



COMMUNITY
connectivity program

Vernon

East Main Street (Route 74), West Main Street, Vernon Avenue and Brooklyn Street – Road Safety Audit

October 18, 2016



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Acknowledgements:

OFFICE OF INTERMODAL PLANNING
BUREAU OF POLICY AND PLANNING
CONNECTICUT DEPARTMENT OF TRANSPORTATION

With assistance from AECOM Transportation Planning Group

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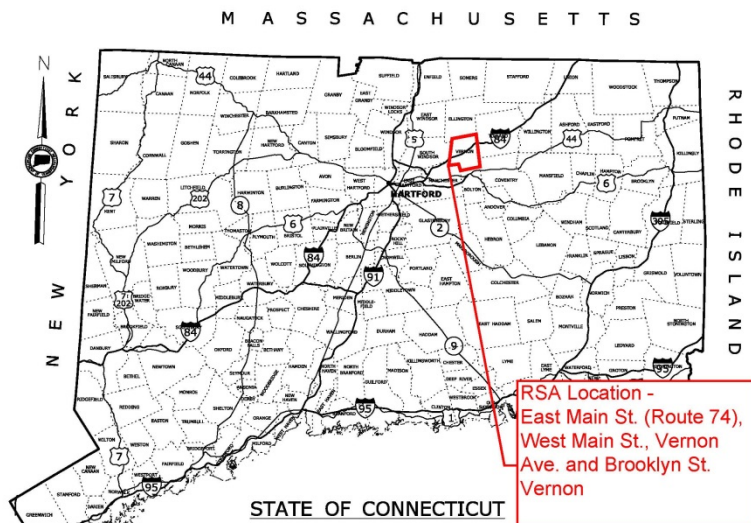
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The Connecticut Department of Transportation (CTDOT) is undertaking a Community Connectivity Program that focuses on improving the state's transportation network for all users, with an emphasis on bicyclists and pedestrians. A major component of this 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 Federal Highway Administration (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 East Main Street, West Main Street, Vernon Avenue and Brooklyn Street, Vernon RSA

The Town of Vernon submitted an application to complete an RSA on East Main Street, West Main Street, Vernon Avenue and Brooklyn Street to improve safety for drivers, pedestrians and bicyclists travelling through this area. East Main Street, which is also designated as Route 74, experiences moderate traffic volumes and moderate speeds, but has limited sidewalks outside of the downtown Rockville area. There is currently a Rails-to-Trails path that has a terminus on Vernon Avenue and the town plans to connect to Shenipsit Lake in neighboring Tolland, but there is no defined route connecting them.

The RSA area is an historic downtown area known as Rockville, with multiple types of land uses. The Town would like to identify ways to improve safety for bicyclists and pedestrians. There are several mill properties in the area that are at various stages of redevelopment and the Town would like to use that redevelopment as an opportunity to further enhance its downtown area.

The Town of Vernon's application contained background information on the area and a description of the corridor. The application is included in Appendix A.

1.1 Location

The RSA area contains sections of four roads in the downtown Rockville section of Vernon, including East Main Street (Route 74), West Main Street, Vernon Avenue and Brooklyn Street (Figure 1). The Average Daily Traffic (ADT) on East Main Street in the RSA area ranges from 3,000 to 9,400 vehicles per day (vpd). All of the roads in the study area have a single lane in each direction, separated by a double yellow center line, with turning lanes provided at major intersections. A small section of East Main Street near the intersections of Park Street and Elm Street consists of two through lanes in the eastbound direction. There are striped shoulders on each side of East Main Street, with varying widths. Brooklyn Street, Vernon Avenue and West Main Street do not have striped shoulders. There are three signalized intersections in the study area.

There is a significant horizontal curve and vertical curve on East Main Street at the intersection with East Street. Other roads are straight or gently curving. Figure 2 shows the study area in a regional context.

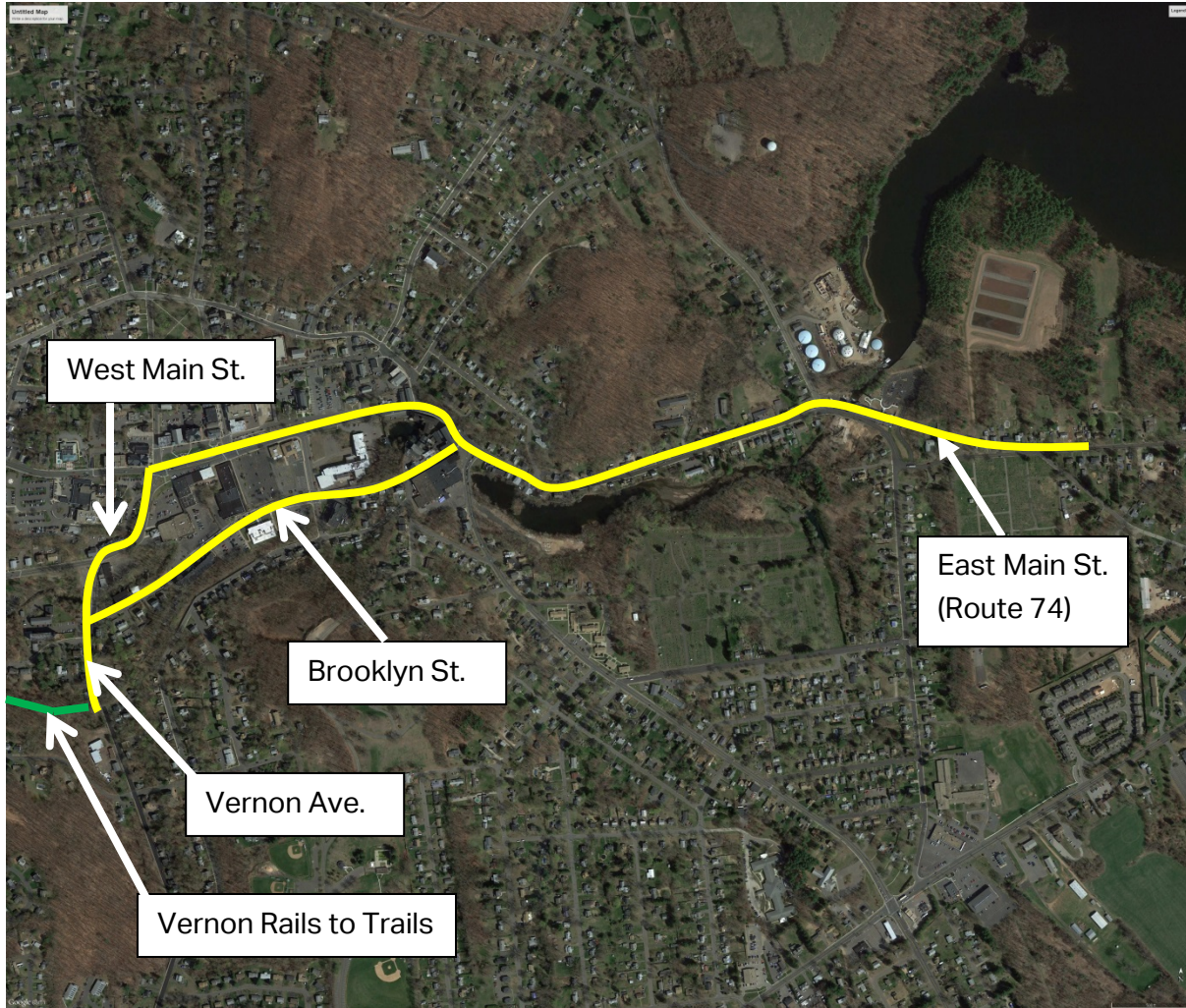


Figure 1. East Main Street, West Main Street, Vernon Avenue and Brooklyn Street, Vernon

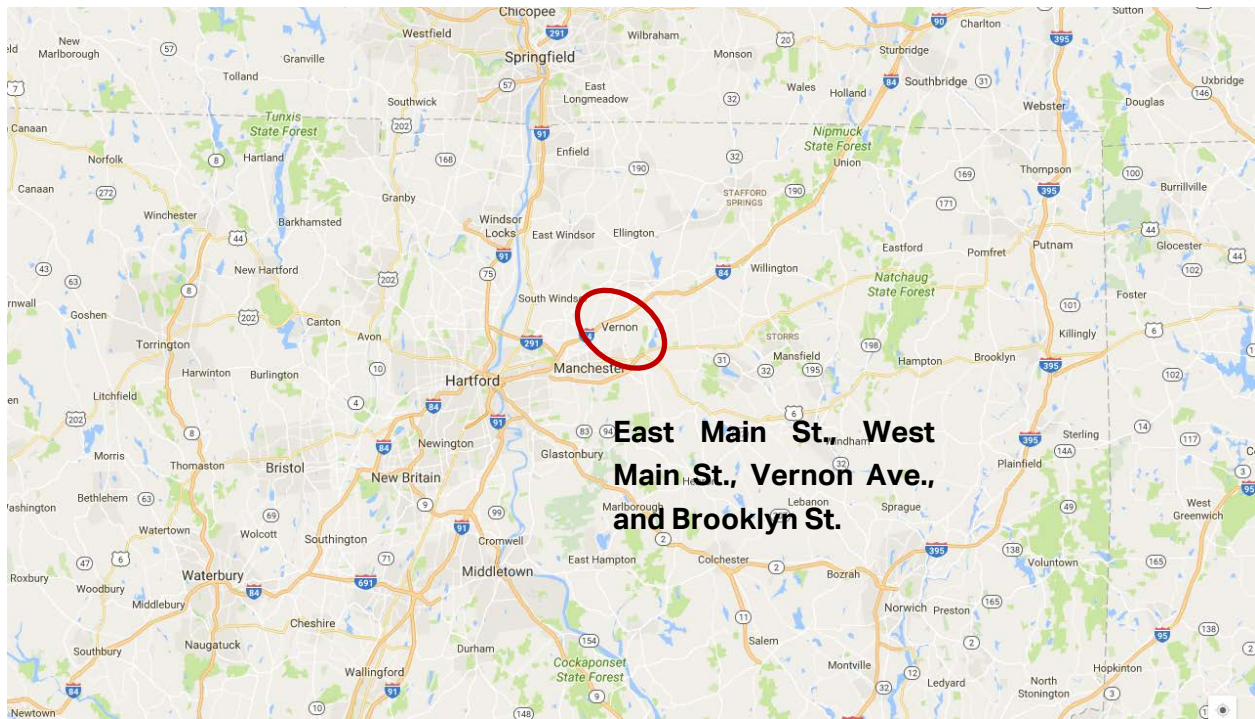


Figure 2. Study Area – Regional Context

2 Pre-audit Assessment

2.1 Pre-audit Information

East Main Street (Route 74) is the main road through the downtown center and is oriented in an east/west direction. The downtown area is part of a national and state historic district and contains several mill buildings in various stages of redevelopment. The Amerbelle Mill property on Brooklyn Street near East Main Street is currently being partially demolished and is expected to be redeveloped in the future. The Loom City Lofts on East Main Street, near the intersection with East Street is a former mill building that has been redeveloped into apartments and small retail establishments. There are several facilities near this corridor that have the potential to generate traffic, including state courts, retail, several restaurants, housing developments, and town offices. There is a Rails-to-Trails path that is a popular trail for walkers, bikers and runners that currently has a terminus at Vernon Avenue.

The crash history in this area is moderate and there were no incidents involving pedestrians or bicyclists between 2012 and 2014 (Table 1 and Table 2). Figure 3 displays crashes that occurred in this area during 2015. The primary accident types from 2012-2014 were rear-end collisions (29%) and fixed object crashes (23%).

