0	1593	1425
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			17			304
Link Speed (mph)		30	30		30	
Link Distance (ft)		1010	800		285	
Travel Time (s)		23.0	18.2		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	696	663	152	283	304
Shared Lane Traffic (%)						
Lane Group Flow (vph)	228	696	815	0	283	304
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	0
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	0
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt					Free
Protected Phases	1	6	2		4	
Permitted Phases	6					Free
Detector Phase	1	6	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	
Minimum Split (s)	8.0	22.0	22.0		22.0	
Total Split (s)	12.0	68.0	56.0	0.0	32.0	0.0
Total Split (%)	12.0%	68.0%	56.0%	0.0%	32.0%	0.0%
Maximum Green (s)	8.0	63.0	51.0		27.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	1.0	2.0	2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)		1.0	1.0		1.0	
Flash Dont Walk (s)		1.0	1.0		1.0	
Pedestrian Calls (#/hr)		0	0		0	
Act Effct Green (s)	68.9	67.9	51.7		22.1	100.0
Actuated g/C Ratio	0.69	0.68	0.52		0.22	1.00
v/c Ratio	0.77	0.61	0.96		0.80	0.21
Control Delay	29.5	8.6	43.8		53.8	0.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	29.5	8.6	43.8		53.8	0.3
LOS	C	A	D		D	A
Approach Delay		13.7	43.8		26.1	
Approach LOS		B	D		C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 84 (84%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 27.4	Intersection LOS: C
Intersection Capacity Utilization 85.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: West St & Beaver St.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	760	180	90	500	70	150	150	100	50	240	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	110		0	150		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.982			0.940			0.965	
Flt Protected	0.950			0.950			0.950				0.994	
Satd. Flow (prot)	1770	1809	0	1770	1829	0	1770	1751	0	0	1787	0
Flt Permitted	0.246			0.080			0.314				0.823	
Satd. Flow (perm)	458	1809	0	149	1829	0	585	1751	0	0	1479	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			10			34			18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1240			1263			221			196	
Travel Time (s)		28.2			28.7			5.0			4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	826	196	98	543	76	163	163	109	54	261	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	1022	0	98	619	0	163	272	0	0	424	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	9.0	22.0		9.0	22.0		15.0	15.0		21.0	21.0	
Total Split (s)	10.0	56.0	0.0	9.0	55.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Split (%)	10.0%	56.0%	0.0%	9.0%	55.0%	0.0%	35.0%	35.0%	0.0%	35.0%	35.0%	0.0%
Maximum Green (s)	6.0	50.0		5.0	49.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		1.0			1.0		1.0	1.0		1.0	1.0	
Flash Dont Walk (s)		1.0			1.0		1.0	1.0		1.0	1.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	59.6	52.8		57.2	50.0		29.0	29.0			29.0	
Actuated g/C Ratio	0.60	0.53		0.57	0.50		0.29	0.29			0.29	
v/c Ratio	0.34	1.06		0.58	0.67		0.96	0.51			0.96	
Control Delay	7.4	68.7		25.9	23.4		96.3	29.3			68.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	7.4	68.7		25.9	23.4		96.3	29.3			68.7	
LOS	A	E		C	C		F	C			E	
Approach Delay		62.2			23.8			54.4			68.7	
Approach LOS		E			C			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 28 (28%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.06			
Intersection Signal Delay: 51.8		Intersection LOS: D	
Intersection Capacity Utilization 108.1%		ICU Level of Service G	
Analysis Period (min) 15			

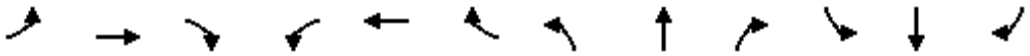
Splits and Phases: 2: West St & New St

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	540	160	270	490	150	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		200	125		200	0
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.333		0.950	
Satd. Flow (perm)	1863	1583	620	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		174				239
Link Speed (mph)	30			30	30	
Link Distance (ft)	800			1240	448	
Travel Time (s)	18.2			28.2	10.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	587	174	293	533	163	239
Shared Lane Traffic (%)						
Lane Group Flow (vph)	587	174	293	533	163	239
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type		custom	pm+pt			custom
Protected Phases	2	2	1	6	4	4
Permitted Phases		4	6			1
Detector Phase	2	2	1	6	4	4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	1.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	11.0	20.0	20.0	20.0
Total Split (s)	63.0	63.0	12.0	75.0	25.0	25.0
Total Split (%)	63.0%	63.0%	12.0%	75.0%	25.0%	25.0%
Maximum Green (s)	58.0	58.0	8.0	70.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	1.0	1.0		1.0	1.0	1.0
Flash Dont Walk (s)	1.0	1.0		1.0	1.0	1.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	63.3	81.7	77.6	76.6	14.4	27.7
Actuated g/C Ratio	0.63	0.82	0.78	0.77	0.14	0.28
v/c Ratio	0.50	0.13	0.50	0.37	0.64	0.39
Control Delay	11.9	0.4	6.7	6.7	51.1	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	0.4	6.7	6.7	51.1	5.3
LOS	B	A	A	A	D	A
Approach Delay	9.3			6.7	23.9	
Approach LOS	A			A	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 62.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: West St & Division St.

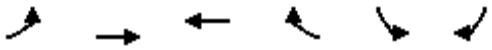


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	660	30	30	860	190	50	0	30	300	0	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		110	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.949			0.964	
Flt Protected		0.997			0.998			0.970			0.965	
Satd. Flow (prot)	0	1846	0	0	1859	1583	0	1715	0	0	1733	0
Flt Permitted		0.384			0.956			0.970			0.965	
Satd. Flow (perm)	0	711	0	0	1781	1583	0	1715	0	0	1733	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				130		24			15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1610			1010			288			312	
Travel Time (s)		36.6			23.0			6.5			7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	717	33	33	935	207	54	0	33	326	0	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	793	0	0	968	207	0	87	0	0	446	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt			Perm		pm+ov	Split			Split		
Protected Phases	1	6			2	8	4	4		8	8	
Permitted Phases	6			2		2						
Detector Phase	1	6		2	2	8	4	4		8	8	

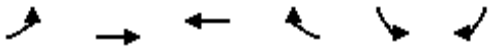
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.0	24.0		24.0	24.0	12.0	12.0	12.0		12.0	12.0	
Total Split (s)	10.0	70.0	0.0	60.0	60.0	18.0	12.0	12.0	0.0	18.0	18.0	0.0
Total Split (%)	10.0%	70.0%	0.0%	60.0%	60.0%	18.0%	12.0%	12.0%	0.0%	18.0%	18.0%	0.0%
Maximum Green (s)	6.0	64.0		54.0	54.0	13.0	7.0	7.0		13.0	13.0	
Yellow Time (s)	3.0	4.0		4.0	4.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Max	C-Max		C-Max	C-Max	None	None	None		None	None	
Walk Time (s)		1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Flash Dont Walk (s)		1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)		64.0			54.0	71.4		7.0			15.4	
Actuated g/C Ratio		0.64			0.54	0.71		0.07			0.15	
v/c Ratio		1.58			1.01	0.18		0.61			1.60	
Control Delay		290.5			45.0	1.5		52.7			314.7	
Queue Delay		0.0			0.0	0.0		0.0			0.0	
Total Delay		290.5			45.0	1.5		52.7			314.7	
LOS		F			D	A		D			F	
Approach Delay		290.5			37.4			52.7			314.7	
Approach LOS		F			D			D			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 93 (93%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.60			
Intersection Signal Delay: 167.6		Intersection LOS: F	
Intersection Capacity Utilization 108.0%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 10: Lake Ave & Westville Ave



