COMMUNITY
connectivity program

Windsor

Windsor Avenue (Route 159) – Road Safety Audit

April 28- 2016

CONNECTICUT DEPARTMENT OF TRANSPORTATION

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Acknowledgements:

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With assistance from AECOM Transportation Planning Group

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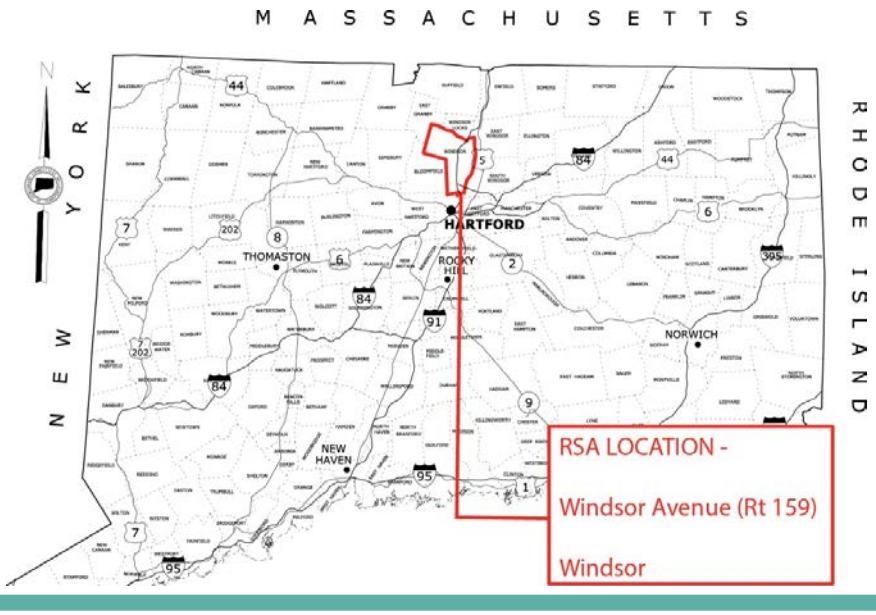
The Connecticut Department of Transportation (CTDOT) is undertaking a Community Connectivity Program that focuses on improving the state's transportation network for all users, with an emphasis on bicyclists and pedestrians. A major component of this program is conducting Road Safety Audits (RSA's) at selected locations. An RSA is a formal safety assessment of the existing conditions of walking and biking routes and is intended to identify the issues that may discourage or prevent walking and bicycling. It is a qualitative review by an independent team experienced in traffic, pedestrian, and bicycle operations and design that considers the safety of all road users and proactively assesses mitigation measures to improve the safe operation of the facility by reducing the potential crash risk frequency or severity.

The RSA team is made up of CTDOT staff, municipal officials and staff, enforcement agents, AECOM staff, and community leaders. An RSA Team is established for each municipality based on the requirements of the individual location. They assess and review factors that can promote or obstruct safe walking and bicycling routes. These factors include traffic volumes and speeds, topography, presence or absence of bicycle lanes or sidewalks, and social influences.

Each RSA was conducted using RSA protocols published by the FHWA. For details on this program, please refer to www.ctconnectivity.com. Prior to the site visit, area topography and land use characteristics are examined using available mapping and imagery. Potential sight distance issues, sidewalk locations, on-street and off-street parking, and bicycle facilities are also investigated using available resources. The site visit includes a "Pre-audit" meeting, the "Field Audit" itself, and a "Post-Audit" meeting to discuss the field observations and formulate recommendations. This procedure is discussed in the following sections.



1 Introduction to the Windsor (Windsor Avenue) RSA

The Town of Windsor submitted an application to complete an RSA along Windsor Avenue (Route 159) from the Hartford town line to Broad Street to improve safety for pedestrians and bicyclists. The corridor is a high traffic roadway with a large number of crashes and a high Average Daily Traffic (ADT). Pedestrian and bicycle traffic is significant, as residents walk and bike to shopping and work as well as to access CT Transit bus routes. The community wants to improve safety for bicycle traffic along the roadway and improve the pedestrian walkways. Sidewalks along the roadway have aged and are in need of some repair and improvements to meet current ADA guidelines.

The Town of Windsor application contained information on traffic volumes, crash data, and mapping of the intersection. The application and supporting documentation are included in Appendix A.

1.1 Location

The site is the 2.6 mile section of Windsor Avenue from the Hartford town line to Island Road (Figure 1 and 2). The Windsor Avenue ADT is 19,700 vehicles per day (vpd). This is a significant volume of traffic for a roadway to process.

Windsor Avenue is a state-owned and maintained facility (Route 159) that runs in a relatively straight north/south direction. It is often used as a bypass for I-91 and to access I-291 during peak traffic times. Windsor Avenue consists of two lanes in each direction, separated by an 8 foot wide median island for the majority of the length. Turn lanes are provided at major intersections, and median breaks exist at most intersections and major driveways to allow left turn movements. Land use is primarily retail/commercial at the southern end of the corridor, and transitions to multi-family residential and then to single family residential properties north of the I-291 crossing.

Generally, there are concrete sidewalks along both sides of the street (some are concrete pavers) throughout the entire corridor. The sidewalks vary in condition, but are generally serviceable, with some localized sections in need of replacement. The sidewalk varies from 4 to 6 feet in width and along most of the corridor, and a snow shelf is generally provided. The snow shelf varies between wide grass buffers and narrow (1 foot) brick paved separators.

Figure 1. Location Map – RSA Corridor: Windsor Avenue (Route 159)

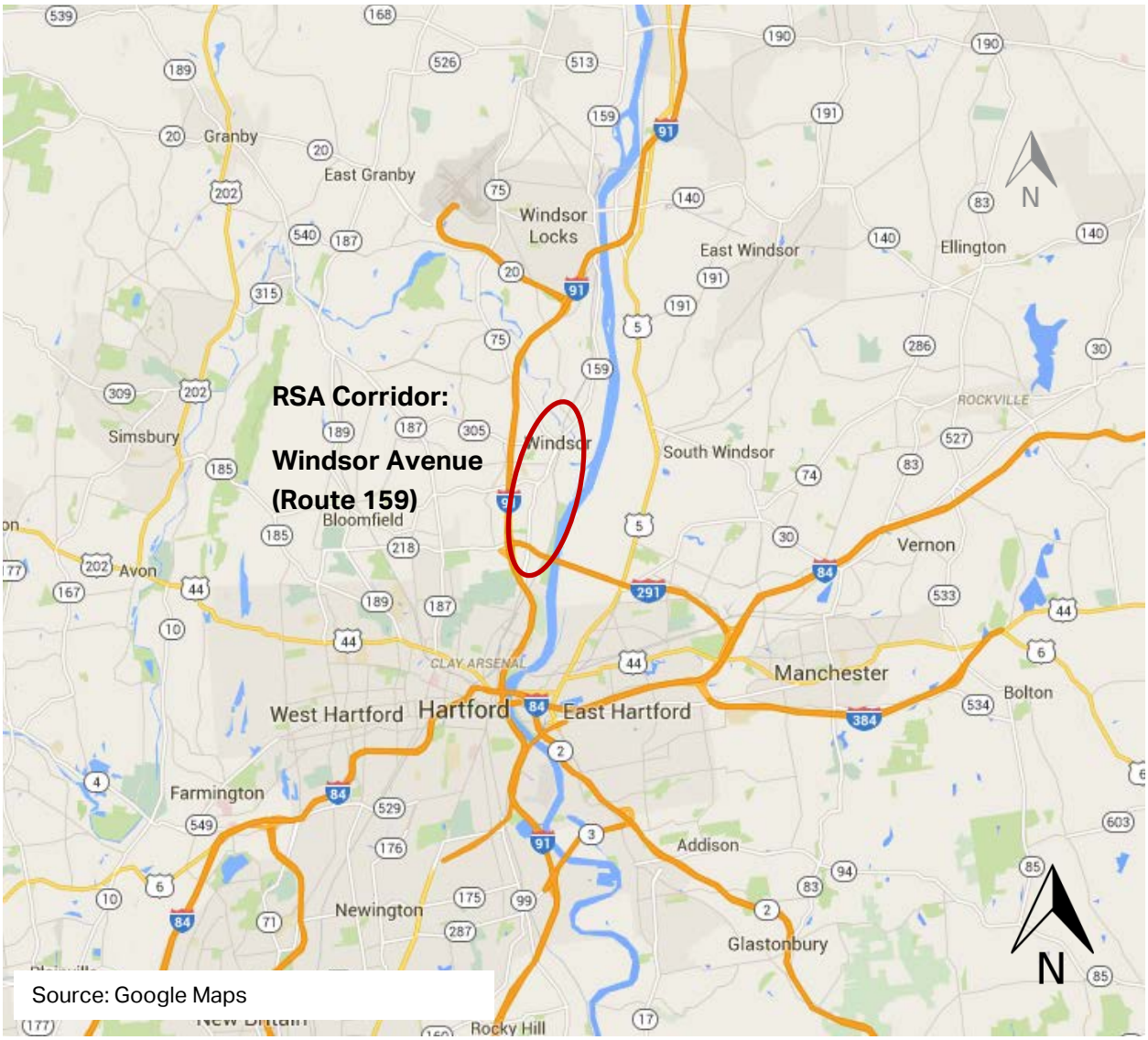


Figure 2. Regional Context Map

The roadway consists of narrow shoulders (generally 1 foot wide), two 11-foot travel lanes in each direction and an 8-foot wide median. The median is planted and maintained by the Town. There are a total of 31 intersections within the study area, and approximately 1/3 of them are signalized, with the remainder controlled by side street stop signs. Left turn lanes are primarily provided at signalized intersections, and dedicated left turn lanes are not provided at the majority of un-signalized intersections or other median cuts. As a result, through traffic must maneuver around left turning traffic. The numerous intersections and additional driveways create difficulties for drivers to negotiate clear travel paths (3).

