COMMUNITY
connectivity program

Manchester

Downtown – Road Safety Audit

August 3, 2016

CONNECTICUT DEPARTMENT OF TRANSPORTATION

AECOM

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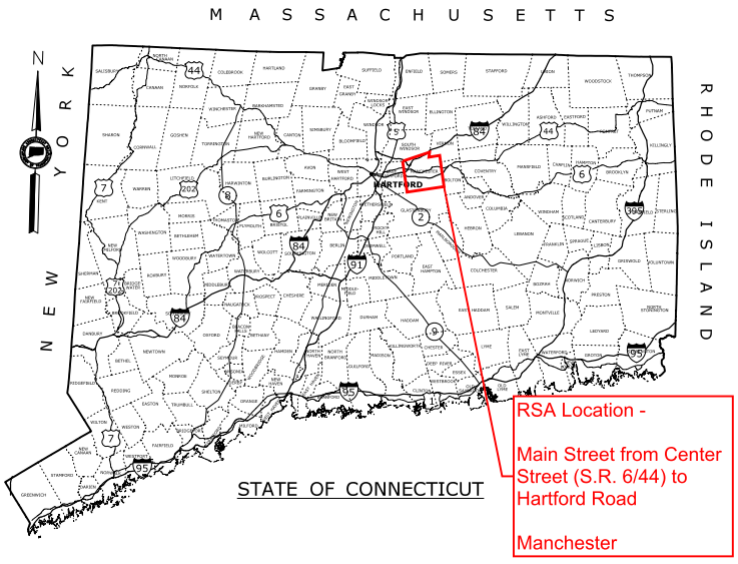
The Connecticut Department of Transportation (CTDOT) is undertaking a Community Connectivity Program that focuses on improving the state's transportation network for all users, with an emphasis on bicyclists and pedestrians. A major component of this program is conducting Road Safety Audits (RSA's) at 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 Manchester (Downtown) RSA

The Town of Manchester submitted an application to complete an RSA along Main Street to improve safety for pedestrians and bicyclists. The northern section includes civic functions (Mary Cheney Library and Center Park) on the west side of the street and small businesses on the east side. The central section includes dense small retail, commercial and office development as well as some religious institutions on both sides of the road. The southern section includes Bennet Academy (public middle school), Carter Chevrolet and small businesses on the east side; and South Methodist Church and Bennet senior housing complex on the west side. The Town is concerned with improving pedestrian safety in this commercial area. There have been several crashes involving pedestrians, and many of the incidents occurred at night when visibility is lower and average speeds increase due to lower traffic volume. In addition to these concerns, pedestrians have been observed crossing mid-block, posing a safety risk from conflict with unsuspecting motorists.

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

1.1 Location

The site is the 0.8 mile section of Main Street between Center/East Center Street and Charter Oak Street/Hartford Road in the Town of Manchester (Figure 1). Main Street is a town owned road and is classified as a Principal Arterial. The northern end of Main Street Average Daily Traffic (ADT) is 14,000 vehicles per day (vpd.) and at the southern end by Hartford Road the ADT is 17,000 vpd. The southern end of the corridor provides connections to/from I-384, the primary highway access for southern Manchester (Figure 1). Figure 2 shows the regional location of the RSA and the roadway network in the surrounding area.

Figure 1. Main Street, Manchester

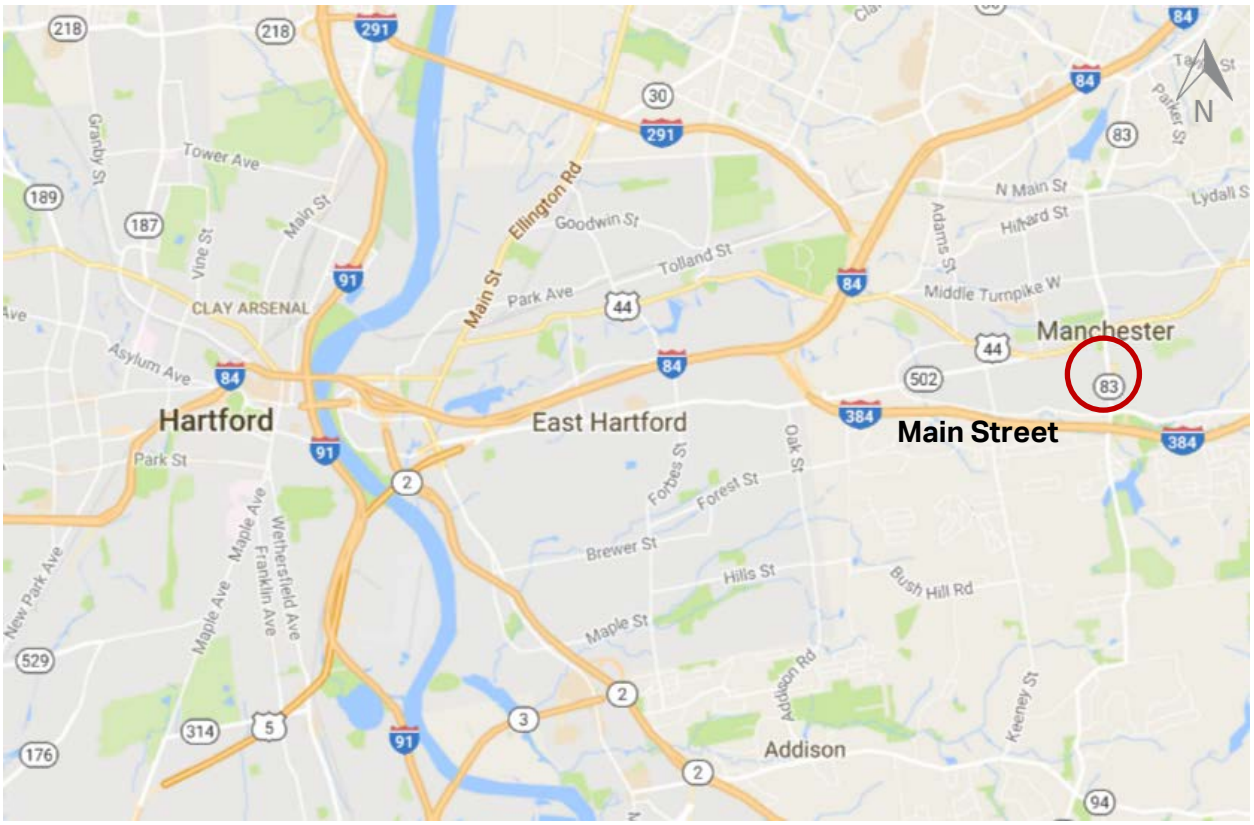


Figure 2. Study Area - Regional Context

Source: Google Maps

2 Pre-Audit Assessment

2.1 Pre-Audit Information

The crash history in the audit corridor is relatively high, with a total of 220 accidents reported between 2012 and 2014 (Table 1). The majority of crashes were classified as property damage only; however 22% resulted in injury. Rear-end collisions were the most common type, accounting for 38% of all crashes (Table 2). Rear-end collisions are commonly associated with traffic congestion, closely spaced intersections, roadside parking and frequent driveways, all of which is consistent with the corridor's characteristics. Other commonly reported types were Sideswipe-Same Direction (19% of crashes) and Turning-Intersecting Paths accounting for 10% of crashes. These are also consistent with this corridor.

Between 2012 and 2014 five crashes involving a pedestrian was reported, including four injuries and one fatality. In all of these incidents, the pedestrian was at or close to a signalized pedestrian crossing. It is also noted that most of the incidents occurred at night when

visibility is lower and average speeds increase due to lower traffic volume. There were two reported crashes involving bicyclists in side street crosswalks, both resulting in injuries.

Severity Type	Number of Accidents	
Property Damage Only	170	77%
Injury of any type (Serious, Minor, Possible)	49	22%
Injury (No fatality)	1	0%
Total	220	

Table 1. Crash Severity 2012-2014

Source: UConn Connecticut Crash Data Repository

Manner of Crash / Collision Impact	Number of Accidents	
Turning-Intersecting Paths	3	1%
Sideswipe-Same Direction	41	19%
Rear-end	84	38%
Angle	21	10%
Backing	19	9%
Turning-Opposite Direction	10	5%
Turning-Same Direction	10	5%
Fixed Object	4	2%
Sideswipe-Opposite Direction	7	3%
Head-on	0	0%
Not Applicable	15	7%
Front to rear	5	2%
Rear to rear	0	0%
Front to front	1	0%
Sideswipe, same direction	0	0%
Sideswipe, opposite direction	0	0%
Total	220	

Table 2. Crash Type 2012-2014

Source: UConn Connecticut Crash Data Repository

Figure 3 through Figure 5 display the crashes that occurred along the corridor during 2015. The majority of crashes are concentrated at the intersections. The largest cluster of crashes occurred at the signalized intersections of Center/East Center Street and Hartford Street/Charter Oak Street. A relatively high proportion of the accidents that occurred at the intersection with Hartford Street/Charter Oak Street resulted in injuries, suggesting higher

speeds at this location, possibly due to the less urban feel of Main Street south of this location and the presence of the interstate highway ramps.