Severity Type	Number of Crashes	
Property Damage Only	36	75%
Injury (No fatality)	12	25%
Fatality	0	0%
Total	48	

Table 1. Crash Severity 2012-2014

Source: UConn Connecticut Crash Data Repository

Manner of Crash / Collision Impact	Number of Crashes	
Unknown	0	0%
Sideswipe-Same Direction	4	8%
Rear-end	14	29%
Turning-Intersecting Paths	7	15%
Turning-Opposite Direction	4	8%
Fixed Object	11	23%
Backing	3	6%
Angle	2	4%
Turning-Same Direction	2	4%
Moving Object	0	0%
Parking	1	2%
Pedestrian	0	0%
Overturn	0	0%
Head-on	0	0%
Sideswipe-Opposite Direction	0	0%
Miscellaneous- Non Collision	0	0%
Total	48	

Table 2. Crash Type 2012-2014

Source: UConn Connecticut Crash Data Repository

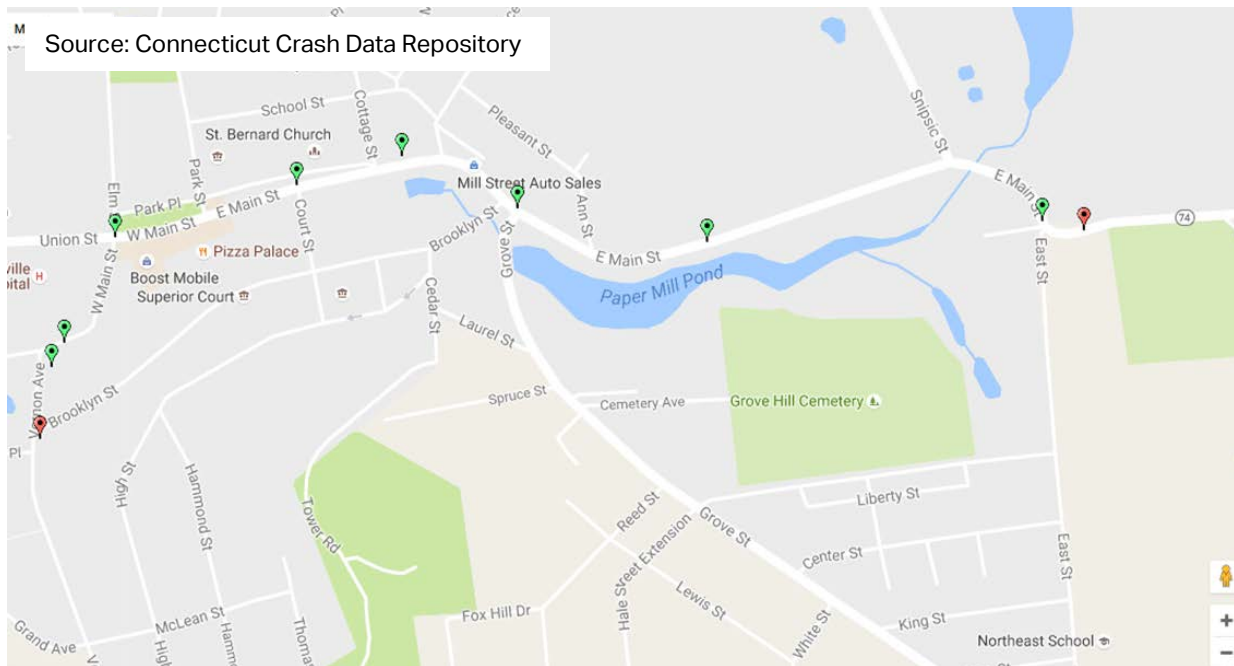


Figure 3. Crashes that Occurred in 2015 (Connecticut Crash Data Repository)

The Town of Vernon would like to make the RSA area more accommodating to cyclists and pedestrians as well as improving vehicle operations. There are several horizontal curves in the alignment of the roads in the study area including one on West Main Street between Vernon Avenue and Elm Street, one on East Main Street near Prospect Street and one on East Main Street at the intersection with East Street. All three of these curves occur at points where there is also a vertical curve; the combination of which limits sight distance for all users. Vernon Avenue, Brooklyn Street and West Main Street currently do not have striped shoulders for bicycle accommodation. Future development of the mill properties around the study area could increase trip making for all transportation modes.

Figure 4 and Table 3 summarize the roadway geometrics in the study area.



Figure 4. East Main Street, West Main Street, Vernon Avenue and Brooklyn Street Geometrics

Vernon - East Main Street, West Main Street, Vernon Avenue and Brooklyn Street Street Inventory

Street	Route	Lanes	Avg. Lane Width	Sidewalk				Curb	Parking	Shoulder	Ramps	
				Side	Type	Width	Condition*				Exist	Compliant
East Main Street	Route 74	1	11-13'	EB	Concrete	6'	Good	Concrete	No	0-4'	Yes	Some
		1	11-13'	WB	Concrete	6'	Good	Concrete	Some	0-4'	Yes	Some
West Main Street		1	15-16'	EB	Concrete	7'	Good	Granite	No	No	Yes	Some
		1	15-16'	WB	Concrete	7'	Good	Granite	No	No	Yes	Some
Vernon Avenue		1	12-15'	NB	No	N/A	N/A	Granite	No	No	No	N/A
		1	12-15'	SB	Concrete	4-5'	Good	Granite	No	No	Yes	No
Brooklyn Street		1	10-20'	EB	Concrete	5'	Good	Granite/	Yes	No	Yes	Some
		1	10-20'	WB	Mixed	5-7'	Fair	Concrete	Yes	No	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. Street Inventory

2.2 Prior Successful Effort

The Town is in the process of redeveloping mill properties throughout the downtown area. The Minterburn/Roosevelt Mill was recently redeveloped successfully into a residential and retail complex (Loom City Lofts) and the Amerbelle Mill is currently being partially demolished in anticipation of future redevelopment. The Hockanum Mill is being redeveloped and may include a restaurant and motorcycle museum. This mill property is just outside the study area.

The Town is currently about half way through a five to six year paving plan.

The Town recently hired a contractor to identify and repair trip hazards in the sidewalk network downtown. This work has been successfully completed.

The Town has a sidewalk plan as part of their Plan of Conservation and Development.

The signal at the intersection of Park Street and East Main Street is currently being re-designed by CTDOT to include upgraded pedestrian amenities. It is planned to be completed in 2018.

Vernon Avenue was resurfaced last year and the bridge on Vernon Avenue was rebuilt about five years ago. West Main Street is scheduled to be repaved within the next two years.

The Town completed streetscape improvements along Park Place in 2007.

The Town is currently conducting a sign inventory program.

2.3 Pre-Audit Meeting

The RSA was conducted on October 18, 2016. The Pre-Audit meeting was held at 8:30 AM in the Town Hall located on Park Place in Vernon.

The RSA Team was comprised of staff from AECOM, staff from CTDOT, and representatives from Vernon departments including Public Works, Planning, Engineering, Town Administrator and the Chief of Police. The complete list of attendees can be found in Appendix B.

Several items were presented for general information prior to conducting the Audit in the field:

- The ADT counts may be low because there have been several new developments in town since they were last updated.
- There have been two serious bicycle vs. vehicle accidents in the RSA area in 2016.
- There is a jog in the alignment on West Main Street and a utility pole at the corner has been hit several times.
- Sun glare can be a problem on some roads in the RSA area at certain times of the year.
- There is no sidewalk on Route 74 from East Street to the Tolland town line.

- Property owners are required to clear snow from sidewalks; this has occasionally been a problem in the past. The Town will clear snow for the elderly and business owners, if necessary.
- The snow shelf is not always adequate, so snow is sometimes plowed onto sidewalks that have already been cleared.
- Children are either bussed or driven to school; there are very few walkers.
- There is significant pedestrian traffic near the Rockville General Hospital, just outside the RSA area.
- The Cornerstone Shelter on the corner of Prospect Street and East Main Street and a nearby food kitchen generate significant pedestrian traffic.
- The RSA area has steady pedestrian traffic, especially around lunch time.
 - For the most part, pedestrians do make use of the pedestrian facilities and crosswalks.
- There are no bicycle markings or bicycle racks on the street.
- There is some bicycle traffic on the weekends, but most recreational bicyclists stay on the Rails-to-Trails.
- CT Transit buses run along Main Street with several stops that are heavily utilized. There is one bus shelter. Many pedestrians travel to and from the bus stops.
- The proposed expansion of CT Fast Track includes a stop in Vernon.
- Speeds are not a major issue in this area. There has been some DUI enforcement.
- There is elderly housing off of Brooklyn Street and the Town has re-painted the intersection of Court Street and Brooklyn Street to be more accommodating to handicapped users.
- The section of Brooklyn Street between East Main Street and Cedar Street is currently closed as part of the Amerbelle Mill demolition.
- An area adjacent and south of Brooklyn Street (Cedar, Cherry, High Streets) is a dense residential area and many pedestrians come from there to the town center.
- There are several public events throughout the year during which the Town closes roads in the town center and high numbers of pedestrians (10,000) come to the area.
- The Town would like to integrate the re-development of the Amerbelle Mill complex with the surrounding area and make it a model for connectivity in the area.
- The Town would also like to look at sidewalks in the area and identify any locations where improvements are needed.
- The Town's Plan of Conservation and Development includes a sidewalk plan (see Appendix).
- A vendor was recently contracted by the Town to identify and repair trip hazards on sidewalks, with a particular focus on the town center.
- Some sidewalks are older and deteriorated and some have been capped with asphalt.
- Shared parking is something the Town would like to look into more; some shopping plazas (Court House Plaza) have already enacted private agreements. A farmer's market is held in Court House Plaza on Thursdays during the harvest season.
- There is free on-street parking in the town center.

- Parking is somewhat limited but there have been no major problems.
 - There is one large lot that can be used if needed, but many people prefer closer parking to their destinations.
 - Parking can be an issue during snow events when parking bans are in place.
- Some roads are narrow and there is nowhere to put snow making on-street parking difficult. As a result, the Town has to truck snow off site; Brooklyn Street east of Court Street is an example of this.
- CTDOT is upgrading the signal at the intersection of Park Street and East/West Main Street, including new pedestrian facilities.
- Rockville is part of a national and state historic district and there are several signs and monuments for a self-guided walking tour.
- Vernon Avenue was recently resurfaced and the Vernon Avenue bridge was replaced approximately 5 years ago.
- The Town is approximately half way through a five to six year paving plan and has recently re-paved Kingsbury Lane and East Street.
 - West Main Street is scheduled to be re-paved in 2017 or 2018 as part of this program.
- The Amerbelle Mill property could generate a lot of pedestrians depending on how it is redeveloped; the Town would prefer a commercial development.
- Loom City Lofts is a recent redevelopment of a mill property on Route 74 and includes apartments and retail.
- Another mill property located just outside of the RSA area on West Main Street is proposed to be redeveloped in the future.
- A mill property (former Baseball Factory) at 114 Brooklyn Street is currently used as a welding shop and as storage for a local furniture store, but has limited parking.
- The Rockville General Hospital recently shifted from public to private ownership and is looking to increase the number of services provided.
- The Rails-to-trails multi-use path currently ends at Vernon Avenue and there is a desire to investigate whether this can be extended or linked to Tolland.
 - The trail is heavily used especially on weekends.
 - Wayfinding signage would be useful.
 - The Town currently maintains the trail, which is designated as a state greenway.

3 RSA Assessment

3.1 Field Audit Observations

Intersection of West Main Street, Elm Street, and Union Street:

- There are no pedestrian crossing signs at the crosswalk on Elm Street at Park Place.
- The sidewalk on the corner of West Main Street and Elm Street is less than four-feet wide. It also has signs mounted within the sidewalk.
- There are no detectable warning strips at the handicap ramps at the intersection.
- The longest crosswalk at the intersection is 66-foot long and the exclusive (all-red) pedestrian signal phase is 25 seconds long. This appears to be adequate.
- The pedestrian signal heads are outdated.
- It was noted that it may be possible to upgrade the pedestrian signals at this location as part of the CTDOT Park Street improvement project.
- The Elm Street crosswalk does not go to a sidewalk ramp on the northwest corner (Figure 5).
- It was noted that the eastbound left-turn vehicle movement from Union Street onto Elm Street is prohibited.

West Main Street:

- Some signs do not meet the seven-foot minimum height above a sidewalk (Figure 6).
- There is a seven-foot wide concrete sidewalk.
- West Main Street is 32-foot wide with 16-foot lanes in each direction and no shoulders.
 - At the curve, the width is 30-feet (Figure 7).
- It may be possible to provide a bike lane, striped shoulders or cycle track due to the wide lane widths.
- The granite curb reveal is substandard on the north/west side of the street (Figure 7).



Figure 5. Crosswalk not Meeting Ramp on the Northwest Corner of the West Main Street, Elm Street and Union Street Intersection



Figure 6. Low Signs on West Main Street

- Trip hazards had been recently repaired on the sidewalk.

Intersection of West Main Street and Vernon Avenue:

- The handicap ramp on the southwest is steep and not ADA compliant.
- There are no detectable warning strips.

Vernon Avenue:

- Vernon Avenue north of the bridge is 30-feet wide with 15-foot lanes in each direction and no shoulders.
- There are no detectable warning strips at the intersection of Linden Place and Vernon Avenue. The handicap ramp on the northwest corner is not ADA compliant.
- Vernon Avenue south of the bridge is 25-feet wide.
- The sidewalk is four feet wide on the bridge.
- Some vegetation is overgrown and encroaching on the sidewalk on Vernon Avenue (Figure 8).