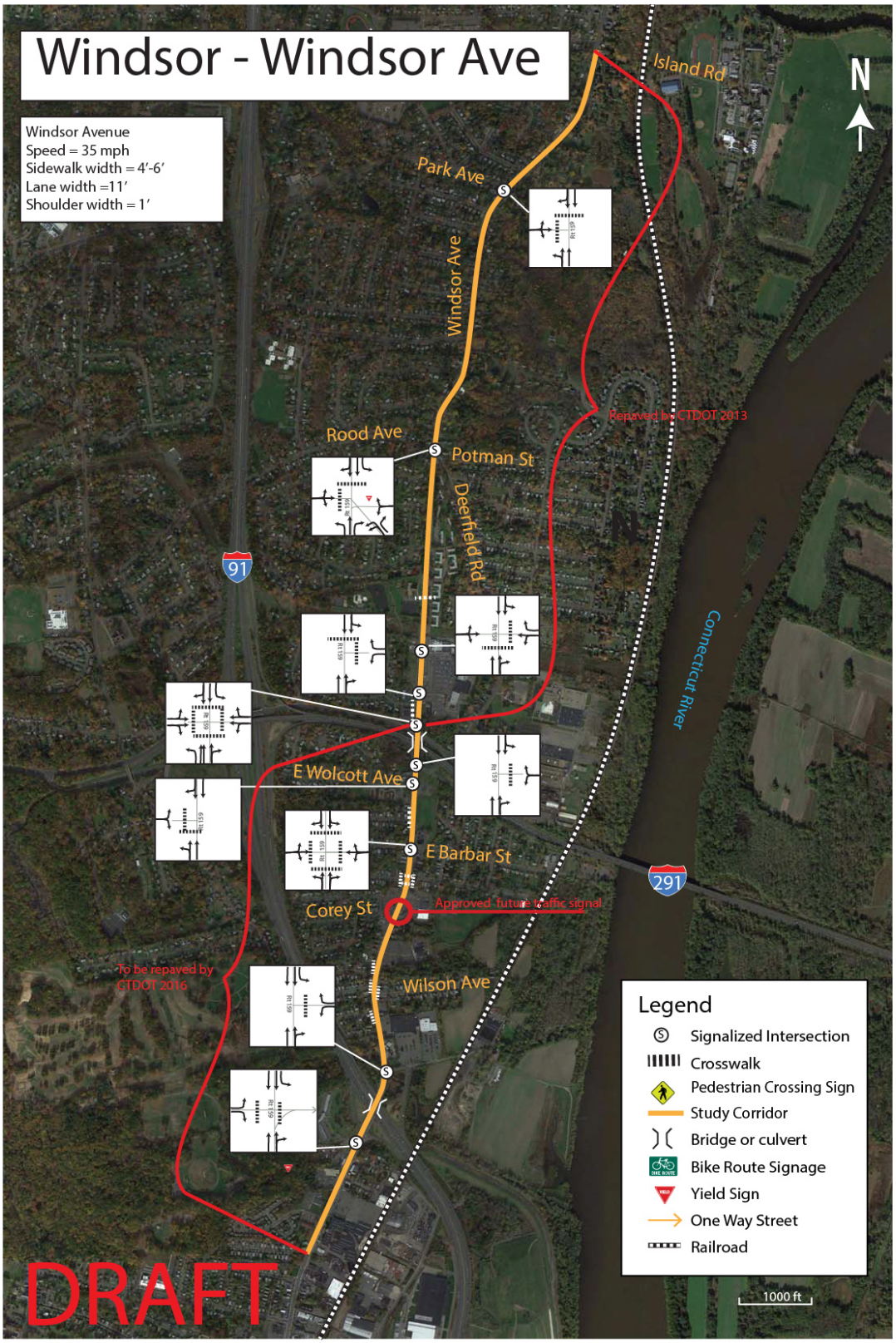


Figure 3. Windsor Avenue (Route 159) Roadway Geometrics

2 Pre-Audit Assessment

2.1 Pre-Audit Information

As noted previously, traffic volumes are significant at this location. Crash history within the RSA location shows that the most frequent are rear-end and turning crashes (4). This is indicative of congestion coupled with access management issues (many driveways). The peak crash rates are during the peak hours.

Severity Type	Number of Accidents	
Property Damage Only	141	72%
Injury (No fatality)	54	28%
Fatality	1	1%
Total	196	

Table 1. Crash Severity 2012-2014

Source: UConn Connecticut Crash Data Repository

Manner of Crash / Collision Impact	Number of Accidents	
Unknown	0	0%
Sideswipe-Same Direction	24	12%
Rear-end	57	29%
Turning-Intersecting Paths	37	19%
Turning-Opposite Direction	18	9%
Fixed Object	19	10%
Backing	4	2%
Angle	10	5%
Turning-Same Direction	16	8%
Moving Object	4	2%
Parking	0	0%
Pedestrian	7	4%
Overturn	0	0%
Head-on	0	0%
Sideswipe-Opposite Direction	0	0%
Unknown	0	0%
Total	196	

Table 2. Crash Type 2012-2014

Source: UConn Connecticut Crash Data Repository

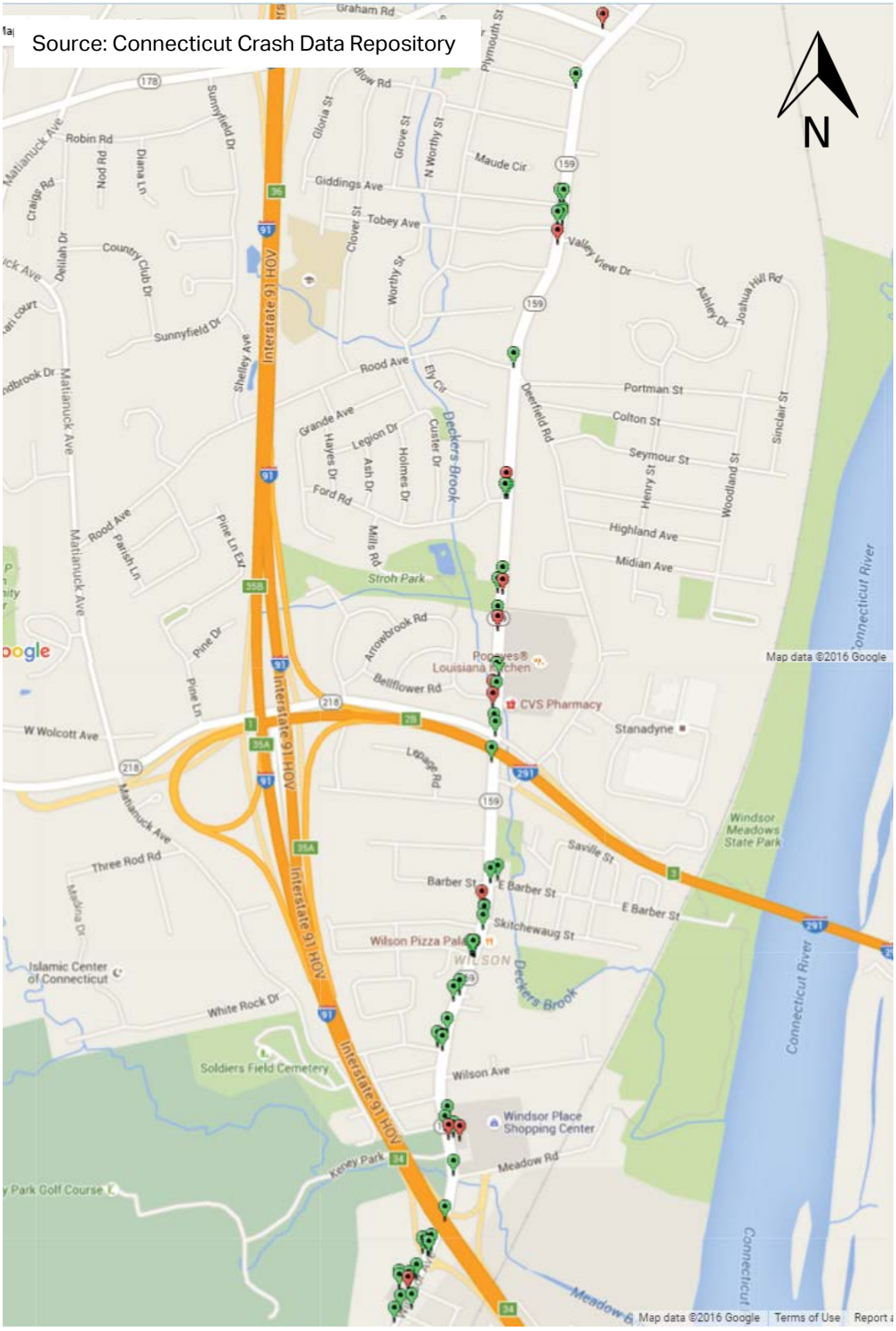


Figure 4. Crashes that Occurred in 2015 (Connecticut Crash Data Repository)

Windsor - Route 159

Street Inventory

From	To	Distance	Width	Sidewalk				Curb	Parking	Shoulder	Ramps	
				Side	Type	Width	Condition				Exist	Compliant
Town Line	Island Road	2.6 miles	2 lane	NB	Concrete	4' - 6'	Fair	Concrete	No	1'	70%	No
			2 lane	SB	Concrete	4' - 6'	Fair	Concrete	No	1'	70%	No
			with									
			Raised Median									

***CONDITION – "Good" is Serviceable Condition that meets current design standards. "Fair" is generally serviceable, but may need minor repairs, or may not completely align with current design standards. "Poor" is not serviceable, and generally inadequate for continued long-term use.**

Table 3. Street Inventory

2.2 Prior Successful Efforts

Windsor Avenue has a fairly consistent cross section consisting of two 11-foot travel lanes in each direction with 1-foot shoulders, separated by an 8-foot wide median island. The total roadway cross-section is generally 54-feet in width. The median is grassed or landscaped throughout the corridor. The existing narrow lane widths and median landscaping present a traffic calming influence on this heavily travelled corridor.