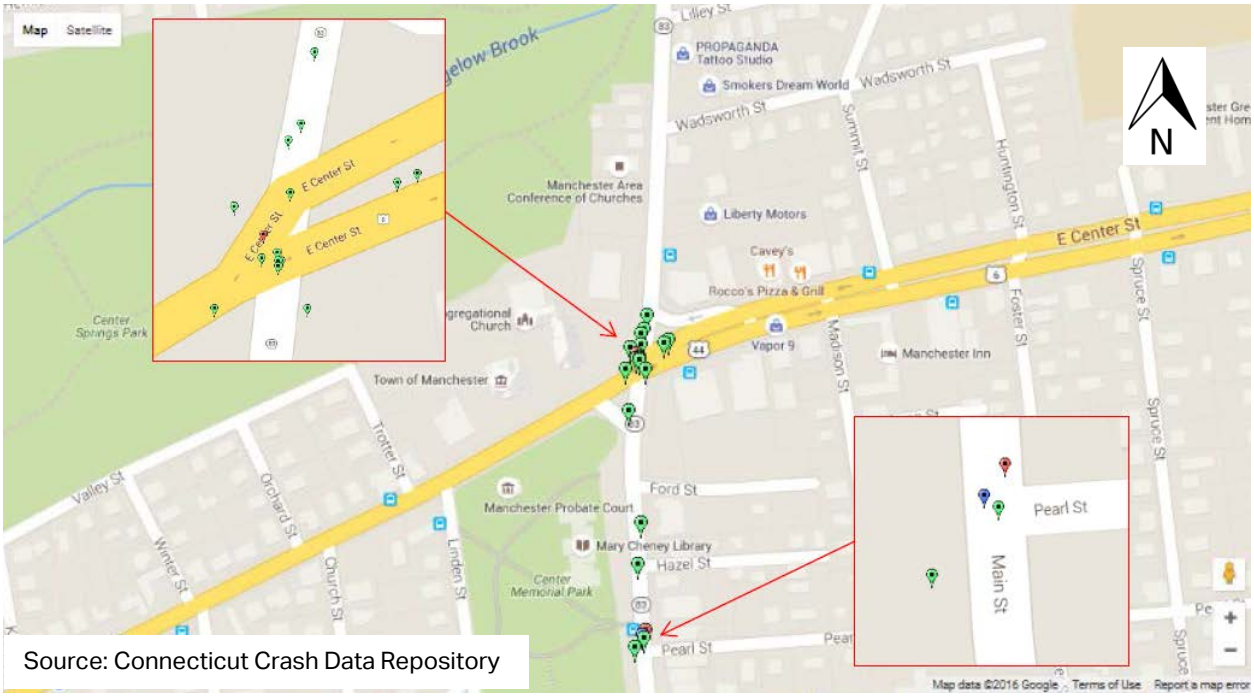


Figure 3. Crashes that Occurred in 2015 (Connecticut Crash Data Repository) , Northern Section of Main Street

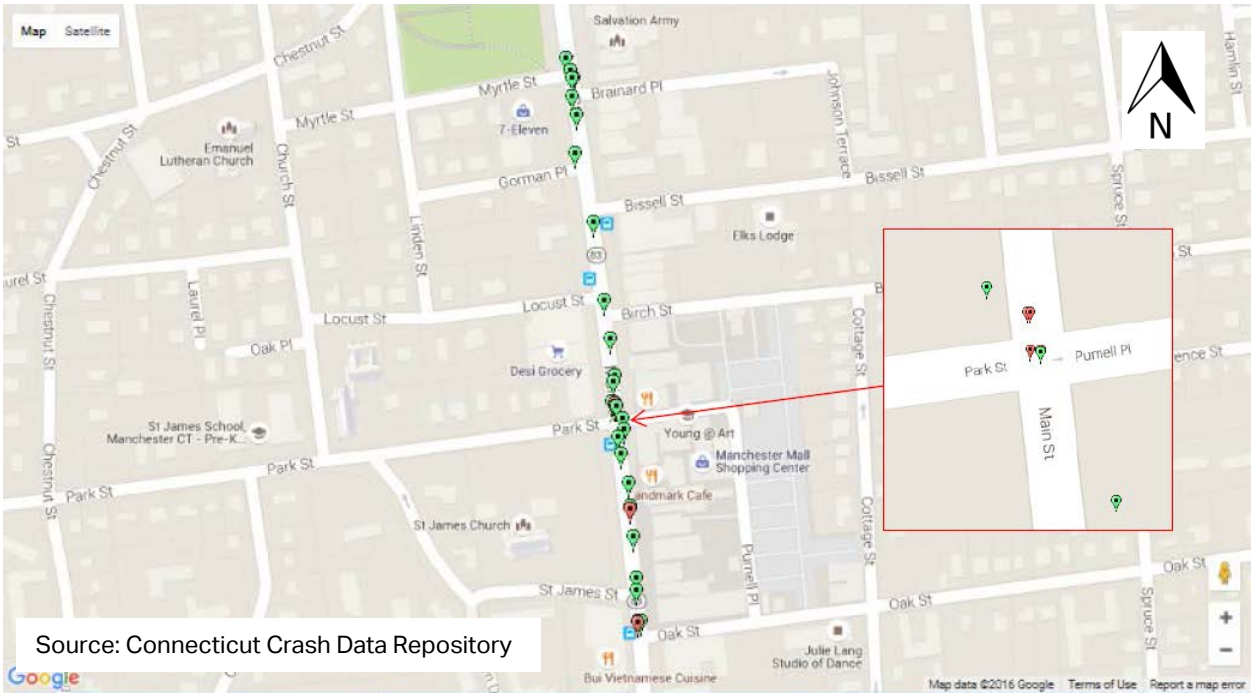


Figure 4. Crashes that Occurred in 2015 (Connecticut Crash Data Repository) , Central Section of Main Street

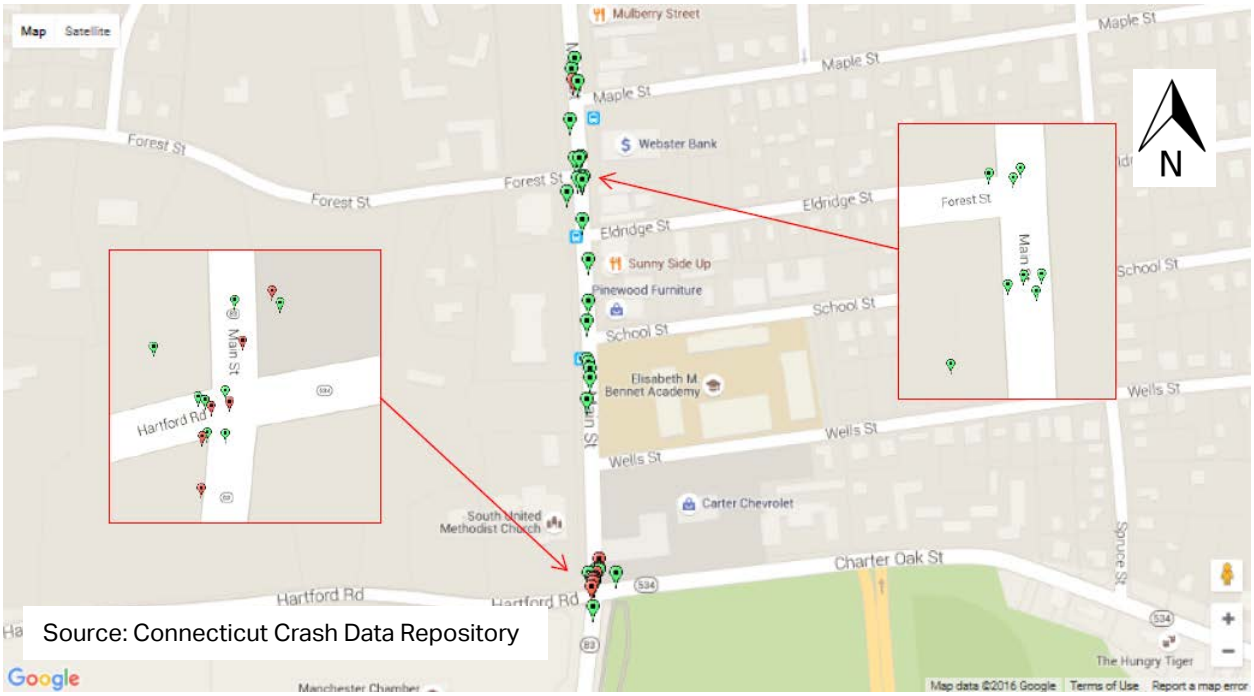


Figure 5. Crashes that Occurred in 2015 (Connecticut Crash Data Repository), Southern Section of Main Street

Main Street is a four lane Town-owned arterial through the downtown area of Manchester with angle parking on both sides. The posted speed limit is 25 mph. Speed counts taken in September of 2015 show that the 85th percentile is between 32 and 36 miles per hour but the maximum recorded speed was two times the 85th percentile (70 MPH). The speed limit is posted and visible along Main Street.

There are nineteen intersections along the corridor. Nine intersections are signalized, and the remaining ones are side-street stop controlled. All of the signalized intersections have exclusive pedestrian signals and crosswalks across many of the legs. There are sidewalks along both sides of Main Street for its entirety. They vary in width but extend through all driveways and have crosswalks across all intersecting streets. Many of the crosswalks on Main Street and intersecting side streets use stamped red brick pavers for emphasis.

There is free on-street parking along Main Street. The majority of the parking is angled except for short lengths of parallel parking in front of St James Church and the Chevrolet Dealership. There is very little room between the end of the parking stalls and the shoulder line. The physical characteristics of the roadway are shown in Figure 6. Main Street Road Geometricsand tabulated in Table 3.