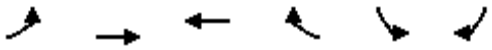
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	720	1020	10	20	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999		0.911	
Flt Protected		0.999			0.983	
Satd. Flow (prot)	0	1861	1861	0	1668	0
Flt Permitted		0.986			0.983	
Satd. Flow (perm)	0	1837	1861	0	1668	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			2		43	
Link Speed (mph)		30	30		30	
Link Distance (ft)		332	1610		228	
Travel Time (s)		7.5	36.6		5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	783	1109	11	22	43
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	794	1120	0	65	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm					
Protected Phases		2	6		4	
Permitted Phases	2					
Detector Phase	2	2	6		4	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0		7.0	
Minimum Split (s)	20.0	20.0	20.0		12.0	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (s)	38.0	38.0	38.0	0.0	12.0	0.0
Total Split (%)	76.0%	76.0%	76.0%	0.0%	24.0%	0.0%
Maximum Green (s)	34.0	34.0	34.0		8.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	1.0	1.0	1.0		1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Max	C-Max	C-Max		None	
Walk Time (s)	1.0	1.0	1.0		1.0	
Flash Dont Walk (s)	1.0	1.0	1.0		1.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)		40.8	40.8		7.2	
Actuated g/C Ratio		0.82	0.82		0.14	
v/c Ratio		0.53	0.74		0.23	
Control Delay		5.0	13.0		12.3	
Queue Delay		0.0	0.0		0.0	
Total Delay		5.0	13.0		12.3	
LOS		A	B		B	
Approach Delay		5.0	13.0		12.3	
Approach LOS		A	B		B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 32 (64%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 9.8		Intersection LOS: A	
Intersection Capacity Utilization 66.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 13: Lake Ave & Abbott Ave

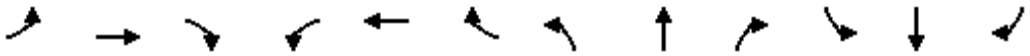


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	300	800	1050	215	300	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	0	210
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.977			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	1676	1638	0	1593	1425
Flt Permitted	0.051				0.950	
Satd. Flow (perm)	86	1676	1638	0	1593	1425
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			16			388
Link Speed (mph)		30	30		30	
Link Distance (ft)		1010	800		285	
Travel Time (s)		23.0	18.2		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	870	1141	234	326	451
Shared Lane Traffic (%)						
Lane Group Flow (vph)	326	870	1375	0	326	451
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	0
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	0
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt					Free
Protected Phases	1	6	2		4	
Permitted Phases	6					Free
Detector Phase	1	6	2		4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	
Minimum Split (s)	8.0	22.0	22.0		22.0	
Total Split (s)	16.0	96.0	80.0	0.0	24.0	0.0
Total Split (%)	13.3%	80.0%	66.7%	0.0%	20.0%	0.0%
Maximum Green (s)	12.0	91.0	75.0		19.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	1.0	2.0	2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)		1.0	1.0		1.0	
Flash Dont Walk (s)		1.0	1.0		1.0	
Pedestrian Calls (#/hr)		0	0		0	
Act Effct Green (s)	92.0	91.0	75.0		19.0	120.0
Actuated g/C Ratio	0.77	0.76	0.62		0.16	1.00
v/c Ratio	1.50	0.68	1.33		1.29	0.32
Control Delay	271.3	6.4	177.3		199.1	0.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	271.3	6.4	177.3		199.1	0.6
LOS	F	A	F		F	A
Approach Delay		78.6	177.3		83.9	
Approach LOS		E	F		F	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 17 (14%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.50			
Intersection Signal Delay: 120.4		Intersection LOS: F	
Intersection Capacity Utilization 124.5%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: West St & Beaver St.

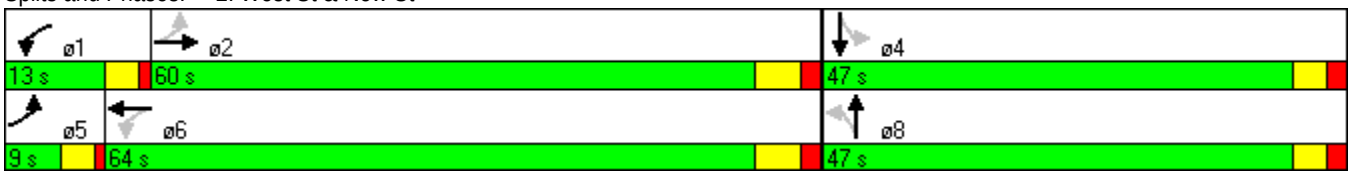


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	810	140	205	810	135	160	325	215	70	275	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	140		0	170		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.978			0.979			0.940			0.962	
Flt Protected	0.950			0.950			0.950				0.993	
Satd. Flow (prot)	1770	1822	0	1770	1824	0	1770	1751	0	0	1779	0
Flt Permitted	0.074			0.069			0.312				0.275	
Satd. Flow (perm)	138	1822	0	129	1824	0	581	1751	0	0	493	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			10			31			18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1240			1263			387			313	
Travel Time (s)		28.2			28.7			8.8			7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	880	152	223	880	147	174	353	234	76	299	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	109	1032	0	223	1027	0	174	587	0	0	522	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	7.0		5.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	9.0	22.0		9.0	22.0		21.0	21.0		21.0	21.0	
Total Split (s)	9.0	60.0	0.0	13.0	64.0	0.0	47.0	47.0	0.0	47.0	47.0	0.0
Total Split (%)	7.5%	50.0%	0.0%	10.8%	53.3%	0.0%	39.2%	39.2%	0.0%	39.2%	39.2%	0.0%
Maximum Green (s)	5.0	54.0		9.0	58.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		1.0			1.0		1.0	1.0		1.0	1.0	
Flash Dont Walk (s)		1.0			1.0		1.0	1.0		1.0	1.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	61.0	54.0		69.0	58.0		42.0	42.0			42.0	
Actuated g/C Ratio	0.51	0.45		0.58	0.48		0.35	0.35			0.35	
v/c Ratio	0.79	1.25		1.13	1.16		0.86	0.93			2.84	
Control Delay	44.6	144.1		132.3	113.7		72.9	58.0			859.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	44.6	144.1		132.3	113.7		72.9	58.0			859.5	
LOS	D	F		F	F		E	E			F	
Approach Delay		134.6			117.0			61.4			859.5	
Approach LOS		F			F			E			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 66 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 2.84			
Intersection Signal Delay: 216.4		Intersection LOS: F	
Intersection Capacity Utilization 136.0%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: West St & New St