Pedestrian sidewalks are provided throughout the length of the corridor on both side of the street. They are generally comprised of 5-foot wide concrete walkways, separated from the travel way with concrete curb and a grass, landscaped, or architectural paver snow shelf. In some areas, the snow shelf is quite narrow (1-foot), but in most areas it is 5 to 10 feet wide, providing good separation between the pedestrian traffic and vehicular traffic.

Pedestrian signals are provided at most signalized crossings, and handicapped ramps are provided at all intersections.

2.3 Pre-Audit Meeting

The RSA was conducted on April 28, 2016. The Pre-Audit meeting was held at 8:30 AM in the Windsor Town Hall, located at 275 Broad Street in Windsor.

The RSA Team was comprised of staff from CTDOT and AECOM, as well as representatives from several Windsor departments and organizations, including the Engineering Department, Police Department, Planning Department, and Town Manager's Office. The complete list of attendees can be found in Appendix B. Materials distributed to the RSA Team, including the agenda, audit checklist, ADT counts, crash data and roadway geometrics, can be found in Appendix C.

RSA Team members from Windsor were presented with relevant information for the audit, and the following issues were discussed:

- The Town was notified by the CTDOT that there were plans for implementing a "road diet" within the corridor in conjunction with the upcoming CTDOT road resurfacing project. The proposed road diet would be established through a modified line striping plan that consists of restriping the existing roadway to provide a single lane of traffic in each direction as opposed to the existing two lanes of traffic in each direction. The restriping would include a wider left shoulder, one 11-foot travel lane, and an 8-foot wide right (outside) shoulder in each direction. The outside shoulder would not be striped as a bike lane. Town staff expressed the following concern with the proposed road diet:
    - How would the RSA being conducted impact the ongoing project to repave?

- If based on ADTs only, how would the implementation of a road diet impact turning movements, queue and traffic speeds?
- The current road diet restriping plan eliminates some crosswalks that Town staff believe to be important. Is there an opportunity to restripe these crosswalks?
- The proposed outside roadway shoulders are approximately 8-feet in width. Is there the ability to designate these shoulders as bike lanes?
- How would the proposed road diet affect the need for a signal at the Corey Street intersection?

- In response to the above Town concerns, RSA Audit members relayed the following information:
  - It was discussed that road diets can be as simple as reorganizing pavement to give more space to non-motorized modes but can include major modification as well.
  - FHWA is generally favorable toward road diets when the ADT is 20,000 or less. It was indicated that issues have been experienced nationwide due to diversion of traffic through other neighborhoods. Teaching drivers how to use the new roadway design is also an issue.
- The Town and Community have been emphasizing bicyclist and pedestrian safety within the corridor. Town staff would like to collect information which would help to improve both bicyclist and pedestrian safety.
- Community members have voiced a desire for traffic calming in the area as well as the inclusion of dedicated bike lanes.
- The Town has been looking into rapid flash beacons for midblock crosswalks and would like to discuss potential locations within the corridor for future installation.
- People use the corridor to bypass the congestion on I-91.
- Several bus routes service this corridor. They should be accommodated in the design.

The population and demographics surrounding the corridor are in need of alternate transportation such as public transportation and safe bicyclist and pedestrian facilities.

3 RSA Assessment

3.1 Field Audit Observations and Questions

Site 1 – Corey Street

- Although the roadway is state-owned, the town maintains the center medians (Figure 5).
- How will the proposed road diet impact speeds?
- The curbing is broken or missing in sections (Figure 6).
- Due to past repaving, most of the curbs are not 6 inches high. Many are flush or within 2 inches of the roadway.
- The median averages 8 feet wide as is desired to remain as a visual aesthetic and traffic calming element.
- Motorists can make U-turns at most median breaks.
- Median breaks allow for left turn movements, however, there are presently no dedicated left turn lanes at unsignalized intersection and other median breaks, how would the road diet impact traffic queuing as a result?
- Should drivers be permitted to utilize the new shoulder areas included with the road diet to maneuver around buses or stopped cars waiting to make left turns?
- Where along this section of roadway would left turn lanes be beneficial due to the new road diet?
- There are many driveways and bus stops within this section
- The current roadway shoulders are 1 foot wide.

Figure 5. Center Median

Figure 6. Broken Curbing

- Could the outside shoulders proposed with the road diet be striped as designated bike lanes?
- Many sidewalk ramps don't have tactile warning strips, are narrow and the ramps are not ADA compliant (Figure 7). There are signs that protrude into the walkway and do not have the required 7-feet of clearance (per the MUTCD).
- Utility poles encroach on the sidewalk and do not have proper clearance in places.
- Windsor prefers brick as the material for buffers.
- Brick pavers are missing in spots or have sinkholes.
- Old sign post stubs stick out and are tripping hazards (Figure 8).
- In some locations the crosswalk paint is very faded (Figure 9).
- Pedestrian phase signals do not have count downs.
- Some pedestrian pushbuttons are not compliant. They are too far from the ramp/crosswalk.
- The sidewalk varies in width from 4'-6'.
- Telephone poles and vegetation block sight lines.
- Bus shelters are not located at all stops because of right-of-way issues and also because the free shelters require advertising on them which Windsor does not allow.
- Can/should bus bay bump outs be installed?
- It does not appear that the signal is necessary at Barber Street.
- Is the intersection at Corey Street a candidate location for rapid flashing beacons?

Figure 7. Narrow Sidewalk Ramp with Inadequate Landing

Figure 8. Sign Stub Trip Hazard

Figure 9. Faded Crosswalk

- There are a few vacant lots that could be redeveloped. These are opportunities for the town to widen the sidewalk and make multi-use paths.
- Stamped concrete is easier to maintain then brick pavers. The concrete mix is dyed so that if it gets broken it still appears colored.
- One biker was observed riding on the sidewalk and one in the roadway.

Figure 10. Pedestrian Push Button Far From Crosswalk

Site 2 – I-291 Overpass

- The pedestrian phase push button is far from the intersection (Figure 10).
- The snow shelf under the bridge is 14 feet wide.
- There are no sidewalk lights under the overpass bridge (Figure 11).
- One way to accommodate continuation of the bike lane from East Barber Street into town would be to create a multi-use path. There appears to be sufficient right-of-way.

Figure 11. Lack of Lighting Under the Overpass Bridge

- There is a signal at the north drive to the Price Rite shopping plaza, and a gas station is located on the opposite side of Windsor Avenue. The gas station has two very wide driveways. The southern driveway is located within the signalized intersection zone, and the Windsor Avenue stop bar is in the center of the driveway. There are no signal indications controlling the gas station driveway. This creates confusion for vehicles entering and exiting the driveway (Figure 12).
- The mid-block crossing between the large apartment complex and Stroh Park is heavily used by children in the summer. There is no sight distance issue but speeds are high, making the crossing difficult. The sidewalk ramps and median

Figure 12. Uncontrolled Drive Opposite Price Rite

sidewalk are narrow, with dirt encroaching and apparent drainage issues (Figure 13).

Site 3 – Deerfield Road

- Rood Avenue has no pedestrian push button to cross even though it is a signalized crossing with a crosswalk.
- The crossing across Deerfield Road is long and skewed.
- There is not enough time to complete the crossing on Deerfield Road.
- Vehicles can turn right on red from Deerfield Road even though it is a shallow angle. To see oncoming traffic they must pull into the crosswalk (Figure 14).

Site 4 – Valley View Drive

- Accident data shows a large number (ie, side swipes, rear end, fixed object, etc...) here.
- The median is 6 feet with a 1 foot buffer on either side.

Figure 13. Mid-Block Crossing at Stroh Park

Figure 14. Long, Skewed Crossing at Deerfield Road

3.2 Post-Audit Workshop - Key Issues

1. A number of issues still remain with regard to the possible implementation of a road diet on the southern portion of Windsor Avenue:
    a. The road diet was presented to the Town with no previous input and little time for comment at this time. The Town would have preferred to be involved in the decision-making process as well as involve and notify the community. CT DOT should notify towns ahead of time.
    b. Town staff still has many questions related to the proposed road diet.

c. The Town recognizes the benefits of a road diet to a community; however, would like more information related to the criteria for recommending the road diet, potential queuing due to left turn movements, signal timing, safety related to the potential use of shoulder areas to bypass turning traffic, and safety impacts on bicyclist and pedestrian traffic. There are still concerns that the medians do not allow for adequate turning queues, and that the single painted through lane could create more of a hazard due to maneuvering around stopped turning vehicles.

2. The number of jobs in Windsor is greater than the working age population residing in Windsor. Commuting traffic is from the greater Hartford and Springfield areas. Additionally, many vehicles utilizing the Route 159 corridor may be using the area as access between I-91 and I-291. The implementation of a road diet may complicate the vast population utilizing the corridor.