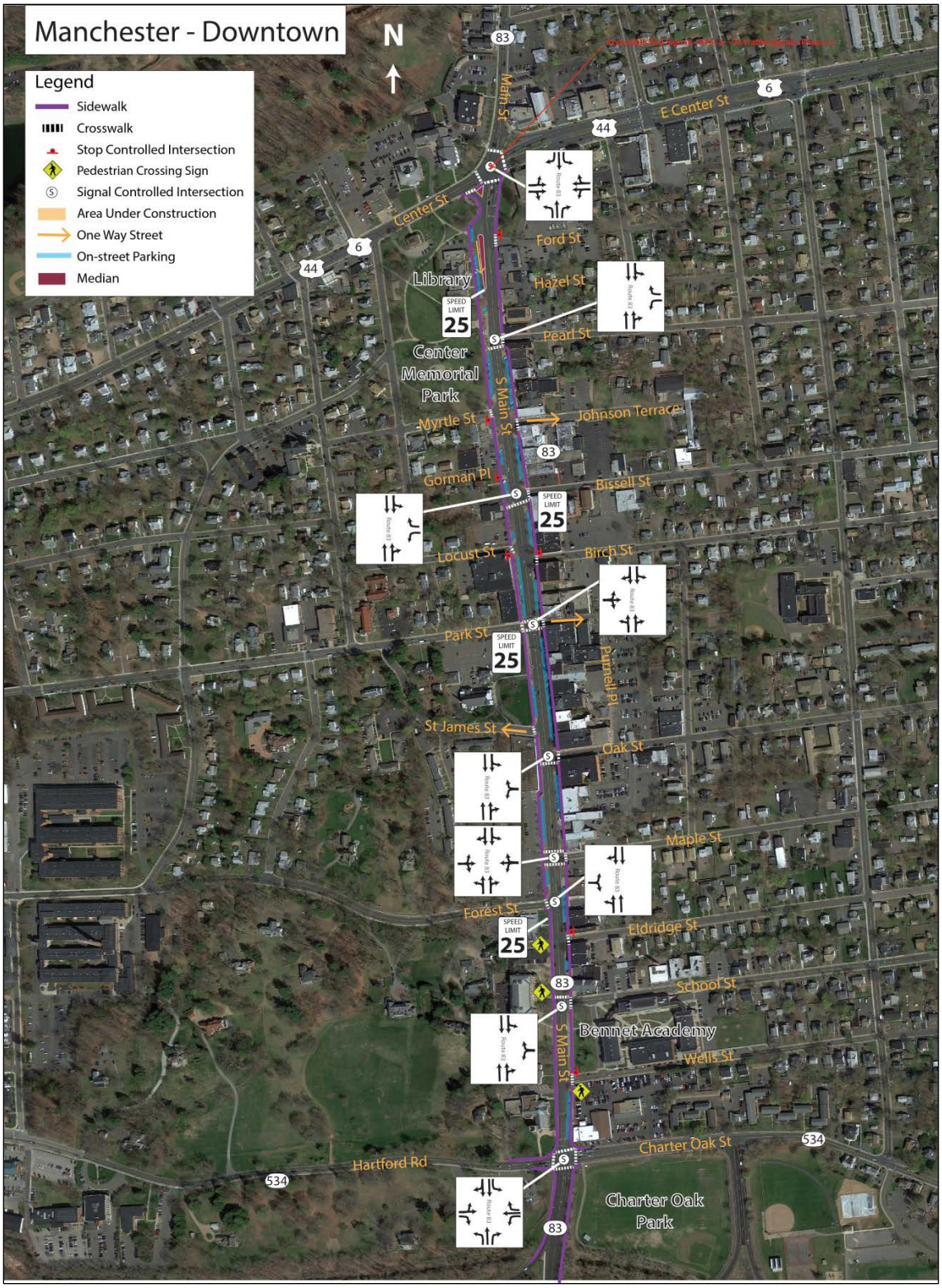


Figure 6. Main Street Road Geometrics

Manchester - Main Street

Street Inventory

From	To	Distance	Width	Sidewalk				Curb	Parking	Shoulder	Ramps	
				Side	Type	Width	Condition				Exist	Compliant
Center Street	Pearl Street	0.15 miles	22'	NB	Concrete	8'	Fair	Concrete	No	2'	Yes	Some
			22'	SB	Concrete	8'	Fair	Concrete	Yes	2'	Yes	Some
Pearl Street	Hartford Road	0.65 miles	22'	NB	Concrete	10-20'	Fair	Concrete	Yes	2'	Yes	Some
			22'	SB	Concrete	8-14'	Fair	Concrete	Yes	2'	Yes	Some

***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. Intersection Street Inventory

2.2 Prior Successful Efforts

- Redesigned in 1980's with new sidewalk, curbing, lighting and streetscaping.
- Installing LED lighting (Figure 7).
- Added crosswalk enhancements (colored brick finish).
- Updated many pedestrian signals.

Figure 7. New LED Lighting Being Installed

2.3 Pre-Audit Meeting

The RSA was conducted on August 3, 2016 The Pre-Audit meeting was held at 8:30 AM in the Lincoln Center Hearing Room located at 494 Main Street in Manchester.

The RSA Team was comprised of staff from CTDOT and AECOM, and representatives from several Manchester departments and organizations including the Engineering Department, Police Department, Downtown Special Services District, and the Planning Department. 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 road geometrics, can be found in Appendix C.

RSA Team members from Manchester presented relevant information for the audit, including:

- Main Street was redesigned in the 1980's to put in new sidewalk, curbing, lighting, streetscape amenities and new signals.
- Main Street is not used as a through road; most traffic is local.
- There are a significant number of vehicles that travel along Main Street.

- Crashes occur all throughout the day but ones involving injuries and fatalities occur after 6 PM. Research on speed and crash severity found that after 6 PM when traffic decreases, the speeds ramp up and that is when more severe accidents occur. It is difficult to design for both daylight and nighttime. Many of the crashes resulting in severe injuries or fatalities were attributed to lack of visibility. There is no center lighting and the cross-section of the road is wide.
- Traffic signals along Main Street are set to a progression of 25 MPH. At night there is limited side street traffic so vehicles travel at a higher speed.
- All traffic signals on Main Street have pedestrian push buttons and an exclusive phase.
- Pedestrians often cross mid-block.
- There is a significant amount of pedestrian traffic along Main Street throughout the day.
- Coming off of the highway, the road is wide and visually encourages motorists to go fast. There is no gateway at the southern end of Main Street to signify that this is a pedestrian and commercial zone.
- There have been some discussions regarding installing a center median along Main Street in order to provide traffic calming. There are significant concerns about its impact on the Manchester Road Race.
- Manchester is currently converting all street lights to LED along Main Street in order to improve lighting.
- There is no crossing on Main Street by Myrtle Street; pedestrians tend to Jay-walk here to access the convenience store.
- There used to be no U-turn signs at all signalized intersections along Main Street, but they are no longer there.
- Pearl Street and Locust Street were formerly one-way, but are now bidirectional. Saint James Street and Brainard Place are still one-way, and motorists have been observed going the wrong way.
- There are no traffic signals at either Birch Street or Locust Street.
- Many of the side streets have limited sight lines when trying to pull out onto Main Street.
- There are bulb outs at most of the intersections but the Main Street still feels wide, particularly where angle parking exists. The width of the road makes lighting difficult.
- South of Hartford Road, Main Street is state Route 83.
- The police department recently put up portable speed monitors to collect data along Main Street. The data showed that the 85th percentile was within 15 MPH of the posted speed limit (25 MPH) which implies that there is not excessive speeding along the roadway.
- Between Center Street and Park Street it is difficult for motorists to see pedestrians crossing at night due to the limited lighting, change in elevation, and oncoming headlights, which back light pedestrians.

- Parking along Main Street is predominately angled. The potential for reversed angle parking was discussed. With reverse angled parking vehicles back into the parking stalls. The shallow angle provides better visibility and safety is improved in a number of ways:
    - The trunk is to the sidewalk and not traffic if you must open it.
    - The doors open towards the street blocking children from the road.
    - Vehicles can pull straight into traffic, with better visibility.
- Reverse angle parking could help decrease the overall crash rate, but it does not narrow the roadway width.
- How can bicyclists be accommodated? Currently they ride on the sidewalk even though there are town ordinances against it. Installing bike lanes would require taking away a lane of traffic. Options for bicycle lanes with the angled parking includes creating a buffer behind the angle parking and placing the bicycle lanes on the edge of the travel lanes, creating bicycle lanes in the center of the roadway, converting parking to parallel and using the extra space to install lanes, or installing a bicycle lane between the sidewalk and parking stalls by pushing parking towards the center.
- A road diet was discussed, which would condense the lanes down to three lanes with the center lane used as a left turn lane. This could cause queueing problems at the signals since there is a short distance between many of them.

3 RSA Assessment

3.1 Field Audit Observations

- Intersection of Main Street and Center Street/East Center Street (Route 44) (Figure 8):
    - There is no turn on red from southbound Main Street to Center Street westbound.
    - This intersection has an exclusive pedestrian phase. The pedestrian signal heads are not countdown. They are audible.
    - The ramps do not have tactile warning strips.
    - The crosswalks are the "Zebra Style."
    - The sidewalks on the south side of the intersection are 10 feet wide.

Figure 8. Intersection of Main Street and Route 44

- Manchester is currently retrofitting the street lights with LED and positioning them in such a way to maximize the light shed.
- The curbing is deteriorating in places (Figure 9).
- There are bus bay pull outs on both sides of Main Street in front of Center Memorial Park. The stop on the west side has a shelter, but the east side does not (Figure 10).
- There is a mix of bicycle friendly and non-friendly catch basin grates along the corridor.
- Manchester has invested in streetscaping.
- To provide parking in front of the library, an island was installed to create a buffer (Figure 11). There were discussions about increasing the parking area by channeling all traffic into a single lane and adding parallel parking along the outside of the island. A second alternative would be to narrow the width of the median and convert the inside parking from parallel to angled.
- The Pearl Street intersection has crosswalks comprised of red brick pattern across the southern side of Main Street and across Pearl Street. Pedestrian use is heavy due to a CTTransit bus stop is on the western side. Pedestrians cross everywhere, not just the designated crosswalks. Barriers along the sidewalk could channelize people to marked crossings but there are maintenance concerns and potential snow removal issues. Decorative barriers would work best at key locations such as the bump outs.
    - The intersection only has tactile warning strips in the southeast corner. The pedestrian signal heads have audio and are count down.

Figure 9. Deteriorating Curbing

Figure 10. Bus Stop Pull Out on the East Side of Main Street

Figure 11. Island/Median in Front of Library to Designate Parking

- Just south of the Pearl Street Intersection angled parking begins. Cars often perform U-turns or left hand turns to access the parking on the other side.
- Several pedestrians were observed Jay-walking at several points along the corridor (Figure 12).
- There are bump outs at Brainard Place and the 7-Eleven (Figure 13). This intersection is not signalized. These bump outs shorten the crossing distance and many pedestrians cross mid-block here. A formalized mid-block crossing treatment here, such as a rapid flashing beacon, could prove useful.
    - A mid-block crossing here may require shortening the driveway widths for 7-eleven in order to install proper ramps.
    - This location could be a candidate for decorative fencing to channelize pedestrians to proper crossings.
    - An alternative to a mid-block crossing treatment would be to remove the signal at Pearl Street by converting it to a one-way street westbound and relocating the signal to Brainard Place.
- The Bissell Street intersection has count down pedestrian signal heads and is audible. There are crosswalks across Bissell Street and on the southern side of Main Street. There are detectable warning strips on all ramps.
- Pedestrians often cross on the north side of the Bissell Street Intersection, where there is not a crosswalk. The island in the northeast corner acts as a bump out.
- Many of the street lights are obstructed by the trees diminishing the light shed (Figure 14).

