CHAPTER 2

MOBILITY PLAN

A sustainable and viable downtown must balance the many competing interests that exist in urban environments (i.e. traffic, parking, pedestrian and vehicle safety, landscaping and development). As the city has grown, traffic of all types through the downtown has increased. Backups are long at peak periods, and safety is a concern, especially for bikers and pedestrians.

This chapter reviews the transportation network and offers solutions to make it safe and reasonably efficient for current and future needs. A central focus of the transportation analysis is identifying long-term public right-of-way needs, so that those needs can be protected as redevelopment occurs in the downtown area (*see Chapter 3 for the redevelopment opportunities*).

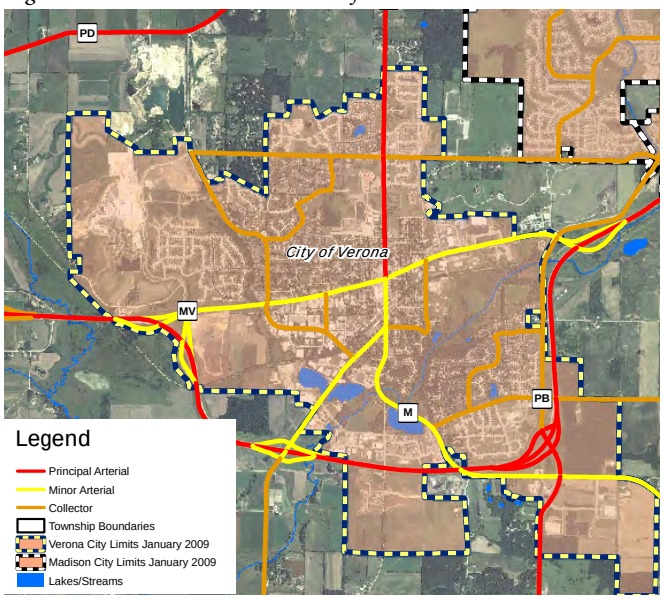
2.1 EXISTING CONDITIONS

This section is an overview of existing roadway characteristics along Main Street (CTH M) from Paoli Street to Harriet Street and Verona Avenue (Business 18-151) from Legion Street to Lincoln Street. Elements evaluated include alternative transportation facilities, parking impacts, traffic volumes, crash analysis, and access and right-of-way encroachment investigations. This information, and associated illustrations, comes from a combination of MSA field surveys and prior work and data collected by City staff.

The study area includes four distinct segments of arterial roadways:

- Main St. from Paoli St. to Verona Ave.
- Main St. from Verona Ave to W. Harriet St.
- Verona Ave. from Legion St. to Main St.
- Verona Ave. from Main St. to Lincoln St.

Figure 2.1: Current Functional Classification Network



Both roadways provide two-way traffic, with one travel lane in each direction. There is one traffic signal in the study area located at the intersection of Main Street & Verona Avenue. Only a few of the intersections in the study area have turning lanes. Parking is generally available on both sides of Main Street and Verona Avenue throughout the corridor, with some limitations.

ALTERNATIVE TRANSPORTATION FACILITIES

Providing for alternative modes of transportation is important to maintaining a vibrant downtown district. Consideration for improved walking, bicycling, and transit through the corridor will be key to improving safety and user experience.

Figure 2.2: Intersection Controls and Crosswalk Locations

Figure 2.3: Military Ridge State Trail (S. Main Street Crossing)

Figure 2.4: Main Street & Verona Avenue Intersection Bike Usage

Bicycle and Pedestrian Facilities

Pedestrian safety and connectivity is an important feature to the community, especially because it affects the ability of those who cannot drive to be active, independent, and engaged in the community. In general, sidewalks are provided within the project corridor. In an effort to increase pedestrian safety at crosswalks, the City installed crossing guards at multiple locations near the schools and added orange pedestrian flags at crosswalks to alert drivers.

One of the City's major assets is the Military Ridge State Trail that cuts through the heart of the City, crossing S. Main Street just south of W. Railroad Street. This year-round 40-mile trail follows the old Chicago and Northwestern railroad corridor from Fitchburg to Dodgeville, and ultimately connects to the City of Madison trail system. A majority of the trail is unpaved, but suitable for walking and biking. In addition to the State trail, the City has a local trail spur that runs parallel to Verona Avenue from Lincoln Street to old PB.

There are no bicycle lanes on Main Street or Verona Avenue. The existing cross sections do not provide adequate room for bike accommodations while also providing on-street parking. Based on traffic video review, the majority of the children and young adult bicyclists use the existing sidewalk network and pedestrian crosswalks to avoid traffic in the road.

Bus Routes & Stops

The project corridor is currently served by Madison Metro fixed transit routes 55 and 75, which run Monday - Friday during the peak hours (*i.e. 6AM – 9AM and 3PM – 7PM*). As shown in *Figure 2.2*, there are only a few stops along Verona Avenue and no stops along Main Street.

Other Transit Services

Additional public transportation in the City of Verona is limited to services coordinated by the Verona Senior Center (located at 108 Paoli Street). These services are provided largely through volunteer efforts and donations. No other community-wide transit services are provided in the City.

VEHICLE & PEDESTRIAN ACCESS

Both vehicular access and pedestrian access to a property are critical to its value and desirability. A business in a highly visible location can be undermined by poor access and forced to relocate. Access in the study area was evaluated with respect to both vehicles and pedestrians for each of the four study segments previously identified. Driveway/doorway locations, types of access, ease of movements, and network connectivity are described below. Overview maps showing access, parking, crosswalks and traffic control are included in *Appendix A*.

S. Main Street (Paoli Street to Verona Avenue)

This segment is a mix of commercial and residential land uses with direct access to Main Street.

Vehicle Access

There are 16 driveway access points along this stretch of roadway. Twelve of the access points/ driveways within this segment are on the east side of the street, and four on the west.

From Paoli Street to W. Railroad Street there are seven homes and three multi-family buildings which face Main Street. Six of the seven homes have direct access to Main Street, the last using the adjacent side street for vehicle access. The multi-family buildings have one primary access on Main Street and parking on-site. There are no alleys for alternative driveway locations.

On the east side of Main Street, straddling the Military Ridge State Trail, two commercial

Figure 2.5: Parking Locations and Access Points

Figure 2.6: S. Main Street Roadway Cross-Section

buildings directly connect to Main Street through one-way angle parking lots. A narrow grass terrace separates the public roadway from the private parking lot in front of each building, and the sidewalk is shifted onto the private parcels, between the parking area and the building. Directly west is a public park that only has access from W. Railroad Street. On-street parking begins just north of the Military Ridge State Trail.

The largest business on this segment is Miller & Sons Grocery Store; access to the store is provided off of Main Street, Park

Figure 2.7: Main Street & Church Street Pedestrian Crossing

Figure 2.8: Main St Business Access and Shift in Sidewalk Location

Lane, Shuman Street and Church Avenue. Businesses on corner lots have primary access on the adjacent side street. Midblock businesses have vehicle access through Memorial Baptist Church property or the back alley between Park Lane and E. Railroad Street. Patrons of these businesses typically use on-street parking. Memorial Baptist Church has one main access off Main Street but additional parking near the back alley as well.

Park Bank and the Mobil gas station are located on the south leg of the Main Street and Verona Avenue intersection. Park Bank has primary access on Main Street and Verona Avenue, but additional access points on the surrounding roads of Shuman Street and Park Lane via the parking lots of adjoining properties. Mobil has two access points on Verona Avenue and an additional two access points on Main Street, one of which is shared with the building to the south. At least two of the access points are close to the signalized intersection and are often blocked during peak traffic periods due to long queues at the intersection.

Pedestrian Access

Pedestrian crossings are clearly marked near Park Avenue, Church Street and Military Ridge State Trail. One of the heaviest pedestrian access locations is near the Church Street intersection. Crash records indicate a number of accidents have been attributed to this crossing location (*see Appendix A*).

Sidewalk is present throughout this segment. Near W. Railroad Street and the Military Ridge State Trail crossing, the sidewalk jogs away from the roadway and closer to the businesses due to the narrow terrace between the business parking lots and Main Street, as seen in Figure 2.8.

N. Main Street (Verona Avenue to W. Harriet Street)

This segment of Main Street is primarily a residential corridor with some properties converted to commercial businesses. Most of the commercial businesses are located on the southern end of the segment close to Verona Avenue. N. Main Street also provides direct access to Verona High School and Badger Middle School at the north end and beyond the project limits.

Vehicle Access

Walgreens is located at the southernmost end of the segment. This business has two driveways; one on Main Street and one on Verona Avenue. Access is also provided through a shared parking lot with the State Bank of Cross Plains. State Bank has two additional, direction-restricted access points on Main Street to and from the drive through window, and two access points on Shuman Street. Other businesses lining Main Street all have one primary driveway access point to Main Street.

There are six residential driveways on this segment, with vehicles generally backing out onto the roadway to exit. Some properties are multi-family dwellings with parking generally in the back. Homes located on intersection corners commonly have driveways facing the side streets. There are no alleys for alternative access. The nine marked on-street parking spots are all on the east side of the street.

Pedestrian Access

Sidewalk is present on both sides of Main Street and throughout the surrounding street network. Marked crosswalks across Main Street are limited to the north approach of the high school access and at Llanos Street. Both locations have crossing guards stationed to assist pedestrians. Pedestrians traveling southbound past W. Harriet Street commonly conflict with vehicular traffic leaving the school campus. As seen on the next page in Figure 13, Miovision traffic counting cameras captured video of vehicles during the school release hour attempting to turn onto N. Main Street but blocking pedestrian traffic and creating unsafe circumstances for both pedestrians and vehicles.

Of the homes noted on this segment, seven have private sidewalk leading to Main Street. One residence has stairs directly behind the sidewalk leading up to the house. Others all are at grade sidewalk connections to the front entrance of the home. All businesses noted also have pedestrian access points to the main entrance of the building.

E. Verona Avenue (Main Street to Lincoln Street)

This segment of Verona Avenue is a mix of commercial and residential properties.

Vehicle Access

There are 19 access points along Verona Avenue between Main Street and Lincoln Street, only three of which are residential driveways. The north side features eight access points, five business accesses and three residential properties. The south side features 12 access points, nine business accesses and three residential properties.

Corner lots generally have their primary access on the adjacent side street, however four properties have access on both Verona Avenue and the side street: Mobil, Capitol Bank, Klinke Cleaners, and Kwik Trip. Properties that have more than one access on Verona Avenue include Mobil, Natural Health Works, and Hughes Flooring. There are also 45 on-street parking spots; 20 on the north side and 25 on the south side.

Figure 2.9: N. Main Street On-Street Parking

Figure 2.10: Pedestrian & Vehicle Conflict Points at W. Harriet Street

Figure 2.11: E. Verona Avenue Cross Section

Pedestrian Access

Sidewalk is present throughout with business and residential walking paths. There are a total of 11 pedestrian access points along this segment. A multi-use path begins on the southeast approach of Lincoln Street which connects Hometown USA Community Park to the Military Ridge State Trail to the east. Marked crosswalks crossing Verona Avenue are located at Jefferson Street and Lincoln Street.

Figure 2.12: W. Verona Avenue Roadway Cross Section

Figure 2.13: W. Verona Avenue & Westlawn Avenue Pedestrian Crossing

W. Verona Avenue
(Legion Street to Main Street)

This segment of Verona Avenue is a mix of commercial, institutional and residential properties. There are two elementary school facilities that impact W. Verona Avenue: Sugar Creek and New Century.

Vehicle Access

There are 14 businesses lining the west segment of Verona Avenue. All of the businesses have at least one vehicular access on Verona Avenue and those on corner lots have an additional access on the adjacent side-street. Some neighboring properties have shared access and shared parking facilities through connected parking lots. There are significant areas of park land between Legion Street and Marietta Street which have limited driveway access locations on Verona Avenue. New Century School has primary vehicle access on the surrounding street network, however the parking stalls in front of the school on Verona Avenue function as a school drop-off location. Of the six residential properties, four have a private driveway on Verona Avenue. Additional parking is available for most of the length of segment with 83 available on-street parking spaces; 37 on the north side and 46 on the south side.