3. The Town of Windsor Plan of Conservation and Development (POCD) calls for pedestrian enhancements in this corridor.

4. The Town has an existing capital project in the 6-year Capital Improvement Program to repair and enhance the medians throughout this corridor. It is based on potential state or federal funding for the project.

5. The Town has an existing capital project in the 6-year Capital Improvement Program to install a traffic signal at the intersection of Windsor Avenue and Corey Street.

6. The Town would like to create future pedestrian-friendly routes and trails in the area.

7. Since the corridor is state-owned, crosswalks across Windsor Avenue are completed by the state, and the Town installs and maintains longitudinal crosswalks on the side streets.

8. The median at the northern signalized exit to the Price Rite was removed, creating a longer crosswalk. Additionally, the drive on the west side of the intersection is not included in the signal phasing.

9. Active speed detectors not allowed on state roads. An encroachment permit is needed to place them.

10. Public outreach is needed to pitch new ideas, CTDOT may be able to provide information or attend meetings in support.

4 Recommendations

From the discussions during the Post-Audit meeting, the RSA team compiled a set of recommendations that are divided into short-term, mid-term, and long-term categories. For the purposes of the RSA, **Short-term** is understood to mean modifications that can be expected to be completed very quickly, perhaps within six months, and certainly in less than a year if funding is available. These include relatively low-cost alternatives, such as striping and signing, and items that do not require additional study, design, or investigation (such as right-of way acquisition.) **Mid-term** recommendations may be more costly and require establishment of a funding source, or they may need some additional study or design in order to be accomplished. Nonetheless, they are relatively quick turn-around items, and should not require significant lengths of time before they can be implemented. Generally, they should be completed within a window of eighteen months to two years if funding is available. **Long-term** improvements are those that require substantial study and engineering, and may require significant funding mechanisms and/or right-of-way acquisition. These projects generally fall into a horizon of two years or more when funding is available.

4.1 Short-Term

1. Signage:
    a. Adjust signage height to meet the required seven (7) feet standard.
    b. Consolidate signs, where possible, to reduce visual clutter.
    c. Relocate all signs out of the pedestrian way.
    d. Replace worn-out signs with reflective signs.
    e. Remove or cut down old sign stubs so that they are flush with the pavement.
    f. Establish "No Turn on Red" and install appropriate signing for Deerfield Road turning onto Windsor Avenue (Figure 15).

Figure 15. Deerfield Road "No Turn On Red" Approach

2. Signals:
    a. Adjust the pedestrian crossing times to comply with latest standards. In particular the crossing at Deerfield Road needs to be adjusted.

b. Conduct a warrant analysis on the signal at East Barber Street to determine if it is necessary.

3. Sidewalks/Crosswalks:
    a. Repaint crosswalks.
    b. Repair damaged sidewalk areas (Figure 16).
    c. Replace sidewalk ramps and/or add detectable warning strips to ramps where needed (Figure 17).
    d. Add a crosswalk across Deerfield Road south of Portman Street and remove the Deerfield Road crossing at Windsor Avenue to shorten the crossing distance.
    e. Clear sidewalk and ramps at the Stroh Park mid-block crossing where dirt has encroached on the walks.
    f. There is evidence of foot traffic from the CVS site directly to Windsor Avenue, and pedestrians crossing directly at Arrowbrook Road. Sidewalk should be connected, and a crosswalk painted at this location, along with appropriate signage.

Figure 16. Damaged Curb and Sidewalk

Figure 17. Typical Detectable Warning Strip

Figure 18. Loop Detectors Within Crosswalk

4. Evaluate the Deerfield Road intersection to improve geometry.
5. Relocate loop detectors that are in the cross walk at Rood Avenue (Figure 18).
6. Work with CTDOT to allow active speed detectors to be placed on state roads.
7. After the next significant snowstorm conduct a snow shelf analysis.
8. Work with CTDOT to encourage a cooperative design process and sufficient comment periods.

Figure 19 depicts these short-term recommendations.

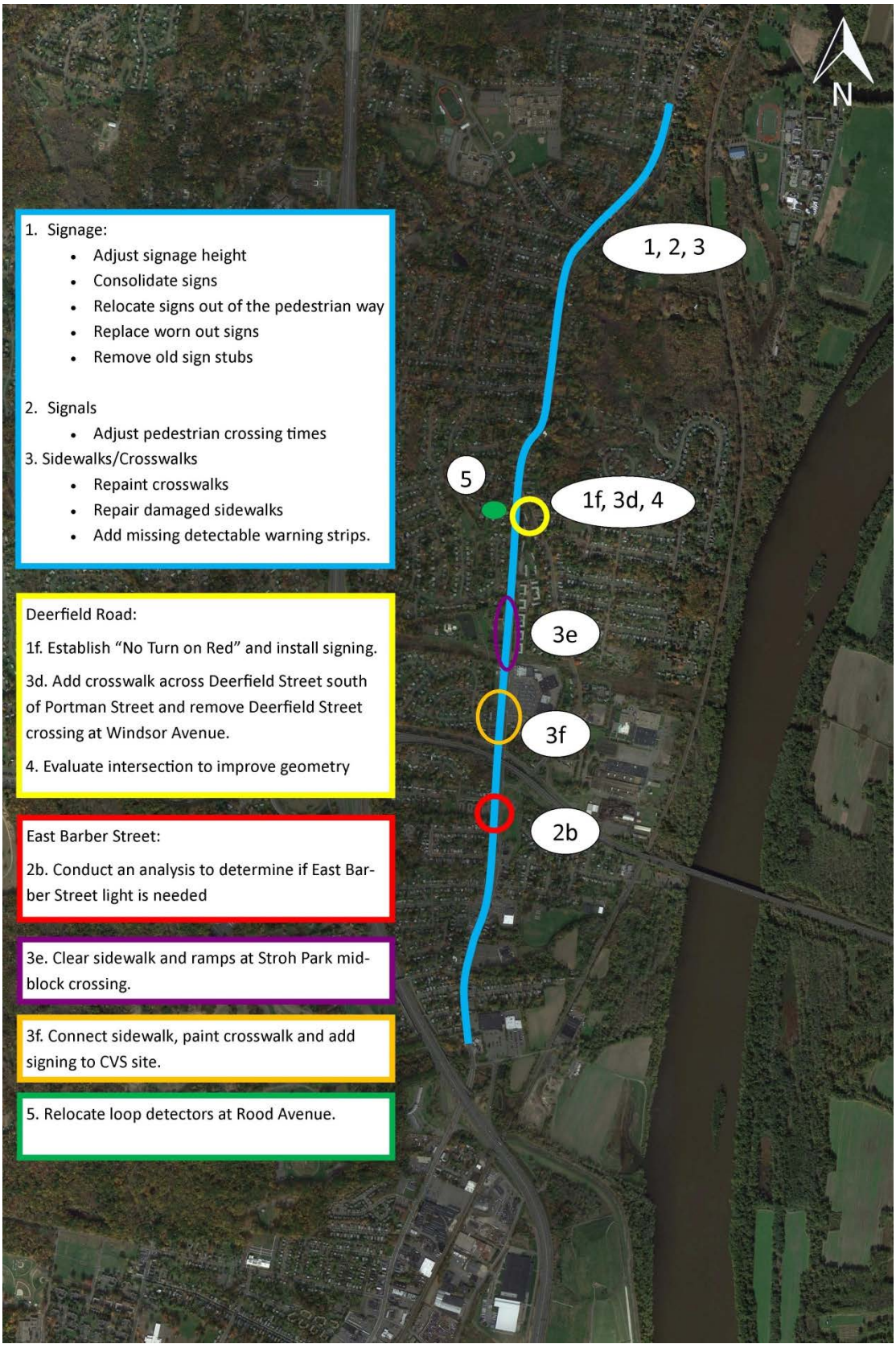


Figure 19. Short-Term Recommendations

4.2 Mid-Term

1. Bring all ramps into compliance with current ADA standards.
2. Replace existing pedestrian signals with count down signals (Figure 20).
3. Relocate pedestrian push buttons with ADA buttons in the correct locations.
4. Conduct a traffic/concept study of corridor, including capacity, additional bicycle accommodation, pedestrian safety, land use, access management, and drainage.
5. Improve street and sidewalk lighting at the I-291 overpass.
6. Improve lighting at the pedestrian crossing at Stroh Park.

Figure 20. Typical Countdown Head

Figure 21 depicts these mid-term recommendations.