Intersection of Vernon Avenue and Brooklyn Street:

- There is a crosswalk on the north side of the intersection with handicap ramps and detectable warning strips. Vernon Avenue is uncontrolled, but there are no pedestrian crossing signs.
- There are new catch basin grates on Vernon Avenue at this location that are bicycle friendly.

Vernon Rails-to-Trails at Vernon Avenue

- There is concrete sidewalk (between 4 and 5 feet wide) and granite curb on the west side of Vernon Avenue.
- The trail terminates on the west side of Vernon Avenue.



Figure 7. West Main St. looking North



Figure 8. Vegetation Overgrowth on Vernon Avenue

- The existing signage is not adequate to direct pedestrians and bicyclists to the downtown center (Figure 9).

Brooklyn Street:

- Brooklyn Street is the preferred route to link the Rails-to-Trails terminus on Vernon Avenue to the town center.
- Brooklyn Street is 24-feet wide at Vernon Avenue with 12-foot lanes in each direction and no shoulders.
- Brooklyn Street is 28-feet wide with a 16-foot westbound lane and a 12-foot eastbound lane at the welding shop (former Baseball Factory) just east of the intersection with Vernon Avenue.
- There is a seven-foot bituminous and concrete sidewalk on the north side at the west end and the condition is poor.
 - An eight-foot wide multi-use path could be an option to replace this sidewalk.
- There is a 50 foot long mid-block crosswalk that is on a skew (Figure 10). There are no handicap ramps or pedestrian signs provided at the crosswalk.
- Brooklyn Street is 43-feet wide at the Ledgecrest apartments with parking on both sides of the street. A two-foot wide snow shelf begins on each side Brooklyn Street at the Ledgecrest apartments and continues to the north.
- There are options to provide shoulder striping or bicycle lanes to reduce the travel lane width on Brooklyn Street.
- North of Court Street, there is a short section of angled parking on the east side, and Brooklyn Street reduces to 20 feet wide north of that point and adjacent to the Amerbelle Mill property.



Figure 9. Existing Rails-to-Trails Signage



Figure 10. Skewed Mid-block Crosswalk on Brooklyn Street

Intersection of Brooklyn Street and Court Street

- There are no detectable warning strips at the four apex handicap ramps.
- Curb extensions may be possible at the intersection of Brooklyn Street with Court Street to reduce crosswalks that are up to 64-feet long. Large truck movements may be an issue to installing curb extensions.
- The crosswalk lengths can be reduced by moving crosswalks off the corners (apex ramps) closer to the stop bars (Figure 11).
- The preferred route for the trail extension is via Court Street north to East Main Street.



Figure 11. Crosswalks at the Intersection of Brooklyn Street and Court Street

Intersection at East Main Street, Brooklyn Street and Grove Street:

- Brooklyn Street and Grove Street intersect East Main Street very close to one another (Figure 12).
- There are no crosswalks. Handicap ramps are provided on both sides of the Grove Street leg, but there are no detectable warning strips.
- Pedestrian buttons are provided on the north side of East Main Street and the southwest corner of East Main Street and Brooklyn Street for pedestrians to cross concurrently with traffic. There are no pedestrian signals.
- A long-term solution to provide a round-about was mentioned.



Figure 12. Grove Street, Brooklyn Street, East Main Street Intersection

East Main Street between Grove Street and Park Street

- There is limited sight distance on westbound East Main Street approaching Prospect Street due to vertical and horizontal curves.
- A crosswalk is located west of Prospect Street (Figure 13). There are handicap ramps on each side of the crosswalk, but the ramp on the north



Figure 13. Crosswalk at Prospect Street

side is not ADA compliant. There are no detectable warning strips and outdated pedestrian crossing signs.

- Several crashes have occurred where westbound vehicles on East Main Street have struck utility poles and buildings just west of Prospect Street.
- East Main Street is 30-feet wide at Prospect Street, with 11-foot lanes and four-foot shoulders in each direction.
- There are damaged sidewalks along the south side of East Main Street that are trip hazards. At Court Street the sidewalk condition is poor.
- Some of the catch basins in the RSA area do not have bike friendly catch basin grates.
- There is a crosswalk across Cottage Street at East Main Street. There are handicap ramps, but no detectable warning strips.
- Court Street is 43 feet wide with no shoulders and only a single lane in each direction. Curb parking is permitted.
- There are no crosswalks at the intersection of East Main Street and Court Street. There is a handicap ramp on the southeast corner, but none on the southwest corner. There are no detectable warning strips. The stop sign on the Court Street approach is located too far back from the intersection.
- There are bus stops on both sides of East Main Street west of Court Street, but no crosswalks are provided on East Main Street. East Main Street in this area is very wide due to the transition to multiple lanes (five lanes) east of the Park Street intersection.
- It is unclear whether the second eastbound through lane on East Main Street between Park Street and Court Street is necessary.

- There are no handicap ramps at the intersection of East Main Street and Park Street (Figure 14).
 - The longest crosswalk length is 76 feet and the exclusive (all-red) pedestrian phase is 27 seconds which appears adequate. The CTDOT will be improving this intersection and signal equipment.
- There are no detectable warning strips at the crosswalk across St. Bernard Terrace at Park Street and Park Place.



Figure 14. Lack of Sidewalk Ramps at East Main Street/Park Street Intersection

East Main Street/Tolland Avenue between Loom City Lofts and Kingsbury Avenue

- The sidewalk on the south side of east Main Street in the vicinity of Loom City Lofts is in poor condition.
- There is limited sight distance for vehicles turning from East Street onto Route 74 due to a switchback horizontal curve and a steep hill at the intersection (Figure 15). Several crashes were noted.
- The sidewalk on the south side of East Main Street currently ends at East Street.
- It appears that the north side of Tolland Avenue between East Street and Kingsbury Avenue would be a better place to construct a new sidewalk because the terrain is more level, right of way appears adequate and this is the side with houses. The existing sidewalk in Tolland on Route 74 (Tolland Stage Road) is also on the north side.



Figure 15. East Street looking West on Route 74

3.2 Post Audit Workshop - Key Issues

Intersection of West Main Street, Elm Street and Union Street:

- Pedestrian facilities that need upgrading include handicap ramps, detectable warning strips and pedestrian signals. CTDOT will investigate

whether this signal can be added to the existing signal project at Park Street and East Main Street.

West Main Street:

- This is a wide street (30-32-feet) and could be considered for shoulders, bike lanes or a cycle track.
- There is a pinch point at the corner where the road narrows and there are utility poles close to the edge of pavement.
- Consideration should be given to increasing the radius at the turn.
- Pedestrian handicap ramps and detectable warning devices need improvement.

Vernon Avenue:

- Vernon Ave. is 30-feet wide at the bottom of the hill and 25-feet wide past the bridge.
- Wayfinding signage and/or a map would be useful at the Rails-to-Trails trailhead (Figure 16).
- Pedestrian handicap ramps and detectable warning devices need improvement.
- The crosswalk at the intersection of Vernon Avenue and Brooklyn Street needs signage.

Brooklyn Street:

- Brooklyn Street is the preferred route to link the Rails-to-Trails terminus on Vernon Avenue to the downtown.
- There is handicap signage that should be removed because it is not standard and is likely not needed.
- The skewed mid-block crosswalk would be more effective if straightened. Handicap ramps and pedestrian crossing signs should be added.



Figure 16. Rails-to-trails Sign on Vernon Avenue



Figure 17. Brooklyn Street facing East

- Some sections of Brooklyn Street are very wide and a bike lane or shoulder could be striped or a multi-use facility path added (Figure 17).
- The sidewalk near the mill building on the west end of the street goes up to the face of the building (Figure 18).
 - The area in front of the mill building is the controlling point to determine whether or not a multi-use path would fit.
- There are long crosswalks at the Court Street intersection and operations would be improved if they were reduced (Figure 19).
 - The lane widths could possibly be narrowed with street trees and a landscaping strip added.
 - Shifting the crosswalks away from the curb radii and closer to the stop bars would reduce the crossing distance.
 - The Town does not want to add curb extensions due to plowing concerns.
 - Court Street is also very wide to accommodate truck deliveries at the Anacoil business on Court St (Figure 20).
 - One possible improvement may be to stripe bike lanes on Court Street so that the curb to curb width remains the same but the lane widths are narrowed.
 - It appears that the Town would not be able to direct pedestrians/bicyclists to use Courthouse Plaza as a connection between Brooklyn Street and East Main Street because it is a private way. The preferred connection would be via Court Street.



Figure 18. Sidewalk Near the Mill Building.



Figure 19. Intersection of Brooklyn Street and Court Street



Figure 20. Looking North on Court Street from Brooklyn Street Intersection

East Main Street between Grove Street and Park Street

- Grove Street and Brooklyn Street intersect with East Main Street, but are closely spaced. There appear to be opportunities to improve the intersection configuration in the long-term.
 - CTDOT will investigate whether this intersection could be considered for a roundabout.
 - There are no crosswalks or pedestrian signals at this intersection.
- Extending a trail behind Paper Mill Pond to East Street is not feasible due to grading constraints.
- Sight distance for westbound motorists on East Main Street approaching the Prospect Street intersection and crosswalk is poor and a rectangular rapid flashing beacon or other treatment may be warranted.
 - An advisory speed sign and reflectors on westbound East Main Street coming down the hill approaching Prospect Street may be useful.
 - The pedestrian signs at the crosswalk at Prospect Street are outdated and should be updated with the latest standard signs.
- There is no crosswalk at East Main Street and Court Street. A crosswalk and ADA accessible handicap ramps should be considered.
- East Main Street is very wide where the CT Transit bus stops are located across from Court Street. (Figure 21).
 - Pedestrians need a safe way to cross East Main Street at this location.
 - This is a popular bus stop and generates significant pedestrian traffic.



Figure 21. Bus Stop on East Main Street

- CTDOT will coordinate with CT Transit as to why the stop was located here and if it can be relocated or consolidated with an adjacent stop.

East Main Street/Tolland Avenue between Snipsic Street and Kingbury Avenue:

- There is limited sight distance at the crosswalk at Snipsic Street and there are no pedestrian signs.
- At the intersection with East Street sightlines are restricted due to the combination of vertical and horizontal curves.
 - Steep grades may make a roundabout infeasible at this location.
 - Reducing curb radii and realigning East Street to the east across from the Loom City Lofts driveway and at less of a skew could improve operations (Figure 22).
- The best location for a sidewalk between East Street and Kingsbury Avenue is on the north side of Tolland Avenue (Figure 23).
 - A potential pedestrian crossing on East Main Street/Tolland Avenue would need to be evaluated to determine where the safest location would be. This should be done in conjunction with evaluating realignment options at East Main Street and East Street.



Figure 22. Looking West on East Main Street from just East of East Street



Figure 23. North Side of Route 74 looking West

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 or more years when funding is available.

4.1 Short Term

1. Install pedestrian crosswalk signs at the intersections of Elm Street and Park Place, Vernon Avenue and Brooklyn Street, and Brooklyn Street at Ledgecrest apartment complex (Figure 25).
2. Determine if pedestrian facilities at the intersection of West Main Street, Elm Street and Union Street including handicap ramps, detectable warning strips, countdown pedestrian signals and audible pushbuttons can be upgraded to current standards as part of the signal project at East Main Street and Park Street (Figure 24, Figure 26, Figure 27).
3. Raise all traffic signs to seven-foot height.
4. Stripe shoulder lines on West Main Street to provide 11-foot wide travel lanes and four to five foot wide shoulders to accommodate bicycles. The shoulder striping will need to be adjusted at the curve in the road.
5. Trim vegetation that is encroaching on sidewalks throughout the RSA area.
6. Investigate right of way limits on Brooklyn Street to determine if an eight-foot wide multi-use path is feasible east of the mill building (Baseball Factory).
7. The Town to coordinate with CTDOT to evaluate whether the second through lane on East Main Street eastbound between Park Street and Court Street is necessary.
8. Install wayfinding signage and/or a map at the Rails-to-Trails trailhead on Vernon Avenue and at other locations on Brooklyn Street and Court Street.
9. The Town to coordinate with CTDOT to install an advisory speed sign and reflectors for westbound East Main Street traffic approaching Prospect Street.
10. The Town to coordinate with CTDOT to investigate the following pedestrian improvements:
 - a. West Main Street/Elm Street/Union Street - Install handicap ramp on northwest corner and detectable warning strips;
 - b. East Main Street/Grove Street – Install crosswalks, detectable warning strips, pedestrian signals;
 - c. East Main Street/Prospect Street – Upgrade pedestrian crosswalk signs and handicap ramps, install detectable warning strips;
 - d. East Main Street/Cottage Street – Install detectable warning strips;

- e. East Main Street/Court Street – Install crosswalk across Court Street, detectable warning strips, and handicap ramp on the west side, move stop sign closer to intersection, upgrade catch basin grates;
- f. East Main Street/Snipsic Street – Evaluate crosswalk location on west side of intersection and consider moving to the east side. Provide proper handicap ramps and crosswalk signage.
- g. Improve sidewalk on East Main Street east of Court Street and Loom City Lofts.