Pedestrian Access

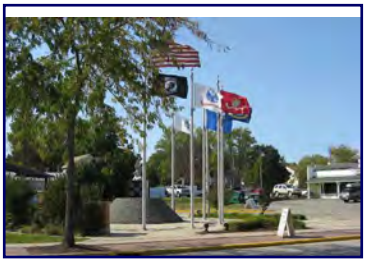
Marked crosswalks across Verona Avenue are located near Marietta Street, Westlawn Avenue and Legion Street. The heaviest pedestrian access locations appear to be near Westlawn Avenue. A crossing guard is stationed at the intersection for the three neighboring schools; New Century School, Sugar Creek Elementary School and Verona High School. Sidewalk is present throughout the segment with private and residential paths to each building.

STREETSCAPING

Over the last decade the City has reconstructed several street sections within and near the study area, including installation of some streetscaping features. Currently the streetscaping varies depending on the street and location along that street. The next page illustrates the current conditions along the Main Street and Verona Avenue corridors.

Hometown Junction Park

Unique to the corridor, this park incorporates several streetscaping features not found elsewhere on Main Street. Streetscaping features present include red stamped concrete terraces, gray stone paver accents, and decorative fencing.



Verona Avenue Corridor

Maple Grove to Lincoln

Sidewalks: 5 ft. concrete (north side) / 10 ft. asphalt (south side)
Terrace: 5-15 ft. grass (north side) / 10 ft. grass (south side)
Median: grass / stamped concrete
Lighting: Tall decorative single-arm full-cutoff (terrace)
Other Streetscape Features: street trees, banners, hanging baskets, and directional signage

Lincoln to Main

Sidewalks: 5 ft. concrete
Terrace: 4-5 ft. grass
Median: None
Lighting: Tall Cobra Head on concrete pole
Other Streetscape Features: banners

Main to Legion

Sidewalks: 5 ft. concrete
Terrace: 4-7 ft. grass
Median: None
Lighting: Tall Cobra Head on concrete pole
Other Streetscape Features: street trees & banners

Legion to Nine Mound

Sidewalks: 5 ft. concrete
Terrace: 10+ ft. grass
Median: grass / stamped concrete
Lighting: Tall decorative double-arm full-cutoff (median)
Other Streetscape Features: street trees, banners & hanging baskets

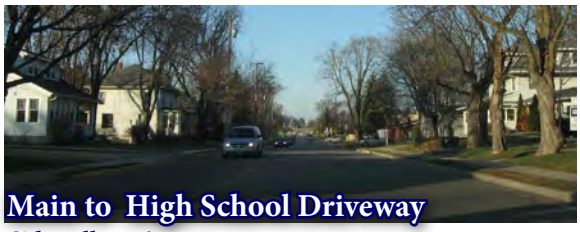
Main Street Corridor

Paoli to Bike Path

Sidewalks: 5 ft. concrete
Terrace: 5 ft grass
Median: None
Lighting: Tall Cobra Head on concrete pole
Other Streetscape Features: banners

Bike Path to Main

Sidewalks: 5 ft. concrete
Terrace: 5 ft. grass/concrete
Median: None
Lighting: Tall Cobra Head on concrete pole
Other Streetscape Features: street trees, banners, stamped concrete (park), a few benches & flower pots



Main to High School Driveway

Sidewalks: 5 ft. concrete
Terrace: 2-5 ft. grass/concrete
Median: None
Lighting: Tall Cobra Head on concrete or wood pole
Other Streetscape Features: banners & street trees

High School Driveway to Cross Country

Sidewalks: 10 ft. asphalt (west side) / 5 ft. concrete (east side)
Terrace: 5 ft. grass
Median: grass / stamped concrete
Lighting: Tall Cobra Head on wood (utility pole)
Other Streetscape Features: banners

TRAFFIC ASSESSMENT

To assess the existing operational conditions within the study area, MSA collected and reviewed the current traffic volumes within the corridors, and studied the existing operational conditions. Average delay and length of queuing were determined through analysis to assess the locations where transportation improvements are likely needed to maintain or improve operations in the future.

Traffic Volumes

The Wisconsin Highway Traffic Volume Data website maintained by the Wisconsin Department of Transportation (WisDOT) provides ADT on each segment of the study area. As shown in Table 2.1, the ADT within the project corridor varies by location. See *Appendix A* for complete current and projected traffic volumes data.

To supplement this ADT data, MSA collected traffic volume turning movements at several major intersections within the corridor using Miovision video collection units. The locations reviewed, including dates, times and type of traffic control, is shown in Table 2.2.

Intersection Operation & Capacity Analysis

An operational and capacity analysis was completed using two different analysis outputs: Synchro 8 HCM Mode and SimTraffic. *Synchro 8 HCM Mode* is based on the procedures, methods and techniques contained in the Highway Capacity Manual, 2010 Edition. *SimTraffic* is based on microsimulation modeling that assesses the impact of blocked turn lanes and network flow on intersection operations.

This type of analysis provides a Level of Service (LOS) for the intersection, which is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good (LOS "A") to very poor (LOS "F"). Typically, the minimum acceptable condition for most intersections is LOS "C"; however, lower LOS values can be acceptable in certain cases. The delay is measured in seconds per vehicle, which can be used to determine the Level of Service for the intersection. Table 2.3 represent the delay criteria used for determining the Level of Service at an intersection.

Table 2.1: Existing Average Daily Traffic Summary

Roadway	From	To	2012 ADT
Main Street	*Paoli Street*	*Verona Avenue*	*10,800*
Main Street	*Verona Avenue*	*W. Harriet Street*	*10,300*
Verona Avenue	*Legion Street*	*Main Street*	*11,400*
Verona Avenue	*Main Street*	*Lincoln Street*	*13,900*

Table 2.2: Video Collection Inventory

Intersection	Date	Time	Traffic Control
Main St & W. Harriet St	*11/13/2012*	*7:00 AM - 6:00 PM*	*Stop Sign (West)*
Main St & Church/Railroad St	*11/14/2012*	*7:00 AM - 6:00 PM*	*Stop Sign (East/West)*
Main St & Paoli St	*11/28/2012*	*7:00 AM - 6:00 PM*	*Stop Sign (West)*
Verona Ave & Lincoln St	*11/15/2012*	*7:00 AM - 6:00 PM*	*Stop Sign (North/South)*
Verona Ave & West Lawn Ave	*11/15/2012*	*7:00 AM - 6:00 PM*	*Stop Sign (North)*
Main St & Verona Ave	*11/28/2012*	*7:00 AM - 6:00 PM*	*Traffic Signal*
Verona Ave & Enterprise Dr	*10/03/2013*	*7:00 AM - 6:00 PM*	*Traffic Signal*

For this analysis MSA reviewed three peak hours: morning rush hour (7:30-8:30am), afternoon - when the schools let out (3:45-4:45pm), and evening rush hour (4:45-5:45pm). The intersections that were reviewed are listed in Table 2.2. The outputs that best represented observed field conditions are summarized on the next page. Full output summaries of both analysis procedures are included in *Appendix A*.

Table 2.3: Highway Capacity Manual "Level of Service"

Level of Service	Average Control Delay (sec/veh)	
	Stop Control	*Signal Control*
"A" (best)	*0 to 10*	*0 to 10*
"B" (good)	*>10 and ≤15*	*>10 and ≤20*
"C" (desirable)	*>15 and ≤25*	*>20 and ≤35*
"D" (delay)	*>25 and ≤35*	*>35 and ≤55*
"E" (congestion)	*>35 and ≤50*	*>55 and ≤80*
"F" (forced flow)	*>50*	*>80*

All turning movements operated at LOS C or better, except for the following:

Morning Peak Hour

- ***Verona Avenue & Lincoln Street***
  Northbound LT, LOS D (26.2 sec)

- ***Main Street & Paoli Street***
  Eastbound LT, LOS D (26.9 sec)

- ***Main Street & Verona Avenue***
  Northbound TH/RT, LOS E (61.2 sec)

School Peak Hour

- ***Verona Avenue & Lincoln Street***
  Northbound LT, LOS F (66.8 sec)
  Southbound, LOS E (39.0 sec)

- ***Main Street & W. Harriet Street***
  Eastbound, LOS F (175.3 sec)

- ***Main Street & Verona Avenue***
  Northbound TH/RT, LOS F (102.8 sec)
  Southbound TH, LOS F (193.1 sec)
  Southbound LT, LOS D (44.7)
  Eastbound TH, LOS F (80.1 sec)
  Westbound TH, LOS E (65.2 sec)
  Westbound LT, LOS D (36.4 sec)

Evening Peak Hour

- ***Verona Avenue & Lincoln Street***
  Northbound LT, LOS F (66.9 sec)
  Southbound, LOS F (53.6 sec)

- ***Main Street & W. Harriet Street***
  Eastbound, LOS F (135.7 sec)

- ***Main Street & Verona Avenue***
  Northbound TH/RT, LOS F (108.9sec)
  Northbound LT, LOS D (35.5 sec)
  Southbound TH, LOS F (167.4 sec)
  Southbound LT, LOS D (35.5 sec)
  Eastbound TH, LOS E (63.5 sec)
  Westbound TH, LOS E (64.1 sec)

Intersection Queuing Analysis

A queuing analysis was similarly conducted using both software outputs for all movements identified in the Level of Service (LOS) analysis. The primary purpose of the existing condition queue analysis was to determine if certain movement queue lengths are impacting access to turn lanes or properties within the study area. The following movements were identified as having a potential impact to the corridor:

Verona Avenue & Lincoln Street

The northbound left turn lane delay reaches LOS F during all peak hours of the day. However, due to the low volume, the 95th percentile queue length (i.e. projected queue is at this length or shorter 95% of the time) is not expected to reach the Verona Fire Department access south of the intersection. The southbound approach is the primary driveway access for a fast-food restaurant (Culver's). The 95th percentile queue starting at the school release peak hour will likely block some on-site maneuverability for the restaurant.

Main Street & Paoli Street

The eastbound (95th percentile) left turn lane is not anticipated to extend past the existing left turn storage lane queue length. All other movements are anticipated to clear the intersection quickly with minimal queuing.

Main Street & W. Harriet Street

The eastbound queue length is anticipated to extend through Shuman Street, blocking traffic leaving the student parking lot to travel south on Shuman Street or Marietta Street. These queues may be impacting travel behavior of students leaving school at the end of the day.

Main Street & Verona Avenue

A heavy inflow of traffic to the main intersection of the City creates long queue lengths and undesirable delay. See *Appendix A* for the queuing display of the Main/ Verona intersection.

- The longest eastbound queue length was noticed during the school release peak hour and is expected to extend through the Verona Avenue & Marietta Street intersection with potential to block all movements at Marietta Street and Shuman Street. Driveway access to the local businesses will likely also be blocked by queues.
- The longest westbound queue length was noticed during the school release peak hour and is expected to extend through the Verona Avenue & Franklin Street intersection with potential to block all movements to the intersection as well as local driveway access locations.
- The longest northbound queue length was noticed during the PM peak hour and is expected to extend to the Church Avenue intersection. The potential for all turning movements to be blocked at Park Lane are expected, as well as the surrounding business access points.
- The longest southbound queue length was noticed during the school release peak hour and is blocking both the W. Harriet Street and E. Harriet Street intersections.

Figure 2.14: N. Main St & W. Harriet St - at School Peak Hour

Figure 2.15: Main/Verona Intersection - at School Peak Hour

SAFETY ASSESSMENT

It is hard to understate the importance of user safety in a downtown area. Proper access spacing, improved sight lines, and dedicated multimodal facilities are all ways to enhance safety and reduce crashes. The following assessment of recent crash data will help determine specific locations where safety improvements will be particularly effective.

The most recent five-year crash history for the entire project study area was requested and received from the University of Wisconsin Traffic Operations and Safety Laboratory. Crashes related to alcohol were not included in the analysis. Weather related crashes, such as snow, ice or wet road conditions, were identified and noted. Crashes were sorted by approach, type of crash and crash severity. Crash severity can be broken down into "Property Damage" or "Injury Severity". Injury severity is classified as shown below:

- Type C - possible injury/non-evident injury claims
- Type B - visible injury evident that is not incapacitating/minor injury
- Type A - incapacitating injury/severe injury
- Type K - fatality

Below is a summary of the crash data received. See *Appendix A: Crash Location Map* for more details.