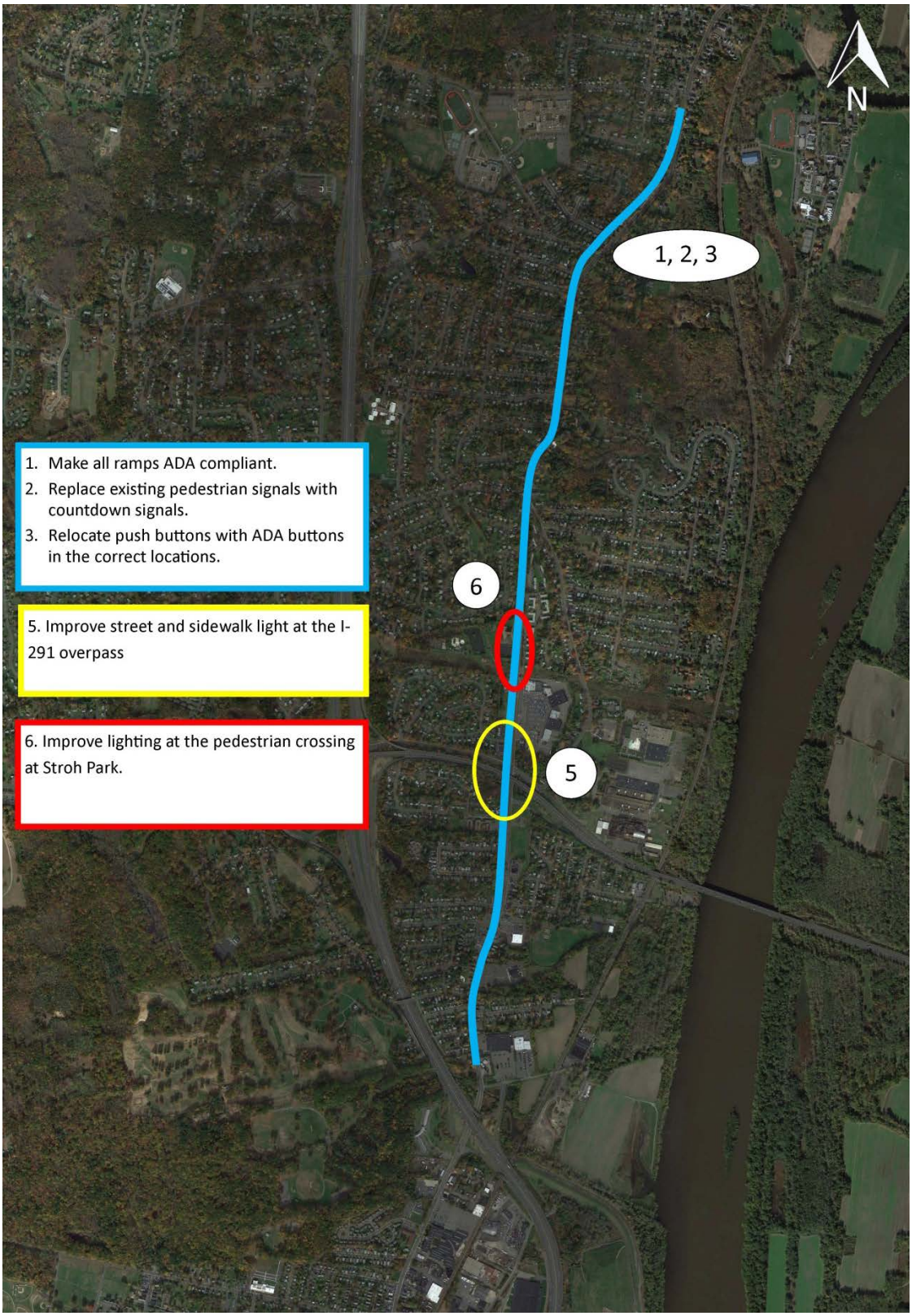


Figure 21. Mid-Term Recommendations

4.3 Long-Term

1. Bring all sidewalks up to current standards and widen, as appropriate. Relocate walks as necessary to provide adequate snow shelf.
2. Update curbing so that it has a sufficient reveal (lip).
3. Install rapid flashing beacons at the mid-block crossing at Stroh Park ().
4. Add crosswalk and flashing beacon across Windsor Avenue from Corey Street to connect to the Community Center.
5. All signalized crossings should have pedestrian signal heads and phasing.
6. Replace brick pavers with stamped concrete (23).
7. At the north signalized driveway for the Price Rite shopping plaza, geometric and signal modifications are needed to:
    - Control the gas station driveway movements with the traffic signal.
    - Better define the gas station drives.
    - Control the left turn entering and exiting movements (permitted at south drive and prohibited at north drive).
    - These improvements will require signalization modifications, median modifications and curb/driveway modifications.
8. Relocate utilities out of the sidewalk envelope.
9. If the study for Deerfield Road and Windsor Avenue determines that a new configuration is warranted, begin the design and construction process.
10. Replace all loop detectors with video detection (Figure).

Figure 25 depicts these long-term recommendations.

Figure 23. Typical Flashing Beacon

Figure 24. Example of Stamped Concrete Pavers

Figure 24. Video Detector

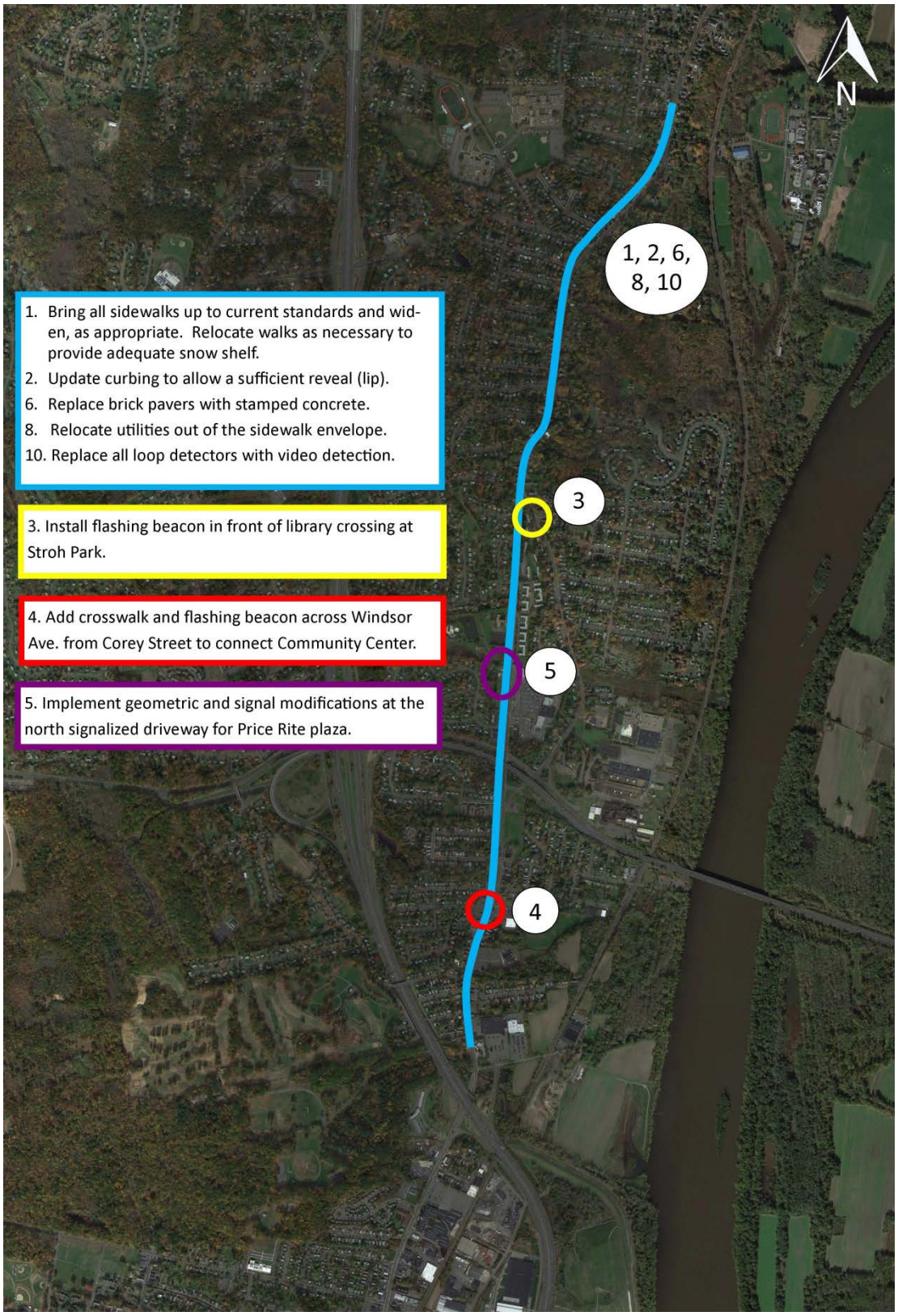


Figure 255. Long-Term Recommendations

4.4 Summary

This report outlines the observations, discussions and recommendations developed during the RSA. It documents the successful completion of the Town of Windsor RSA and provides Windsor with an outlined strategy to improve the transportation network along Windsor Avenue (Route 159) for all road users particularly focusing on pedestrians and cyclists. Moving forward, Windsor may use this report to prepare strategies for funding and implementing the improvements, and as a tool to plan for including these recommendations into future development along Windsor Avenue.

COMMUNITY
connectivity program

Appendix A

Built to deliver a better world

Welcome to the Community Connectivity Program Application

Please fill in the following information to provide the Audit team leaders with a comprehensive description of the area contained in this application.