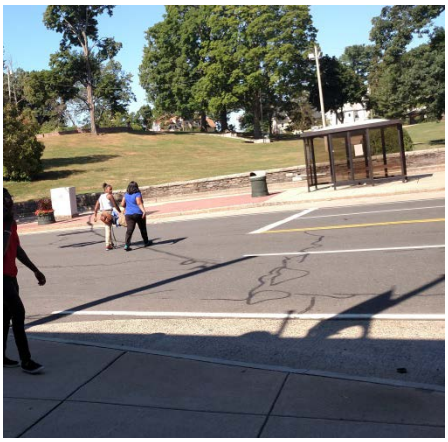


Figure 12. Pedestrians Crossing Mid-Block

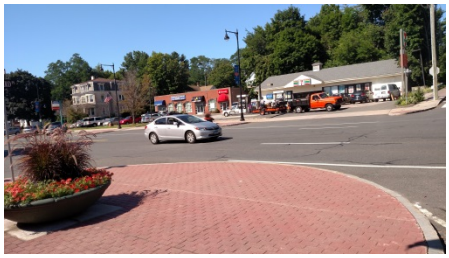


Figure 13. Bump Out at Brainard Place

Figure 14. Light Blocked by Tree Canopy

- A parking sign at Bissell Street is obstructed by the tree canopy.
- The sidewalk on the east side varies between 10 and 20 feet between Pearl Street and Hartford Road.
- The Birch Street crosswalk does not have tactile warning strips.
- The bump out at Birch Street encourages mid-block crossings.
- The stop bar at Birch Street is set far back resulting in very poor sight lines. Vehicles must pull past the stop bar and into the crosswalk to see. (Figure 15).
- The Purnell Street intersection has crosswalks across all four legs with red brick pavers.
- Vehicles park in front of St. James church on the west side of the road and pedestrians often cross midblock to access the pizza shop on the other side. (Figure 16).
- Bike racks have been installed in the proximity of the Landmark Café.
- The Oak Street intersection has modern, audible push buttons with arrows, countdown pedestrian heads and tactile warning strips.
- There is a private alleyway on the east side of Main Street between Bray Jewelers and One Heritage Place from Main Street to the public parking lot behind. It is closed off and locked, blocking access. (Figure 17).
- There is an underutilized public parking lot on the west side of Main Street across from Maple Street.

Figure 15. Birch Street Intersection

Figure 16. Parallel Parking in Front of Saint James Church

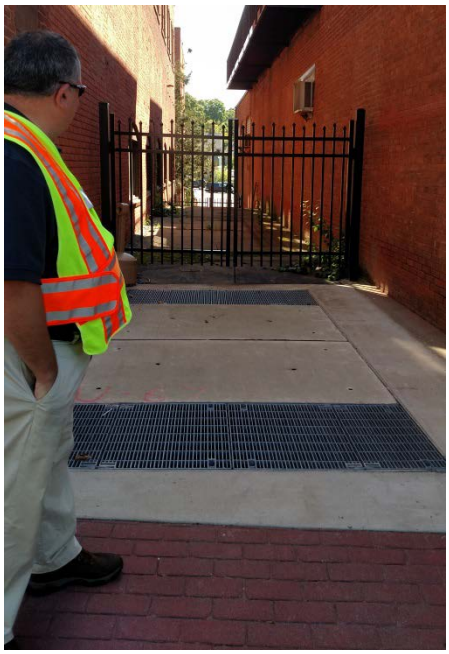


Figure 17. Private Alley to Parking Lot Closed to Public

- Diagonal on-street parking on the west side of Main Street ends at Forest Street.
- The signals for Maple Street and Forest Street are less than 200 feet apart. The Maple Street intersection has detectable warning strips, stamped red pavers, and audible, pedestrian countdown signal heads.
- Most of the bump outs are raised but some are at grade with unique paving to aid in plowing and clearly delineate them. Snow is piled on these in the winter. (Figure 18).
- The driveway across from Forest Street was closed and diagonal parking was added. These vehicles back up into the intersection to leave.
- The Forest Street intersection has a crosswalk across Forest Street only. It does not have tactile warning strips. (Figure 19).
- There is limited on-street parking (7 parallel spaces in from of the Chevrolet Dealership) between School Street and Hartford Road.
- The pedestrian signal push button in the northeast corner of the School Street Intersection is set far back from the crossings.
- At School Street intersection the bus stop on the west side of Main Street does not have a pull out, it does have a shelter. The bus stop on the east side does not have a shelter but there is a pull out. Bus stops are on the south side of the intersection.
- The intersection of Hartford Road and Main Street has crosswalks across all four legs. The crossings are long and do not have tactile warning strips. (Figure 20).
- Many of the route information signs are faded.

Figure 18. Bump Out Used for Snow Collection in the Winter

Figure 19. Forest Street Intersection

Figure 20. Hartford Road Intersection

3.2 Post-Audit Workshop - Key Issues

- A median in the center of the road would provide traffic calming and channelize pedestrians to crossings. A median would require the removal of a travel lane. Medians could be raised or flush to the road with a textured pavement with removable bollards so that they can be taken out during road race but provide a sense of safety. Removable bollards become expensive with maintenance. The width of the roadway warrants exploring a median from Bissell Road north.
    - Plowing around medians can be difficult. If the median was flush with bollards, they would have to be removed in the winter.
    - Medians have merits in reducing road width and providing traffic calming.
    - In some locations the curb line could be pushed back, narrowing the sidewalk. This could create short strategically placed medians.
    - Medians must be a minimum of 6 feet if they are to be pedestrian refuges.
    - Medians can have a stamped treatment with planters.
- Travel lanes are 11 feet wide.
- During the winter there are issues with snow. Currently it is piled on flush cobblestone bump outs. Could the medians be at grade?
- The bump outs at certain locations encourage pedestrians to cross rather than use the adjacent crosswalk. If they were blocked off with bollards, it could deter them from crossing without a crosswalk. The bump outs are currently used to pile snow in the winter.
- The focus should be on where pedestrians can safely cross instead of preventing them from crossing where they should not.
- Most of the bus stops have shelters and bus pull outs.
- Significant streetscaping has been done.
- There are lighting issues. Several of the street lights are blocked by tree canopies or do not provide enough illumination.
- Trees need to be trimmed or removed around lights and around signing. Detailed thought should be put into the location of trees so that they do not block the lights. The roots are heaving the sidewalk in some places.
- Traffic calming may be needed towards the south end of Main Street. The ramps for I-384 could be reconfigured.
- Manchester has conducted two parking studies. It has become difficult to enforce the two hour parking limit. Paid parking (parking kiosks) should be explored.

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. Reposition the angle of the lights to maximize the area lit.
2. Educate the community with a public meeting campaign about jay walking.
3. Enforce jay walking laws.
4. Replace catch basin grates with bicycle friendly ones (Figure 21).
5. Install bicycle racks (Figure 22).
6. Eliminate parking in front of church to reduce jay walking. (Figure 23).
7. Add "No U Turn" or "No Left Turn" signs to the traffic span wires to control turns into the parking stalls. (Figure 24).
8. Establish regulation against U-turns on Main Street to make it legally enforceable.
9. Install speed limit signs overhead on the traffic span wires.
10. Work with the private alleyway owners to open them up to connect parking to the businesses along Main Street.
11. Install pedestrian crossing signs at the triangular channelizing island at the intersection of Main Street and Center Street. (Figure 25).
12. Trim vegetation that blocks traffic signs and diminishes lighting. (Figure 26).
13. Perform sidewalk maintenance where the curbing/sidewalk is deteriorating.

Figure 27 depicts these recommendations.