Crash Data Analysis

A total of 59 crashes occurred within the project study area between 2007 and 2012. Of those, seven crashes involved bikes or pedestrians and 12 crashes relate to parked vehicles or business accesses. The high percentage of crashes involving bikes, pedestrians and vehicle access indicate a need to improve the visibility of bike and pedestrian facilities as well as create safer access management practices.

Only two locations within the study area had greater than 10 crashes within the last five years.

Main Street & Verona Avenue

The crash history table indicates 22 crashes occurred at the signalized intersection of Main Street and Verona Avenue. The types of crashes reported are as follows:

Eastbound: 3 Crashes

- *2 rear end collisions, with property damage only*
- *1 left turn collision with a pedestrian, with injury severity C*

Westbound: 7 Crashes

- *5 rear end collisions, with property damage only*
- *1 left turn collision involving a driveway access, property damage only*
- *1 angle collision involving a driveway access, property damage only*

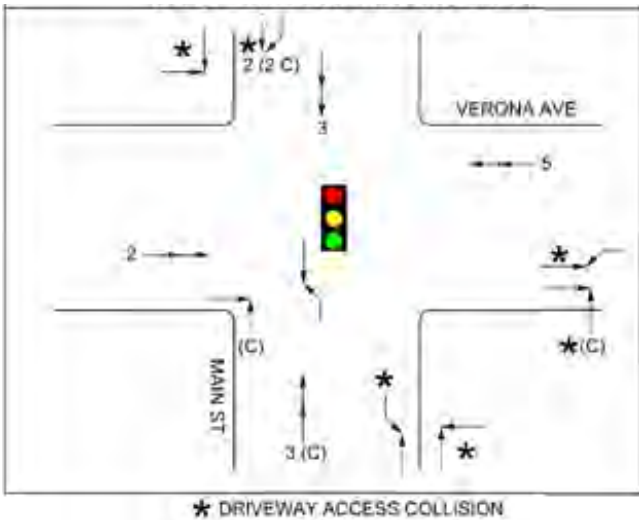
Northbound: 6 Crashes

- *3 rear end collisions, one injury severity C and two with property damage only*
- *1 angle collision with property damage only involving a driveway access*
- *2 left turn collisions with property damage only, one involving a driveway access*

Southbound: 6 Crashes

- *3 rear end collisions with property damage only*
- *1 angle collisions with property damage only involving a driveway access*
- *2 collisions with a pedestrian, both injury severity C*

Figure 2.16: Main Street & Verona Avenue Crash Diagram



A large number of crashes at this location are rear end collisions, which are common at signalized intersections. High vehicular volume causes long delays and driver frustration approaching the Main Street and Verona Avenue intersection. Vehicles following too closely and inattentively driving are the main contributor to the high number of rear end collisions.

Other than one angle crash with a pedestrian (noted with a dashed line in Figure 2.16) and one left turn collision, all other crashes at this intersection are due to the close proximity of business accesses. Of the 22 crashes at the intersection, seven are due to vehicles trying to enter or leave a business driveway. Two crashes are related to vehicles attempting to enter a business driveway and running into a bicyclist riding in the roadway. No bike accommodations exist on Main Street or Verona Avenue.

Main Street & Church Street/E. Railroad Street

The crash history table indicates 15 crashes occurred at the stop controlled intersections of Main Street & Church Street/E. Railroad Street. The types of crashes reported are as follows:

Eastbound: 1 Crash

- *1 collision with a bicycle, injury severity* C

Northbound: 11 Crashes

- *2 angle crashes with property damage only, one involving a driveway access*
- *1 collision with a pedestrian, injury severity A*
- *6 rear end collisions, property damage only (one weather related), one involving a driveway access*
- *1 collision with a fixed object, property damage only*
- *1 left turn crash, property damage only*

Southbound: 3 Crashes

- *3 same direction sideswipe crashes (involving parked vehicles)*

Crash history at this location shows that intersection geometry, traffic control, and physical characteristics of the area combine to create a problematic location. The high number of rear end crashes indicates there is likely a combination of inadequate sight distance and lack of driver awareness. A heavily used pedestrian crossing is located on the south approach of Church Street; drivers may not see pedestrians looking to cross the intersection and therefore not expecting drivers in front of them to stop. Also, two crashes at this location are angle crashes with pedestrians where drivers failed to yield to the pedestrians in the crosswalk.

All three sideswipe collisions were with parked vehicles. These crashes indicate that current traffic channelization or areas of unrestricted parking may be impacting the crash rates, particularly under poor weather conditions.

UTILITIES

Numerous underground and overhead private utilities exist throughout the study area. Companies with known facilities in the area include MG&E, Alliant Energy, TDS and Charter Communications. Final design of recommended street improvements should include a determination of compensable and non-compensable relocations.

Public utilities including sanitary sewer and water main have been systematically upgraded throughout the community. None of the sewer or water facilities in the study area are in need of upgrade or replacement.

Figure 2.17: Main Street & Church Street Crash Diagram

Figure 2.18: Main Street & Railroad Street Crash Diagram

RIGHT-OF-WAY ENCROACHMENTS

Based on GIS and other provided data, right of way is generally assumed as extending from back of sidewalk to back of sidewalk. General encroachments may include business signs, awnings, decorative landscaping, and pedestrian access walks.

Some residential properties have small retaining walls and decorative landscaping within close proximity to the back of sidewalk. These items may be encroaching on the right of way and should be reviewed in conjunction with potential improvements for facility expansions.

ARCHEOLOGICAL & HAZARDS REVIEWS

A desktop review of potential archaeological sites and locations with hazardous materials was completed. These classifications were reviewed to identify any sites that might impede or increase the cost of proposed land use or transportation improvements.

Archeological Sites

A desktop review was used to determine if any archaeological sites are located within ½ mile of the project area. This search identified two known archaeological sites. Verona Cemetery is located north of the project limits on N. Main Street. There are approximately 2,700 interments buried at the cemetery since 1848. A second cemetery adjoins Verona Cemetery and is associated with St. Andrew Parish, with approximately 250 interments.

An archeological survey may be considered to verify potential impacts and determine if other sites exist.

Hazardous Material Survey

As part of the project a hazardous materials scan was conducted within the project area using the Wisconsin Department of Natural Resources Bureau for Remediation and Redevelopment Tracking System (BRRTS). Two open/ongoing cleanups of potential hazardous material sites are located within a ½-mile of the project area.

- Ellis Manufacturing Co., Inc. – 107 W. Railroad Street – Soil Contamination (Gasoline). This is in the study area.
- Kettle Café Union 76 – 507 W. Verona Road – Soil Contamination (Gasoline). This is outside the study area.

There are an additional 11 closed/completed sites located within or near the project limits. Of the 11 sites that are closed/completed, eight still have known groundwater and/or soil contamination. Though cleanup or remediation activities have been completed at these sites, some contamination may remain (i.e. under an approved surface cap) and may be an impediment to further site disturbance.

Below is the list of eight sites still known to have groundwater and/or soil contamination.

- Old Verona Quik Mart – 202 E. Verona Avenue – Groundwater Contamination
- Mobil Gas Station – 101 E. Verona Avenue – Groundwater and Soil Contamination
- Old Suburban II Motors – 100 E. Verona Avenue – Groundwater Contamination
- Old Kwik Trip – 201 E. Verona Avenue – Groundwater and Soil Contamination
- Old Dane County Prairie FS Co-op – Groundwater and Soil Contamination
- Zurbuchen Oil Co – 509 W. Verona Avenue – Groundwater and Soil Contamination
- John Erickson Chevrolet – 513 W. Verona Avenue - Groundwater and Soil Contamination
- Town & Country Ford – 515 W. Verona Avenue – Groundwater Contamination

If alterations to these sites are anticipated for development or transportation facilities, further hazardous materials assessments may be appropriate.

2.2 Intersection Alternatives

While there are many intersections in the study area that may see improvements in the coming years, only three of these require an analysis of unique alternative solutions: the intersection of Main Street and Verona Avenue, the intersection of Lincoln Street and Verona Avenue, and the proposed extension of Silent Street to Main Street. Both intersections are candidates for improvement and MSA prepared a range of alternatives for each to share and discuss with the community. This section considers the strengths and weaknesses of the alternatives considered.

Other mobility improvements not requiring an alternatives analysis are presented in *Section 2.3: Recommendations*.

MAIN & VERONA INTERSECTION

The intersection of Main Street and Verona Avenue is the linchpin of the downtown Verona traffic network. Due to the configuration of the existing street network, a high volume of both local and regional traffic travels through this intersection on a daily basis. Most of the current congestion and property access frustrations stem from the lack of sufficient turn lanes and queue lengths at this intersection. This intersection was therefore the primary focus of improvement alternatives.

This study identified and evaluated three alternatives that could be viable improvements to manage current and future congestion:

1. *An expanded signalized intersection, with two through lanes in each direction*
2. *A multilane roundabout*
3. *Creation of a one-way pair by moving northbound traffic to Franklin St. (from Railroad St. to Harriet St.)*

It should also be noted that this study considered several other possible intersection types, as illustrated below. Each of these was deemed inappropriate for the Verona setting due to cost, space constraints, and/or character impacts. In particular, the restriction of movements and unfamiliarity with the configurations also made these alternatives undesirable when compared to the alternatives described above.

A. *At-grade jug handle*
B. *Left-turn crossover*
C. *Right-turn to u-turn*
D. *Grade separation (not illustrated)*

The three selected alternatives were weighed using criteria similar to the WisDOT intersection control evaluation process. As part of the alternatives review, the following factors were compared using 2035 projected traffic volumes:

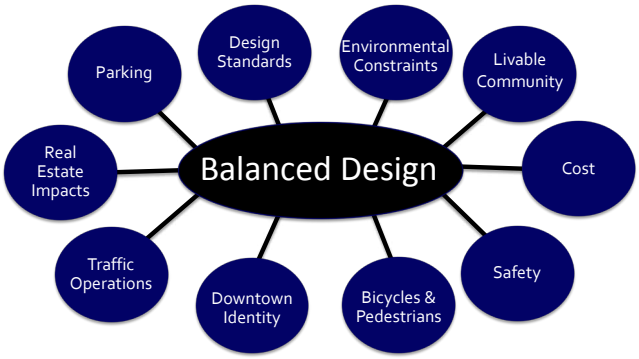
- *Traffic operations*
- *Safety*
- *On-street parking*
- *Business access*
- *Pedestrian & bicycle accommodations*
- *Right of way impacts*
- *Land use and development impacts*
- *Cost*

A.

B.

C.

Figure 2.19: Balanced Design Diagram



Alternative One - Traffic Signal

Figure 2.20 (*on the next page*) illustrates this alternative.

Traffic Operations - While the improved traffic signal would reduce traffic delays and backups in the near term, by 2035 traffic operations will only be a slight improvement to 2013 conditions (*see Table 2.4 below*). To further reduce delays, a larger intersection with dual left turn lanes and three through lanes would be necessary. However, these options were not explored further due to the significant amount of right-of-way, cost, and detrimental impact to non-vehicular traffic and the overall feel of the downtown area.

Safety - Improved geometrics and up to date traffic signal equipment can help improve visibility at the intersection, however the signal alternative will not significantly change the existing safety conditions inherent with a traffic signal. Additionally, it is most desirable to align or offset left turn lanes to the left across the intersection to improve sight distance for both turning vehicles and the conflicting through traffic. However, in an attempt to minimize right-of-way and building impacts, the north/south left turn lanes are marginally offset to the right, reducing visibility from desired conditions slightly.

On-Street Parking - The biggest on-street parking impacts are on the south and west approaches of the intersection, with approximately 35% loss due to the additional lanes necessary to improve intersection operations.

Access - The access locations within 200 feet of the intersection are currently blocked by long queues waiting at the traffic signal. This will still be the case as queuing increases over time. Visibility may improve with the elimination of on-street parking, however entering and exiting any access points within the functional intersection area will continue to pose a challenge during peak traffic times. Access for future redevelopment is recommended to be placed further from the intersection or consolidated whenever possible.