1. Applicant contact information

Name	Victoria Houle
Title	Project Engineer
Email Address	houle@townofwindsorct.com
Telephone Number	(860) 285-1862

2. Location information

Address	Windsor Avenue (Route 159)
Description	Windsor Avenue from the Hartford townline to Broad St/Island Rd
City / Town	Windsor, CT

3. Roadway type
(Please select all that apply)

- [x] **State road**
- [ ] **Local road**
- [ ] **Private Road**
- [ ] **Other (please specify)**

4. Zoning
(Please select all that apply)

- [ ] **Industrial**
- [x] **Residential**
- [x] **Commercial**
- [x] **Mixed Use**
- [x] **Retail**
- [ ] **N/A (not applicable)**
- [x] **Other (please specify)**

Public & Quasi Public

5. Approximate mile radius around the location

Greater than a ½ mile

Other (Please Specify)

6. Community Sites
(Please select all that apply)

- [x] **Community Centers**
- [x] **Business Districts**
- [x] **Restaurant/Bar Districts**
- [x] **Churches**
- [x] **Housing Complexes**
- [x] **Proximity to Schools**
- [ ] **Tourist Locations (examples – Casino, Malls, Parks, Aquarium, etc...)**
- [ ] **N/A (not applicable)**
- [ ] **Other (please specify)**

Public & Quasi Public

7. Employment Facilities
(Retail, Industrial, etc...)

- [x] **Yes**
- [ ] **No**

If Yes please describe (please specify)

This corridor is connected to both small local business as well as larger shopping centers which provide employment opportunities to both Windsor residents as well as out-of-town commuters. Employment facilities include retailers and businesses such as local grocery markets, small restaurants, gas stations, hair salons, Dunkin

8. Educational facilities
(Please select all that apply)

- [x] **Public, Parochial, Private Schools (more than 1 school within a ½ mile)**
- [ ] **University / Community Colleges**
- [ ] **N/A (not applicable)**
- [x] **Other (please specify)**

The Bureau of Education and Services for the Blind (BESB)

9. Transit facilities
(Please select all that apply)

- [x] **Bus**
- [ ] **Rail**
- [ ] **Ferry**
- [ ] **Airport**
- [x] **Park and Ride Lot**
- [ ] **N/A (not applicable)**
- [x] **Other (please specify)**

Link to the Windsor River Trail System, Link to CT DEEP Boat Launch at East Barber

10. Safety Concerns
(Please select all that apply)

- [x] **Traffic (volumes & speed)**
- [x] **Collisions**
- [x] **Sidewalks**
- [x] **Traffic Signals**
- [ ] **Traffic Signs**
- [x] **Parking Restrictions / Additions**
- [x] **Drainage**
- [x] **ADA Accommodations**
- [ ] **Agricultural & Live Stock crossing**
- [x] **Maintenance issues (cutting grass, leaves, snow removal)**
- [ ] **N/A (not applicable)**
- [x] **Other (please specify)**

Bicyclist safety

11. Are there any past, current or future transportation/economic development projects near this location (i.e. Federal, State or local projects)?

Yes

If Yes please describe and list all projects.

The Town owns a parcel at 458 Windsor Avenue which was obtained for the purposes of providing a future mixed-use development site. The Town has been actively monitoring potential redevelopment opportunities for this site.

The Town has also completed a conceptual study and design for improvements to the medians along the corridor. Staff is also actively pursuing potential grant funding opportunities for the construction of these improvements.

The Connecticut Department of Transportation recently re-paved the portion of this roadway between the intersection of Route 218 and Island Road in 2013. The remaining stretch of roadway between Route 218 south to the Hartford townline is scheduled for resurfacing in 2016. It is desired by the Town to better accommodate bicyclist traffic along this stretch of roadway through line re-striping or some other means. A new traffic signal at the intersection of Windsor Avenue and Corey Street has also been approved for future installation. Funding for this project is also being pursued by the Town.

12. Environmental Concerns:

N/A not applicable

If Yes please describe and list.

13. Please explain why this location should be considered for an RSA

This project should be considered for a Road Safety Audit because it is a high traffic roadway with a large number of accidents. CT DOT traffic data indicates that there is an ADT along this stretch of roadway up to 19,700 vehicles per day collected at the intersection of Windsor Avenue and Route 218. Additionally, Town accident reports include approximately 120 accidents over the last three years along this stretch of roadway.

Pedestrian and bicyclist traffic is also significant as area residents walk and ride to shopping areas and work, as well as access the CT Transit bus line. According to Town accident reports, 3 accidents involving pedestrians have occurred within the last 3 years. There has been significant interest in the community to provide safer travel ways for bicyclist traffic along this roadway.

Sidewalks along the roadway have also aged and some are in need of repair. Sidewalk ramps and pedestrian traffic both at signalized and unsignalized sections are in need of improvements to better meet ADA guidelines.

The Town of Windsor ranks this project as the 1st priority of the 3 projects submitted with hopes to obtain recommendations to more safely accommodate bicyclist traffic along this roadway.

14. Are there plans to expand the area?
(Transportation Oriented Development, Economic Development, housing, etc...)

N/A not applicable

15. Any other pertinent information that is unique to this location?

N/A not applicable

Thank you for completing the Community Connectivity application.

Please click on the "submit button" below and include the following attachments

1. Location map (google, GIS) **(Required)**
2. Collision data (If available)
3. Traffic data (ADT or VMT) (If available)
4. Pedestrian/bicycle data (If available)

Submit Application

COMMUNITY
connectivity program

Appendix B

Built to deliver a better world

Road Safety Audit

Town: Windsor
RSA Location: Windsor Ave
Meeting Location: Town Hall
Address: 275 Broad St, Windsor, CT 06095
Date: 4/28/2016
Time: 8:30 AM

Participating Audit Team Members

Audit Team Member	Agency/Affiliation
Krystal Oldread	AECOM
Stephen Mitchell	AECOM
Jonathan Luiz	Town of Windsor
Victoria Houle	Town of Windsor
Abby St. Peter	Town of Windsor
Donald Melanson	Town of Windsor
Patrick Zapatka	CTDOT

COMMUNITY
connectivity program

Appendix C

Built to deliver a better world

Road Safety Audit – Windsor

Meeting Location: Windsor Town Hall
Address: 275 Broad Street, Windsor, CT 06095
Date: 4/28/2016
Time: 8:30 AM

Agenda

Type of Meeting: **Road Safety Audit – Pedestrian Safety**

Attendees: **Invited Participants to Comprise a Multidisciplinary Team**

Please Bring: **Thoughts and Enthusiasm!!**

8:30 AM **Welcome and Introductions**

- Purpose and Goals
- Agenda

8:45 AM **Pre-Audit**

- Definition of Study Area
- Review Site Specific Data:
  - Average Daily Traffic
  - Crash Data
  - Geometrics
- Issues
- Safety Procedures

10:00 AM **Audit**

- Visit Site
- As a group, identify areas for improvements

12:00 AM **Post-Audit Discussion / Completion of RSA**

- Discussion observations and finalize findings
- Discuss potential improvements and final recommendations
- Next Steps

2:30 PM **Adjourn for the Day – but the RSA has not ended**

Instruction for Participants:

- Before attending the RSA, participants are encouraged to observe the intersection and complete/consider elements on the RSA Prompt List with a focus on safety.
- All participants will be actively involved in the process throughout. Participants are encouraged to come with thoughts and ideas, but are reminded that the synergy that develops and respect for others' opinions are key elements to the success of the overall RSA process.
- After the RSA meeting, participants will be asked to comment and respond to the document materials to assure it is reflective of the RSA completed by the multidisciplinary team.

Audit Checklist

Pedestrians and Bicycles	Comment

Pedestrian Crossings
• Sufficient time to cross (signal)
• Signage
• Pavement Markings
• Detectable warning devices (signal)
• Adequate sight distance
• Wheelchair accessible ramps
  o Grades
  o Orientation
  o Tactile Warning Strips
• Pedestrian refuge at islands
• Other	

Pedestrian Facilities
• Sidewalk
  o Width
  o Grade
  o Materials/Condition
  o Drainage
  o Buffer
• Pedestrian lighting
• Pedestrian amenities (benches, trash receptacles)
• Other	

Bicycles • Bicycle facilities/design • Separation from traffic • Conflicts with on-street parking • Pedestrian Conflicts • Bicycle signal detection • Visibility • Roadway speed limit • Bicycle signage/markings • Shared Lane Width • Shoulder condition/width • Traffic volume • Heavy vehicles • Pavement condition • Other	

Roadway & Vehicles	
• Speed-related issues o Alignment; o Driver compliance with speed limits o Sight distance adequacy o Safe passing opportunities	
• Geometry o Road width (lanes, shoulders, medians); o Access points; o Drainage o Tapers and lane shifts o Roadside clear zone /slopes o Guide rails / protection systems	

• Intersections o Geometrics o Sight Distance o Traffic control devices o Safe storage for turning vehicles o Capacity Issues	

• Pavement
  o Pavement Condition (excessive roughness or rutting, potholes, loose material)
  o Edge drop-offs
  o Drainage issues
• Lighting Adequacy	

• Signing
  • Correct use of signing
  • Clear Message
  • Good placement for visibility
  • Adequate retroreflectivity
  • Proper support	

• Signals
  o Proper visibility
  o Proper operation
  o Efficient operation
  o Safe placement of equipment
  o Proper sight distance
  o Adequate capacity	

• Pavement Markings
  o Correct and consistent with MUTCD
  o Adequate visibility
  o Condition
  o Edgelines provided	

• Miscellaneous
  o Weather conditions impact on design features.
  o Snow storage	