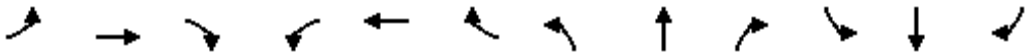


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	720	345	345	890	350	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		140	160		230	0
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.071		0.950	
Satd. Flow (perm)	1863	1583	132	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		39				99
Link Speed (mph)	30			30	30	
Link Distance (ft)	800			1240	448	
Travel Time (s)	18.2			28.2	10.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	783	375	375	967	380	516
Shared Lane Traffic (%)						
Lane Group Flow (vph)	783	375	375	967	380	516
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type		custom	pm+pt			custom
Protected Phases	2	2	1	6	4	4
Permitted Phases		4	6			1
Detector Phase	2	2	1	6	4	4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	1.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	11.0	20.0	20.0	20.0
Total Split (s)	57.0	57.0	18.0	75.0	45.0	45.0
Total Split (%)	47.5%	47.5%	15.0%	62.5%	37.5%	37.5%
Maximum Green (s)	52.0	52.0	14.0	70.0	41.0	41.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	1.0	1.0		1.0	1.0	1.0
Flash Dont Walk (s)	1.0	1.0		1.0	1.0	1.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	52.0	87.9	80.1	79.1	31.9	59.0
Actuated g/C Ratio	0.43	0.73	0.67	0.66	0.27	0.49
v/c Ratio	0.97	0.32	0.93	0.79	0.81	0.62
Control Delay	50.3	6.2	36.5	16.3	54.0	21.6
Queue Delay	0.0	0.0	0.0	0.1	0.5	0.0
Total Delay	50.3	6.2	36.5	16.3	54.5	21.6
LOS	D	A	D	B	D	C
Approach Delay	36.0			22.0	35.5	
Approach LOS	D			C	D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 14 (12%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 30.3		Intersection LOS: C	
Intersection Capacity Utilization 87.2%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: West St & Division St.

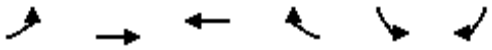


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	800	40	20	1115	330	70	0	20	175	0	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		110	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.970			0.951	
Flt Protected		0.994			0.999			0.963			0.969	
Satd. Flow (prot)	0	1840	0	0	1861	1583	0	1740	0	0	1717	0
Flt Permitted		0.000			0.971			0.963			0.969	
Satd. Flow (perm)	0	0	0	0	1809	1583	0	1740	0	0	1717	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				182		9			20	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1610			1010			338			362	
Travel Time (s)		36.6			23.0			7.7			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	870	43	22	1212	359	76	0	22	190	0	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1033	0	0	1234	359	0	98	0	0	299	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	1		1	1	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	110		20	100	100	20	0		20	0	
Trailing Detector (ft)	0	0		0	0	0	0	5		0	5	
Detector 1 Position(ft)	0	0		0	0	0	0	5		0	5	
Detector 1 Size(ft)	20	6		20	6	100	20	-5		20	-5	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		104			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	pm+pt			Perm		pm+ov	Split			Split		
Protected Phases	1	6			2	8	4	4		8	8	
Permitted Phases	6	1		2		2						
Detector Phase	1	6		2	2	8	4	4		8	8	

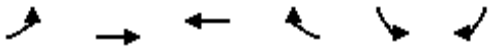
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.0	24.0		24.0	24.0	17.0	12.0	12.0		17.0	17.0	
Total Split (s)	9.0	86.0	0.0	77.0	77.0	22.0	12.0	12.0	0.0	22.0	22.0	0.0
Total Split (%)	7.5%	71.7%	0.0%	64.2%	64.2%	18.3%	10.0%	10.0%	0.0%	18.3%	18.3%	0.0%
Maximum Green (s)	5.0	80.0		71.0	71.0	17.0	7.0	7.0		17.0	17.0	
Yellow Time (s)	3.0	4.0		4.0	4.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	Max	C-Max		C-Max	C-Max	None	None	None		None	None	
Walk Time (s)		1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Flash Dont Walk (s)		1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	
Act Effct Green (s)		80.0			71.0	89.0		7.0			17.0	
Actuated g/C Ratio		0.67			0.59	0.74		0.06			0.14	
v/c Ratio		0.84			1.15	0.29		0.89			1.15	
Control Delay		18.3			91.7	1.6		111.6			145.3	
Queue Delay		0.0			0.0	0.0		0.0			0.0	
Total Delay		18.3			91.7	1.6		111.6			145.3	
LOS		B			F	A		F			F	
Approach Delay		18.3			71.4			111.6			145.3	
Approach LOS		B			E			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 15 (13%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.15			
Intersection Signal Delay: 61.9		Intersection LOS: E	
Intersection Capacity Utilization 141.0%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 10: Lake Ave & Westville Ave



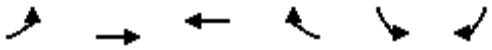
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	35	910	1215	70	35	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.993		0.932	
Flt Protected		0.998			0.976	
Satd. Flow (prot)	0	1859	1850	0	1694	0
Flt Permitted		0.823			0.976	
Satd. Flow (perm)	0	1533	1850	0	1694	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			13		32	
Link Speed (mph)		30	30		30	
Link Distance (ft)		332	1610		362	
Travel Time (s)		7.5	36.6		8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	989	1321	76	38	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1027	1397	0	76	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm					
Protected Phases		2	6		4	
Permitted Phases	2					
Detector Phase	2	2	6		4	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0		7.0	
Minimum Split (s)	20.0	20.0	20.0		12.0	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (s)	108.0	108.0	108.0	0.0	12.0	0.0
Total Split (%)	90.0%	90.0%	90.0%	0.0%	10.0%	0.0%
Maximum Green (s)	104.0	104.0	104.0		8.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	1.0	1.0	1.0		1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Max	C-Max	C-Max		None	
Walk Time (s)	1.0	1.0	1.0		1.0	
Flash Dont Walk (s)	1.0	1.0	1.0		1.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)		107.4	107.4		7.6	
Actuated g/C Ratio		0.90	0.90		0.06	
v/c Ratio		0.75	0.84		0.55	
Control Delay		7.1	15.4		49.3	
Queue Delay		0.0	0.0		0.0	
Total Delay		7.1	15.4		49.3	
LOS		A	B		D	
Approach Delay		7.1	15.4		49.3	
Approach LOS		A	B		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 13.0		Intersection LOS: B	
Intersection Capacity Utilization 88.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 13: Lake Ave & Abbott Ave