Table 2.4: 2035 Volumes Summary Table (Alternative One)

Peak Hour	Output	Parameters	West Approach			East Approach			South Approach			North Approach			Overall Intersection
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Lanes			1	2 Shared		1	2 Shared		1	2 Shared		1	2 Shared		-
AM Peak	SimTraffic	LOS	C	C		C	C		C	D		C	C		C
		Delay (s)	31.4	23.7		20.7	32.0		22.9	35.4		28.4	20.6		26.4
		Queue (ft)	250	250		100	225		150	300		150	250		
	HCM	LOS	D	C		C	D		C	D		D	D		D
		Delay (s)	47.0	25.3		25.1	39.2		23.8	49.2		35.2	43.2		40.0
		v/c ratio	0.93	0.51		0.28	0.77		0.4	0.89		0.79	0.86		
School Peak	SimTraffic	LOS	C	E		B	C		C	C		C	D		C
		Delay (s)	31.0	76.0		20.0	30.6		25.5	29.7		25.4	35.2		31.1
		Queue (ft)	100	500		150	225		100	200		125	350		
	HCM	LOS	D	C		B	C		C	C		B	C		C
		Delay (s)	46.6	26.8		19.5	29.6		20.6	27.4		19.3	31.9		29.3
		v/c ratio	0.92	0.67		0.54	0.73		0.35	0.63		0.49	0.83		
PM Peak	SimTraffic	LOS	C	E		D	E		D	C		C	E		D
		Delay (s)	34.1	61.2		46.1	76.7		43.7	32.2		26.7	64.1		49.1
		Queue (ft)	275	550		225	775		125	250		275	700		
	HCM	LOS	E	D		C	E		C	C		C	E		D
		Delay (s)	59.7	37.2		32.6	67.1		33.0	32.4		23.3	70.1		52.3
		v/c ratio	0.95	0.62		0.59	0.89		0.6	0.51		0.45	0.98		

Err - Volume exceeds capacity, value cannot be calculated
Queues rounded to the nearest vehicle length (25 ft per vehicle)

Figure 2.20: Alternative One - Traffic Signal

Bike and Pedestrian Accommodation - Bike and pedestrian facilities will further increase the roadway cross section through the downtown. A 5-foot bike lane and wide sidewalks are included in the design. Traffic signals should be timed to accommodate pedestrian crossing times and countdown timers added to improve pedestrian knowledge and safety.

Right-of-Way Impacts - Several buildings near the intersection will need to be removed in order to provide the amount of lanes necessary for traffic flow. Some sites will be need to be reconfigured to function properly *(see Appendix A)*.

Land Use and Development Impacts - This alternative does not drive significant changes in the current or future land use plans for the City.

Cost - Rough cost estimates were prepared for both right-of-way and construction costs. Construction is estimated to cost between $4.5-6 Million, with the total cost for this alternative ranging from $10-12 Million.

Alternative Two - Roundabout

Figure 2.21 (*on the next page*) illustrates this alternative.

Operations - As shown in *Table 2.5 (below)*, the roundabout shows the shortest queues for the design year traffic (2035). It also has the shortest average delays on all approaches. An operational concern is the possibility of long-term failure. While the timing of a traffic signal can be adjusted to manage congestion and queue lengths, a roundabout can't be tweaked in the same way.

Safety - Historically, roundabouts have a good safety record when compared to other full access at-grade intersections. A roundabout reduces speed through the intersection and the number of conflict points to create a safer condition compared to the stop or signal control alternatives. In particular, roundabouts have shown significant reductions in injury and fatal crashes. Studies by the Insurance Institute for Highway Safety show that roundabouts reduce all crashes by up to 40%, injury crashes by up to 75%, and fatality collisions by 90%.

Parking - The roundabout has the smallest overall footprint and least on-street parking loss. The biggest impact to parking is the south approach due to the physical constraints of the existing buildings.

Access - A roundabout is a unique alternative in the fact that business access closest to the intersection may be restricted to right-in, right-out due to the splitter islands. However, the roundabout provides a u-turn option that allows drivers to avoid left turns in and out of driveways during peak traffic periods. It can be easier to accommodate access closer to the intersection on a roundabout due to this u-turn ability.

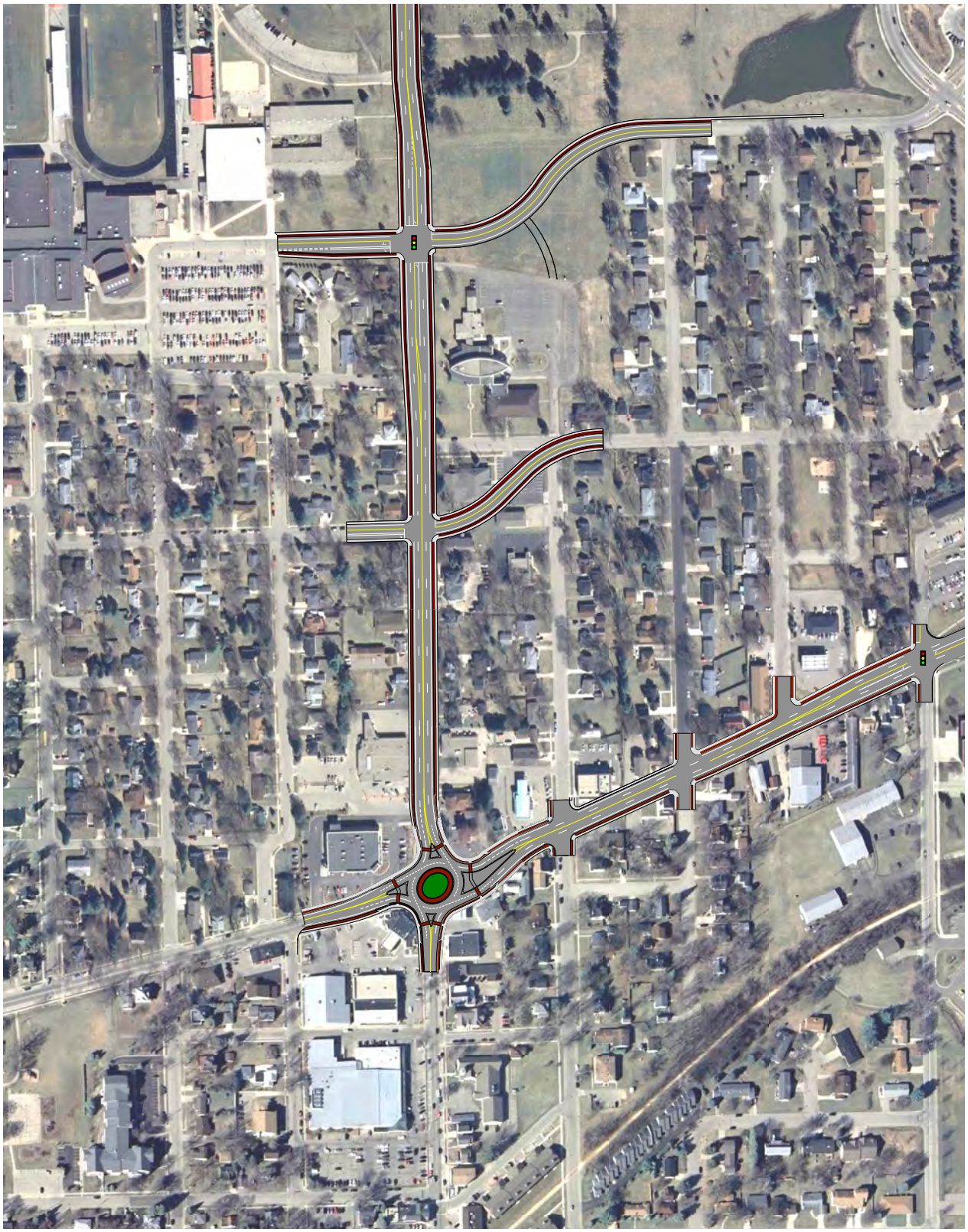
Bike and Pedestrian Accommodation - Pedestrians and bikes are accommodated for this alternative using an off-street multi-use path. There are mixed opinions on the safety of roundabout pedestrian crossings and significant local concerns were expressed at the public information meetings. Roundabout experts have data showing that roundabouts are no more dangerous than other intersection types, though they acknowledge the importance of active efforts by pedestrians to manage their safety by being aware and assertive when crossing. The perceived danger and vulnerability for pedestrians at roundabouts is not supported through any data or crash history at existing roundabout locations.

Table 2.5: 2035 Volumes Summary Table (Alternative Two)

Peak Hour	Output	Parameters	West Approach		East Approach		South Approach		North Approach		Overall Intersection
			LT/TH	TH/RT	LT/TH	TH/RT	LT/TH	TH/RT	LT/TH	TH/RT	
Lanes			1	1	1	1	1	1	1	1	-
PM Peak	Sidra	LOS	D	D	B	B	B	B	C	C	C
		Delay (s)	45.4	45.4	18.7	18.7	15.3	15.3	30.9	30.9	28.9
		Queue (ft)	200	200	100	100	75	75	200	200	
		v/c ratio									

Err - Volume exceeds capacity, value cannot be calculated
Queues rounded to the nearest vehicle length (25 ft per vehicle)

Figure 2.21: Alternative Two - Roundabout



Right-of-Way Impacts - The largest right-of-way impact for this alternative is to the southeast quadrant of the intersection. Several buildings may be lost to the construction and additional right-of-way strip taking at the tie-in points as well *(see Appendix A)*.

Land Use and Development - There is some concern, locally, that drivers may be less likely to see or think about businesses near the roundabout because they will be more focused on navigating the intersection, as compared to the time that people sitting at red lights may spend looking around while they wait. However, this alternative does not drive significant changes in the current or future land use plans for the City.

Cost - Rough cost estimates were prepared for both right-of-way and construction costs. Construction is estimated to cost between $3.5-5 Million, with the total cost for this alternative ranging from $6-8 Million.

Alternative Three - One-Way Pair

Figure 2.22 (*on the next page*) illustrates this alternative.

Operations - As shown in *Table 2.6 (below)*, the one-way pair of Main Street and Franklin Street provides the most capacity beyond the design year volumes, meaning it would likely function effectively for a longer time than the other two alternatives. It provides the least amount of delay and queues, by reducing conflicting vehicle movements.

Safety - The one-way pair reduces conflicts for vehicles and pedestrians by allowing pedestrians to focus on only one direction of travel. Left turning vehicles no longer have to yield to oncoming traffic (operate more like a right hand turn) and reduce the potential for rear end crashes.

Parking - On-street parking is reduced by 42% with this alternative; however there is the potential to add marked parking spaces on Franklin Street. The biggest impact to parking is on S. Main Street due to the physical constraints on that block.

Access - While the one-way pair access patterns are safer due to the one directional travel, it can become more difficult for patrons to navigate the downtown. Some drivers may have to circle a block in order to get into the main access. Additional side-street connections would be made to provide more opportunities to turn around.

Table 2.5: 2035 Volumes Summary Table (Alternative Three)

Main & Verona Intersection

Peak Hour	Output	Parameters	West Approach			East Approach			South Approach			North Approach			Overall Intersection
			TH		RT	LT	LT/TH	TH	LT	TH	RT	LT	TH	RT	
	Lanes		2		1	1	1	1				1	2	1	-
PM Peak	SimTraffic	LOS	D	E	C	D	D	C				C	D	B	D
		Delay (s)	50.2	78.4	29.8	38.5	41.8	21.5				29.1	37.8	13.7	40.9
		Queue (ft)	400	850	375	125	150	350				250	400	275	
	SYNCHRO*	LOS		D	C	B	B					B	C	C	D
		Delay (s)	-	53.4	27.8	15.5	16.2					19.4	30.8	21.0	37.4
		Queue (ft)		375	100	50	50					125.0	425.0	75.0	
		v/c ratio	-	0.95	0.25	0.62	0.76					0.32	0.94	0.39	

Franklin & Verona Intersection

Peak Hour	Output	Parameters	West Approach			East Approach			South Approach			North Approach			Overall Intersection
			LT	LT/TH	TH	TH		RT	LT	TH	RT	LT	TH	RT	
	Lanes		1	1	1	2		1		2	1				-
PM Peak	SimTraffic	LOS	A	B	B	D	D	C	C	C	A				A
		Delay (s)	6.5	14.0	12.2	40.3	52.0	26.8	28.5	28.4	8.3				4.8
		Queue (ft)	125	125	325	375	575	325	200	200	100				
	SYNCHRO*	LOS	B	A			D	C		D	A				C
		Delay (s)	11.6	9.6		-	43.7	31.2	-	43.7	6.9				27.3
		Queue (ft)	175	175			275	100		250.0	50.0				
		v/c ratio	0.62	0.62		-	0.83	0.29	-	0.81	0.32				

*Synchro Outpurts reviewed due to HCM 2010 methology not supporting turning movments with shared & exclusive lanes

Figure 2.22: Alternative Three - One-Way Pair

Bike and Pedestrian Accommodation - Pedestrians and bicyclists have only one direction of travel to navigate in this alternative. Due to the reduced amount of lanes on Main Street and Franklin Street, additional roadway width is available to provide bike lanes and increased sidewalk/terrace width for pedestrians. The increased width also enhances local business entrances and creates a pedestrian friendly downtown.