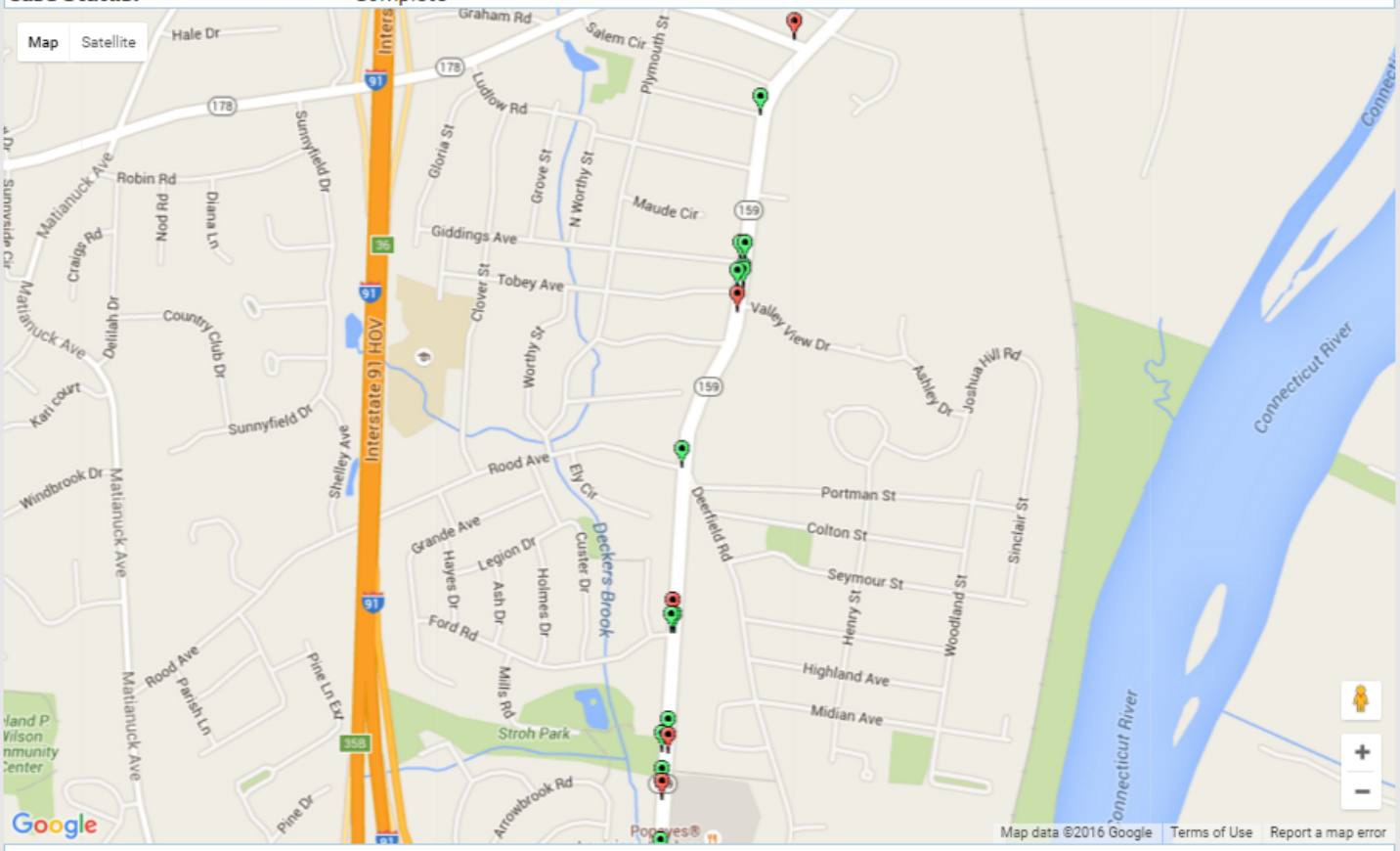
Windsor Avenue (Rt 159)
Community Connectivity
Program Application
Site Location Map
Project Area
N
Feet
0
1,500
3,000
TOWN OF WINDSOR
First in Connecticut. First for its citizens.
Windsor
W I N D S O R
SOUTH WINDSOR
RIVER
91
Loomis Institute
High Sch
Stony Hill Sch
Park Ave Sch
Clover St Sch
Wilson Jr High Sch
Wilson
Golf Course
Soldiers Field Cemetery
INTERCHANGE 34
INTERCHANGE 35
INTERCHANGE 36
BISSELL BRIDGE
WINDSOR MEADOWS STATE PARK
Barbour Sch
Hospital

Average Daily Traffic (ADT)

2015 Crashes

UCONN Connecticut Crash Data Repository

Search Criteria:	
Dataset:	mmucc
Towns:	Windsor
Town & Route:	Town:164 Route:159 Intersection:undefined Milepost:-
Crash Severity:	Injury of any type (Serious, Minor, Possible), Fatal (Kill), Property Damage Only
Body Type:	null, null, null
Condition at Time of Crash:	null, null, null
Driver Distracted By:	null, null, null
Non-motorist Distracted By:	null, null, null
Case Status:	Complete



Markers | Heatmap | Select & Query | Query Selection

Injury of any type (Serious, Minor, Possible) | Fatal (Kill) | Property Damage Only

Select All | Deselect All

2015 Crashes

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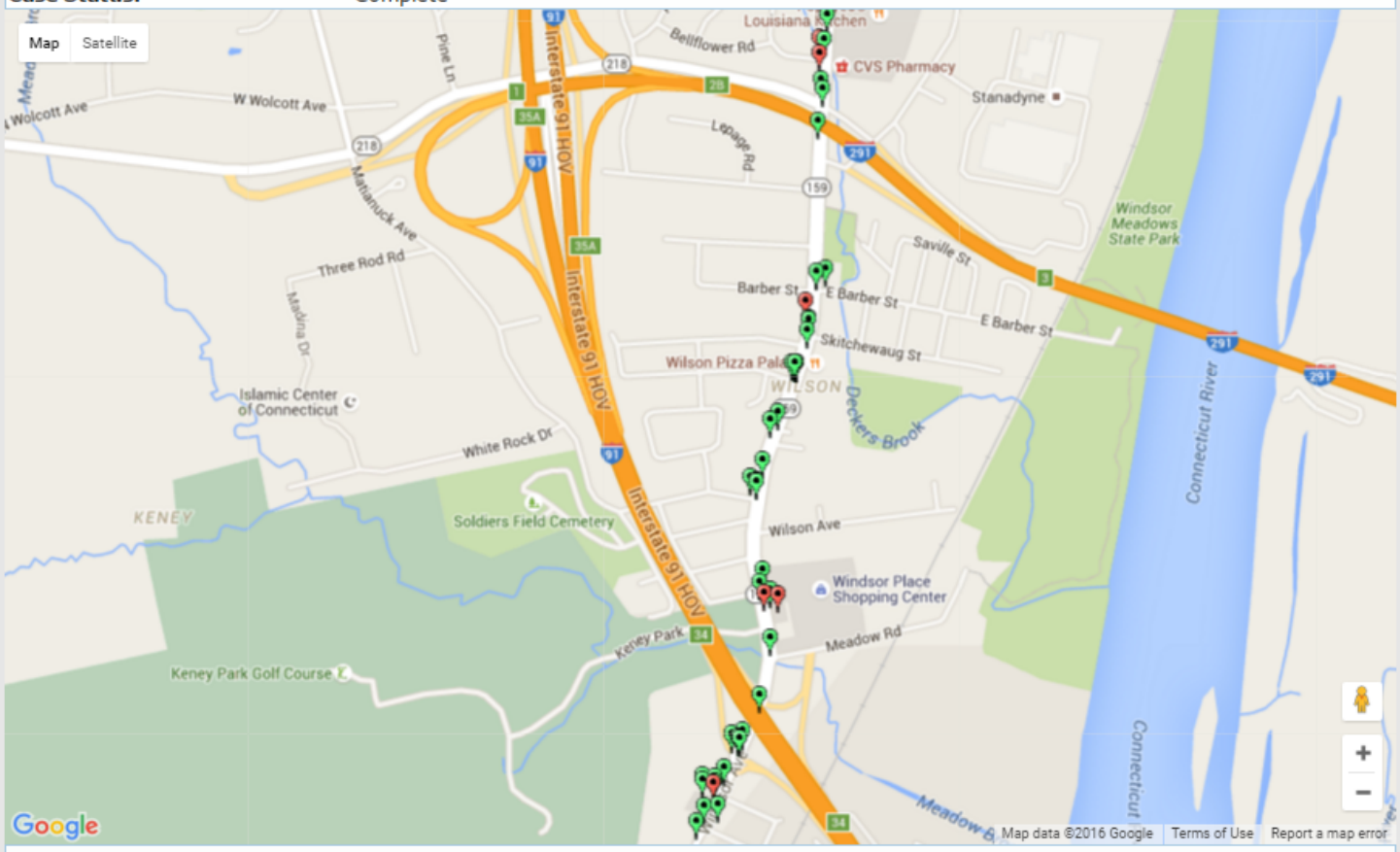


Markers | Heatmap | Select & Query | Query Selection

Injury of any type (Serious, Minor, Possible) | Fatal (Kill) | Property Damage Only

Select All | Deselect All

This web site is exempt from discovery or admission under 23 U.S.C. 409.