Figure 21. Bike Friendly Catch Basin Grate

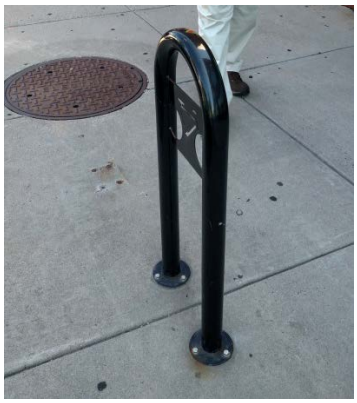


Figure 22. Install Bike Racks

Figure 23. Eliminate Parking

Figure 24. Example of Detectable Warning Strips

Figure 25. Pedestrian Crossing Sign

Figure 26. Trim Vegetation

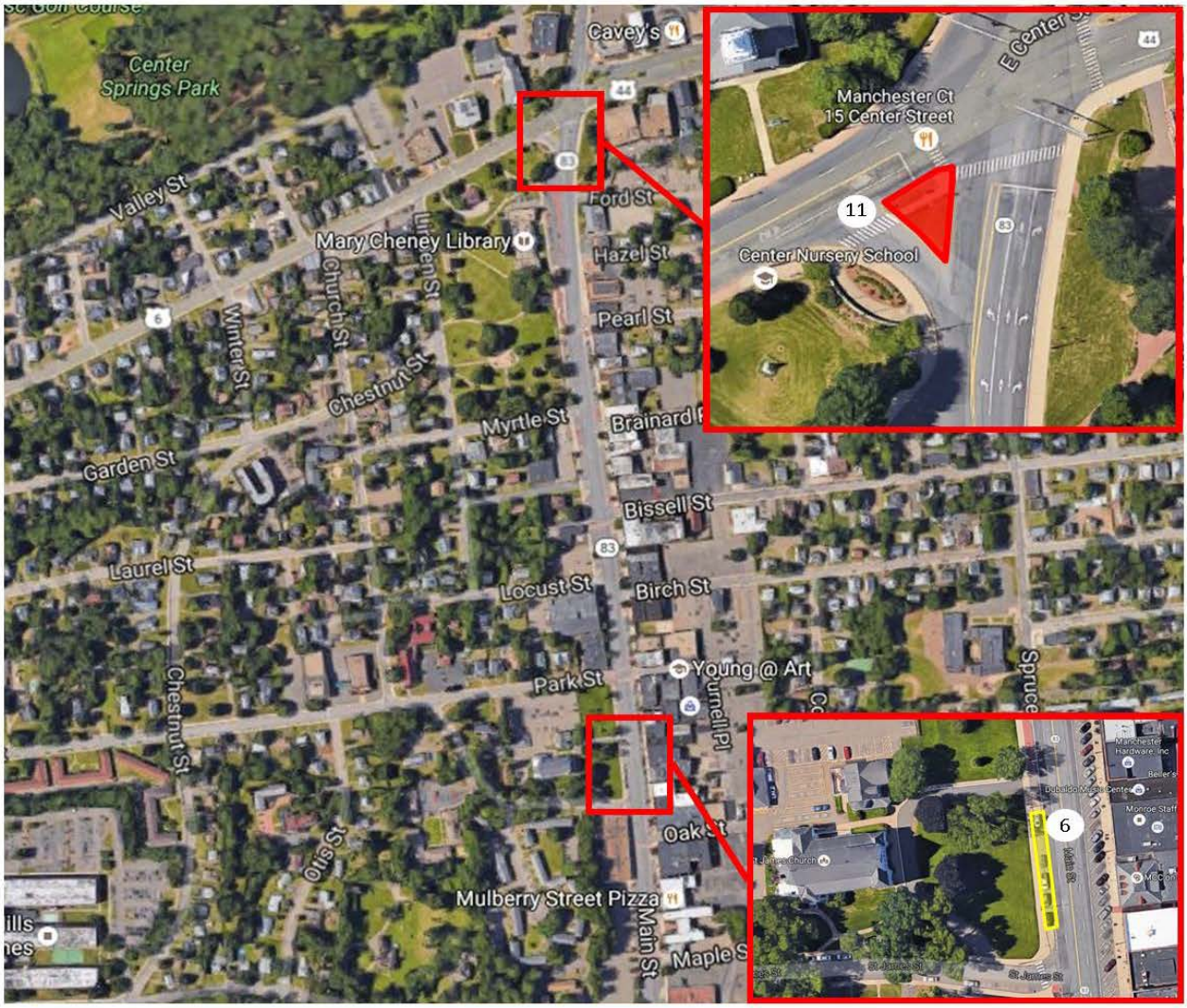


Figure 27. Short Term Recommendations Map

4.2 Medium Term

1. Investigate paid/metered parking.
2. Create consistency with the pedestrian push button, sign display and audible tone using the latest standard.
3. Replace the pedestrian signal heads at Center Street with countdown pedestrian signal heads. (Figure 28).
4. Install tactile warning strips on all ramps. (Figure 29).
5. Create formal crosswalks across Main Street at Myrtle Street/Brainard Place and Locust Street.
6. Install decorative bollards and chains at key bulb outs to prevent pedestrians from crossing midblock. This includes Brainard Place, and the north-east corner of the Bissell Street intersection. (Figure 30).
7. Create a gateway into Manchester from Hartford Road.
8. Remove angled parking at the intersection of Main Street and Forest Street. (Figure 31).
9. Add a crosswalk at Forest Street across Main Street.

Figure 32 depicts these recommendations.

Figure 28. Countdown Signal

Figure 29. Tactile Warning Strips

Figure 30. Decorative Bollard

Figure 31. Remove Parking

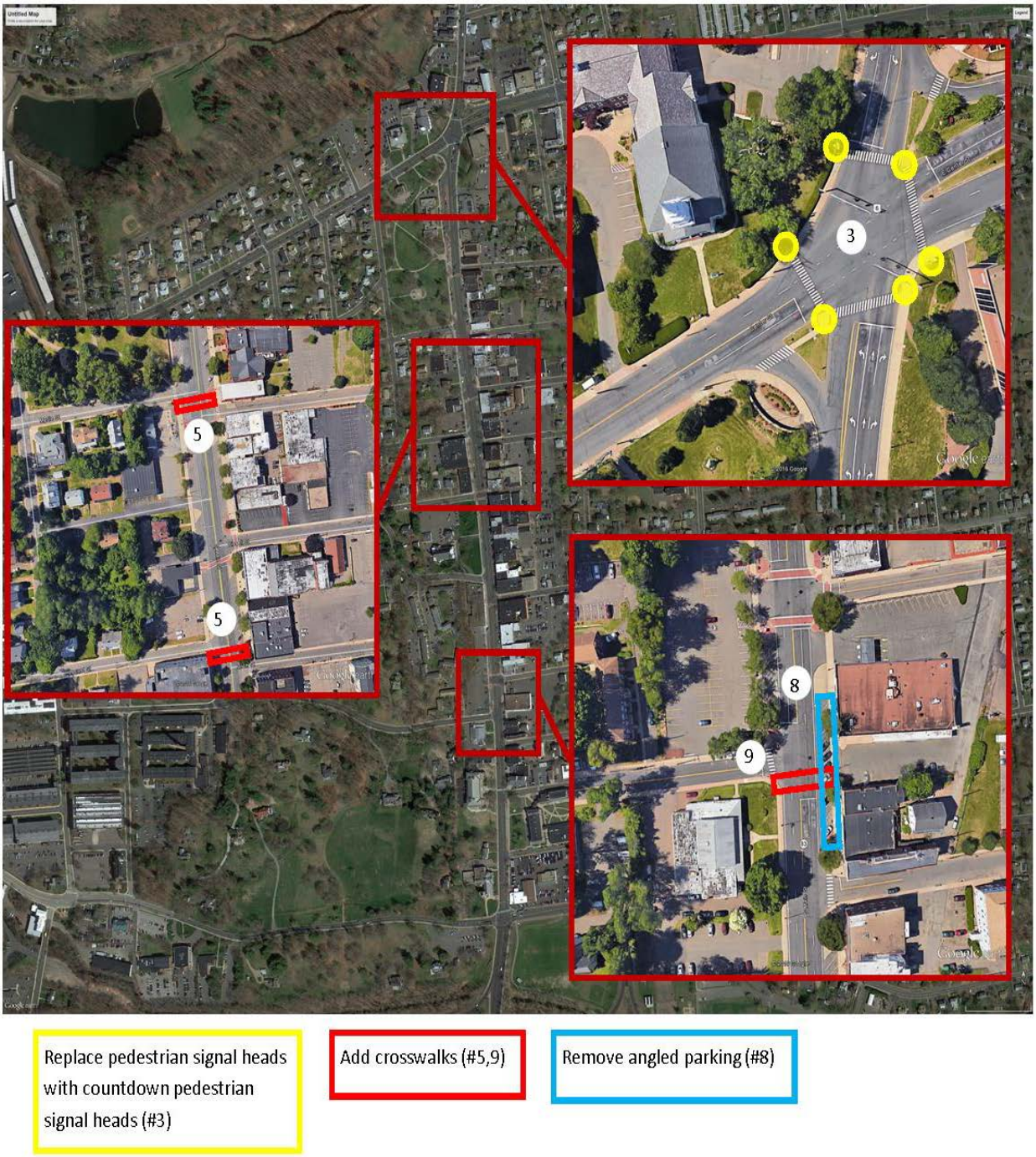


Figure 32. Medium Term Recommendations

4.3 Long Term

1. Conduct a road diet study that investigates traffic calming on the north end of Main Street.
2. Increase parking on Main Street for the library.
    - Extend the single lane to Pearl Street and add parallel parking.
    - Reconfigure the median to replace existing parallel parking with angled parking
3. Investigate backed angle parking. (Figure 33).
4. Replace street trees with varieties that will not block signage or impede lighting. (Figure 34).
5. Reconfigure the ramp for I-384 just south of Hartford Street. Possibilities include a median to block vehicles from making an illegal left turn or changing where the ramps touch down.

Figure 33. Reverse Angle Parking

Figure 34. Street Lined with Trees That do not Block Signs or Light

Figure 35 depicts these recommendations.

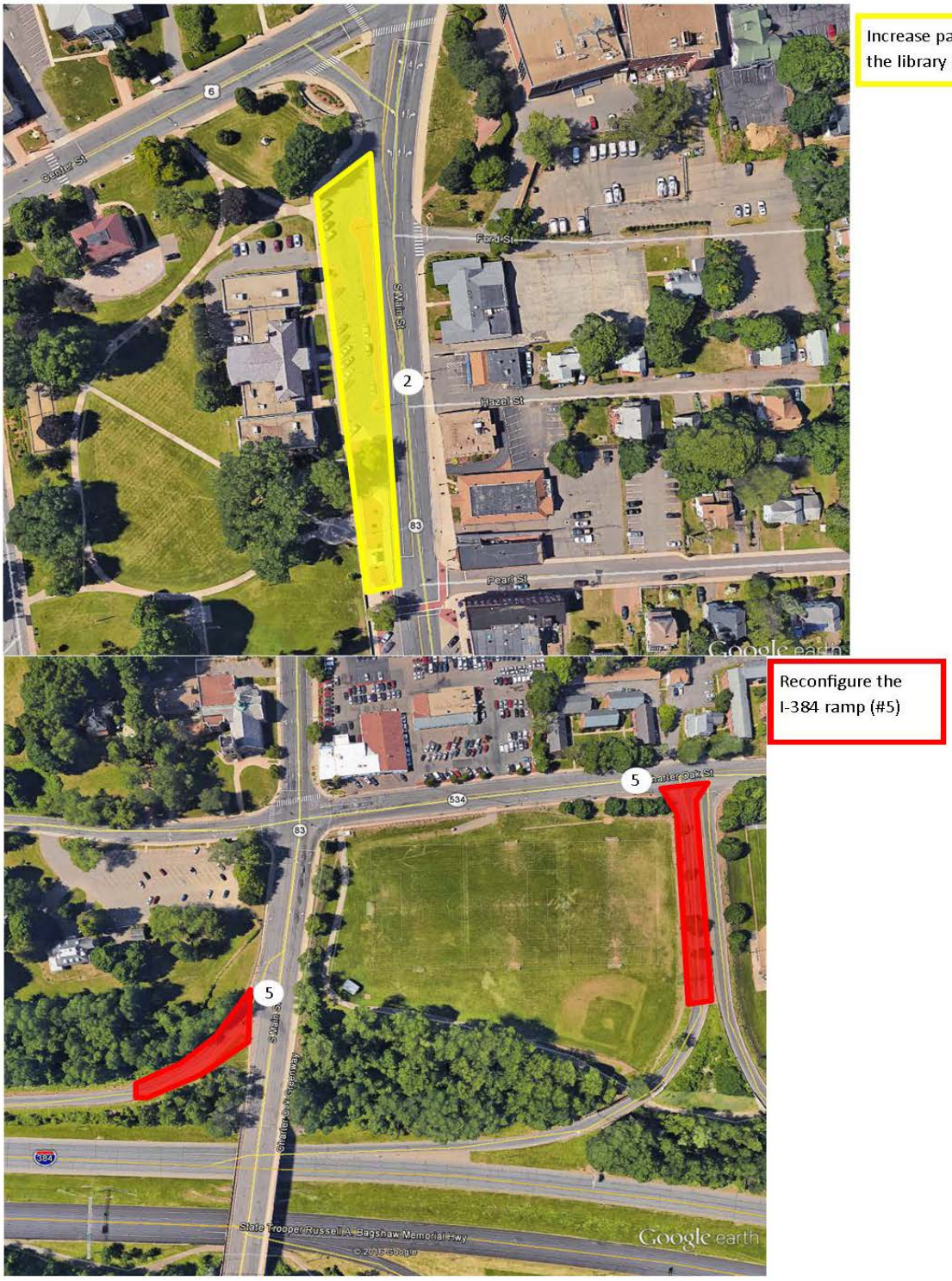


Figure 35. Long Term Recommendations Map

4.4 Summary

This report outlines the observations, discussions and recommendations developed during the RSA. It documents the successful completion of the Town of Manchester RSA and provides Manchester with an outlined strategy to improve the transportation along Main Street for all road users at, particularly focusing on pedestrians and cyclists. Moving forward, Manchester 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 Main Street.