Figure 28 depicts some of these recommendations.



Figure 25. Pedestrian crossing sign



Figure 24. Pedestrian Push Button.



Figure 26. Pedestrian Detectable Warning Strip.



Figure 27. Pedestrian Countdown Signal Head

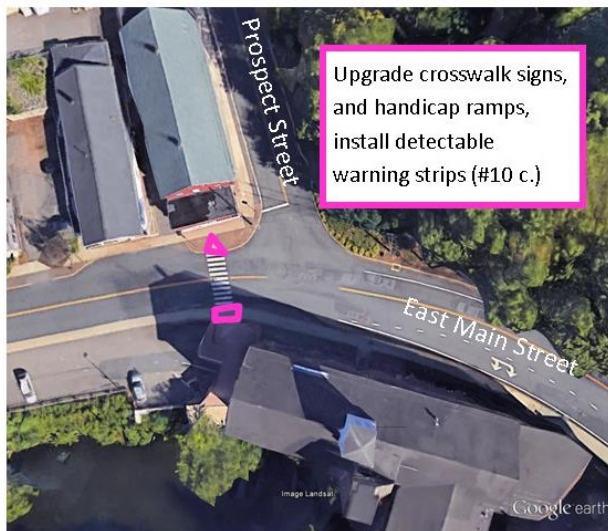
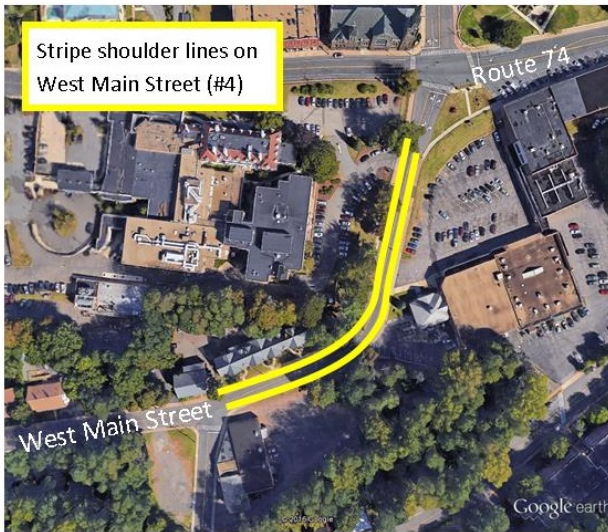


Figure 28. Short Term Recommendations

4.2 Medium Term

1. Reset the curb on West Main Street to the proper reveal height when re-paving the road.
2. Provide the following pedestrian improvements:
 - a. West Main Street/Vernon Avenue – Upgrade handicap ramps and install detectable warning strips;
 - b. Vernon Avenue/Linden Place - Upgrade handicap ramps and install detectable warning strips;
 - c. Brooklyn Street/Apartment complex - Re-stripe the mid-block crosswalk so that it is perpendicular and add handicap ramps and detectable warning strips;
 - d. Brooklyn Street/Court Street - install detectable warning strips;
 - e. Park Street/Park Place/St. Bernard's Terrace - Install detectable warning strips;
3. The Town to coordinate with CTDOT to evaluate use of rectangular rapid flashing beacons (RRFB) or other enhanced pedestrian measures at the intersection of East Main Street and Prospect Street. Coordinating the RRFB with an advance flashing warning beacon on westbound East Main Street approaching Prospect should also be evaluated (Figure 29).
4. Repair damaged sidewalks damaged sidewalks where needed.
5. Replace catch basin grates with the new bike friendly grates as needed.
6. Coordinate with CT Transit to determine if the bus stop locations on East Main Street near Court Street can be relocated or consolidated with another stop.
7. Consider bicycle facilities on West Main Street including a cycle track or bike lanes.
8. Stripe bike lanes on Court Street and reduce the width of the travel lanes.

Figure 30 depicts some of the recommendations.



Figure 29. Rectangular Rapid Flashing Beacon

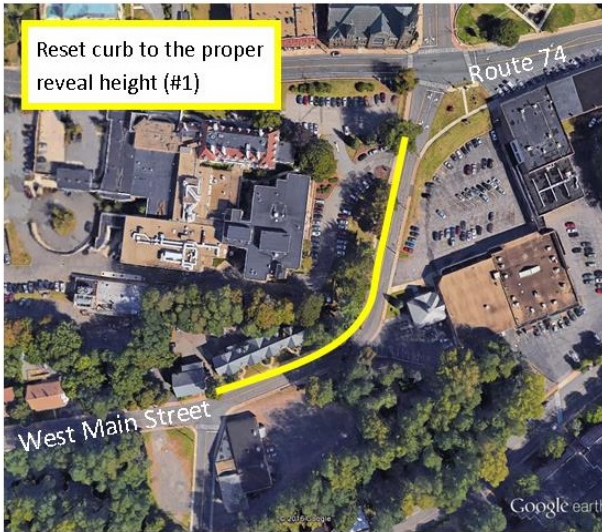


Figure 30. Medium Term Recommendations

4.3 Long Term

1. Consider options to reduce pedestrian crossing distance at the Court Street and Brooklyn Street intersection including narrowing lanes, shifting crosswalks away from curb radii and adding a landscaping strip.
2. Assess options to improve the configuration of the intersection of Grove Street and Brooklyn Street with East Main Street, including a roundabout.
3. The Town to coordinate with CTDOT to evaluate alternative intersection geometry at East Street and East Main Street to improve sight distance and safety and provide for safe pedestrian crossings.
4. The Town to coordinate with CTDOT to construct a sidewalk on the north side of Tolland Avenue from East Street to the Tolland town line and design a pedestrian crossing of East Main Street/Tolland Avenue to connect it to the existing sidewalk on the south side of East Main Street.
5. Evaluate the alternative of lengthening the radius of the curve on West Main Street east of Vernon Avenue.
6. Design and construct bike lanes or a multi-use path on Brooklyn Street.
7. Consider constructing a snow shelf on Vernon Avenue between Brooklyn Street and West Main Street.

Figure 31 depicts some of these recommendations.

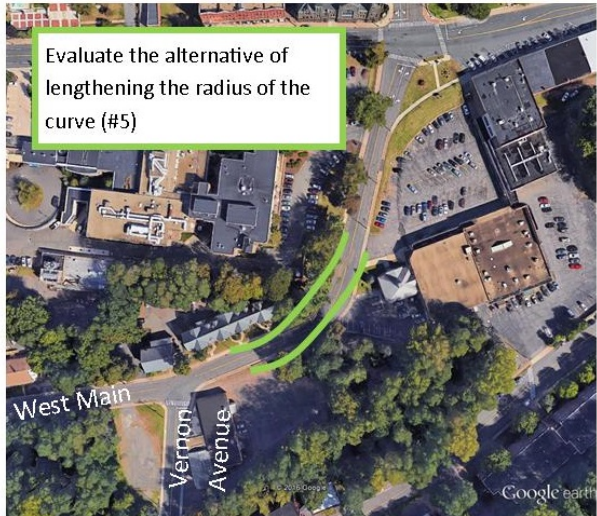


Figure 31. Long Term Recommendations

4.4 Summary

This report documents the observations, discussions and recommendations developed during the successful completion of the Town of Vernon RSA. It provides Vernon with an outlined strategy to improve the transportation network for all road users on East Main Street, West Main Street, Vernon Avenue and Brooklyn Street, particularly focusing on pedestrians and cyclists. Moving forward, Vernon 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.



COMMUNITY
connectivity program

Appendix A



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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	<input type="text"/>
Title	<input type="text"/>
Email Address	<input type="text"/>
Telephone Number	<input type="text"/>

2. Location information

Address	<input type="text"/>
Description	<input type="text"/>
City / Town	<input type="text"/>

3. Roadway type
(Please select all that apply)

State road

Local road

Private Road

Other (please specify)

4. Zoning
(Please select all that apply)

Industrial

Residential

Commercial

Mixed Use

Retail

N/A (not applicable)

Other (please specify)

5. Approximate mile radius around the location

Other (Please Specify)

6. Community Sites
(Please select all that apply)

Community Centers

Business Districts

Restaurant/Bar Districts

Churches

Housing Complexes

Proximity to Schools

Tourist Locations (examples – Casino, Malls, Parks, Aquarium, etc...)

N/A (not applicable)

Other (please specify)

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

Yes

No

If Yes please describe (please specify)

8. Educational facilities

(Please select all that apply)

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)

Bus

Rail

Ferry

Airport

Park and Ride Lot

N/A (not applicable)

Other (please specify)

10. Safety Concerns
(Please select all that apply)

Traffic (volumes & speed)

Collisions

Sidewalks

Traffic Signals

Traffic Signs

Parking Restrictions / Additions

Drainage

ADA Accommodations

Agricultural & Live Stock crossing

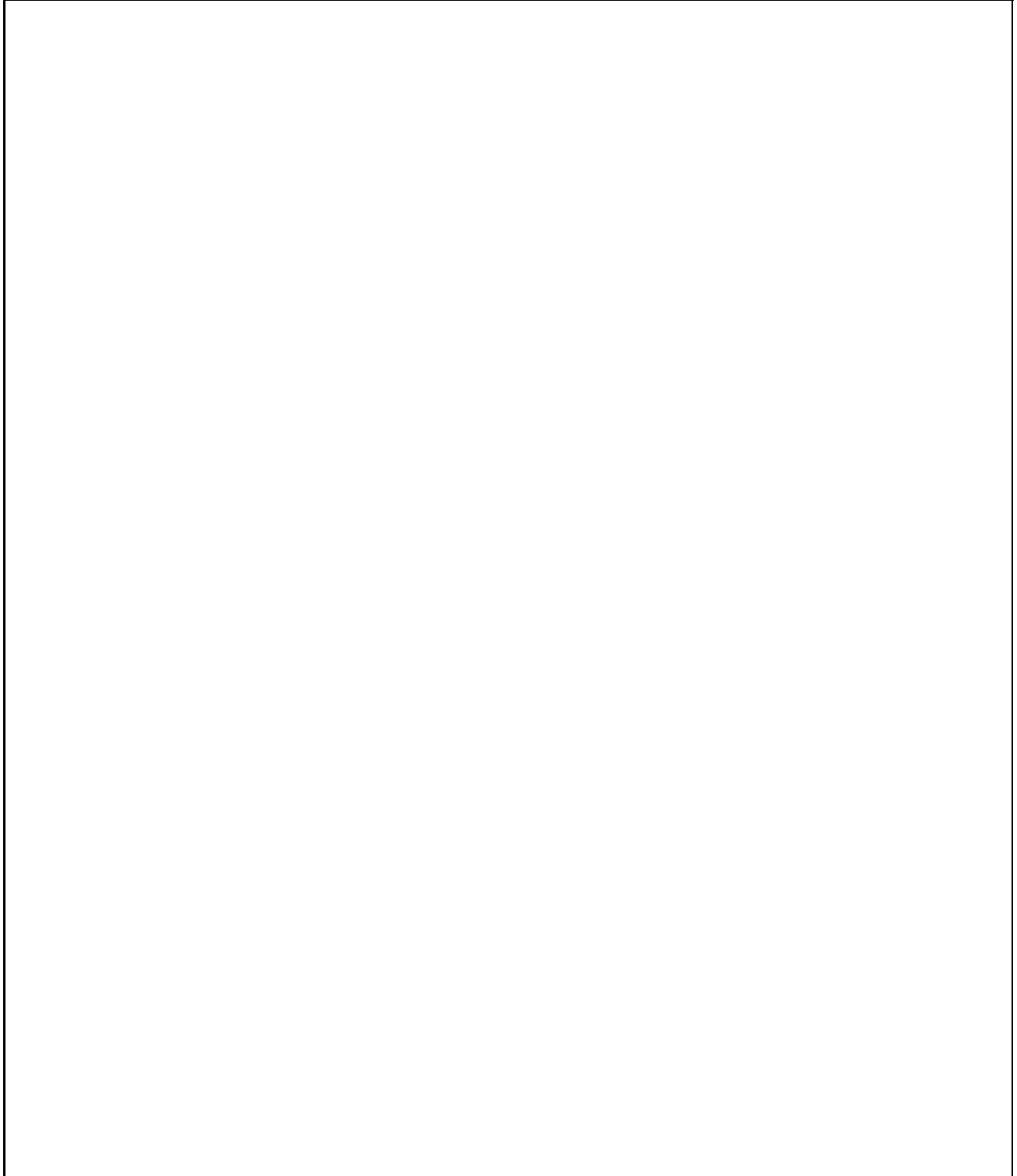
Maintenance issues (cutting grass, leaves, snow removal)