Road Safety Audit – Windsor

Crash Summary

Data: 3 years (2012-2014)

1 accident resulted in a fatality

7 accidents involved pedestrians, all resulted in injuries

4 accidents involved bicyclists, 3 resulted in injuries

Severity Type	Number of Accidents	
Property Damage Only	141	72%
Injury (No fatality)	54	28%
Fatality	1	1%
Total	196	

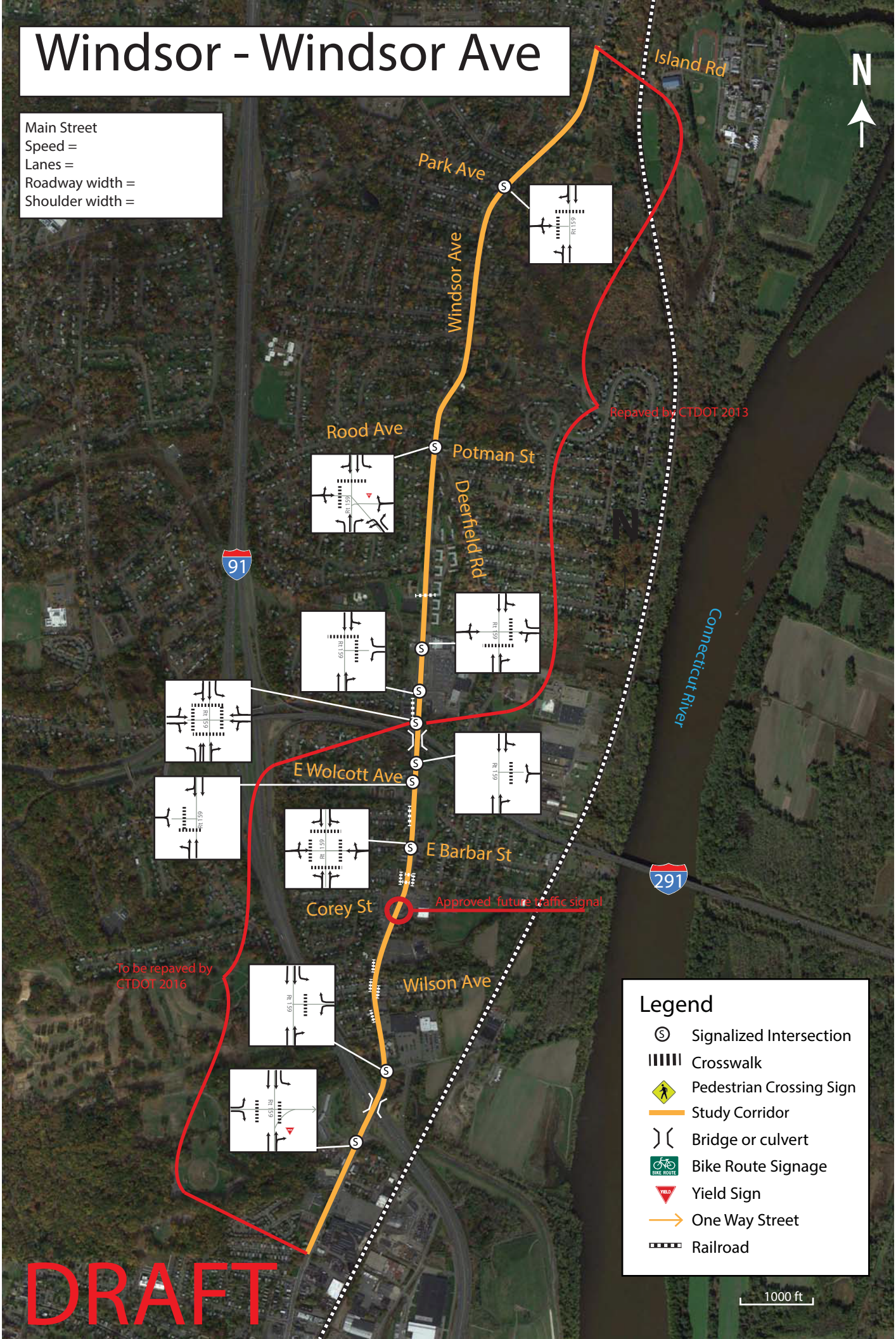
Manner of Crash / Collision Impact	Number of Accidents	
Unknown	0	0%
Sideswipe-Same Direction	24	12%
Rear-end	57	29%
Turning-Intersecting Paths	37	19%
Turning-Opposite Direction	18	9%
Fixed Object	19	10%
Backing	4	2%
Angle	10	5%
Turning-Same Direction	16	8%
Moving Object	4	2%
Parking	0	0%
Pedestrian	7	4%
Overturn	0	0%
Head-on	0	0%
Sideswipe-Opposite Direction	0	0%
Total	196	

Weather Condition	Number of Accidents	
Snow	4	2%
Rain	21	11%
No Adverse Condition	165	84%
Unknown	3	2%
Blowing Sand, Soil, Dirt or Snow	1	1%
Other	0	0%
Severe Crosswinds	0	0%
Sleet, Hail	2	1%
Total	196	

Light Condition	Number of Accidents	
Dark-Not Lighted	5	3%
Dark-Lighted	44	22%
Daylight	143	73%
Dusk	1	1%
Unknown	2	1%
Dawn	1	1%
Total	196	

Road Surface Condition	Number of Accidents	
Snow/Slush	7	4%
Wet	41	21%
Dry	143	73%
Unknown	3	2%
Ice	1	1%
Other	1	0.5%
Total	196	

Time		Number of Accidents	
0:00	0:59	2	1.0%
1:00	1:59	2	1.0%
2:00	2:59	1	0.5%
3:00	3:59	1	0.5%
4:00	4:59	2	1.0%
5:00	5:59	2	1.0%
6:00	6:59	1	0.5%
7:00	7:59	11	5.6%
8:00	8:59	15	7.7%
9:00	9:59	7	3.6%
10:00	10:59	6	3.1%
11:00	11:59	8	4.1%
12:00	12:59	11	5.6%
13:00	13:59	9	4.6%
14:00	14:59	14	7.1%
15:00	15:59	18	9.2%
16:00	16:59	23	11.7%
17:00	17:59	22	11.2%
18:00	18:59	12	6.1%
19:00	19:59	9	4.6%
20:00	20:59	7	3.6%
21:00	21:59	3	1.5%
22:00	22:59	7	3.6%
23:00	23:59	3	1.5%
Total		196	


Windsor - Windsor Ave
Main Street
Speed =
Lanes =
Roadway width =
Shoulder width =
Island Rd
Park Ave
Windsor Ave
Rood Ave
Potman St
Deerfield Rd
Repaved by CTDOT 2013
91
Connecticut River
E Wolcott Ave
E Barbar St
291
Corey St
Approved future traffic signal
To be repaved by CTDOT 2016
Wilson Ave
N
Legend
Signalized Intersection
Crosswalk
Pedestrian Crossing Sign
Study Corridor
Bridge or culvert
Bike Route Signage
Yield Sign
One Way Street
Railroad
1000 ft
DRAFT

Post-Audit Discussion Guide

Safety Issues

- Confirmation of safety issues identified during walking audit

Potential Countermeasures

- Short Term recommendations

- Medium Term recommendations

- Long Term recommendations

Next Steps

- Discussion regarding responsibilities for implementing the countermeasures (including funding)

Road Safety Audit – Windsor

Fact Sheet

Functional Classification:

- The Windsor Avenue corridor (Route 159) is classified as a Minor Arterial

ADT

- ADT along this corridor spans between 9,900 and 12,200

Population and Employment Data (2014):

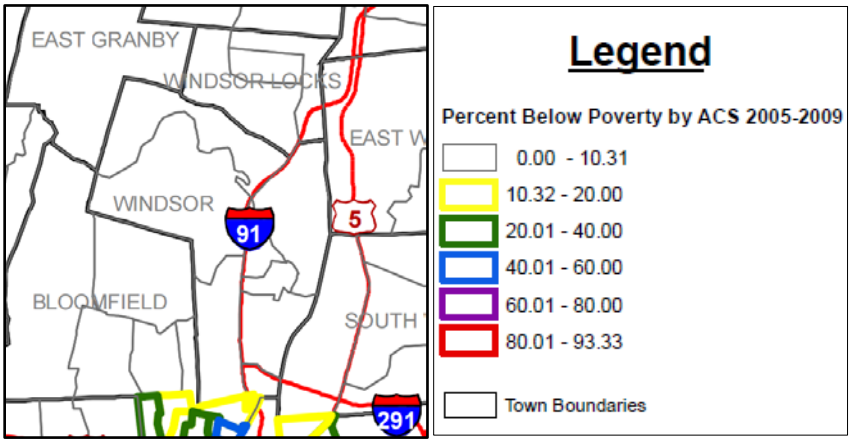
- Population: 29,130
- Employment: 23,990

Urbanized Area

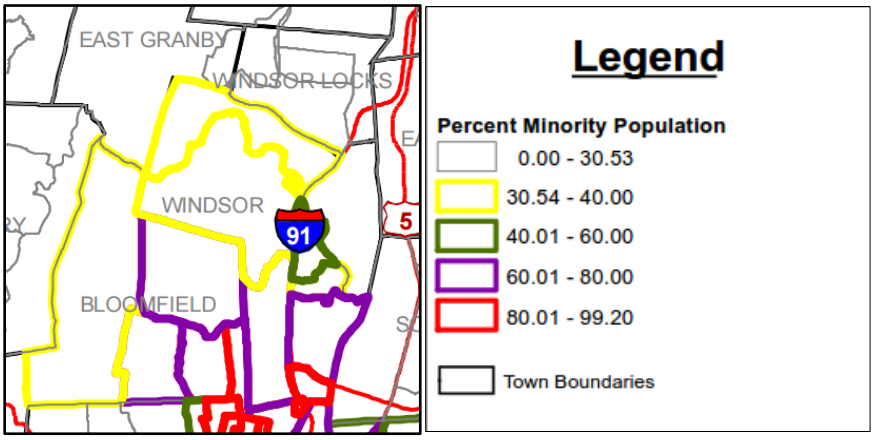
- Windsor Avenue is located within the Hartford Urbanized Area

Demographics

- The statewide average percentage below the poverty line is 10.31%. On the southern end of this corridor, near the Hartford city line, up to 20% of Windsor residents are below the poverty line.



- The statewide average percentage minority population is 30.53%. On the southern end of this corridor, near the Hartford city line, up to 99.2% of Windsor residents are minority.



Air Quality

- Windsor's CIPP number 228
- Windsor is within the Greater CT Marginal Ozone Area
- Windsor is within a CO Attainment Area