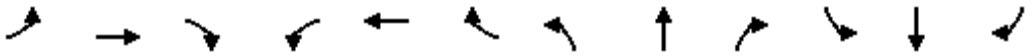


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	210	640	610	140	260	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160			50	0	185
Storage Lanes	1			1	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	1676	1676	1425	1593	1425
Flt Permitted	0.235				0.950	
Satd. Flow (perm)	394	1676	1676	1425	1593	1425
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				51		304
Link Speed (mph)		30	30		30	
Link Distance (ft)		1010	800		285	
Travel Time (s)		23.0	18.2		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	696	663	152	283	304
Shared Lane Traffic (%)						
Lane Group Flow (vph)	228	696	663	152	283	304
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	0
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	0
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt			Perm		Free
Protected Phases	1	6	2		4	
Permitted Phases	6			2		Free
Detector Phase	1	6	2	2	4	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	8.0	22.0	22.0	22.0	22.0	
Total Split (s)	12.0	68.0	56.0	56.0	32.0	0.0
Total Split (%)	12.0%	68.0%	56.0%	56.0%	32.0%	0.0%
Maximum Green (s)	8.0	63.0	51.0	51.0	27.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	C-Max	None	
Walk Time (s)		1.0	1.0	1.0	1.0	
Flash Dont Walk (s)		1.0	1.0	1.0	1.0	
Pedestrian Calls (#/hr)		0	0	0	0	
Act Effct Green (s)	68.9	67.9	54.8	54.8	22.1	100.0
Actuated g/C Ratio	0.69	0.68	0.55	0.55	0.22	1.00
v/c Ratio	0.60	0.61	0.72	0.19	0.80	0.21
Control Delay	10.9	6.3	23.0	7.2	53.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	6.3	23.0	7.2	53.8	0.3
LOS	B	A	C	A	D	A
Approach Delay		7.4	20.0		26.1	
Approach LOS		A	C		C	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 89 (89%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 76.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: West St & Beaver St.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	760	180	90	500	70	150	150	100	50	240	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		50	110		50	150		50	50		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.956	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1781	0
Flt Permitted	0.308			0.099			0.174			0.613		
Satd. Flow (perm)	574	1863	1583	184	1863	1583	324	1863	1583	1142	1781	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			51			30			91		19	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1240			1263			221			196	
Travel Time (s)		28.2			28.7			5.0			4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	826	196	98	543	76	163	163	109	54	261	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	826	196	98	543	76	163	163	109	54	370	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	8.0	22.0	22.0	8.0	22.0	22.0	8.0	15.0	15.0	8.0	21.0	
Total Split (s)	8.0	56.0	56.0	8.0	56.0	56.0	10.0	26.0	26.0	10.0	26.0	0.0
Total Split (%)	8.0%	56.0%	56.0%	8.0%	56.0%	56.0%	10.0%	26.0%	26.0%	10.0%	26.0%	0.0%
Maximum Green (s)	4.0	50.0	50.0	4.0	50.0	50.0	6.5	21.0	21.0	6.5	21.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	0.5	2.0	2.0	0.5	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	3.5	5.0	5.0	3.5	5.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		1.0	1.0		1.0	1.0		1.0	1.0		1.0	
Flash Dont Walk (s)		1.0	1.0		1.0	1.0		1.0	1.0		1.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	56.8	51.6	51.6	56.0	50.0	50.0	29.7	23.0	23.0	28.8	21.0	
Actuated g/C Ratio	0.57	0.52	0.52	0.56	0.50	0.50	0.30	0.23	0.23	0.29	0.21	
v/c Ratio	0.32	0.86	0.23	0.59	0.58	0.09	0.86	0.38	0.25	0.15	0.95	
Control Delay	8.9	31.9	8.7	24.5	20.8	8.9	66.2	36.7	11.4	24.8	73.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	8.9	31.9	8.7	24.5	20.8	8.9	66.2	36.7	11.4	24.8	73.3	
LOS	A	C	A	C	C	A	E	D	B	C	E	
Approach Delay		25.5			20.1			41.4			67.1	
Approach LOS		C			C			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 33.1		Intersection LOS: C	
Intersection Capacity Utilization 87.9%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: West St & New St

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	540	160	270	490	150	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		200	125		200	0
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.333		0.950	
Satd. Flow (perm)	1863	1583	620	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		174				239
Link Speed (mph)	30			30	30	
Link Distance (ft)	800			1240	448	
Travel Time (s)	18.2			28.2	10.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	587	174	293	533	163	239
Shared Lane Traffic (%)						
Lane Group Flow (vph)	587	174	293	533	163	239
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type		custom	pm+pt			custom
Protected Phases	2	2	1	6	4	4
Permitted Phases		4	6			1
Detector Phase	2	2	1	6	4	4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	1.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	11.0	20.0	20.0	20.0
Total Split (s)	63.0	63.0	12.0	75.0	25.0	25.0
Total Split (%)	63.0%	63.0%	12.0%	75.0%	25.0%	25.0%
Maximum Green (s)	58.0	58.0	8.0	70.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	1.0	1.0		1.0	1.0	1.0
Flash Dont Walk (s)	1.0	1.0		1.0	1.0	1.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	63.3	81.7	77.6	76.6	14.4	27.7
Actuated g/C Ratio	0.63	0.82	0.78	0.77	0.14	0.28
v/c Ratio	0.50	0.13	0.50	0.37	0.64	0.39
Control Delay	11.0	0.8	4.2	3.6	51.1	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	0.8	4.2	3.6	51.1	5.3
LOS	B	A	A	A	D	A
Approach Delay	8.7			3.8	23.9	
Approach LOS	A			A	C	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 62.5%	ICU Level of Service B
Analysis Period (min) 15	

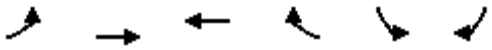
Splits and Phases: 3: West St & Division St.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	660	30	30	860	190	50	0	30	300	0	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	0		110	0		0	0		50
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.949				0.850
Flt Protected	0.950				0.998			0.970			0.950	
Satd. Flow (prot)	1770	1850	0	0	1859	1583	0	1715	0	0	1770	1583
Flt Permitted	0.074				0.958			0.970			0.950	
Satd. Flow (perm)	138	1850	0	0	1785	1583	0	1715	0	0	1770	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				130		24				47
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1610			1010			288			312	
Travel Time (s)		36.6			23.0			6.5			7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	717	33	33	935	207	54	0	33	326	0	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	750	0	0	968	207	0	87	0	0	326	120
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt			Perm		pm+ov	Split			Split		Perm
Protected Phases	1	6			2	8	4	4		8	8	
Permitted Phases	6			2		2						8
Detector Phase	1	6		2	2	8	4	4		8	8	8