N/A (not applicable)

Other (please specify)

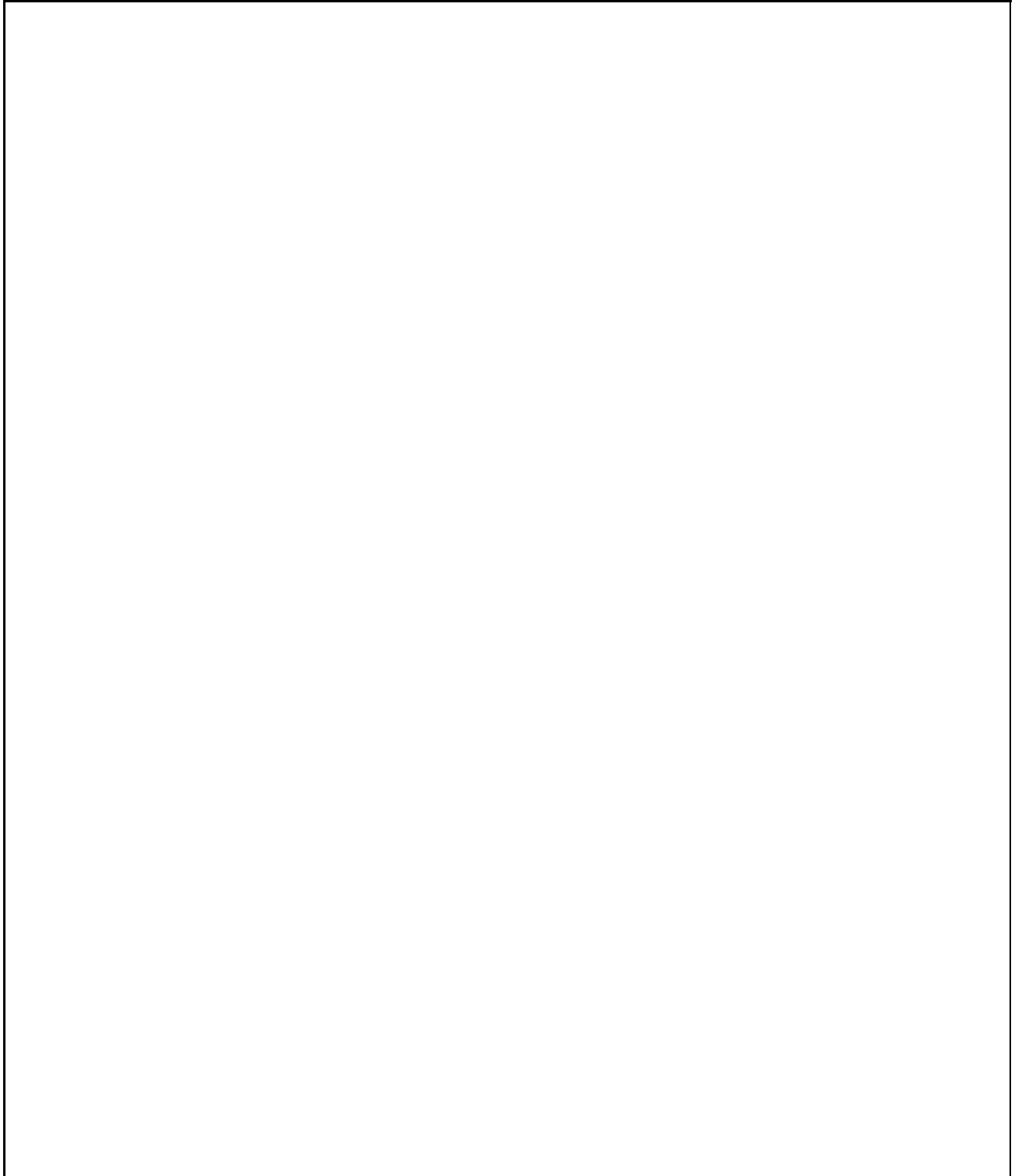
11. Are there any past, current or future transportation/economic development projects near this location (i.e. Federal, State or local projects)?

If Yes please describe and list all projects.

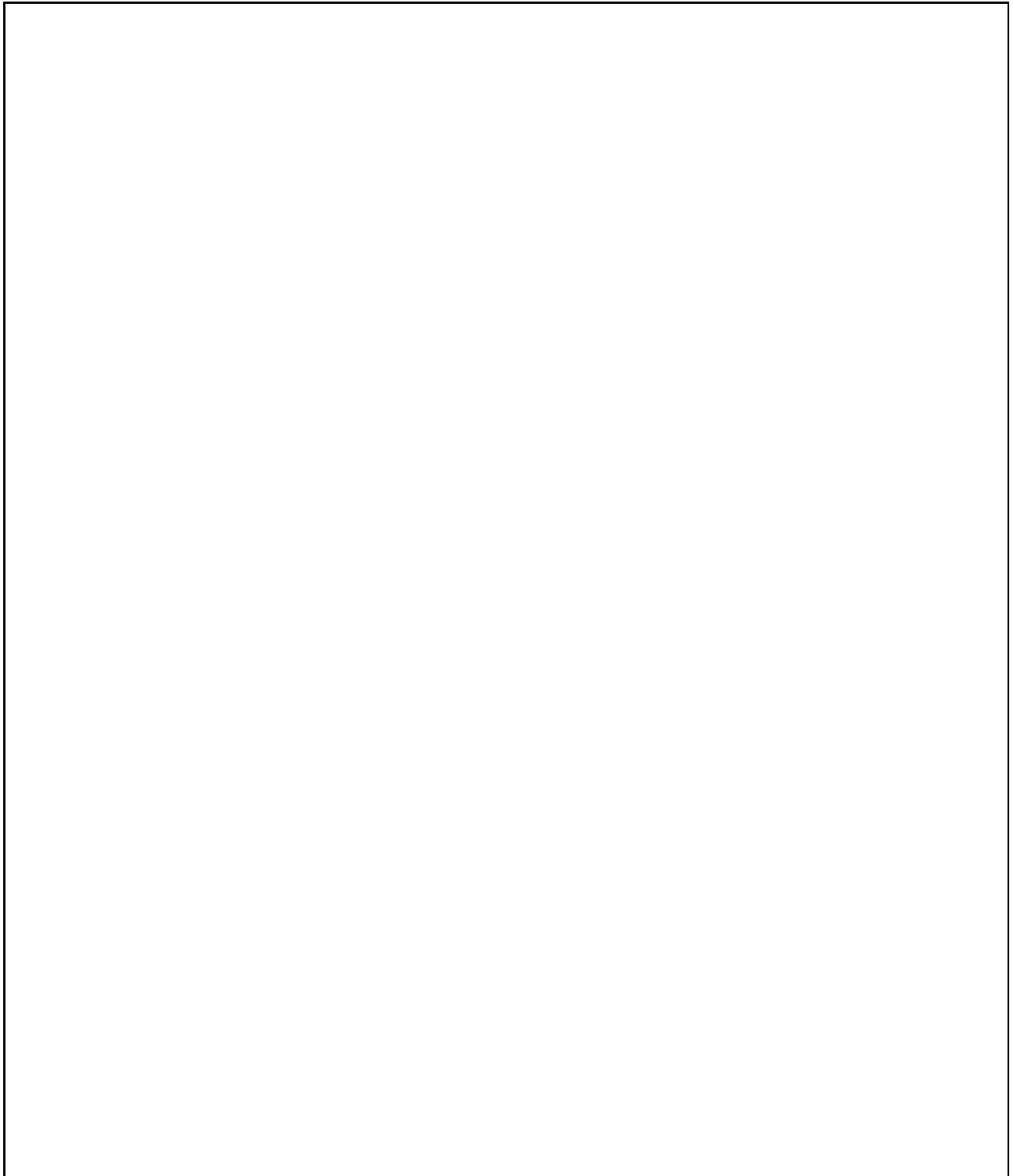
A large, empty rectangular box with a thin black border, intended for the user to describe and list any past, current, or future transportation or economic development projects near the location. The box is currently blank.

12. Environmental Concerns:

If Yes please describe and list.

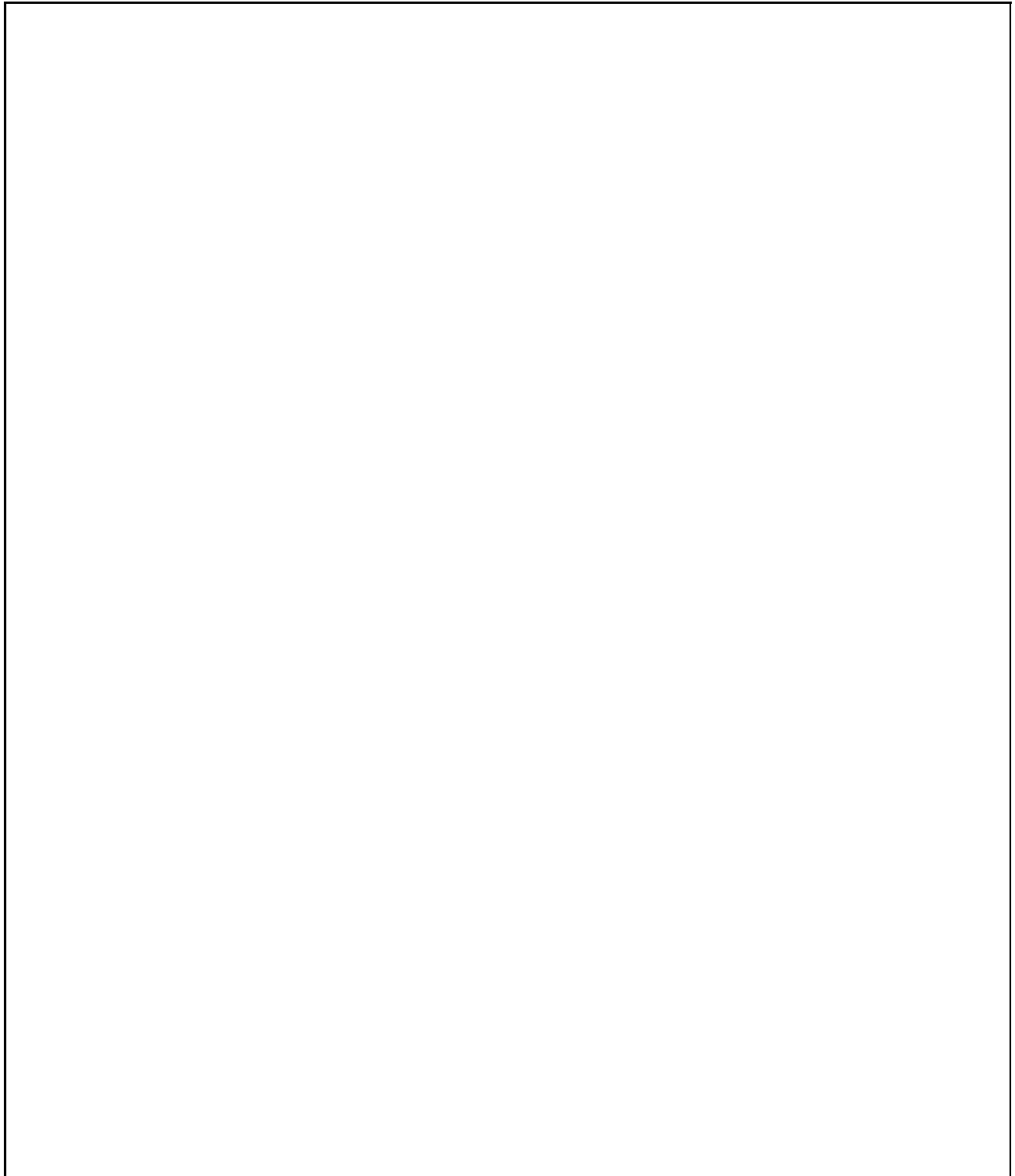
A large, empty rectangular box with a thin black border, intended for the user to describe and list any environmental concerns. The box occupies most of the page's vertical space below the instruction.

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

A large, empty rectangular box with a thin black border, intended for the user to provide an explanation for why a location should be considered for an RSA. The box occupies most of the page's vertical space below the question.

14. Are there plans to expand the area?

(Transportation Oriented Development, Economic Development, housing, etc...)



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

A large, empty rectangular box with a thin black border, intended for the user to provide any other pertinent information unique to the location.