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	Jeff LaMalva
Title	Town Engineer
Email Address	jlamalva@manchesterct.gov
Telephone Number	(860) 647-3158

2. Location information

Address	Main Street from Center Street (S.R. 6/44) to Hartford Rd
Description	Downtown Manchester
City / Town	Manchester

3. Roadway type
(Please select all that apply)

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

4. Zoning
(Please select all that apply)

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

5. Approximate mile radius around the location

Greater than a ½ mile

Other (Please Specify)

6. Community Sites
(Please select all that apply)

- [ ] **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)**

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

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

If Yes please describe (please specify)

Restaurants, offices, retail

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)**
- [ ] **Other (please specify)**

9. Transit facilities
(Please select all that apply)

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

10. Safety Concerns
(Please select all that apply)

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

Pedestrian safety

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

No

If Yes please describe and list all projects.

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

Main Street between US Routes 6 & 44 (Center St./E. Center St.) and State Route 534 (Charter Oak Street)/Hartford Road is a four lane Town-owned arterial through the downtown area of Manchester. Approximately 14,000 vehicles per day travel this road. The posted speed limit is 25 mph. There are eight signalized intersections within this segment of Main Street, all with exclusive pedestrian signals.

The northern section includes civic functions (Mary Cheney Library and Center Park) on the west side of the street and small businesses on the east side. The central section includes dense small retail, commercial and office development on both sides of the road. The southern section includes Bennet Academy (public middle school), Carter Chevrolet and small businesses on the east side and South Methodist Church and Bennet senior housing complex on the west side.

There were a total of 184 crashes reported in the three year period from January 1, 2012 through December 31, 2014. These include backing and side swipe accidents relating to the angle parking on the street. Four pedestrians have been struck crossing Main Street within this three year period including one fatality. In all of these incidents, the pedestrian was at or close to a signalized pedestrian crossing. Also, most of the incidents occurred at night when visibility is lower and average speeds increase due to lower traffic volume. In addition, one pedestrian and two bicyclists were hit in the side street crosswalks.

The Town is concerned with improving pedestrian safety in this commercial area. The Engineering Division completed a review of crash history, speed data and visual observations to come up with recommendations; however we feel a road safety audit with other experts is needed.

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

No

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

Yes

Downtown Manchester hosts the annual Thanksgiving day road race where as many as 15,000 participants and thousands more spectators gather along this section of roadway. Any recommendations for physical improvements should consider any impacts to the participants of this event.

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: Manchester
RSA Location: Main Street between Hartford Road and Center Street
Meeting Location: Lincoln Center Hearing Room (1st Floor)
Address: 494 Main Street
Date: 8/3/2016
Time: 8:30AM

Participating Audit Team Members

Audit Team Member	Agency/Organization
Krystal Oldread	AECOM
Steve Mitchell	AECOM
Tana Parseliti	DMSSD
Michael Swetzes	DMSSD
Rick Johnson	DMSSD
Sonja Howe	TOM - Budget
Sgt. Stephen Bresciano	Police - Traffic
Jeff LaMalva	TOM - Engineering
Matt Bordeaux	TOM - Planning
Michelle Handfield	TOM - Engineering
Kyle Shiel	TOM - Planning
Craig Babowicz	CT DOT

COMMUNITY
connectivity program

Appendix C

Built to deliver a better world

Road Safety Audit – Manchester

Meeting Location: Lincoln Center Hearing Room (1st Floor)
Address: 494 Main Street
Date: 8/3/2016
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

12:30 PM **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	

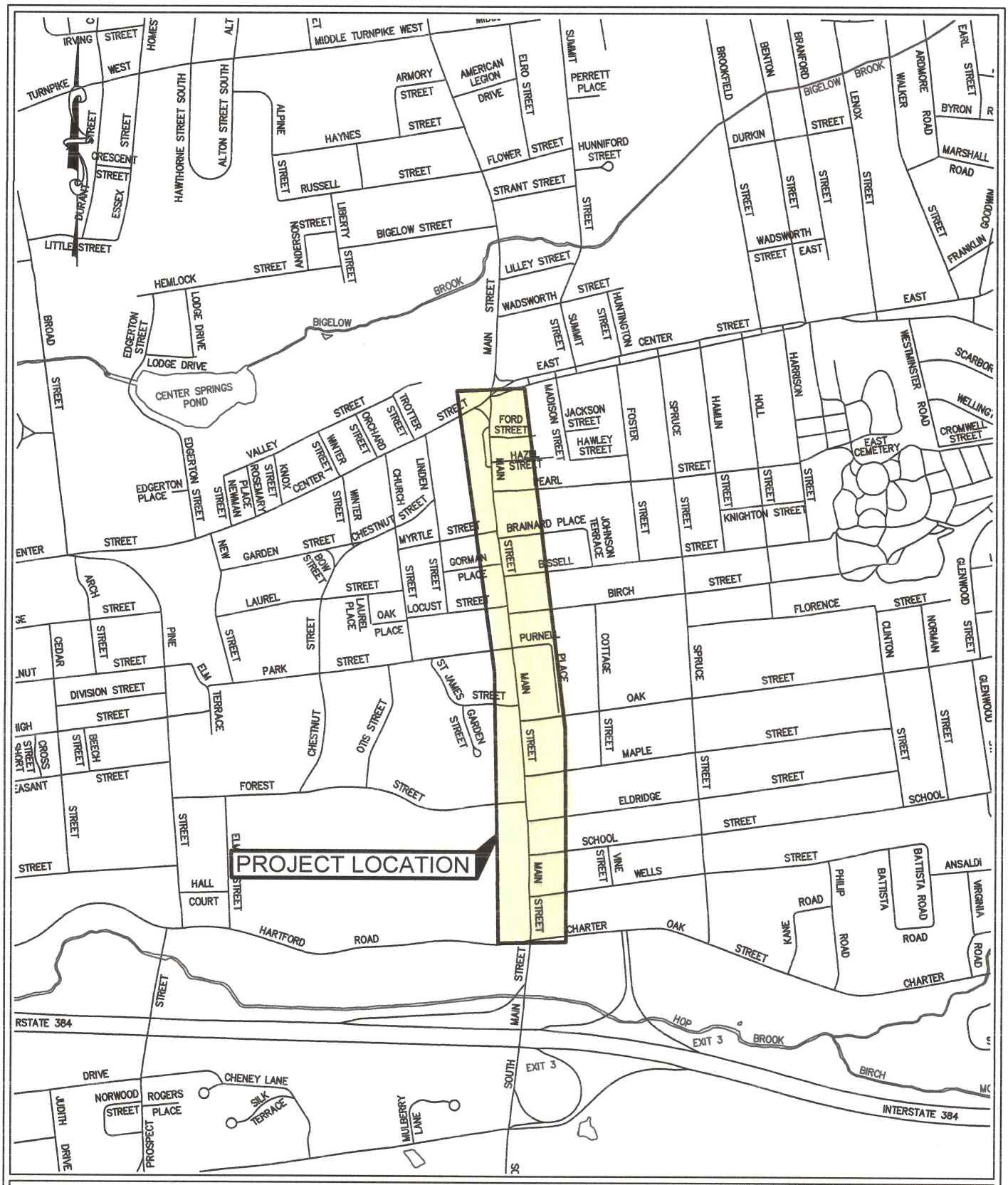
• Pavement
  o Pavement Condition (excessive roughness or rutting, potholes, loose material)
  o Edge drop-offs
  o Drainage issues
• Lighting Adequacy	

• 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	



COMMUNITY CONNECTIVITY PROGRAM APPLICATION

LOCATION PLAN

MAIN STREET

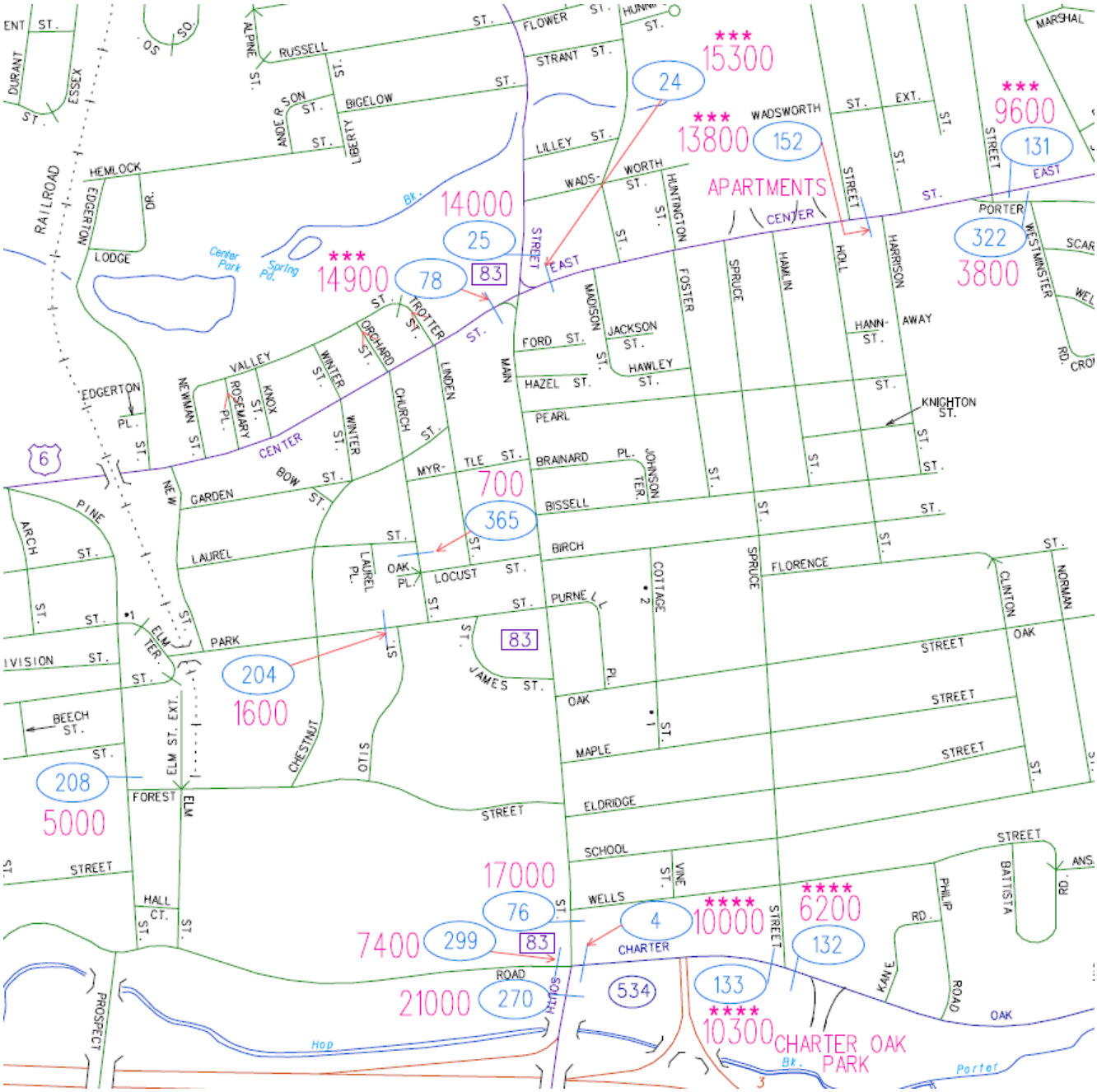
CENTER STREET TO HARTFORD ROAD

TOWN OF MANCHESTER
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

DATE: FEBRUARY 2016

SCALE: 1" = 1000'