Right-of-Way Impacts - This alternative takes the least amount of overall right-of-way in the downtown core. The roadway cross section generally fits within the existing limits and left-over width will be dedicated to sidewalk and terrace width. There would be significant impacts however at the merge and diverge locations of the one-way pair *(see Appendix A).*

Land Use and Development - The one-way pair would increase the exposure and value of land along Franklin St. for retail or service use. However it could also decrease total traffic on Main St. and compromise the value of those sites.

Cost - The merge/diverge locations will have the biggest cost for reconstruction and right-of-way acquisition. Also, the intersection of Verona Avenue and Franklin Street will need to be signalized, increasing cost of construction and maintenance. Rough cost estimates were prepared for both right-of-way and construction costs. Construction is estimated to cost between $5-6 Million, with the total cost for this alternative ranging from $11-13 Million.

LINCOLN STREET CONNECTION

The lack of signal control at the Lincoln and Verona intersection has been noted as major frustration for those making left turns onto Verona Avenue. Though installation of a signal may not be warranted based on current traffic volumes, another signal could be considered if it improves the traffic progression within the corridor. Four alternatives were considered, as described below. The associated data tables are found in *Appendix A*.

Alternative One - Realign Lincoln to Gilman & signalize Lincoln/Gilman St and West Verona Ave

This alternative would eliminate the existing intersection of Lincoln Street and move all traffic to Gilman Street. Traffic signals could be installed and provide reasonable traffic signal spacing between the existing signals at Main Street and Enterprise Drive. Redevelopment of the parcels south of Verona Avenue between Lincoln Street and Jefferson Street would be required and coordination with those property owners vital. The installation of a traffic signal at Gilman Street would trigger the need to expand Verona Avenue to four lanes sooner than the no-build scenario. In addition, east/west left turn lanes are desired for safety and operational benefits.

Figure 2.23: Lincoln Street Fix - Alternative One

Alternative Two – Realign Lincoln St to Enterprise Dr
Similar to Option 1, the existing Lincoln Street roadway would be removed and aligned to the existing signalized intersection of Enterprise Drive. This alternative would require rebuilding/relocating the Eagle's Nest hockey rink. Initial discussions with residents and City Staff gave mixed accounts of whether the rink is open to redevelopment due to the condition of the facility. Also, enhancements to the Military Ridge State Trail are desired to improve sight distance and driver awareness of the crossing. Significant coordination with the Eagle's Nest will be necessary to determine the viability of this alternative.

Figure 2.24: Lincoln Street Fix - Alternative Two

Alternative Three – Move signal infrastructure from Enterprise Dr to Horizon Dr & signalize Lincoln St
Only minor geometric changes would be necessary at each of the three intersections. The existing signal infrastructure would be reused at Horizon Drive to reduce costs. Changes to the Enterprise and Horizon intersection would be desirable to guide traffic onto Horizon Drive, as shown in *Figure 2.25*. The primary benefit of this option is signal spacing; the spacing between Main Street, Lincoln Street, and Horizon Drive is optimal for the speed limit and traffic volumes. The progression of vehicles is optimized for conditions and flow through the corridor closer to ideal.

Figure 2.25: Lincoln Street Fix - Alternative Three

Alternative Four – Add a traffic signal at Lincoln Street
This option creates the least disruption of current travel behavior. Intersection improvements to Lincoln Street would be the only geometric upgrades. Due to the short distances between Lincoln Street and Enterprise Drive, the two signals may need to operate as a one controller setup as volumes increase to minimize backups between the intersections. Additionally, the fire station has planned to create a new vehicle access directly onto Verona Avenue between the two intersections. This creates a challenging signal timing plan and safety concern for queued vehicles when the fire department needs access to Verona Avenue. It also provides the least amount of flexibility for adjustments as traffic volumes grow in the future.

Figure 2.26: Lincoln Street Fix - Alternative Four

SILENT STREET CONNECTION

Two alternatives were considered for connecting Silent Street to Main Street. The City owns right-of-way for a direct connection to Main Street from the western stub of Silent Street. A second alternative to align Silent Street with the High School access was also reviewed. Aligning the street and High School driveway into one intersection improves the likelihood of installation of a traffic signal near the school access, and could improve both traffic and pedestrian accommodations. Additionally, by connecting the school to Silent Street, it improves alternative access for school staff, students, and visitors by providing a route to the school from the east that avoids the Main and Verona intersection. Church access may also be improved by the signal if the parking is connected to the Silent Street extension.

2.3 Mobility Recommendations

This section presents the recommended solutions to alleviate existing and forecasted mobility problems within the study area. These final preferred solutions were selected and refined to meet four key goals identified during this planning process:

1. *Improve pedestrian and bicycle facilities*
2. *Improve property access, especially during peak traffic periods*
3. *Reduce school-related traffic and congestion*
4. *Improvements should enhance downtown character and quality, not just reduce traffic congestion.*

See *Chapter 4: Action Plan* for the phasing of the solutions presented in this section.

MAIN & VERONA INTERSECTION

This intersection is the linchpin to the function of the local transportation network and was the focus of considerable study and discussion. See Section 2.2 for alternatives discussed and reviewed during this planning process. The signalized intersection alternative was selected based on its effectiveness to alleviate existing traffic concerns, while maintaining familiar traffic patterns and improving bike and pedestrian safety.

It is proposed that this intersection be improved in two stages. The first stage will reduce congestion by adding turn lanes, but will not require the removal of any buildings. The second stage, considered the "long-term solution", will expand the intersection to feature two through lanes in every direction. This stage will require the removal of several existing buildings.

Stage One

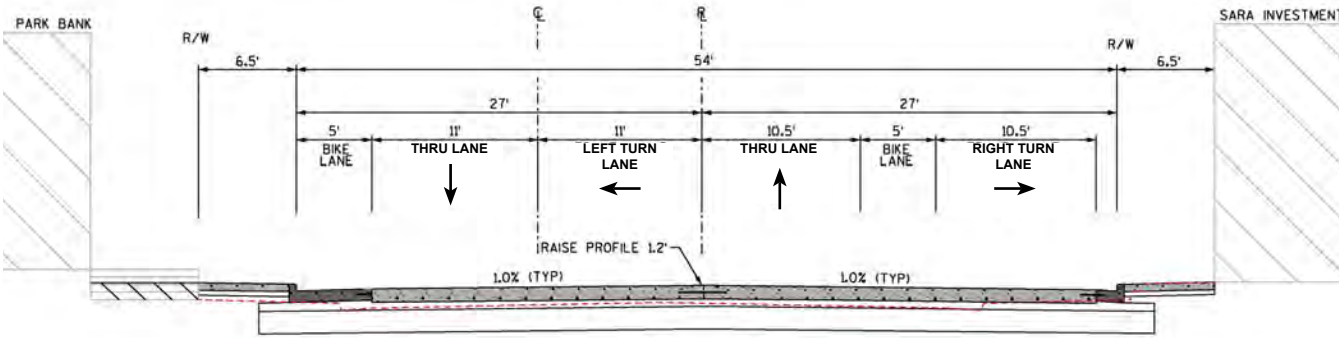
This redesign will include a left-, thru-, and right-lane on all approaches of the intersection. Storage lanes for left and right turn lanes will be extended to handle longer queue lengths. This alternative utilizes all of the available roadway width, including expanding the right-of-way to the building faces on S. Main Street. No building impacts are expected as part of this improvement project, however there may be impacts to the Mobil station operations that could limit circulation and or use of all existing fueling positions. See *Figure 2.27 (below) and Figure 2.28* (*on the next page*).

Bike lanes will also be added to the Main Street approaches. The S. Main Street typical section south of Park Street will be modified to include on-street bike

Figure 2.27: Main / Verona Improvements - Stage One

Figure 2.28: Main/Verona - Stage One Improvements

South Main Street Cross Section



lanes, driving lanes and one side of on-street parking. Bike lanes were not considered for installation on Verona Avenue as part of this short term improvement. East/west bike traffic will be encouraged to utilize the Military Ridge State Trail as the preferred route.

As shown in *Figure 2.28 (on the previous page)*, pedestrian crossings are maintained on all four approaches of the intersection. A crossing of the E. Verona Avenue approach is contingent upon closure of the Mobil station driveway at the corner.

Stage Two

Figure 2.29 illustrates the stage two improvements to this intersection. These improvements assume two through lanes in all directions. This translates to six lanes in each approach to the intersection. The on-street parking will be lost along all approaches. This loss will be offset by the addition of off-street public parking areas as outlined in the land-use plan (*See Section 3.3*).

Based on the results of the study, the following improvements are recommended as part of the long term solution.

Travel lanes - provide one left turn lane, one through lane, and one shared through/right turn lane on all four approaches to the intersection. Lane widths are recommended at 11 feet to balance operations and right-of-way limitations. Bike lanes are included in both directions on each leg.

Sidewalk/Terrace - A minimum of 6 feet is provided for areas where the sidewalk is adjacent to the back of curb. Wherever possible, a 6' terrace and a 6' sidewalk should be constructed to provide space for streetscaping elements (including lights, benches, landscaping and other items), width for shared sidewalk space, and space for snow storage, hydrants and other public works needs.