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)



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Appendix B



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Road Safety Audit

Town: Vernon
RSA Location: East Main Street
Meeting Location: Vernon Town Hall, 3rd floor
Address: 14 Park Place, Vernon, CT 06066
Date: 10/18/2016
Time: 8:30 AM

Participating Audit Team Members

Audit Team Member	Agency/Organization
Brad Sabean	Aecom
Marina Rodriguez	Town of Vernon
Craig Babowicz	CTDOT
David Smith	Vernon
Matt Cegielski	CTDOT
John Ward	John Ward
Jim Kenny	Police Department
Jeff Schambach	Public Works
Jeff Maxtutis	Aecom



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Appendix C



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Road Safety Audit – Vernon

Meeting Location: Vernon Town Hall, 3rd floor
Address: 14 Park Place
Vernon, CT 06066
Date: 10/18/2016
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 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
<p>Pedestrian Crossings</p> <ul style="list-style-type: none">• Sufficient time to cross (signal)• Signage• Pavement Markings• Detectable warning devices (signal)• Adequate sight distance• Wheelchair accessible ramps<ul style="list-style-type: none">○ Grades○ Orientation○ Tactile Warning Strips• Pedestrian refuge at islands• Other	
<p>Pedestrian Facilities</p> <ul style="list-style-type: none">• Sidewalk<ul style="list-style-type: none">○ Width○ Grade○ Materials/Condition○ Drainage○ Buffer• Pedestrian lighting• Pedestrian amenities (benches, trash receptacles)• Other	



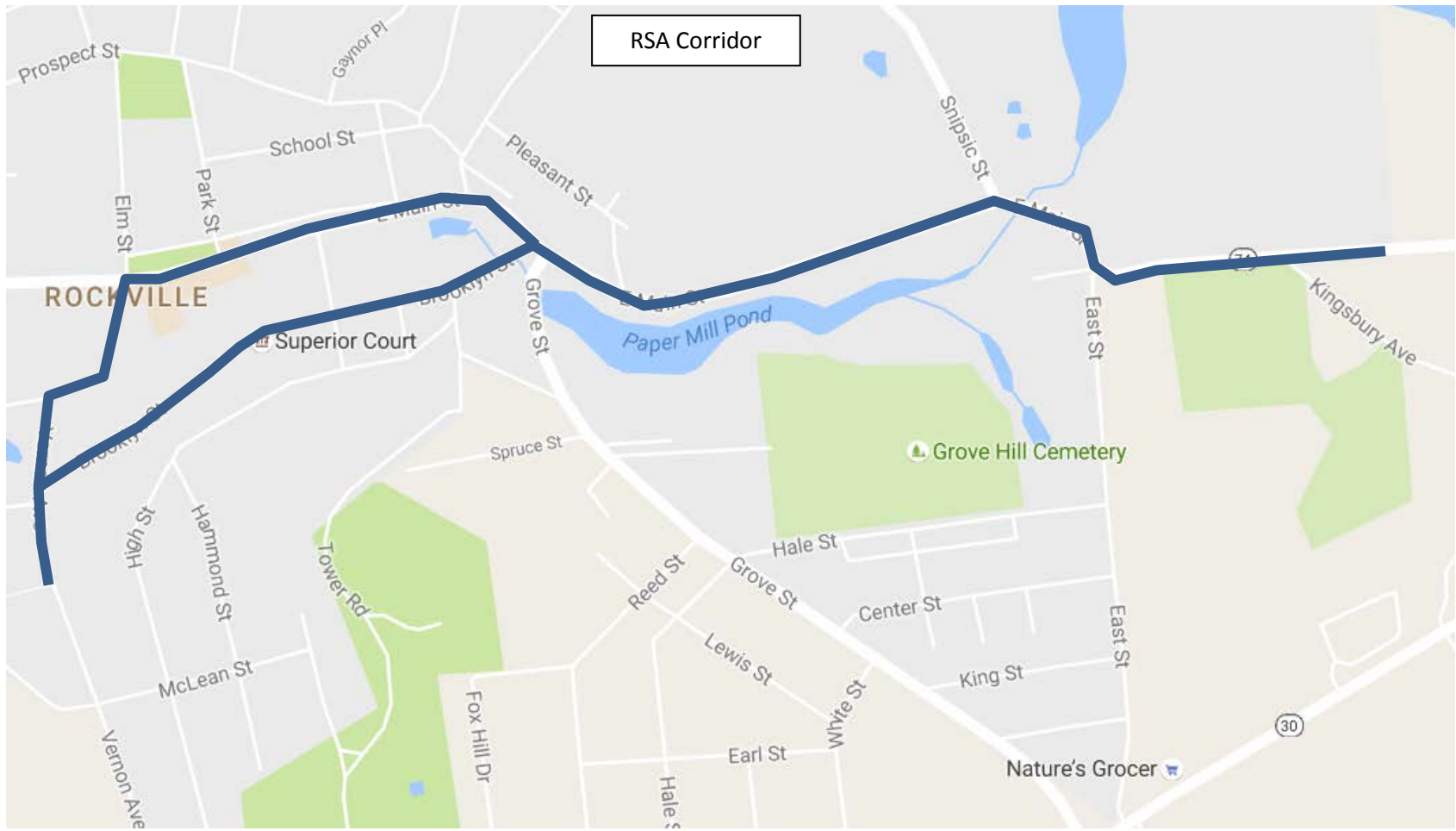
Bicycles <ul style="list-style-type: none">• Bicycle facilities/design• Separation from traffic• Conflicts with on-street parking• Pedestrian Conflicts• Bicycle signal detection• Visibility• Roadway speed limit• Bicycle signage/markings• Shared Lane Width• Shoulder condition/width• Traffic volume• Heavy vehicles• Pavement condition• Other	
--	--

Roadway & Vehicles	
<ul style="list-style-type: none">• Speed-related issues<ul style="list-style-type: none">○ Alignment;○ Driver compliance with speed limits○ Sight distance adequacy○ Safe passing opportunities	
<ul style="list-style-type: none">• Geometry<ul style="list-style-type: none">○ Road width (lanes, shoulders, medians);○ Access points;○ Drainage○ Tapers and lane shifts○ Roadside clear zone /slopes○ Guide rails / protection systems	

<ul style="list-style-type: none">• Intersections<ul style="list-style-type: none">○ Geometrics○ Sight Distance○ Traffic control devices○ Safe storage for turning vehicles○ Capacity Issues	
--	--



<ul style="list-style-type: none">• Pavement<ul style="list-style-type: none">○ Pavement Condition (excessive roughness or rutting, potholes, loose material)○ Edge drop-offs○ Drainage issues• Lighting Adequacy	
<ul style="list-style-type: none">• Signing<ul style="list-style-type: none">• Correct use of signing• Clear Message• Good placement for visibility• Adequate retroreflectivity• Proper support	
<ul style="list-style-type: none">• Signals<ul style="list-style-type: none">○ Proper visibility○ Proper operation○ Efficient operation○ Safe placement of equipment○ Proper sight distance○ Adequate capacity	
<ul style="list-style-type: none">• Pavement Markings<ul style="list-style-type: none">○ Correct and consistent with MUTCD○ Adequate visibility○ Condition○ Edgelines provided	
<ul style="list-style-type: none">• Miscellaneous<ul style="list-style-type: none">○ Weather conditions impact on design features.○ Snow storage	



RSA Corridor

ROCKVILLE

Prospect St

School St

Pleasant St

Snipsic St

Elm St

Park St

E Main St

Brooklyn St

Grove St

East St

30

Kingsbury Ave

Paper Mill Pond

Superior Court

Grove Hill Cemetery

Spruce St

High St

Hammond St

Tower Rd

Reed St

Grove St

Hale St

Center St

King St

East St

30

McLean St

Varnon Ave

Fox Hill Dr

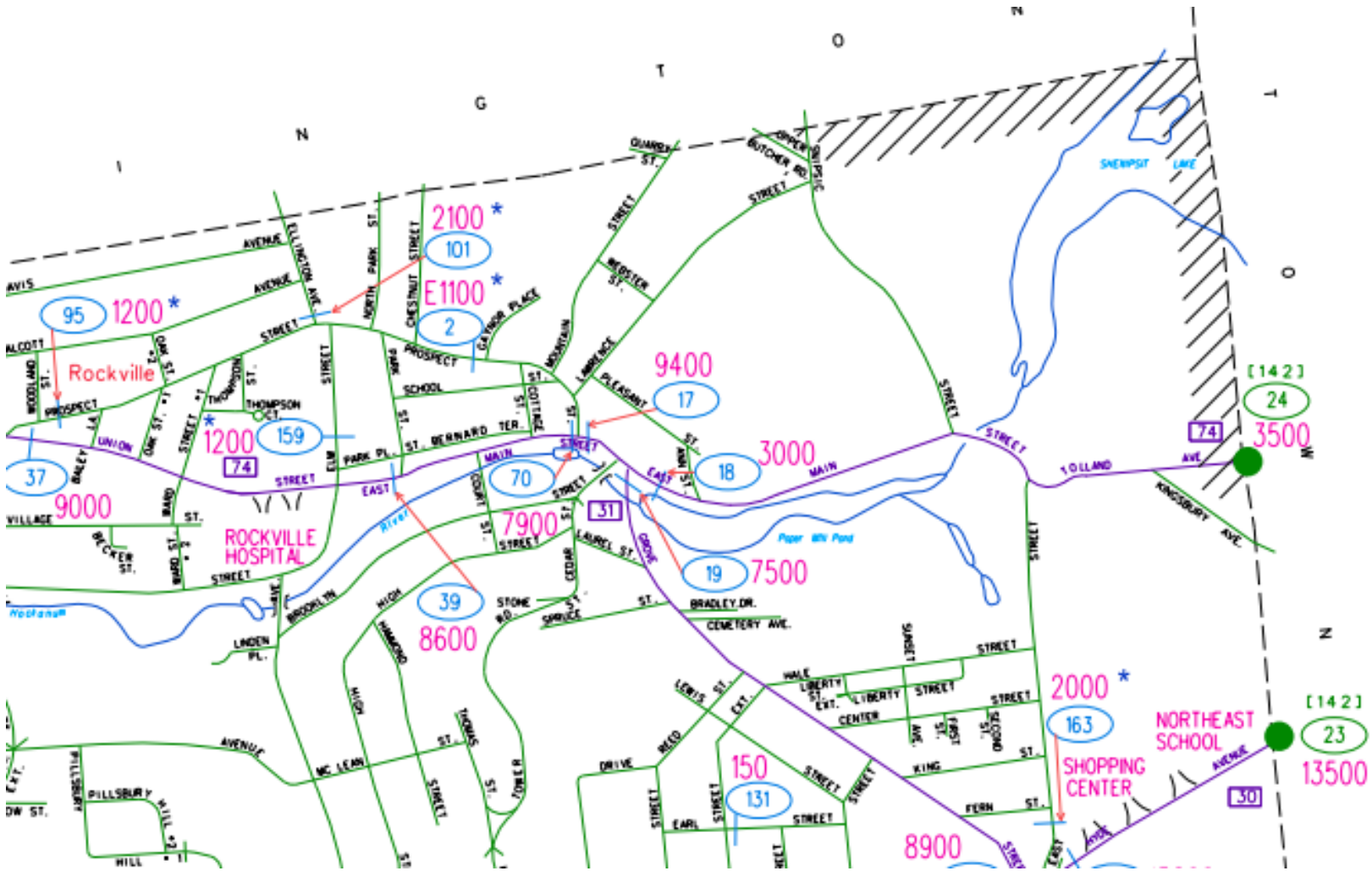
Hale St

Earl St

White St

Nature's Grocer

Average Daily Traffic (ADT)