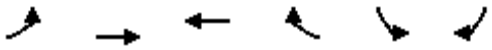
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	9.0	24.0		24.0	24.0	12.0	12.0	12.0		12.0	12.0	12.0
Total Split (s)	10.0	67.0	0.0	57.0	57.0	21.0	12.0	12.0	0.0	21.0	21.0	21.0
Total Split (%)	10.0%	67.0%	0.0%	57.0%	57.0%	21.0%	12.0%	12.0%	0.0%	21.0%	21.0%	21.0%
Maximum Green (s)	6.0	61.0		51.0	51.0	16.0	7.0	7.0		16.0	16.0	16.0
Yellow Time (s)	3.0	4.0		4.0	4.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Max	C-Max		C-Max	C-Max	None	None	None		None	None	None
Walk Time (s)		1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Flash Dont Walk (s)		1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	0
Act Effct Green (s)	63.0	61.0			51.0	71.4		7.0			18.4	18.4
Actuated g/C Ratio	0.63	0.61			0.51	0.71		0.07			0.18	0.18
v/c Ratio	0.23	0.66			1.06	0.18		0.61			1.00	0.36
Control Delay	11.1	17.7			65.9	1.5		52.7			94.1	27.0
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	0.0
Total Delay	11.1	17.7			65.9	1.5		52.7			94.1	27.0
LOS	B	B			E	A		D			F	C
Approach Delay		17.4			54.6			52.7			76.1	
Approach LOS		B			D			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 92 (92%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.06			
Intersection Signal Delay: 46.5		Intersection LOS: D	
Intersection Capacity Utilization 102.0%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 10: Lake Ave & Westville Ave



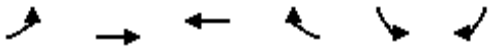
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	720	1020	10	20	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999		0.911	
Flt Protected		0.999			0.983	
Satd. Flow (prot)	0	1861	1861	0	1668	0
Flt Permitted		0.986			0.983	
Satd. Flow (perm)	0	1837	1861	0	1668	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			2		43	
Link Speed (mph)		30	30		30	
Link Distance (ft)		332	1610		228	
Travel Time (s)		7.5	36.6		5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	783	1109	11	22	43
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	794	1120	0	65	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm					
Protected Phases		2	6		4	
Permitted Phases	2					
Detector Phase	2	2	6		4	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0		7.0	
Minimum Split (s)	20.0	20.0	20.0		12.0	



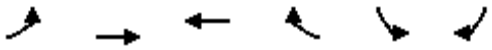
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (s)	38.0	38.0	38.0	0.0	12.0	0.0
Total Split (%)	76.0%	76.0%	76.0%	0.0%	24.0%	0.0%
Maximum Green (s)	34.0	34.0	34.0		8.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	1.0	1.0	1.0		1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Max	C-Max	C-Max		None	
Walk Time (s)	1.0	1.0	1.0		1.0	
Flash Dont Walk (s)	1.0	1.0	1.0		1.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)		40.8	40.8		7.2	
Actuated g/C Ratio		0.82	0.82		0.14	
v/c Ratio		0.53	0.74		0.23	
Control Delay		5.0	16.0		12.3	
Queue Delay		0.0	0.0		0.0	
Total Delay		5.0	16.0		12.3	
LOS		A	B		B	
Approach Delay		5.0	16.0		12.3	
Approach LOS		A	B		B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 32 (64%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 11.4		Intersection LOS: B	
Intersection Capacity Utilization 66.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 13: Lake Ave & Abbott Ave



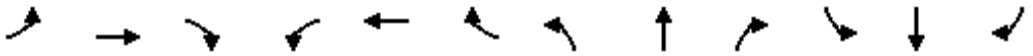
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	300	800	1050	215	300	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			50	0	210
Storage Lanes	1			1	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	1676	1676	1425	1593	1425
Flt Permitted	0.051				0.950	
Satd. Flow (perm)	86	1676	1676	1425	1593	1425
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				49		388
Link Speed (mph)		30	30		30	
Link Distance (ft)		1010	800		285	
Travel Time (s)		23.0	18.2		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	870	1141	234	326	451
Shared Lane Traffic (%)						
Lane Group Flow (vph)	326	870	1141	234	326	451
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	0
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	0
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt			Perm		Free
Protected Phases	1	6	2		4	
Permitted Phases	6			2		Free
Detector Phase	1	6	2	2	4	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	8.0	22.0	22.0	22.0	22.0	
Total Split (s)	16.0	96.0	80.0	80.0	24.0	0.0
Total Split (%)	13.3%	80.0%	66.7%	66.7%	20.0%	0.0%
Maximum Green (s)	12.0	91.0	75.0	75.0	19.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	C-Max	None	
Walk Time (s)		1.0	1.0	1.0	1.0	
Flash Dont Walk (s)		1.0	1.0	1.0	1.0	
Pedestrian Calls (#/hr)		0	0	0	0	
Act Effct Green (s)	92.0	91.0	75.0	75.0	19.0	120.0
Actuated g/C Ratio	0.77	0.76	0.62	0.62	0.16	1.00
v/c Ratio	1.50	0.68	1.09	0.26	1.29	0.32
Control Delay	270.5	8.7	71.3	7.7	199.1	0.6
Queue Delay	0.0	0.0	5.7	0.0	0.0	0.0
Total Delay	270.5	8.7	76.9	7.7	199.1	0.6
LOS	F	A	E	A	F	A
Approach Delay		80.0	65.1		83.9	
Approach LOS		F	E		F	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 52 (43%), Referenced to phase 2:WBT and 6:EBTL, Start of Yellow			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.50			
Intersection Signal Delay: 74.8		Intersection LOS: E	
Intersection Capacity Utilization 110.0%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: West St & Beaver St.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	810	140	205	810	135	160	325	215	70	275	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		50	140		50	170		50	50		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.951	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1771	0
Flt Permitted	0.090			0.066			0.132			0.284		
Satd. Flow (perm)	168	1863	1583	123	1863	1583	246	1863	1583	529	1771	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			30			32			79		19	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1240			1263			387			313	
Travel Time (s)		28.2			28.7			8.8			7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	880	152	223	880	147	174	353	234	76	299	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	109	880	152	223	880	147	174	353	234	76	446	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	10.0	10.0	4.0	10.0	
Minimum Split (s)	8.0	22.0	22.0	9.0	22.0	22.0	8.0	21.0	21.0	8.0	21.0	
Total Split (s)	8.0	63.0	63.0	15.0	70.0	70.0	11.0	34.0	34.0	8.0	31.0	0.0
Total Split (%)	6.7%	52.5%	52.5%	12.5%	58.3%	58.3%	9.2%	28.3%	28.3%	6.7%	25.8%	0.0%
Maximum Green (s)	4.0	57.0	57.0	11.0	64.0	64.0	7.5	29.0	29.0	4.5	26.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	0.5	2.0	2.0	0.5	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	3.5	5.0	5.0	3.5	5.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		1.0	1.0		1.0	1.0		1.0	1.0		1.0	
Flash Dont Walk (s)		1.0	1.0		1.0	1.0		1.0	1.0		1.0	
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	
Act Effct Green (s)	63.0	57.0	57.0	74.0	64.0	64.0	38.1	30.6	30.6	32.0	26.0	
Actuated g/C Ratio	0.52	0.48	0.48	0.62	0.53	0.53	0.32	0.26	0.26	0.27	0.22	
v/c Ratio	0.77	0.99	0.20	0.98	0.89	0.17	1.01	0.74	0.51	0.40	1.12	
Control Delay	37.6	46.0	8.9	86.4	37.2	11.7	105.3	52.6	29.9	37.1	122.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	37.6	46.0	8.9	86.4	37.2	11.7	105.3	52.6	29.9	37.1	122.7	
LOS	D	D	A	F	D	B	F	D	C	D	F	
Approach Delay		40.2			43.0			57.7			110.2	
Approach LOS		D			D			E			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 4 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.12			
Intersection Signal Delay: 54.7		Intersection LOS: D	
Intersection Capacity Utilization 101.4%		ICU Level of Service G	
Analysis Period (min) 15			