Figure 2.29: Main/Verona - Stage Two Improvements

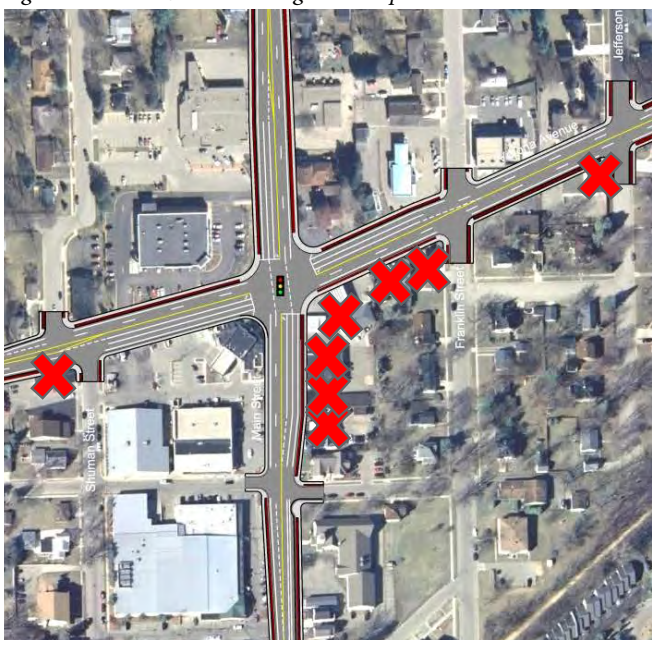


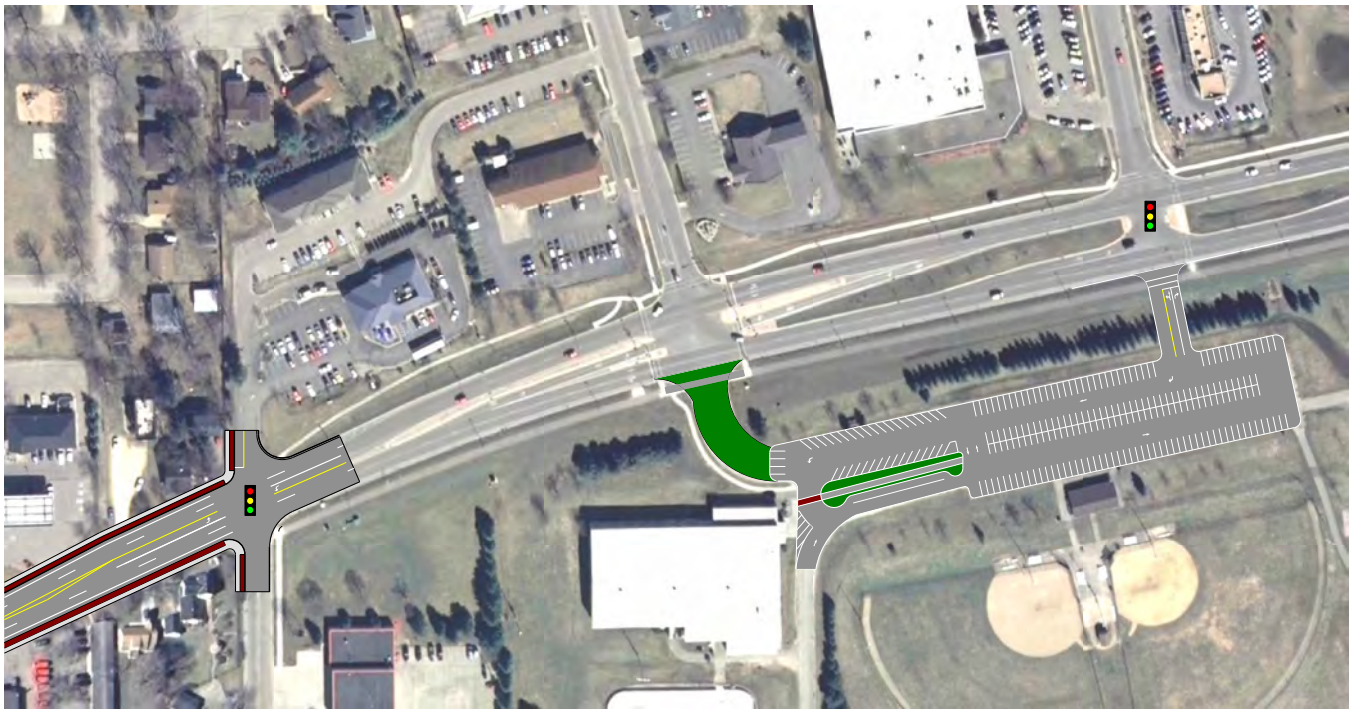
Figure 2.30: Main / Verona Improvements - Stage Two

LINCOLN STREET

There were four alternatives presented to the Steering Committee and general public to resolve the difficulty with left turns at Lincoln Street (*see page* 33-34). The preferred alternative, based on public feedback, is to signalize the Lincoln Street intersection (alternative 4). At some point, as traffic volumes increase, the proximity of the Lincoln Street and Enterprise Drive signals may result in undesirable congestion. If and when this occurs, the City can choose to move the Enterprise Drive signal to Horizon Drive. Figure 2.32 illustrates the relocation of the access driveway for the Eagle's Nest and ball fields that would be necessary if this change were made. Figure 2.31 illustrates the reconfiguration of the intersection of Enterprise Drive and Horizon Drive to direct traffic to the relocated signal - the corresponding right-of-way should be protected from development to preserve this option.

Figure 2.31: Horizon/Enterprise Redesign Concept

Figure 2.32: Lincoln Street Connection Improvements



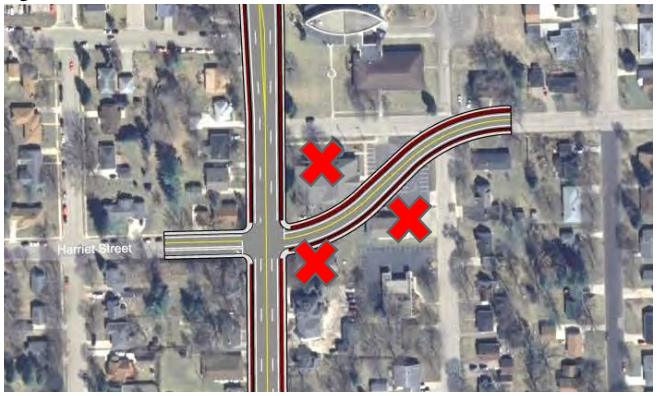
GRID REPAIR IMPROVEMENTS

A central shortcoming of the road network in Verona is the lack of viable north-south or east-west alternatives to traveling on Main Street or Verona Ave when congestion is heavy. Several improvement opportunities were discussed and identified during this process, and could be constructed at any time.

Harriet Street

Harriet Street is busy during the school release peak hour. The City is encouraged to connect East and West Harriet Street as a means of reducing pressure on other connecting roadways. On-street perpendicular parking could be incorporated in this design to help support adjacent redevelopment opportunities (*see Section 3.3*).

Figure 2.34: Harriet Street Connection



Railroad Street / Church Street Connection

Currently East Railroad Street does not line up with either West Railroad Street or Church Street. This creates vehicle conflicts between the three separate intersections with Main Street. Crash reports confirm the anecdotal feedback about the poor visibility at this intersection. The removal of the Plumbing & Glass Services, Inc. (221 S Main Street) building will provide the necessary space to line up East Railroad Street with Church Street. Combining this with the proposed closure of West Railroad Street to expand Hometown Junction Park (see page 67) will improve the safety and function of this section of South Main Street, especially for pedestrians. This is also an opportunity to create a small public plaza at the northeast corner of this newly created intersection, following the streetscaping theme described in *Section 2.3*.

Figure 2.35: East Railroad Grid Repair

RIGHT-OF-WAY NEEDS

The street infrastructure improvements recommended in the preceding pages include some intended for completion within the next several years, and others intended as part of the "ultimate build-out" scenario, not to be completed for several decades or more. While the completion of those longer-term projects may never come to pass, the option of those improvements should be protected. The following table summarizes the public rights-of-way that may eventually be needed, and which should be protected from development and acquired by the City during redevelopment projects.

Street Realignment ROW Needs	Description
East Railroad Street	*As illustrated in Figure 2.35 on page 39, 221 South Main Street (Plumbing & Glass Services, Inc.) should be acquired to enable the realignment and connection of E. Railroad St. with Church St.*
East Harriet Street	*As illustrated in Figure 2.34 on page 39, the realignment of Harriet Street would improve the function of the downtown street grid. The three parcels affected by this realignment should be redeveloped only in coordination with this project.*
Enterprise Drive at Horizon Drive	*As illustrated in Figure 2.31 on page 38, ROW should be acquired along the west side of Enterprise Dr., up to 55′ of additional width at the widest point, to enable realignment with Horizon Drive if and when the Enterprise Drive signal is moved to Horizon.*

Corridor Expansion ROW Needs	Cross Section Layout	Total Width Needed*
Verona Avenue between Franklin/Jefferson	*11′ travel lane x 4, 4′ bike lanes, 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*83*
Verona Avenue west of Marietta Street	*11′ travel lane x 2, 6′ parking x 1, 4′ bike lanes 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*67*
Main Street near Harriet Street	*11′ travel lane x 4, 4′ bike lanes, 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*83*
Main Street north of Silent Street	*11′ travel lane x 4, 4′ bike lanes, 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*83*
Main Street south of Church Avenue	*11′ travel lanes x 2, 6′ parking x 2, 4′ bike lanes, 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*73*

Intersection Improvement ROW Needs	Cross Section Layout	Total Width Needed*
Main Street & Verona Avenue		
North Leg	*11′ travel lane x 5, 4′ bike lanes, 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*94*
East Leg	*11′ travel lane x 5, 4′ bike lanes, 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*94*
South Leg	*11′ travel lane x 5, 4′ bike lanes, 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*94*
West Leg	*11′ travel lane x 5, 4′ bike lanes, 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*94*
Main Street & Silent Street		
North Leg	*11′ travel lane x 5, 4′ bike lanes, 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*94*
East Leg	*11′ travel lane x 3, 4′ bike lanes, 2.5′ C&G, 4′ terrace, 6′ sidewalk*	*72*
South Leg	*11′ travel lane x 5, 4′ bike lanes, 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*94*
West Leg	*11′ travel lane x 3, 4′ bike lanes, 2.5′ C&G, 4′ terrace, 6′ sidewalk*	*72*
Verona Avenue & Lincoln Street		
North Leg	*no change*	-
East Leg	*11′ travel lane x 5, 4′ bike lanes, 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*94*
South Leg	*no change*	-
West Leg	*11′ travel lane x 5, 4′ bike lanes, 2.5′ C&G, 6′ terrace, 6′ sidewalk*	*94*

*** All right-of-way widths include one foot behind the sidewalk. The intersection widths indicate the widest point of each leg, at the intersection. The necessary right-of-way narrows and tapers away from the intersections to the widths described in the "Corridor Expansion ROW Needs" table on the preceding page. See the design concept illustrations in this chapter.**

OTHER ROADWAY IMPROVEMENTS

This includes additional solutions that will help improve the overall functionality within the study area.

Don't Block the Box

This is a simple pavement marking/signing solution that keeps critical access locations clear of vehicles when queued. This option encourages progression of vehicle traffic nearest the intersection with the most uninterrupted flow and low cost.

Signs and pavement markings can be installed as soon as possible on North and South Main Street in areas of critical driveway locations. This roadway improvement will allow patrons of local businesses to easily access driveway that would otherwise be blocked by long queues due to the traffic signal at Main Street & Verona Avenue. Some public outreach or education about the pavement markings may increase compliance. Installation is recommended for the first driveways north and south of Verona Avenue on Main Street.

Figure 2.36: "Don't Block the Box" Example

Basswood Avenue Connection

Some parents are already using the Basswood Avenue cul-de-sac as a drop-off location for the Middle School. This is both more convenient for residents from the northwest quadrant of the City and a way to avoid congestion on Main Street. By providing an access driveway to the parking lots and an official drop-off site from this cul-de-sac, the City and School District could draw even more traffic away from Main Street. A preliminary design concept is illustrated in *Figure 2.37*.

Figure 2.37: Basswood Avenue Connection

Paoli Street

Congestion and difficulty making left turns onto Main Street have led some to call for improvements to this intersection. A roundabout is not considered viable due to it's effects on adjacent residential properties that access Main Street very near or directly into the intersection with Paoli Street. The traffic volume does not meet warrants for a traffic signal at this time, however a traffic signal is the preferred improvement for this location, and this project can proceed as soon as signal warrants are met for any one turning movement. Any changes to the intersection must accommodate the residential property whose driveway aligns with Paoli Street.

North/South Bypass

While working through the mobility solutions, the community endorsed a north-south bypass connecting CTH M to USH 151 to redirect commuter traffic away from Downtown Verona. Further analysis of this potential bypass was not included within the scope of this project. However, the City may pursue additional studies of this project in the future in coordination with the Madison Area Metropolitan Planning Organization, WisDOT, Dane County and surrounding jurisdictions. Any future study should address environmental, economic, and socioeconomic impacts of various alternative routes prior to selecting a preferred route, budgeting, and completing construction.

CROSSING IMPROVEMENTS

There are many places in the Downtown Core where pedestrian crossings could be improved. The most important locations for improvements are those with high pedestrian volumes, especially the routes students use. Several of these are already targeted for general intersection improvement, and crosswalk improvements should be part of those changes. Those intersections include Main Street and Verona Avenue, and Main Street and Church Street. Other intersections are not otherwise planned for improvement, but should have pedestrian crossing improvements. These are described here.

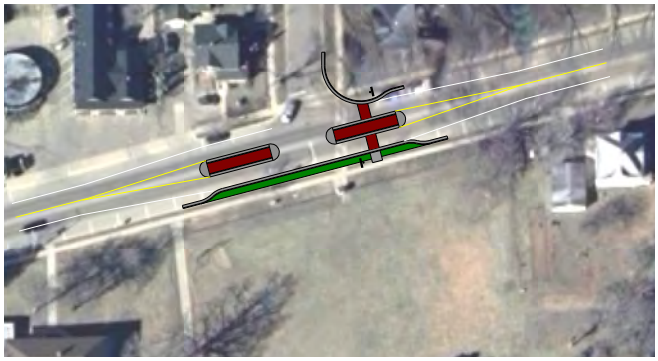
Standard Crosswalk Enhancements

Whenever a segment of either Main Street or Verona Avenue is repaved, pedestrian crossings should be improved to make them more visible and consistent with the general streetscaping theme. The recommended design is either colored concrete or brick bordered in concrete. These can be used with either concrete or asphalt street paving (see Main Street in Mt. Horeb for an example of brick crosswalks in an asphalt street). If and when brick or colored concrete are not selected, the "continental" striping style should be used (solid white bars parallel to the direction of vehicle travel).