Average Daily Traffic (ADT)

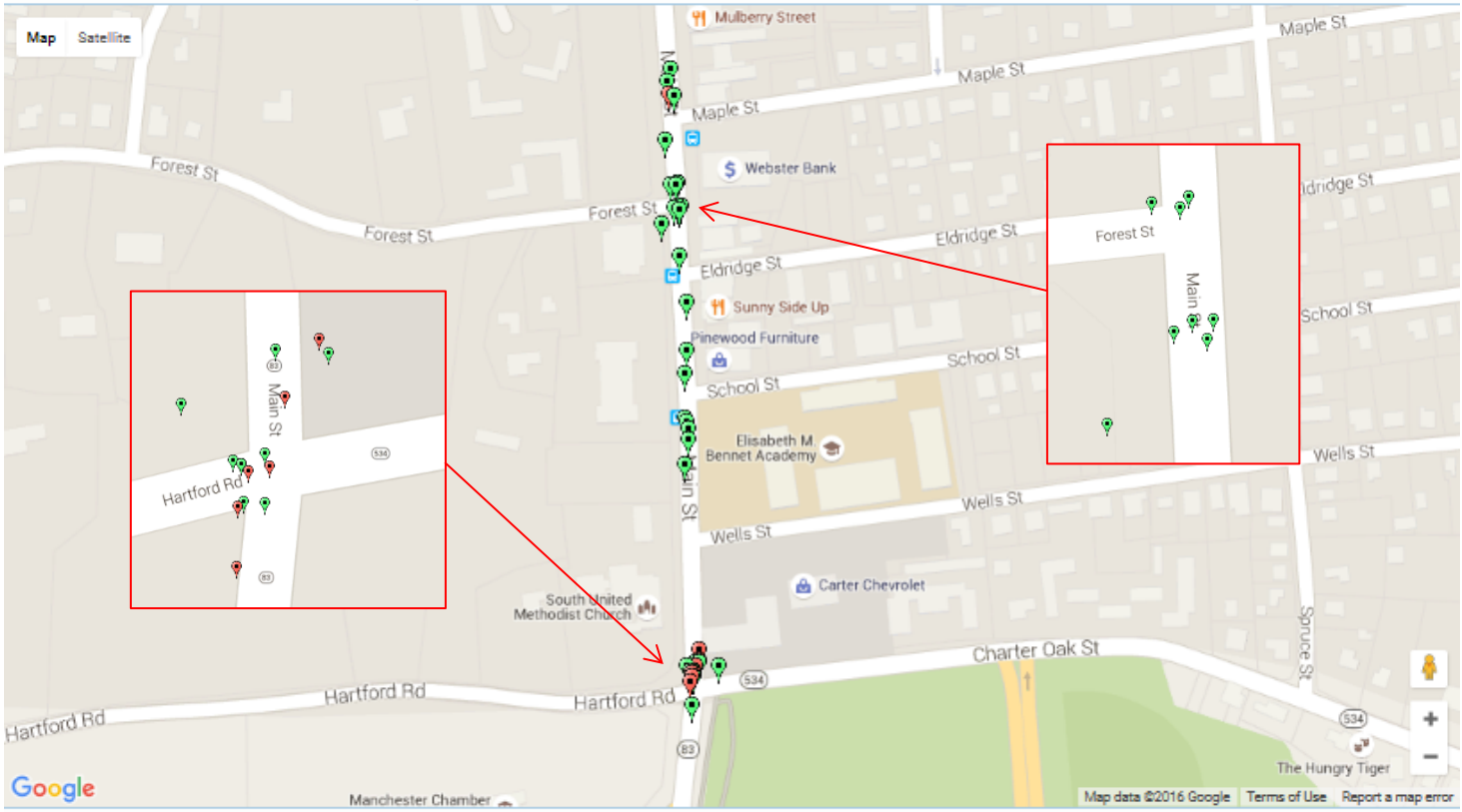


2015 Crashes

UCONN Connecticut Crash Data Repository

Search Criteria:

Dataset:	mmucc
Towns:	Manchester
Crash Severity:	Injury of any type (Serious, Minor, Possible), Fatal (Kill), Property Damage Only
Case Status:	Complete



Markers | Heatmap | Select & Query | Query Selection

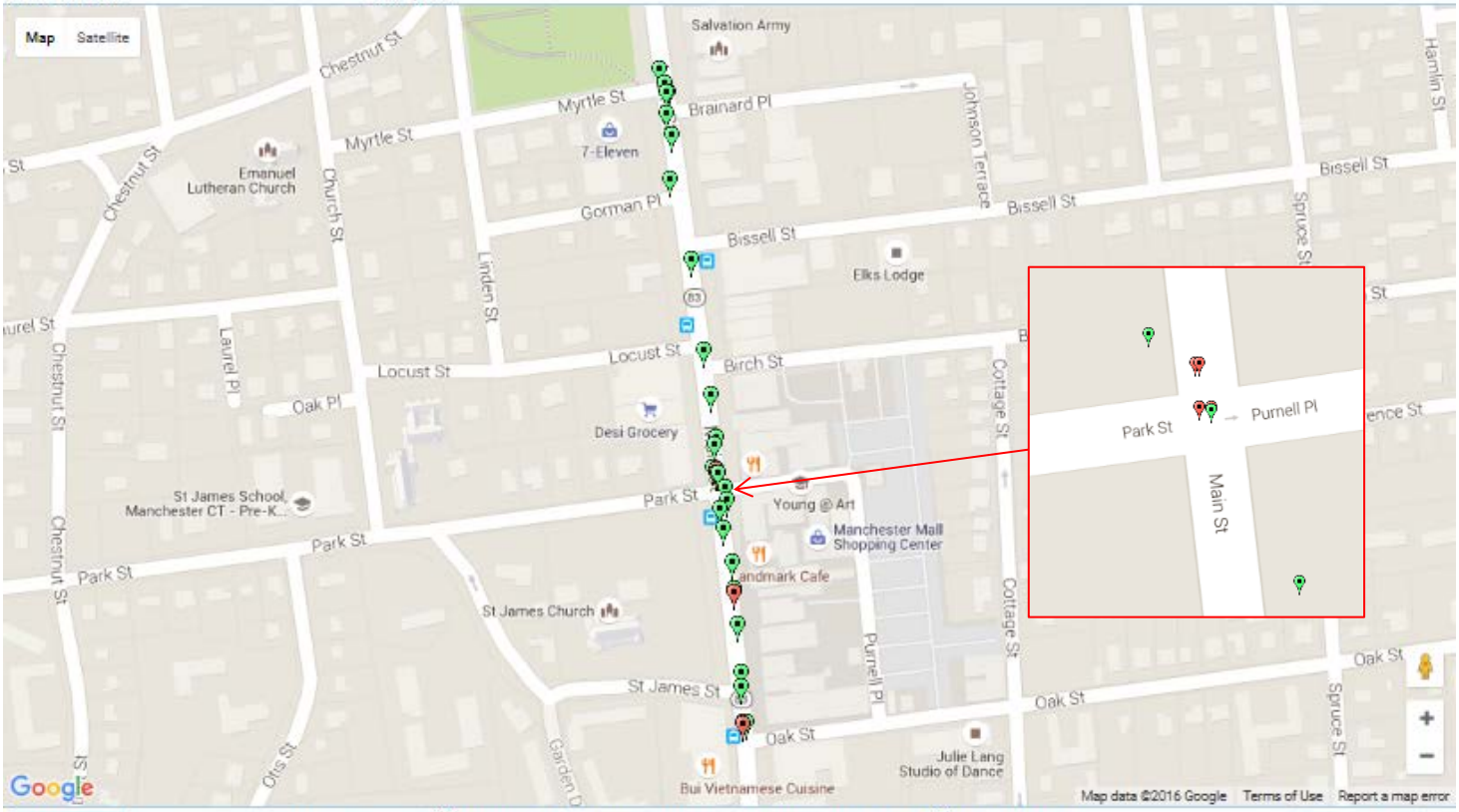
Injury of any type (Serious, Minor, Possible) **Fatal (Kill)**
Property Damage Only

Select All | Deselect All

UCONN Connecticut Crash Data Repository

Search Criteria:

Dataset:	mmucc
Towns:	Manchester
Crash Severity:	Injury of any type (Serious, Minor, Possible), Fatal (Kill), Property Damage Only
Case Status:	Complete