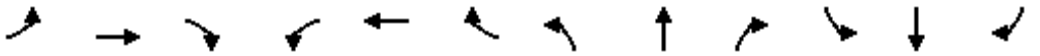
Splits and Phases: 2: West St & New St

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	720	345	345	890	350	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		140	160		230	0
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.071		0.950	
Satd. Flow (perm)	1863	1583	132	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		39				99
Link Speed (mph)	30			30	30	
Link Distance (ft)	800			1240	448	
Travel Time (s)	18.2			28.2	10.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	783	375	375	967	380	516
Shared Lane Traffic (%)						
Lane Group Flow (vph)	783	375	375	967	380	516
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type		custom	pm+pt			custom
Protected Phases	2	2	1	6	4	4
Permitted Phases		4	6			1
Detector Phase	2	2	1	6	4	4

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	1.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	11.0	20.0	20.0	20.0
Total Split (s)	57.0	57.0	18.0	75.0	45.0	45.0
Total Split (%)	47.5%	47.5%	15.0%	62.5%	37.5%	37.5%
Maximum Green (s)	52.0	52.0	14.0	70.0	41.0	41.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	1.0	1.0		1.0	1.0	1.0
Flash Dont Walk (s)	1.0	1.0		1.0	1.0	1.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	52.0	87.9	80.1	79.1	31.9	59.0
Actuated g/C Ratio	0.43	0.73	0.67	0.66	0.27	0.49
v/c Ratio	0.97	0.32	0.93	0.79	0.81	0.62
Control Delay	53.0	5.1	49.5	20.1	54.0	21.6
Queue Delay	0.0	0.0	0.0	1.0	0.7	0.0
Total Delay	53.0	5.1	49.5	21.1	54.7	21.6
LOS	D	A	D	C	D	C
Approach Delay	37.5			29.1	35.6	
Approach LOS	D			C	D	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 70 (58%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 33.7	Intersection LOS: C
Intersection Capacity Utilization 87.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: West St & Division St.

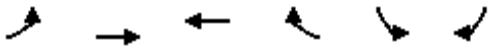


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	800	40	20	1115	330	70	0	20	175	0	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	0		110	0		0	0		50
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.970				0.850
Flt Protected	0.950				0.999			0.963			0.950	
Satd. Flow (prot)	1770	1850	0	0	1861	1583	0	1740	0	0	1770	1583
Flt Permitted	0.054				0.975			0.963			0.950	
Satd. Flow (perm)	101	1850	0	0	1816	1583	0	1740	0	0	1770	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				177		9				60
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1610			1010			338			362	
Travel Time (s)		36.6			23.0			7.7			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	870	43	22	1212	359	76	0	22	190	0	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	120	913	0	0	1234	359	0	98	0	0	190	109
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	1		1	1	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	110		20	100	100	20	0		20	0	20
Trailing Detector (ft)	0	0		0	0	0	0	5		0	5	0
Detector 1 Position(ft)	0	0		0	0	0	0	5		0	5	0
Detector 1 Size(ft)	20	6		20	6	100	20	-5		20	-5	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		104			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	pm+pt			Perm		pm+ov	Split			Split		Perm
Protected Phases	1	6			2	8	4	4		8	8	
Permitted Phases	6	1		2		2						8
Detector Phase	1	6		2	2	8	4	4		8	8	8

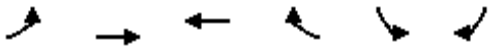
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	9.0	24.0		24.0	24.0	17.0	12.0	12.0		17.0	17.0	17.0
Total Split (s)	9.0	85.0	0.0	76.0	76.0	22.0	13.0	13.0	0.0	22.0	22.0	22.0
Total Split (%)	7.5%	70.8%	0.0%	63.3%	63.3%	18.3%	10.8%	10.8%	0.0%	18.3%	18.3%	18.3%
Maximum Green (s)	5.0	79.0		70.0	70.0	17.0	8.0	8.0		17.0	17.0	17.0
Yellow Time (s)	3.0	4.0		4.0	4.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Max	C-Max		C-Max	C-Max	None	None	None		None	None	None
Walk Time (s)		1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Flash Dont Walk (s)		1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Pedestrian Calls (#/hr)		0		0	0	0	0	0		0	0	0
Act Effct Green (s)	82.0	80.0			70.0	87.0		8.0			16.0	16.0
Actuated g/C Ratio	0.68	0.67			0.58	0.72		0.07			0.13	0.13
v/c Ratio	0.78	0.74			1.17	0.30		0.79			0.81	0.41
Control Delay	43.4	18.4			94.4	0.4		89.9			75.1	27.9
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	0.0
Total Delay	43.4	18.4			94.4	0.4		89.9			75.1	27.9
LOS	D	B			F	A		F			E	C
Approach Delay		21.3			73.2			89.9			57.9	
Approach LOS		C			E			F			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 73 (61%), Referenced to phase 2:WBTL and 6:EBTL, Start of Yellow			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.17			
Intersection Signal Delay: 54.5		Intersection LOS: D	
Intersection Capacity Utilization 112.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 10: Lake Ave & Westville Ave



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	35	910	1215	70	35	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.993		0.932	
Flt Protected		0.998			0.976	
Satd. Flow (prot)	0	1859	1850	0	1694	0
Flt Permitted		0.823			0.976	
Satd. Flow (perm)	0	1533	1850	0	1694	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			13		32	
Link Speed (mph)		30	30		30	
Link Distance (ft)		332	1610		362	
Travel Time (s)		7.5	36.6		8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	989	1321	76	38	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1027	1397	0	76	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm					
Protected Phases		2	6		4	
Permitted Phases	2					
Detector Phase	2	2	6		4	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0		7.0	
Minimum Split (s)	20.0	20.0	20.0		12.0	



