

CITY OF MILLVILLE TRANSPORTATION IMPROVEMENT STUDY

FINAL REPORT

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City of Millville, Cumberland County



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Prepared by:
Michael Baker Jr., Inc.



Clarke Caton Hintz



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NJDOT provides financial support for community transportation planning and improvement studies as a service to local communities. The Department and its consultants strive to provide quality planning studies that include a range of recommended improvements, but make no claims, promises, or guarantees about the availability of funding to implement projects from those recommendations.

Executive Summary

The City of Millville in Cumberland County, New Jersey requested assistance from the New Jersey Department of Transportation, Local Transportation Planning Assistance (NJDOT-LTPA) Unit, in developing a comprehensive transportation improvement study. Representatives of Millville indicated that the study should function as a sub-element to the City's Circulation Element and Land Use Element. Central Millville is the primary focus of the study, but transportation issues in other sections of the City are also examined.

Primary goals for the study include improving east/west travel through the central City, as well as improving pedestrian and bicycle access from residential neighborhoods and open space to the central business district (CBD). The study is also intended to provide conceptual design and parking concepts for promoting Millville's first major redevelopment project along the Maurice River waterfront.

NJDOT – LTPA contracted with Michael Baker Jr., Inc. (Baker), to provide assistance to Millville in preparing the study. The firms Clarke Caton Hintz and TechniQuest Corporation provided support as subconsultants to Baker on the study.

Existing Conditions

Following is a summary of highlights of existing transportation conditions:

- Traffic volumes are heaviest on Main Street (NJ Route 49) and 2nd Street (NJ Route 47). Intersection delays are not significant on Main Street, but queues are often present.
- Intersections on Main Street and 2nd Street account for 8 of the top 12 crash "hot spots" in the City. The highest crash intersection is on Route 47 at Union Crossing Boulevard.
- Options for east-west travel across the city are relatively few, which will present constraints on mobility as the City continues to grow in population.
- County road networks are not continuous through center city, which confuses motorists.
- On-street parking is well-used along High Street during the regular "arts nights."
- In general, roadways were found to be bicycle compatible outside the Millville CBD, and incompatible inside the CBD. The major difference is that roadways outside the CBD typically have shoulders, while roadways inside the CBD permit on-street parking, and the shared travel lane for vehicles and bicyclists in this area typically does not meet the NJDOT recommended width of 14 feet.
- Sidewalks are typically present along downtown roadways, but are missing along some key segments, and crosswalks and pedestrian signals are absent at many intersections.
- Transit service was recently upgraded with the Millville Area Connector (MAC) service operated by Cumberland County.

Recommendations

- Enhance an alternative east-west route to Main Street by making improvements along the corridor of Broad Street, Dock Street, and Brandriff. This would involve installing a roundabout

at the intersection of Brandriff Avenue, Columbia Avenue, Dock Street and Vine Street; making it easier for vehicles to turn at Dock Street and Broad Street; and coordinating the signals along Broad Street.

- Enhance north-south travel by rerouting CR 555 on the north side of town through the underutilized Brandriff Avenue Bridge crossing to connect back into CR 555 on the south end of town at Silver Run Road.
- Improve safety and allow for truck turning movements at the intersection of Main Street and 2nd by restriping the intersection, increasing the curb radius of the northwest corner, and installing 12 inch LED lenses.
- Improve the intersection of Sharp Street and Main Street through roadway re-striping, signal improvements, and modifying curb radius.
- Enhance the roadway network in northern Millville, by advancing the proposals originally developed by the City for the Route 55 to Route 47 off-ramp modifications, and development of a Route 55 connector that will bypass Route 47 and tie into Sharp Street. In total, these improvements will reduce congestion at the Route 47 and Union Crossing Boulevard and create safer access to the Route 47 commercial district.
- Further enhance the roadway network in northern Millville by extension of Wade Boulevard and extension of SW Boulevard to Vineland.
- Develop service road to the east of Route 47 in northern Millville.
- Install sidewalk on segments where missing and identified as priorities.
- Upgrade pedestrian infrastructure at key intersections with pedestrian signals, crosswalks, and signage.
- Develop city-wide bicycle network to encourage greater use of bicycles for work, errands and recreational trips.
- Enhance the appearance of Millville through applied urban design concepts.

1.0 Introduction

1.1 Background and Goals

The City of Millville in Cumberland County, New Jersey requested assistance from New Jersey Department of Transportation, Local Transportation Planning Assistance (NJDOT-LTPA) Unit, in developing a comprehensive transportation improvement study. Representatives of Millville indicated that the study should function as a sub-element to the City's Circulation Element and Land Use Element. Central Millville is the primary focus of the study, but transportation issues in other sections of the City are also examined.

Millville was selected for study under the NJDOT-LTPA program because of its position in the South Jersey economy. Millville and Vineland together comprise an Urban Enterprise Zone, as well as a designated Regional Center in the State Plan. The city has been awarded Federal Trade Zone status associated with Millville Airport. Further, Millville is the only municipality in New Jersey to receive approval for the creation of a Revenue Allocation District.