Westlawn Pedestrian Crossing

Westlawn Avenue is one of a few key points at which elementary students from north of Verona Avenue cross that busy street to reach school. Currently, a crossing guard is stationed before and after school at this location to assist children crossing the street. Existing on-street parking and poor visibility make this a dangerous crossing for young children. The preferred improvement for this location is the addition of medians and small curb bump-outs. The median provides a pedestrian refuge to allow children to focus on crossing one direction of traffic at a time. The small bump-outs would ensure that no vehicles are able to park near or approaching the pedestrian crossing. Some on-street parking in this location would be lost. However, this guarantees maximum visibility of any pedestrians waiting to cross. In addition, this location is a prime candidate for the installation of a rectangular rapid flashing beacon (RRFB). It was expressed at public meetings that drivers do not yield to pedestrians at marked crosswalks. The RRFB would be pedestrian activated and alert drivers to slow down and stop. The RRFB signs would be installed at the curb ramps including the proposed median location.

Figure 2.38: Westlawn Crossing Improvements



Military Ridge State Trail Crossing

The Military Ridge State Trail is a busy commuter and recreational trail that passes through the center of downtown Verona on S. Main Street. The trail currently has a single school crossing sign and pavement markings indicating the location of the crossing. The existing trees lining the trail obstruct the visibility of trail users waiting to cross the road. On-street parking also exists which can hinder visibility further. The preferred improvement at this location is green colored pavement and curb bump-outs to enhance the visibility of trail bikers. Similar to the West Lawn crossing, bump-outs will place trail users in a more visible location when waiting to cross the street. The colored concrete pavement will also alert drivers to use caution in the area. It is also encouraged to place new multi-use trail crossing (MUTCD sign number W11-15) assemblies on both approaches of S. Main Street. The existing school crossing should be reviewed for MUTCD updates and correct sign placement for the Church Street crossing.

As a side note, multiple public participants requested the paving of the Military Ridge State Trail (it is currently crushed limestone). Residents have argued that more people would use the trail if road bikes could navigate the trail more easily, especially commuter travelers. Military Ridge is part of the Rails to Trails program and would need DNR approval to extend the paved section of the trail into and through Verona.

STREETSCAPING IMPROVEMENTS

One method of attracting investment in the downtown is to make public improvements that show residents and business owners that the City is taking the initiative in revitalizing the area. These improvements will also help to create a distinct identity for the downtown, which separates it from other areas of the City and other downtowns in the region. A well designed streetscape incorporates crosswalks, sidewalks, light fixtures, trees, planters, trash receptacles, banners/flags, benches and green spaces within the public right of way. Guidelines in this section are intended to inform streetscape design, either as stand-alone projects or as part of street reconstruction.

"Pedestrian Friendly" Streets

In a downtown setting such as this, foot traffic and convenient pedestrian transportation is nearly as important as vehicle traffic. In general, a "friendly" street has features that provide safety, mobility, and comfort. Examples of these features are described and illustrated on *pages 46-47*.

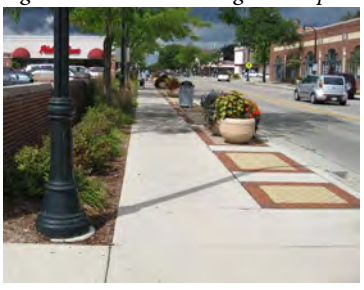
General Streetscaping Guidelines

The following principles are consistent with the best practices for downtown urban design illustrated in the following pages, and they are tailored to match the menu of streetscape configurations for Verona beginning on *page 49*.

Terraces

- Terraces in the Downtown Core will be paved with brick using a concrete base.
- Where space and maintenance budget allows, landscaping may be added to the terrace. Landscape boxes will be flush with the curb and sidewalk - no raised curbs or walls will be used to make winter maintenance less problematic.

Figure 2.39: Terrace Design Examples



Sidewalks

- Maintain a minimum of five, preferably six feet of clear path. Refrain from placing fire hydrants, light and electrical poles, traffic lights, signs, benches, etc. in the clear path zone.

Streets

- Reduce/modify the number of existing driveway access points by sharing driveways wherever possible.
- Reduce corner radii (or provide bump-outs) to slow cars during turning movements and reduce pedestrian crossing distances wherever feasible.
- Clearly mark crosswalks by using either colored concrete or brick set in and bordered by concrete. Both are options even if the roadway material remains asphalt - see Main Street in Mt. Horeb as an example and performance indicator of concrete+brick crosswalks in an asphalt street. If crossings are not provided special paving, pavement markings should utilize the continental/ladder configuration for improved visibility and longevity.

Figure 2.40: Crosswalk Design Examples

Signs and Lights

- Enhance the existing street sign system and make it consistent throughout downtown.
- Provide unique street identifiers within the Downtown Core.
- Extend the Verona Avenue Gateway streetlight design into the Downtown Core, but with black poles instead of blue.

Entryway Features

- Add entryway features at the edges of the downtown core along Main Street and Verona Avenue (*see map on page 48 for locations*). The design of the entry features should meet the following criteria (*see Figure 2.41 below for examples*):
  - *Use a common sign and/or logo welcoming people to "Downtown Verona"*
  - *Use brick wall and/or column*
  - *Illuminate externally (rather than back-lit) and from above (rather than pointed toward the sky)*
  - *Include landscaping (ie. bushes and/or perennials) that will not obscure the sign at mature growth*
  - *Design should be distinguishable, but appropriate in size and height to enhance the downtown pedestrian environment*
  - *If possible, locate on both sides of the street; otherwise, consider coordinated elements on both sides of the street (e.g. stone wall in the sidewalk terrace, as shown in the first image below)*

Figure 2.41: Entryway Feature Examples

Trees

- Provide a cohesive planting policy and select trees based upon the tree's characteristics of growth, durability, branching habit, visual appeal, and maintenance requirements.
- No pavement within a 32 sq ft area around tree trunks to allow for growth (varied configurations feasible, 4' minimum width)
- Trees placed in hardscaped terraces shall have a tree grate around the base.

Figure 2.42: Tree Grate Example

- Maintain a 7-foot height clearance within the clear path zone. Prune trees that impede this zone.

Street Furniture

- Provide a bench on every other block and trash receptacles at high-volumed pedestrian crosswalks. Bolt the benches to pemvement to prevent vandalism.
- Provide bike racks at major destinations and near large parking lots.

Figure 2.43: Street Furniture Examples

PEDESTRIAN FRIENDLY STREETS

In general, a "friendly" street has features that provide ***safety***, ***mobility***, and ***comfort***. Below describes guidelines to achieve such an environment.

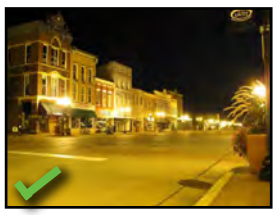
SAFETY

1) Good sight distance
   - *Limit obstructions at crossings (newspaper/ advertising & electrical boxes, over-grown vegetation, etc.)*

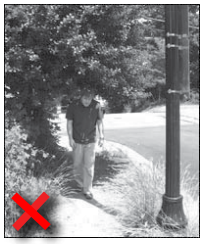

2) Separation & buffering from other modes of travel
   - *Wide sidewalks*
   - *Parking areas*
   - *Sidewalk terrace*
   - *Limit curb-cuts*



3) Pedestrian visibility
   - *Adequate lighting*

4) Adequate height clearance
   - *Well maintained landscaping*
   - *Adequate Awning heights*

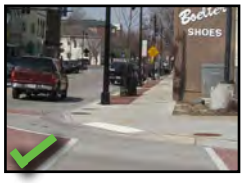



5) Limit crossing distances
   - *Provide bump outs*
   - *Reduce corner radii*
   - *Provide refuge medians at ped. crossings*


MOBILITY

1) Clear path
- *No obstructions within areas of travel*


2) Accessible to all citizens
- *ADA-compliant sidewalks and building entrances*

3) Clear connections
- *Pedestrian pathways to building entrances*


COMFORT

1) At human scale
- *Establish a 1:3-1:2 street width to building height ratio*


2) Soften the urban hardscape
- *Add planters, street trees, landscaped spaces, etc.*



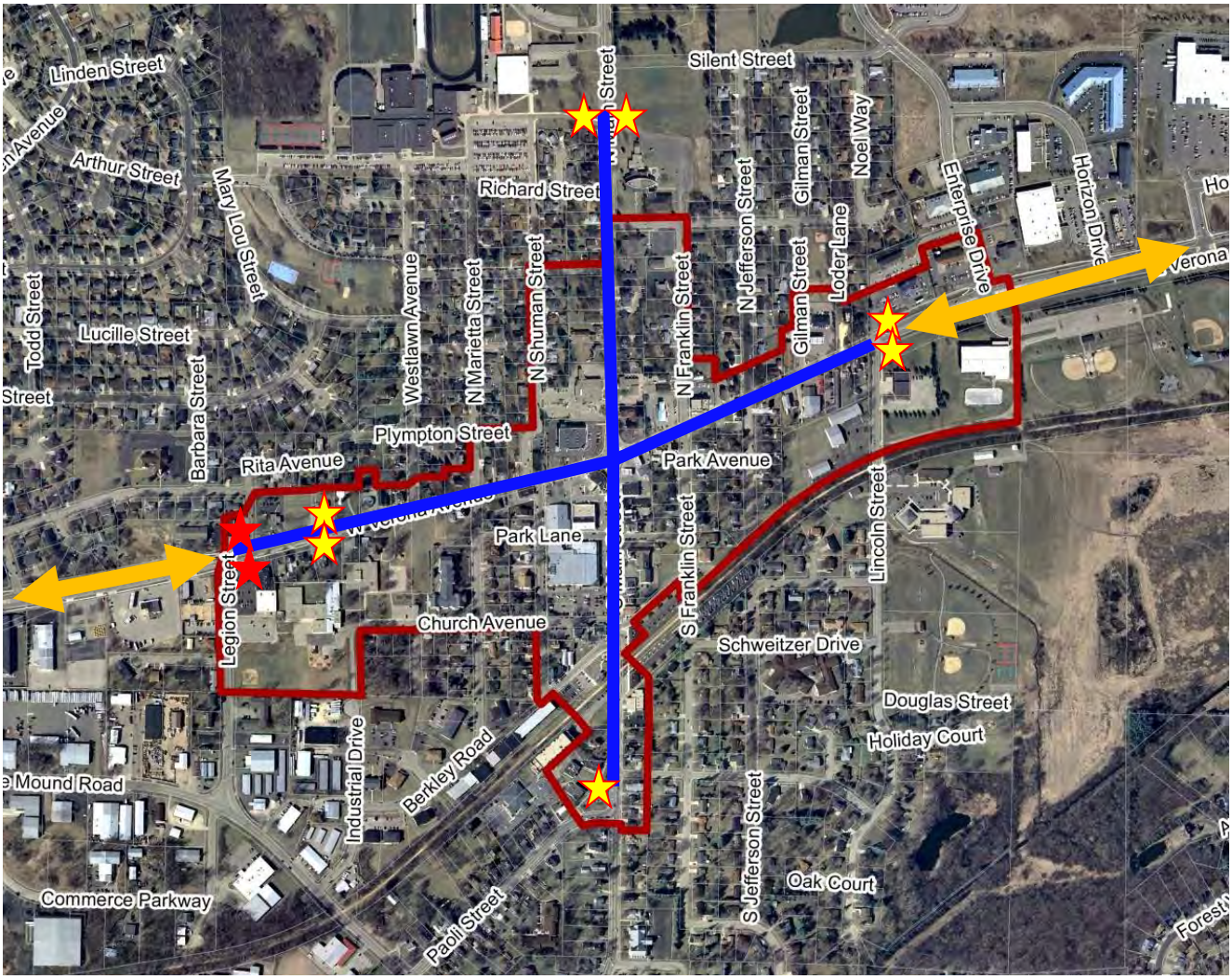
3) Buildings designed w/ pedestrian-friendly features
- Awnings, large and clear windows on the ground-floor, building entrances, view of products/activities, etc.