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (s)	108.0	108.0	108.0	0.0	12.0	0.0
Total Split (%)	90.0%	90.0%	90.0%	0.0%	10.0%	0.0%
Maximum Green (s)	104.0	104.0	104.0		8.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	1.0	1.0	1.0		1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Max	C-Max	C-Max		None	
Walk Time (s)	1.0	1.0	1.0		1.0	
Flash Dont Walk (s)	1.0	1.0	1.0		1.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)		107.4	107.4		7.6	
Actuated g/C Ratio		0.90	0.90		0.06	
v/c Ratio		0.75	0.84		0.55	
Control Delay		7.1	9.6		49.3	
Queue Delay		0.0	0.0		0.0	
Total Delay		7.1	9.6		49.3	
LOS		A	A		D	
Approach Delay		7.1	9.6		49.3	
Approach LOS		A	A		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 114 (95%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 9.8		Intersection LOS: A	
Intersection Capacity Utilization 88.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 13: Lake Ave & Abbott Ave

APPENDIX C:
ARTERIAL LOS REPORT FOR WEST STREET

Phone: Fax:
E-Mail:

PLANNING ANALYSIS

Analyst:	kp
Agency/Co.:	VN Engineers
Date Performed:	6/25/2013
Analysis Time Period:	Peak hour
Urban Street:	West Street
Direction of Travel:	EB & WB
Jurisdiction:	Danbury
Analysis Year:	2032
Project ID:	West Street between Division and Main

Traffic Characteristics

Annual average daily traffic, AADT	24500	vpd
Planning analysis hour factor, K	0.100	
Directional distribution factor, D	0.500	
Peak-hour factor, PHF	0.900	
Adjusted saturation flow rate	1800	pcphgpl
Percent turns from exclusive lanes	50	%

Roadway Characteristics

Number of through lanes one direction, N	1	
Free flow speed, FFS	30	mph
Urban class	4	
Section length	0.42	miles
Median	No	
Left-turn bays	Yes	

Signal Characteristics

Signalized intersections	3	
Arrival type, AT	3	
Signal type (k = 0.5 for planning)	Actuated	
Cycle length, C	100.0	sec
Effective green ratio, g/C	0.500	

Results

Annual average daily traffic, AADT	24500	vpd
Two-way hourly volume	2450	vph
Hourly directional volume	1225	vph
Through-volume 15-min. flow rate	680	v
Running time	65.5	sec
v/c ratio	0.80	
Through capacity	854	vph
Progression factor, PF	1.000	
Uniform delay	20.8	sec
Filtering/metering factor, I	0.506	
Incremental delay	4.0	sec
Control delay	24.8	sec/v
Total travel speed, Sa	10.8	mph
Total urban street LOS	D	

APPENDIX D:
EXISTING DRAINAGE CONDITIONS ON WEST STREET AT THE HOUSATONIC RAILROAD BRIDGE

IMPORTANT NOTE:
THE LOCATION OF SHOWN UNDERGROUND UTILITIES ARE APPROXIMATE.
ADDITIONAL UTILITIES MAY EXIST.
PRIOR TO ANY EXCAVATION OR CONSTRUCTION CONTACT–
"CALL BEFORE YOU DIG" 1–800–922–4455

PRELIMINARY

CITY OF DANBURY
ENGINEERING DEPARTMENT
FARID L. KHOURI, P.E. CITY ENGINEER

MAP SHOWING
WEST STREET RAIL ROAD UNDERPASS
EXISTING CONDITIONS
DANBURY, CONNECTICUT
SCALE: 1" = 20' MARCH 24, 2010

20' 10' 0 20' 40' 60' 80'

APPENDIX E:
ENHANCEMENT AND BEAUTIFICATION COST ESTIMATES

Opinion of Enhancement / Beautification Costs

1. **Gateway at I-84 Ramps**
   $25,000.00
   Lump sum cost includes pavement demolition, proposed granite curb island, proposed bituminous concrete patch pavement, lighting, Danbury gateway sign, stone wall planter, topsoil, plants

2. **Streetscape at Storefront Parking Style**

Calculation of Linear Foot Cost

ITEM	UNIT	UNIT COST	TOTAL PER LF
Remove Existing Road Pavement	8 SF	$3.00/SF	$24.00
Proposed Concrete Walk – 5' Panels	5 SF	$12.00/SF	$60.00
Proposed Bituminous Concrete Patch Pavement	3 SF	$3.00/SF	$9.00
Total Linear Foot Cost of Streetscape			**$93.00**

1,310 Linear Feet of Streetscape X $93.00 = **$121,830.00**

Individual Items not included in Linear Foot Cost

ITEM	UNIT	UNIT COST	TOTAL
Proposed Painted Crosswalk	633 SF	$3.00/SF	$1,899.00
Total Individual Item Cost			**$1,899.00**

Opinion of Total Cost for Streetscape at Storefront Parking Style

Total Linear Foot Cost + Total Individual Item Cost + 10% Contingency = Total Cost

$121,830.00 + $1,899.00 + 10% = **$136,101.00**

3. Neighborhood Streetscape Style

Calculation of Linear Foot Cost

ITEM	UNIT	UNIT COST	TOTAL PER LF
Remove Existing Road Pavement	1.5 SF	$2.00/SF	$3.00
Remove Existing Concrete Walk and Adjacent Lawn	8 SF	$4.00/SF	$32.00
Remove Existing Curb	1 LF	$10.00/SF	$10.00
Proposed Concrete Walk – 5' Panels	5 SF	$12.00/SF	$60.00
Proposed Bituminous Concrete Patch Pavement	1.5 SF	$3.00/SF	$4.50
Proposed Granite Curb	1 LF	$50.00/LF	$50.00
Provide and Place New Topsoil	0.1 CY	$90.00/CY	$9.00
Proposed Lawn	5 SF	$0.50/SF	$2.50
Total Cost per Linear Foot of Streetscape			**$171.00**

Total Linear Foot Cost

8,209 Linear Feet of Streetscape X $171.00 = **$1,403,739.00**

Individual Items not included in Linear Foot Cost

ITEM	UNIT	UNIT COST	TOTAL
Proposed Painted Crosswalk	4,000 SF	$3.00/SF	$12,000.00
Proposed Heavy Duty Concrete Drive Pavement	10,100 SF	$16.00/SF	$161,600.00
Proposed Street Tree	50 EA	$1,500.00/EA	$75,000.00
Proposed Decorative Street Light, Conduit and Wiring	65 EA	$5,000	$325,000.00
Total Individual Item Cost			**$573,600.00**

Opinion of Total Cost for Neighborhood Streetscape Style

Total Linear Foot Cost + Total Individual Item Cost + 10% Contingency = Total Cost

$1,403,739.00 + $573,600.00 + 10% = **$2,175,072.00**

4. Downtown Streetscape with Lawn Style

Calculation of Linear Foot Cost

ITEM	UNIT	UNIT COST	TOTAL PER LF
Remove Existing Road Pavement	1.5 SF	$2.00/SF	$3.00
Remove Existing Concrete Walk and Adjacent Lawn	8 SF	$4.00/SF	$32.00
Remove Existing Curb	1 LF	$10.00/SF	$10.00
Proposed Concrete Walk – 18''x18'' Panels	5 SF	$14.00/SF	$70.00
Proposed Bituminous Concrete Patch Pavement	1.5 SF	$3.00/SF	$4.50
Proposed Granite Curb	1 LF	$50.00/LF	$50.00
Provide and Place New Topsoil	0.1 CY	$90.00/CY	$9.00
Proposed Lawn	5 SF	$0.50/SF	$2.50
Total Cost per Linear Foot of Streetscape			**$181.00**