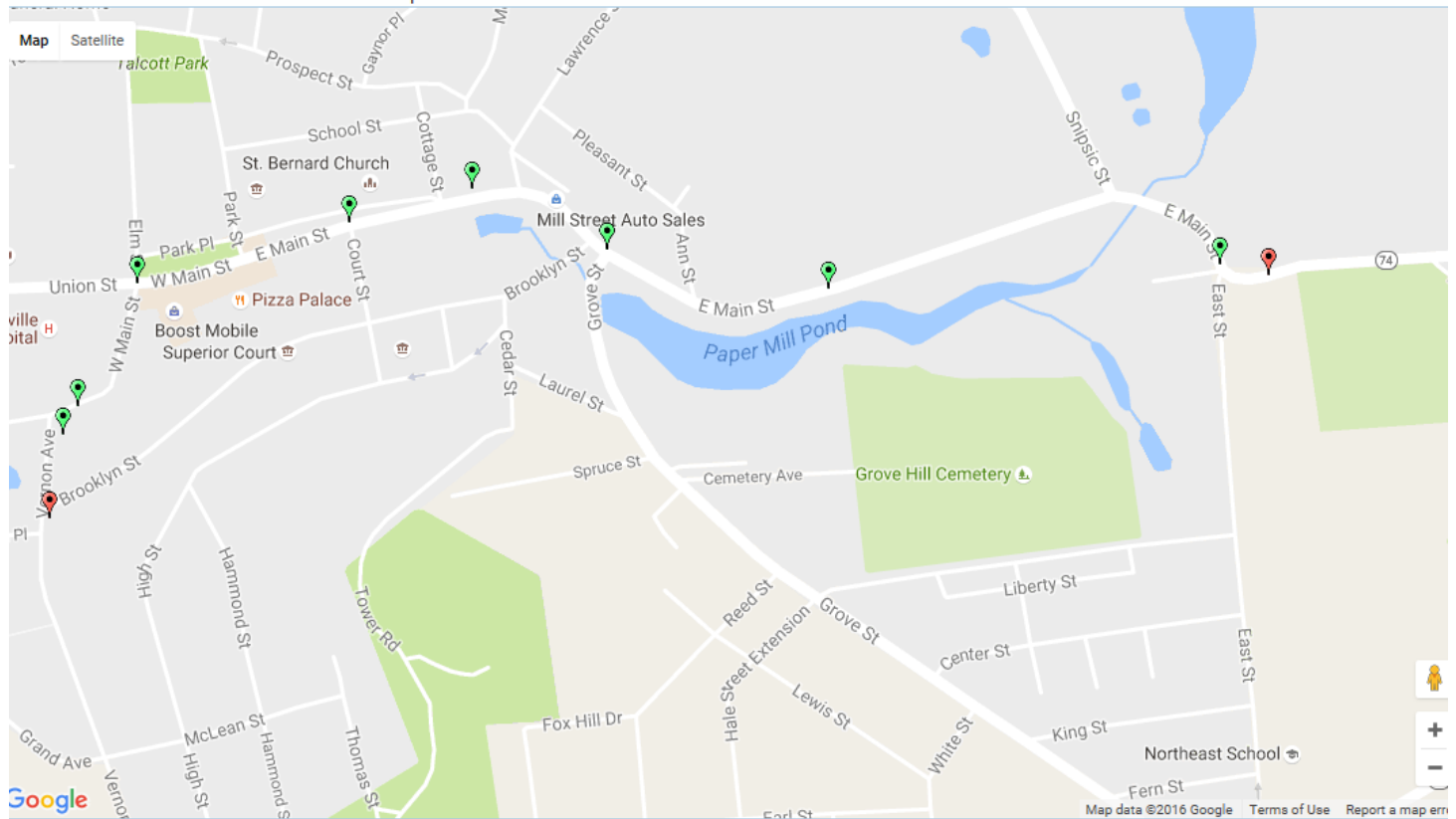
2015 Crashes

UConn

Connecticut Crash Data Repository

Search Criteria:

Dataset: mmucc
Date From: 01/01/2015
Date To: 12/31/2015
Towns: Vernon
Town & Route: Town:146 Route:74 Intersection:undefined Milepost:6.6-8
Town & Route: Town:146 Route:265 Intersection:undefined Milepost:1.4-1.55
Town & Route: Town:146 Route:283 Intersection:undefined Milepost:0.7-1
Crash Severity: Injury of any type (Serious, Minor, Possible), Fatal (Kill), Property Damage Only
Case Status: Complete





Road Safety Audit – Vernon

Crash Summary

Data: 3 years (2012-2014)

There were no crashes that involved pedestrians.

There were no crashes involving bicyclists.

Severity Type	Number of Crashes	
Property Damage Only	36	75%
Injury (No fatality)	12	25%
Fatality	0	0%
Total	48	

Manner of Crash / Collision Impact	Number of Crashes	
Unknown	0	0%
Sideswipe-Same Direction	4	8%
Rear-end	14	29%
Turning-Intersecting Paths	7	15%
Turning-Opposite Direction	4	8%
Fixed Object	11	23%
Backing	3	6%
Angle	2	4%
Turning-Same Direction	2	4%
Moving Object	0	0%
Parking	1	2%
Pedestrian	0	0%
Overturn	0	0%
Head-on	0	0%
Sideswipe-Opposite Direction	0	0%
Miscellaneous- Non Collision	0	0%
Total	48	



Weather Condition	Number of Crashes	
Snow	4	8%
Rain	5	10%
No Adverse Condition	38	79%
Unknown	1	2%
Blowing Sand, Soil, Dirt or Snow	0	0%
Severe Crosswinds	0	0%
Sleet, Hail	0	0%
Total	48	

Light Condition	Number of Crashes	
Dark-Not Lighted	2	4%
Dark-Lighted	16	33%
Daylight	30	63%
Dusk	0	0%
Unknown	0	0%
Dawn	0	0%
Total	48	







Road Surface Condition	Number of Crashes	
Snow/Slush	4	8%
Wet	8	17%
Dry	35	73%
Unknown	0	0%
Ice	1	2%
Other	0	0.0%
Total	48	



Time		Number of Crashes	
0:00	0:59	0	0%
1:00	1:59	1	2%
2:00	2:59	2	4%
3:00	3:59	0	0%
4:00	4:59	0	0%
5:00	5:59	0	0%
6:00	6:59	1	2%
7:00	7:59	0	0%
8:00	8:59	2	4%
9:00	9:59	5	10%
10:00	10:59	3	6%
11:00	11:59	1	2%
12:00	12:59	1	2%
13:00	13:59	2	4%
14:00	14:59	3	6%
15:00	15:59	3	6%
16:00	16:59	3	6%
17:00	17:59	0	0%
18:00	18:59	9	19%
19:00	19:59	4	8%
20:00	20:59	4	8%
21:00	21:59	2	4%
22:00	22:59	1	2%
23:00	23:59	1	2%
Total		48	

Vernon - E Main St

Legend

-  Sidewalk
-  No Sidewalk
-  Crosswalk
-  Stop Controlled Intersection
-  Pedestrian Crossing Sign
-  Signal Controlled Intersection
-  Study Corridor
-  On-street Parking
-  Town Border
-  Existing Rail Trail



Vernon
Tolland



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 – Vernon

Fact Sheet

Functional Classification:

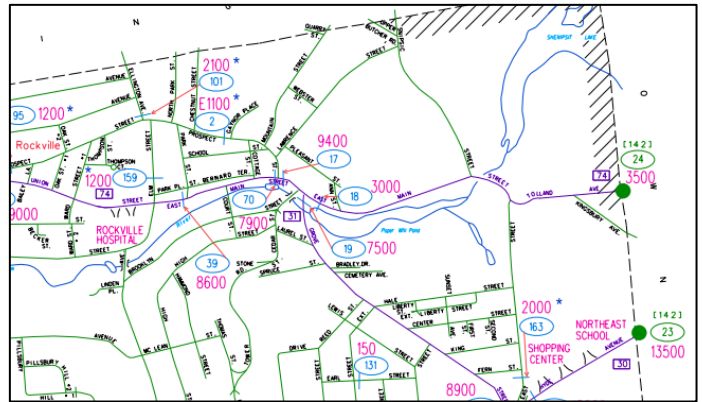
- East Main Street is classified as Minor Arterial
- Brooklyn Street, Vernon Ave and Main Street are classified as local roads

ADT

- ADT on East Main Street is 3,000 to 9,400

Population and Employment Data (2014):

- Population: 29,162
- Employment: 8,568

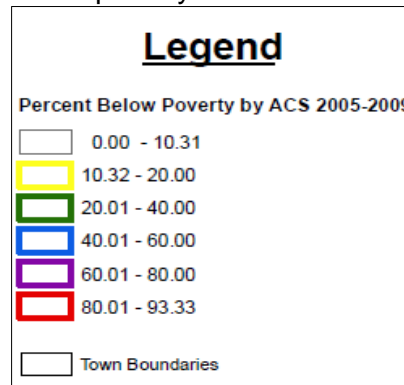


Urbanized Area

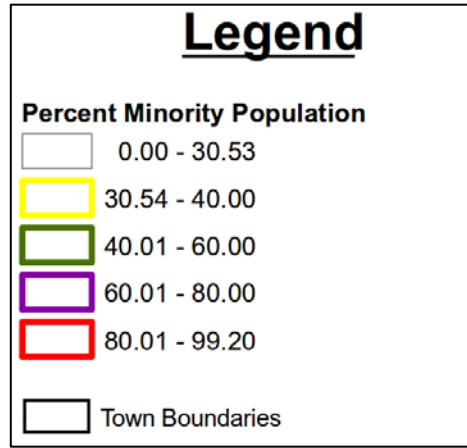
- Vernon is in the Hartford Urbanized Area

Demographics

- The statewide average percentage below the poverty line is 10.31%. Within the vicinity of East 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 East Main Street up to 30% of residents are minorities.



Air Quality

- Vernon's CIPP number 712
- Vernon is within the Greater CT Marginal Ozone Area
- Vernon is within a CO Attainment Area



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Appendix D

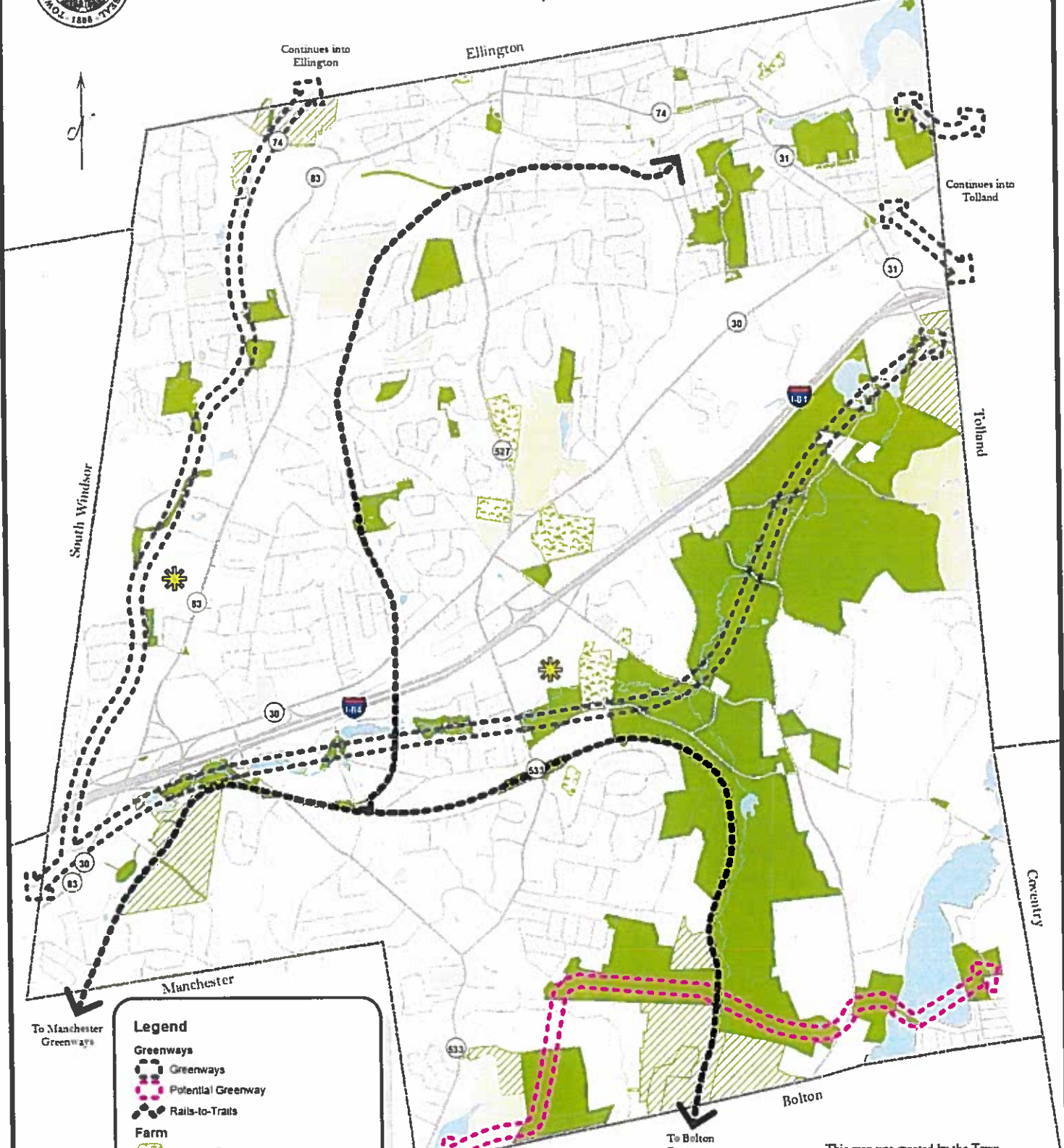
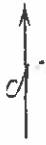