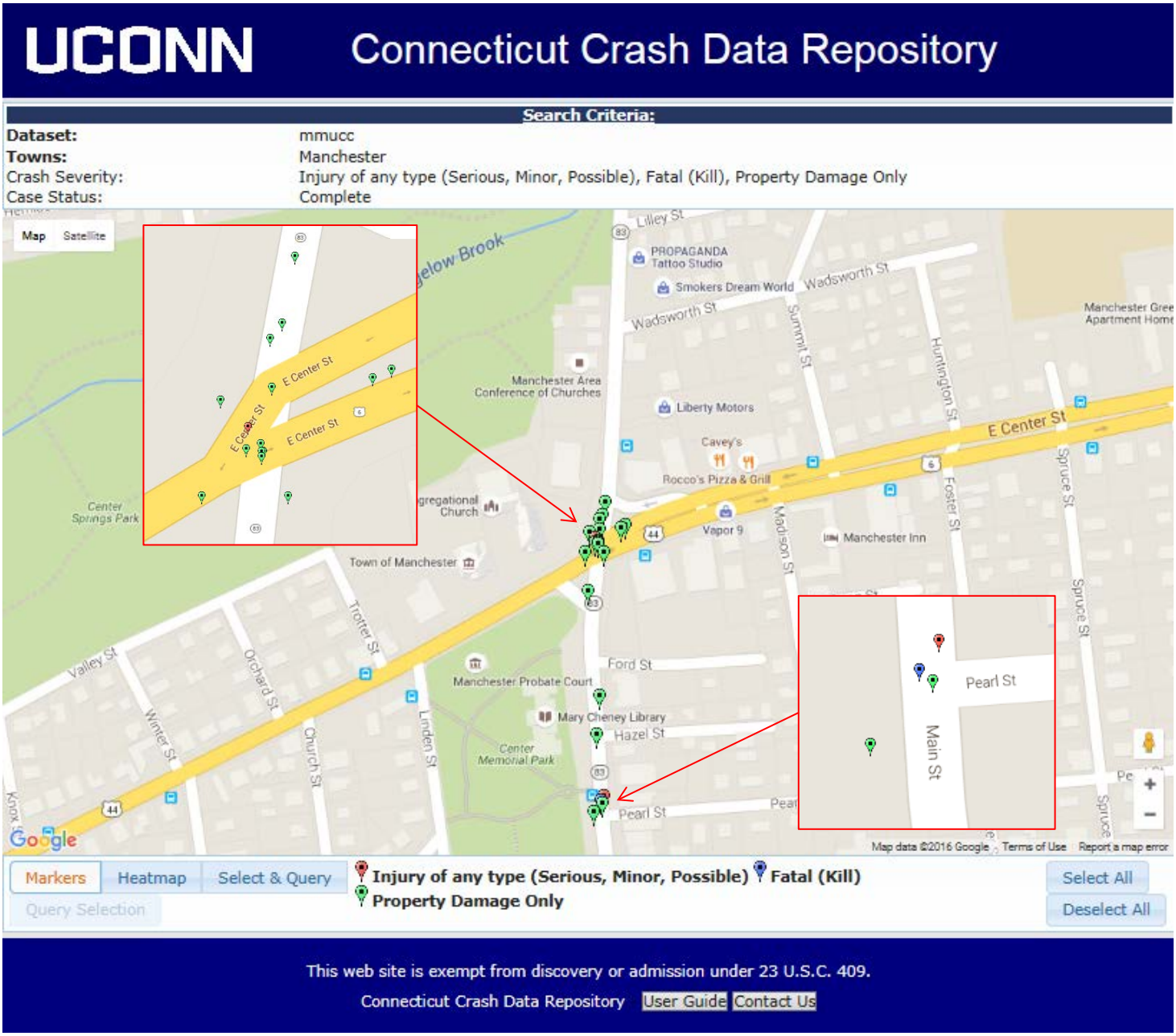


Markers | Heatmap | Select & Query | Query Selection

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

Select All | Deselect All

The fatal crash at Main St. and Pearl St. involved a pedestrian.



Road Safety Audit – Manchester

Crash Summary

Data: 3 years (2012-2014)

Five crashes involved pedestrians. Four resulted in injuries and one resulted in a fatality.

There were two crashes involving bicyclists, both resulted in injuries.

Severity Type	Number of Crashes	
Property Damage Only	170	77%
Injury (No fatality)	49	22%
Fatality	1	0%
Total	220	

Manner of Crash / Collision Impact	Number of Crashes	
Unknown	3	1%
Sideswipe-Same Direction	41	19%
Rear-end	84	38%
Turning-Intersecting Paths	21	10%
Turning-Opposite Direction	19	9%
Fixed Object	10	5%
Backing	10	5%
Angle	4	2%
Turning-Same Direction	7	3%
Moving Object	0	0%
Parking	15	7%
Pedestrian	5	2%
Overturn	0	0%
Head-on	1	0%
Sideswipe-Opposite Direction	0	0%
Miscellaneous- Non Collision	0	0%
Total	220	

Weather Condition	Number of Crashes	
Snow	9	4%
Rain	18	8%
No Adverse Condition	192	87%
Unknown	0	0%
Blowing Sand, Soil, Dirt or Snow	0	0%
Other	1	0%
Severe Crosswinds	0	0%
Sleet, Hail	0	0%
Total	220	

Light Condition	Number of Crashes	
Dark-Not Lighted	3	1%
Dark-Lighted	48	22%
Daylight	166	75%
Dusk	3	1%
Unknown	0	0%
Dawn	0	0%
Total	220	

Road Surface Condition	Number of Crashes	
Snow/Slush	7	3%
Wet	35	16%
Dry	178	81%
Unknown	0	0%
Ice	0	0%
Other	0	0%
Total	220	

Time		Number of Crashes	
0:00	**0:59**	2	1%
1:00	**1:59**	0	0%
2:00	**2:59**	0	0%
3:00	**3:59**	1	0%
4:00	**4:59**	2	1%
5:00	**5:59**	0	0%
6:00	**6:59**	2	1%
7:00	**7:59**	9	4%
8:00	**8:59**	12	5%
9:00	**9:59**	16	7%
10:00	**10:59**	13	6%
11:00	**11:59**	15	7%
12:00	**12:59**	18	8%
13:00	**13:59**	12	5%
14:00	**14:59**	16	7%
15:00	**15:59**	16	7%
16:00	**16:59**	22	10%
17:00	**17:59**	20	9%
18:00	**18:59**	12	5%
19:00	**19:59**	11	5%
20:00	**20:59**	11	5%
21:00	**21:59**	5	2%
22:00	**22:59**	2	1%
23:00	**23:59**	3	1%
Total		220	

Manchester - Downtown

N

Legend

- Sidewalk
- Crosswalk
- Stop Controlled Intersection
- Pedestrian Crossing Sign
- Signal Controlled Intersection
- Area Under Construction
- One Way Street
- On-street Parking
- Median

DRAFT

Accessible Ped Signals (APS) @ ~25 traffic signals (Phase 1)

83 Main St
E Center St 6
44
Center St
6
44
Ford St
Library
Hazel St
SPEED LIMIT 25
Pearl St
Center Memorial Park
S Main St
Myrtle St
Johnson Terrace
83
Gorman Pl
Bissell St
SPEED LIMIT 25
Locust St
Birch St
Park St
SPEED LIMIT 25
Purnell Pl
St James St
Oak St
Maple St
Forest St
SPEED LIMIT 25
Eldridge St
83
School St
Bennet Academy
S Main St
Wells St
Charter Oak St
534
Hartford Rd
534
Charter Oak Park
83

Route 83

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 – Manchester

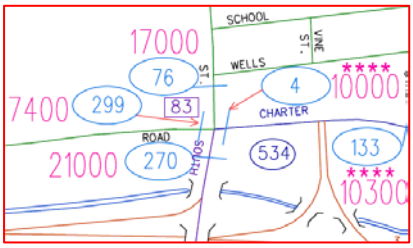
Fact Sheet

Functional Classification:

- Main Street is classified as a Principal Arterial (Other)
- Center Street (State Route 6/44) is classified as a Minor Arterial
- Hartford Road is classified as a Minor Arterial

ADT

- ADT on Main Street is 17,000
- ADT on Center Street east of Main Street is 14,900
- ADT on Center Street west of Main Street is 15,300
- ADT on Hartford Road east of Main Street is 10,000
- ADT on Hartford Road west of Main Street is 7,400



Population and Employment Data (2014):

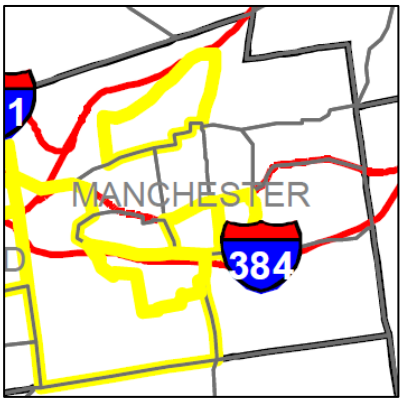
- Population: 58,270
- Employment: 27,605

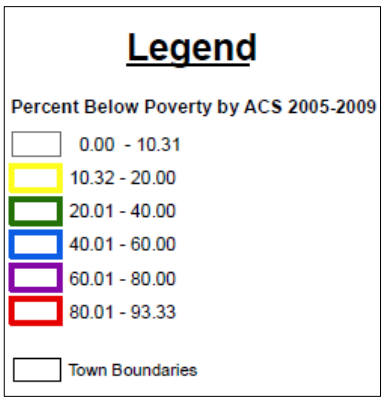
Urbanized Area

- Manchester is located within the Hartford Urbanized Area

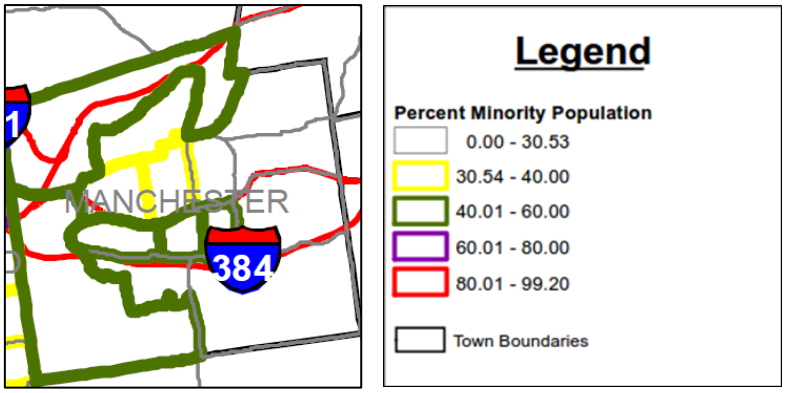
Demographics

- The statewide average percentage below the poverty line is 10.31%. Within the vicinity of Main Street, up to 20% of residents are below the poverty line.





- The statewide average percentage minority population is 30.53%. Within the vicinity of Main Street, up to 60% of residents are minorities.



Air Quality

- Manchester's CIPP number is 216
- Manchester is within the Greater CT Marginal Ozone Area
- Manchester is within a CO Attainment Area