Total Linear Foot Cost

2,790 Linear Feet of Streetscape X $181.00 = **$504,990.00**

Individual Items not included in Linear Foot Cost

ITEM	UNIT	UNIT COST	TOTAL
Imprinted Bituminous Concrete Crosswalk	4,800 SF	$9.00/SF	$43,200.00
Proposed Heavy Duty Concrete Drive Pavement	2740 SF	$16.00/SF	$43,840.00
Proposed Street Tree	7 EA	$1,500.00/EA	$10,500.00
Proposed Decorative Street Light, Conduit and Wiring	23 EA	$5,000	$115,000.00
Total Individual Item Cost			**$212,540.00**

Opinion of Total Cost for Downtown Streetscape with Lawn Style

Total Linear Foot Cost + Total Individual Item Cost + 10% Contingency = Total Cost

$504,990.00 + $212,540.00 + 10% = **$789,283.00**

5. Pedestrian Park at Division Street

Opinion of Site Construction Cost

ITEM	UNIT	UNIT COST	TOTAL
Remove Existing Concrete Walk	1,100 SF	$3.00/SF	$3,300.00
Remove Existing Steps	1 LS	$1,000.00/LS	$1,000.00
Remove Existing Curb	710 LF	$10.00/LF	$7,100.00
Remove Existing Road Pavement	1,065 SF	$2.00/SF	$2,130.00
Remove Existing Tree	4 EA	$500/EA	$2,000.00
Strip and Stockpile Topsoil	143 CY	$8.00/CY	$1,144.00
Proposed Paver Walk	378 SF	$12.00/SF	$4,536.00
Proposed Bluestone Steps with Fieldstone Risers	30 LF	$200.00/LF	$6,000.00
Proposed Concrete Walk – 18”x18”Panels	4,641 SF	$14.00/SF	$64,974.00
Proposed Granite Curb	710 LF	$50.00/LF	$35,500.00
Proposed Bituminous Concrete Patch Pavement	1,065 SF	$3.00/SF	$3,195.00
Proposed Decorative Street Light, Conduit and Wiring	8 EA	$5,000.00/EA	$40,000.00
Proposed Bench	2 EA	$1,500.00/EA	$3,000.00
Relocate Flagpole	1 EA	$2,000.00/EA	$2,000.00
Relocate Garfield Statue	1 EA	$1,500.00/EA	$1,500.00
Proposed Flowering Tree	4 EA	$1,000.00/EA	$4,000.00
Proposed Shrubs/Perennials	1 LS	$2,700/LS	$2,700.00
Place Remediated Existing Topsoil	143 CY	$50.00/CY	$7,150.00
Proposed Mulch	3 CY	$40.00/CY	$120.00
Proposed Lawn	7,725 SF	$0.50/SF	$3,862.00
Total Cost For Pedestrian Park at Division Street			**$195,211.00**

Opinion of Total Cost for Pedestrian Park at Division Street

Total Cost for Pedestrian Park at Division Street + 10% = Total Cost

$195,211.00 + 10% = **$214,733.00**

6. Slope at City Hall

Opinion of Site Construction Cost

ITEM	UNIT	UNIT COST	TOTAL
Remove Existing Concrete Walk	210 SF	$3.00/SF	$630.00
Remove Existing Steps	1 LS	$1,500.00/LS	$1,500.00
Strip and Stockpile Topsoil	81 CY	$8.00/CY	$648.00
Proposed Paver Walk	740 SF	$12.00/SF	$8,880.00
Proposed Bluestone Steps with Fieldstone Risers	15 LF	$200.00/LF	$3,000.00
Proposed Stone Wall	74 LF	$150.00/LF	$11,100.00
Proposed Site Sign	1 LS	$5,000.00/LS	$5,000.00
Proposed Lighted Pillar	6 EA	$4,000.00/EA	$24,000.00
Proposed Flowering Tree	4 EA	$1,000.00/EA	$4,000.00
Proposed Shrubs/Perennials	1 LS	$25,000.00/LS	$25,000.00
Place Remediated Existing Topsoil	81 CY	$50.00/CY	$4,050.00
Provide and Place New Topsoil	170 CY	$90.00/CY	$15,300.00
Proposed Mulch	44 CY	$40.00/CY	$1,760.00
Proposed Lawn	2,200 SF	$0.50/SF	$1,100.00
Total Cost For Slope at City Hall			**$105,968.00**

Opinion of Total Cost for Slope at City Hall

Total Cost for Slope at City Hall + 10% = Total Cost

$105,968.00 + 10% = **$116,565.00**

7. Downtown Streetscape Style and Pedestrian Park at Main Street

Opinion of Site Construction Cost

ITEM	UNIT	UNIT COST	TOTAL
Remove Existing Concrete Walk	12,123 SF	$3.00/SF	$36,369.00
Remove Existing Curb	1,235 LF	$10.00/LF	$12,350.00
Remove Existing Road Pavement	1,875 SF	$2.00/SF	$3,750.00
Proposed Concrete Walk Pavement – 18" Panels	10,623 SF	$14.00/SF	$148,722.00
Proposed Heavy Duty Concrete Drive Pavement	500 SF	$16.00/SF	$8,000.00
Proposed Granite Curb	1,235 LF	$50.00/LF	$61,750.00
Proposed Bituminous Concrete Patch Pavement	1,875 SF	$3.00/SF	$5,625.00
Relocate Existing Parking Meters/Signs	35 EA	$300.00/EA	$10,500.00
Proposed Imprinted Bituminous Concrete Crosswalk	1600 SF	$9.00/SF	$14,400.00
Proposed Painted Pavement Markings	300 SF	$3.00/SF	$900.00
Proposed Permeable Paver Tree Pit	1,000 SF	$28.00/SF	$28,000.00
Proposed Paver Handicap Ramp	220 SF	$14.00/SF	$3,080.00
Proposed Decorative Street Light, Conduit and Wiring	8 EA	$5,000.00/EA	$40,000.00
Proposed Flowering Tree	6 EA	$1,000.00/EA	$6,000.00
Proposed Shrubs/Perennials	1 LS	$10,000.00/LS	$10,000.00
Provide and Place New Topsoil	170 CY	$90.00/CY	$15,300.00
Proposed Mulch	15 CY	$40.00/CY	$600.00
Total Cost For Downtown Streetscape Style and Pedestrian Park at Main Street			**$405,346.00**

Opinion of Total Cost for Downtown Streetscape Style and Pedestrian Park at Main Street

Total Cost for Downtown Streetscape Style and Pedestrian Park at Main Street + 10% = Total Cost

$405,346.00 + 10% = **$445,881.00**

Transportation Management Plan
Lake Avenue and West Street
Danbury, CT

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