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Open Space Plan

Vernon, CT



Legend

- Greenways**
 - Greenways (solid black line)
 - Potential Greenway (dashed pink line)
 - Rails-to-Trails (dashed black line)
- Farm**
 - Heritage Farms (farm icon)
- Open Space**
 - Dedicated Open Space and Parks (solid green)
 - Managed and Other Open Space (light green)
 - Desired Open Space (yellow hatched)
 - Desired Open Space (portion of parcel) (yellow star icon)

To Manchester Greenways

To Bolton Greenways



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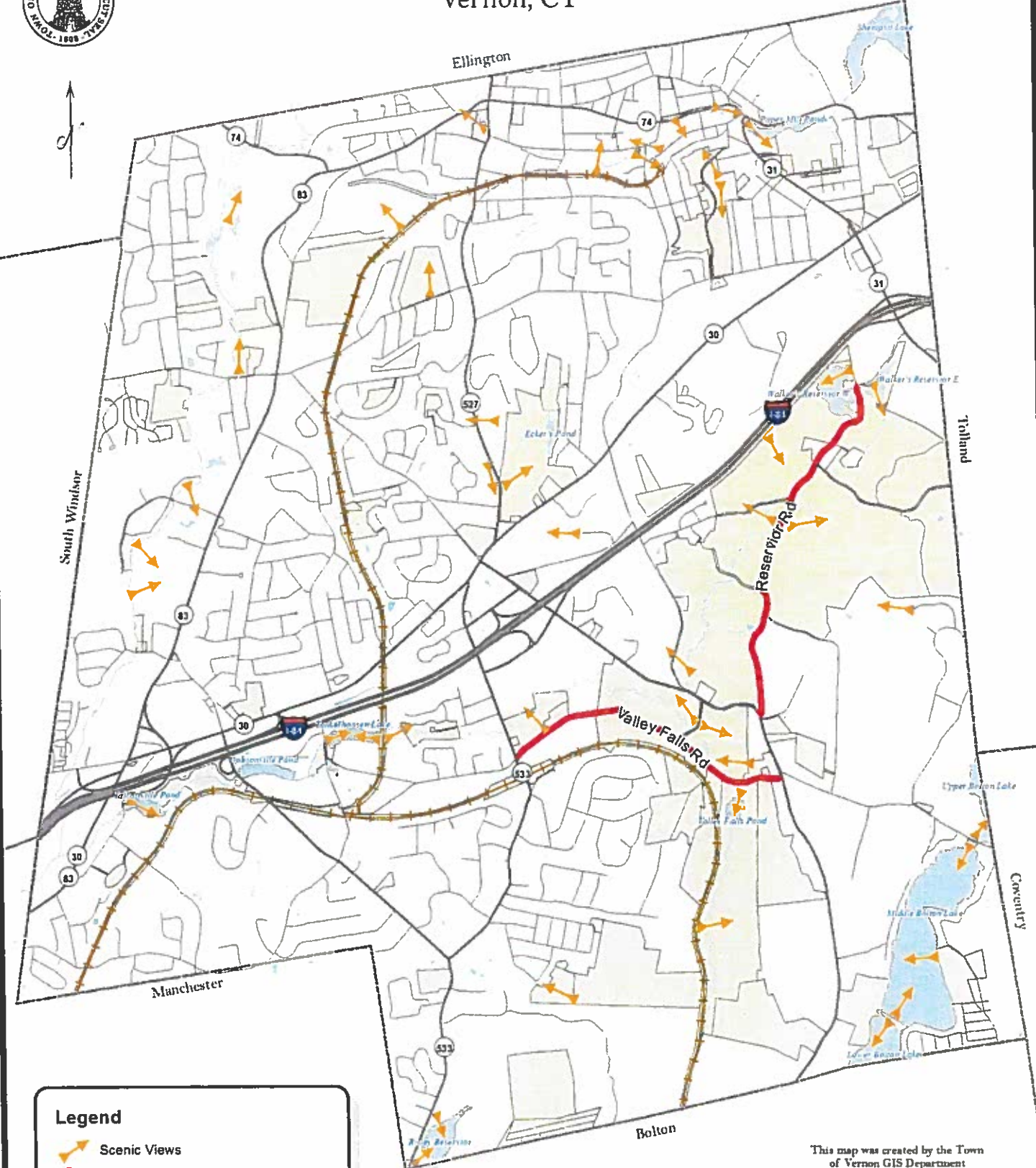
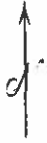
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Open Space Status as of 6/29/11



Scenic Resources Plan

Vernon, CT



Legend

- Scenic Views
- Local Scenic Roads
- Rails to Trails
- Dedicated and Managed Open Space



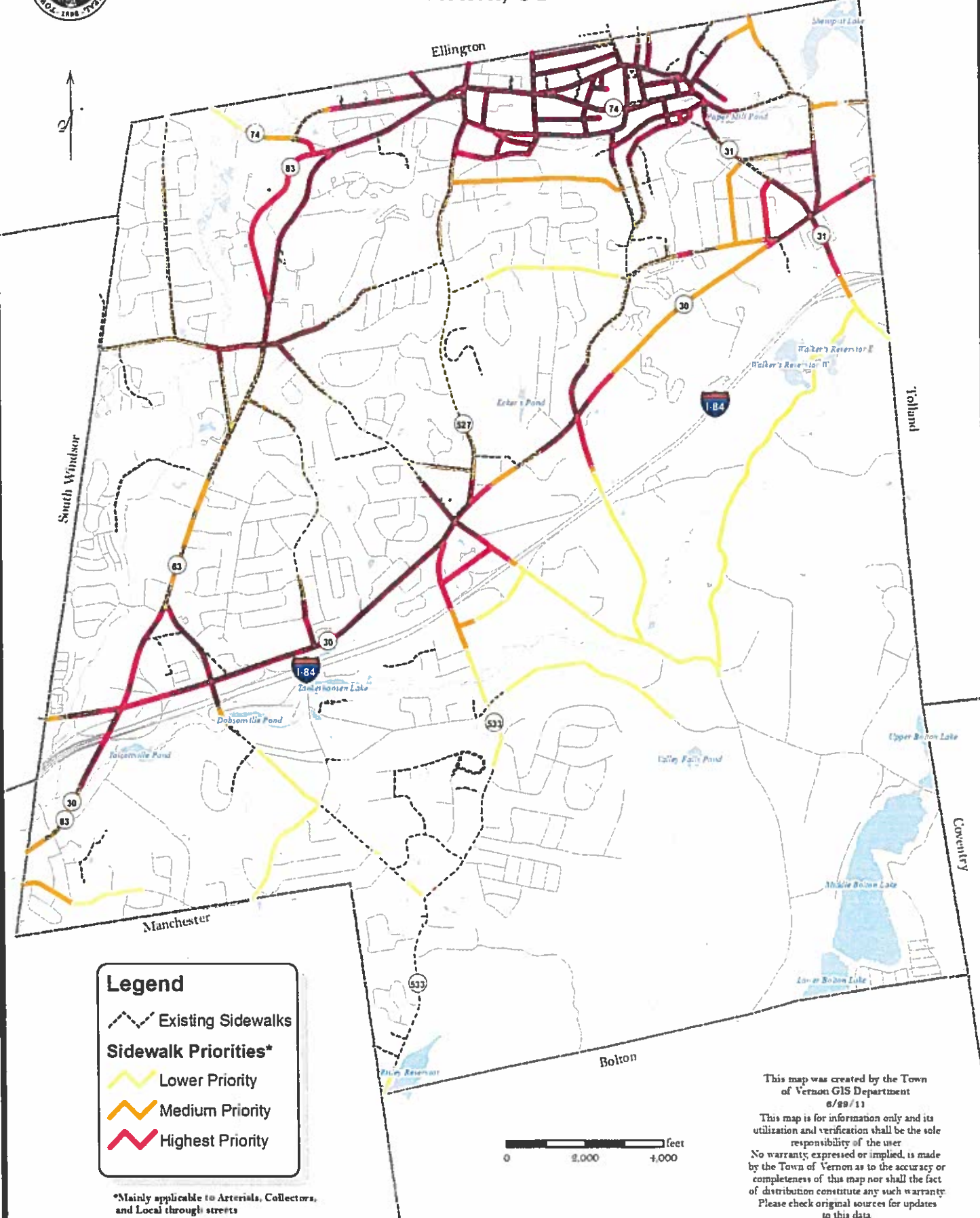
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Sidewalk Plan

Vernon, CT



Legend

- Existing Sidewalks
- Sidewalk Priorities***
- Lower Priority
- Medium Priority
- Highest Priority

*Mainly applicable to Arterials, Collectors, and Local through streets



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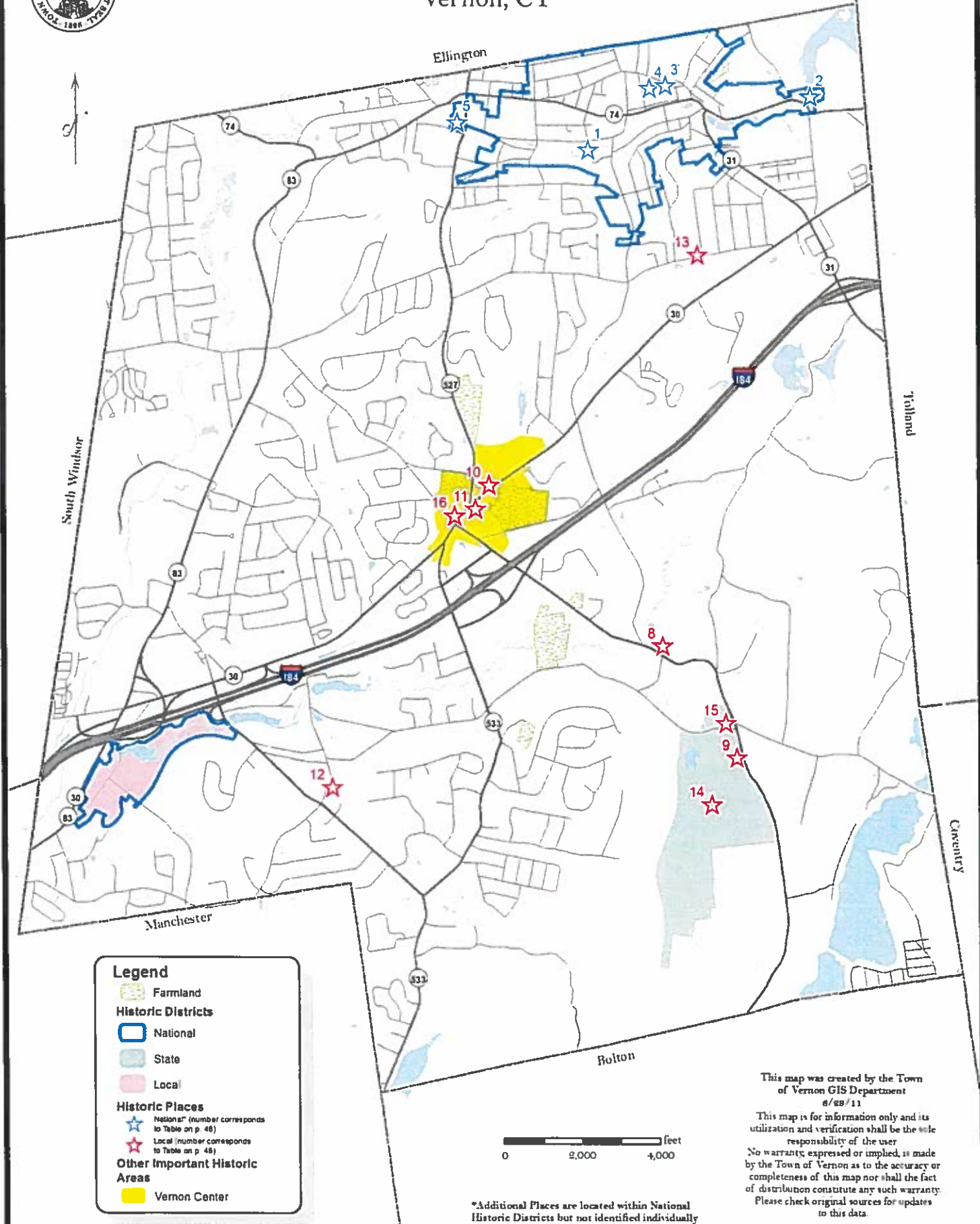
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Historic Resources Plan

Vernon, CT



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*Additional Places are located within National Historic Districts but not identified individually

A
Walk
Through
Rockville's Past . . .
The Loom City
Revisited . . .