4) Limit automobile/truck traffic issues
- *Lower vehicle speed limits*
- *Provide traffic calming devices*


5) Provide pedestrian amenities
- *Add benches, table and chairs, bike racks, etc.*


6) Well-maintained infrastructure
- Well-maintained sidewalks, streets, street fixtures, and street trees


Figure 2.44: Streetscaping Map



Downtown Core Entryway Features

Alternative Location

East and West Gateways (no changes)

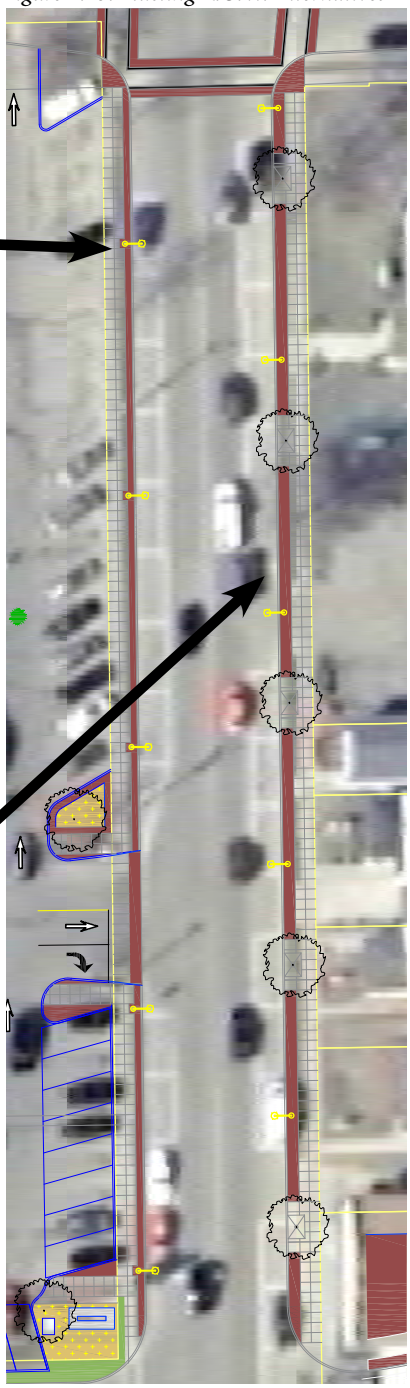
Streetscaping Improvement Areas

Specific Recommendations

Based on the general guidelines and best practices discussed in the prior pages, a streetscaping theme was created for the downtown core. This design theme was established in several formats to work with both existing and expanded sidewalk and right-of-way widths. The result is an interchangeable menu that fits one design theme. It is recommended that the entire length of Verona Avenue and Main Street within the Downtown Core (see Figure 2.44 on the previious page) eventually be reconstructed in one of these formats, in conjunction with improvements to the adjacent street.

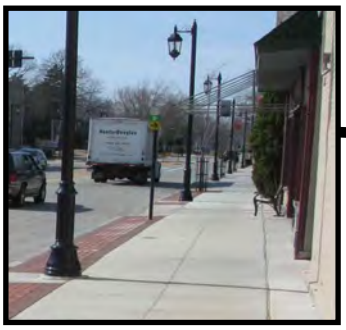
Figures 2.45-2.46 provide conceptual layouts to illustrate how the sidewalk formats can work along South Main Street using existing (*Figure 2.45*) or expanded (*Figure 2.46*) right-of-way.

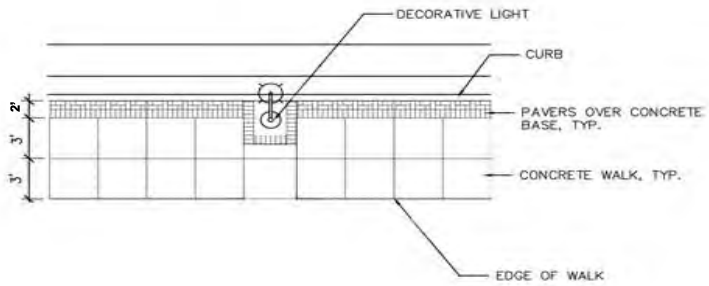
Figure 2.45: Existing R.O.W. Alternatives



<u>Alternative 1 (existing right-of-way w/ 8 feet available)</u>

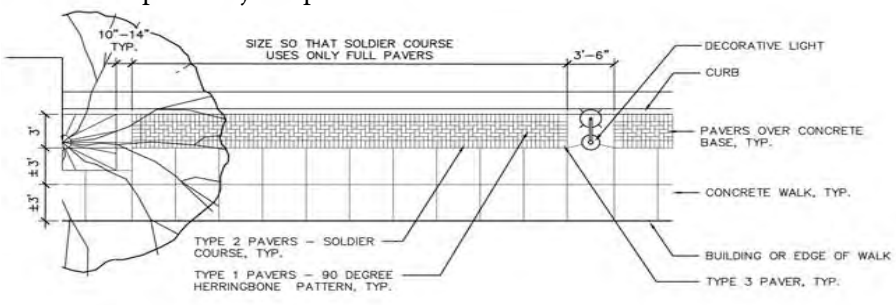
An 8-foot sidewalk section will allow for a 2-foot brick paver terrace and 6-foot sidewalk. Obstructions need at least two feet of clearance from the curb face; therefore, the base of the light fixture will need to encroach upon the sidewalk. However, the design shown below (*and in Figure 2.45*) illustrates how this condition can be built into the sidewalk scoring pattern.





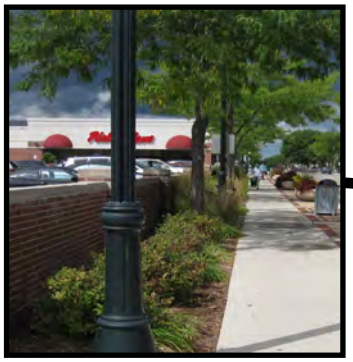
<u>Alternative 2 (existing right-of-way w/ 9/10 feet available)</u>

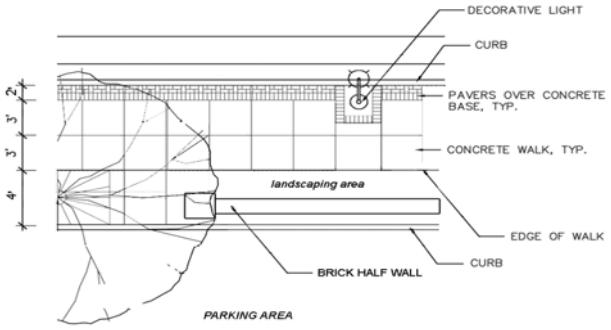
A 9/10-foot sidewalk section will allow for a 3-foot brick paver terrace and 6/7-foot sidewalk. At this width street trees can be incorporated into the street section; however, the tree grate will impede on the sidewalk. The design shown below (*and in Figure 2.45*) illustrates how this condition can be built into the sidewalk expansion joint pattern.



Alternative 3 (expanded right-of-way to 12 feet)

A 12-foot sidewalk width will enhance the pedestrian experience in two ways: 1) allow space for additional streetscaping elements and 2) allow space to buffer parking areas. As shown below and in *Figure 2.46*, a 12-foot section could include a 2-foot brick terrace, 6-foot sidewalk, and a 4-foot landscaped buffer in front of an adjacent parking area that has insufficient space for its own buffer. As illustrated, a brick half-wall would further enhance this buffer, but should not replace the landscaping within this buffer. Evenly spaced street trees could break up the continuous brick wall, which enhances the pedestrian experience as well as provide access between the parking area and the public sidewalk (*see Figure 2.46*).





Alternative 4 (expanded right-of-way to 12 feet)

This alternative is the same as Alternative 2, but with a 9-foot sidewalk section. As shown below and in *Figure 2.46*, this increases the "clear path" walking area, but maintains the 3-foot brick terrace and street tree grates (that impede a foot into the sidewalk section). In this scenario street furniture could be placed along the back edge of sidewalk.

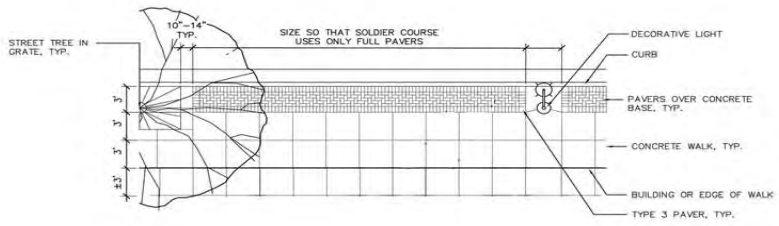
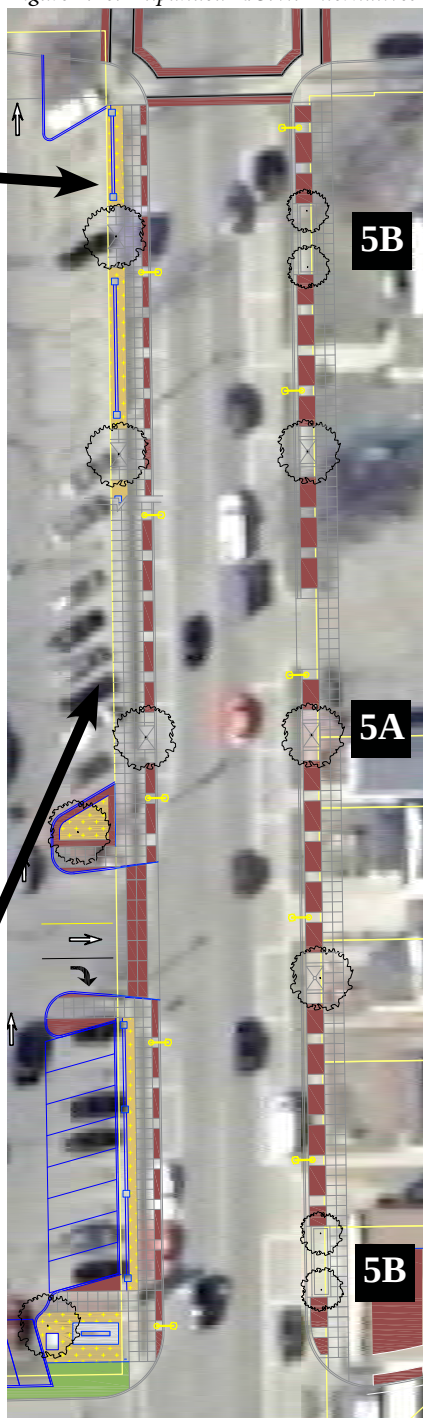
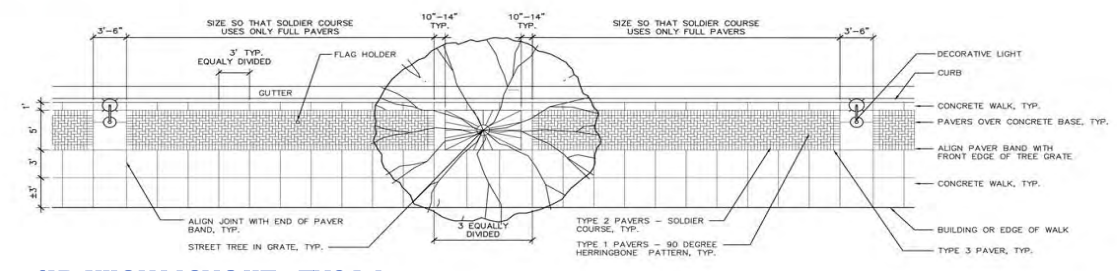


Figure 2.46: Expanded R.O.W. Alternatives



Alternative 5A (expanded right-of-way to 12 feet)
The expanded right-of-way could also allow for a 6-foot brick terrace with a 6-foot "clear path" sidewalk. This wider terrace allows tree grates to remain out of the sidewalk portion, and provides ample room for street furniture. See the illustration below and in *Figure 2.46 (on the east side of the street).*



Alternative 5B (expanded right-of-way to 12 feet)
This is a hybrid of Alternative 5A. It includes 6-foot sidewalks and 6-foot terraces with planting beds evenly spaced (rather the tree grates, as in Alternative 5A). As envisioned in *Figure 2.46*, this can work in combination with Alternative 5A with landscaping beds near intersections and tree grates in the middle of the block (adjacent to on-street parking). To simplify winter maintenance and reduce maintenance costs, planting beds should be constructed at the level of the sidewalk, without a raised curb, wall, or decorative fencing .

MAIN STREET VISION	VERONA AVENUE VISION
	
Existing Conditions	
	
Stage One Improvements	
	
Stage Two Improvements	