The economy is currently in transition. In earlier decades, glass manufacturing and other industries provided the base for Millville's economy, but employment in those industries fell off significantly after World War II. Efforts to revitalize the economy include the initiatives cited above. Other economic revitalization activities have included efforts to position the downtown as a center of arts for Southern New Jersey, as exemplified by the Glasstown Arts District. The New Jersey Motorsports Park draws a large number of visitors to events, and there is growing interest in re-using abandoned industrial facilities for new businesses.

Given its status as an urbanized regional center, the State encourages planning initiatives which will increase economic potential, and make the city a more safe, accessible, and attractive place to live.

Primary goals for the study include improving east/west travel through the central City, as well as improving pedestrian and bicycle access from residential neighborhoods and open space to the central business district. The study is also intended to provide conceptual design and parking concepts for promoting Millville's first major redevelopment project along the Maurice River waterfront.

NJDOT – LTPA contracted with Michael Baker Jr., Inc. (Baker), to provide assistance to Millville in preparing the study. The firms Clarke Caton Hintz and TechniQuest Corporation provided support as subconsultants to Baker on the study.

1.2 Study Approach

The study approach was broken into three components: a) assessment of existing transportation conditions, b) analysis of transportation and needs and c) preparation of system-wide transportation improvement recommendations, and downtown design and parking concepts.

This document first summarizes the existing state of the transportation system for the following modes: vehicular, pedestrian, bicycle and transit. Recommendations are then provided to improve mobility and

safety in these modes, along with urban design recommendations to enhance the livability and appearance of Millville.

Essential input was provided by the project Steering Advisory Committee (SAC). The SAC was comprised of local officials and other local stakeholders, Cumberland County, and NJDOT. Stanley Shewlakow, the chairman of the Millville Planning Board and member of the SAC, passed away toward the end of the study. Mr. Shewlakow provided key input as a study stakeholder. SAC members included:

Name	Organization
Hon. J. Timothy Shannon	Mayor of Millville
Cpt. Matt Rabbai	Millville Police Department
Douglas Whitaker	Cumberland County Asst. County Engineer
John Knoop	Millville City Engineer
Linda Finch	Planning Board Secretary
Marianne Lods	Executive Director, Millville Arts District
Richard Romanik	Former City Parks and Recreation Director
Robert Brewer	Cumberland County Director of Planning
Samantha Fisher	Millville Planning Department
Sgt. Kevin McLaughlin	Millville Police Department
Stanley Shewlakow	Millville Planning Board Chairman
Tom Ayres	Former City Zoning Officer
Dr. Abbas Hirya	NJDOT
Helene Rubin	NJDOT
James Yeager	Michael Baker Jr., Inc.
Daniel Kueper	Michael Baker Jr., Inc.
Stephen Wong	Michael Baker Jr., Inc.
Brian Slaugh	Clarke Caton Hintz, PC

2.0 Existing Vehicular Conditions

2.1 Traffic Volumes

Average daily traffic (ADT) volumes for key roadways were gathered from the NJDOT traffic management system, and were also calculated based on the hourly turning movement counts conducted by the project team in November 2011. **Figure 1** indicates the two-way ADT volumes. As shown, the highest ADT is found on 2nd Street (NJ 47) south of NJ 55, at 32,000 vehicles per day (vpd). The traffic volume on 2nd Street gradually declines to the south, to 14,000 vpd below Sharp Street; 10,000 vpd below G Street; and 8,200 below Main Street.

Main Street, in the heart of the CBD, has the second highest volume, at 18,000 ADT. The volume fluctuates significantly by segment; moving through the CBD from west to east, the ADT changes from 13,000 to 10,500 (as vehicles turn onto Brandriff Avenue); increases to 18,000 (as vehicles turn onto the roadway from Cedar Street); and drops to 15,000 east of 2nd Street.

Other roadways of note include:

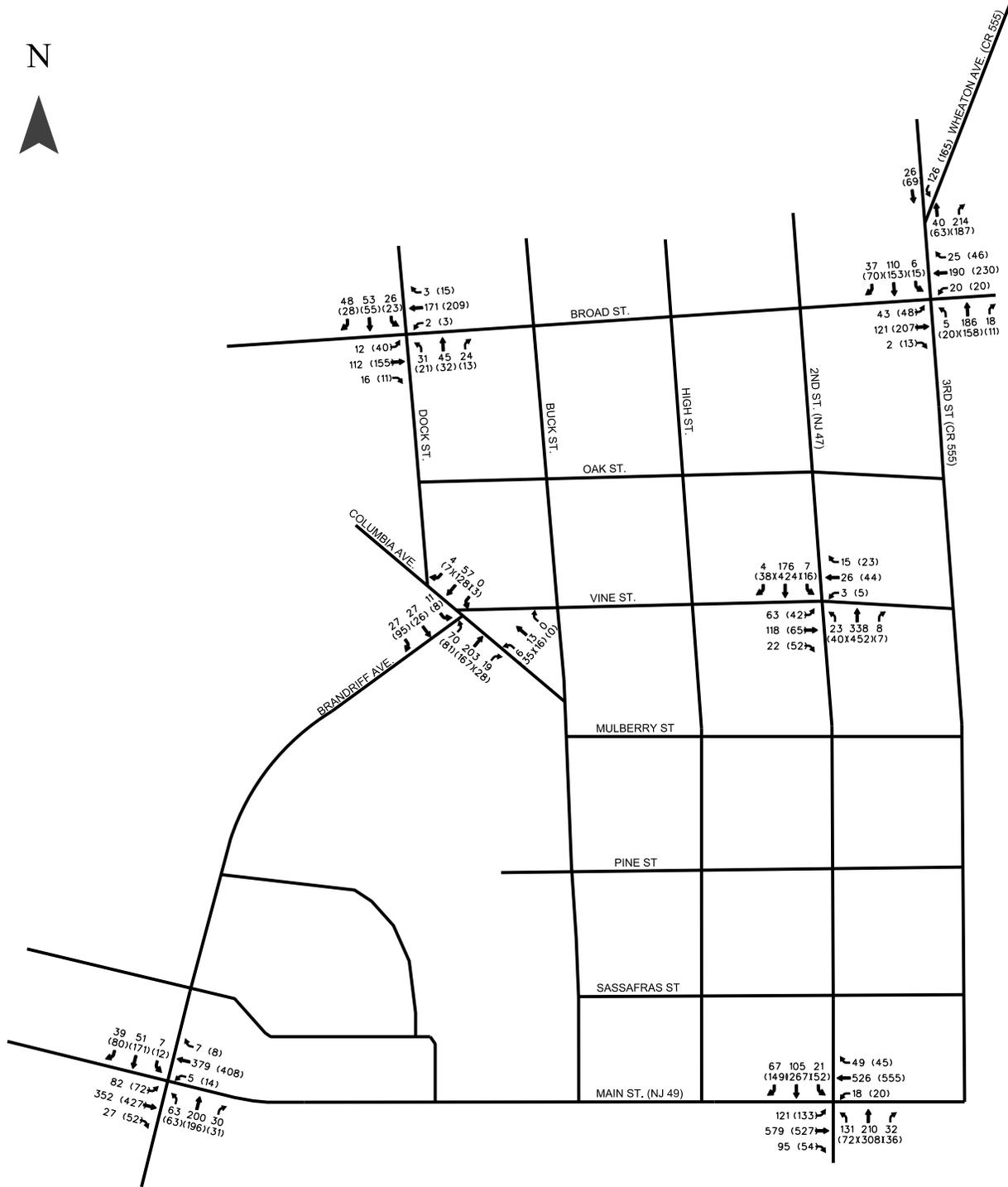
- Sharp Street (CR 667) – ADT of 11,000 south of High Street;
- Wheaton Avenue (CR 555) – ADT of 11,000 north of G Street;
- Cedar Street (CR 555) – ADT of 8,500.

Turning movement traffic counts were conducted in November 2011 at seven intersections in the Millville CBD; these intersections were indicated to be of interest by the local stakeholders. These were conducted on a weekday from 7 to 9 AM, and from 3 to 6 PM. The counts revealed the peak traffic hour in the morning to be from 7:15 to 8:15 AM, and in the evening from 3:45 to 4:45 PM. Traffic volumes are generally higher in the evening peak hour than in the morning peak hour.

Figure 2 indicates the peak hour volumes at the intersections counted. The intersection of Main Street (NJ 49) and 2nd Street (NJ 47) had the highest volumes, at 1,534 in the morning peak hour, and 2,148 in the evening peak hour.

The next section will discuss the implications that these traffic volumes have for vehicular delays on the roadways.

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Baker

Millville Transportation Improvement Study
Figure 2: Peak Hour Traffic Volumes

Wednesday, November 2, 2011
7:15AM - 8:15AM (3:45PM - 4:45PM)

December 2012

LEGEND

= Volumes 7:15-8:15 AM
(#) = Volumes 3:45-4:45 PM

2.2 Level of Service

The 'Level of Service' (LOS) is used by transportation professionals to "grade" intersections by vehicle delay, expressed in terms of average stopped delay per vehicle. At signalized intersections, levels of service range from LOS A (indicating average delays of 10 seconds or less) to LOS F (indicating average delays of greater than 80 seconds). LOS D is generally considered as the desirable upper limit of delay for most drivers (55 seconds), while E and F are considered undesirable. It should be noted, however, that longer traffic delays are generally considered by transportation planners to be more acceptable in traditional downtown business areas.

Levels of service classifications are defined in **Table 1**. It should be noted that there are similar classifications for unsignalized intersections.

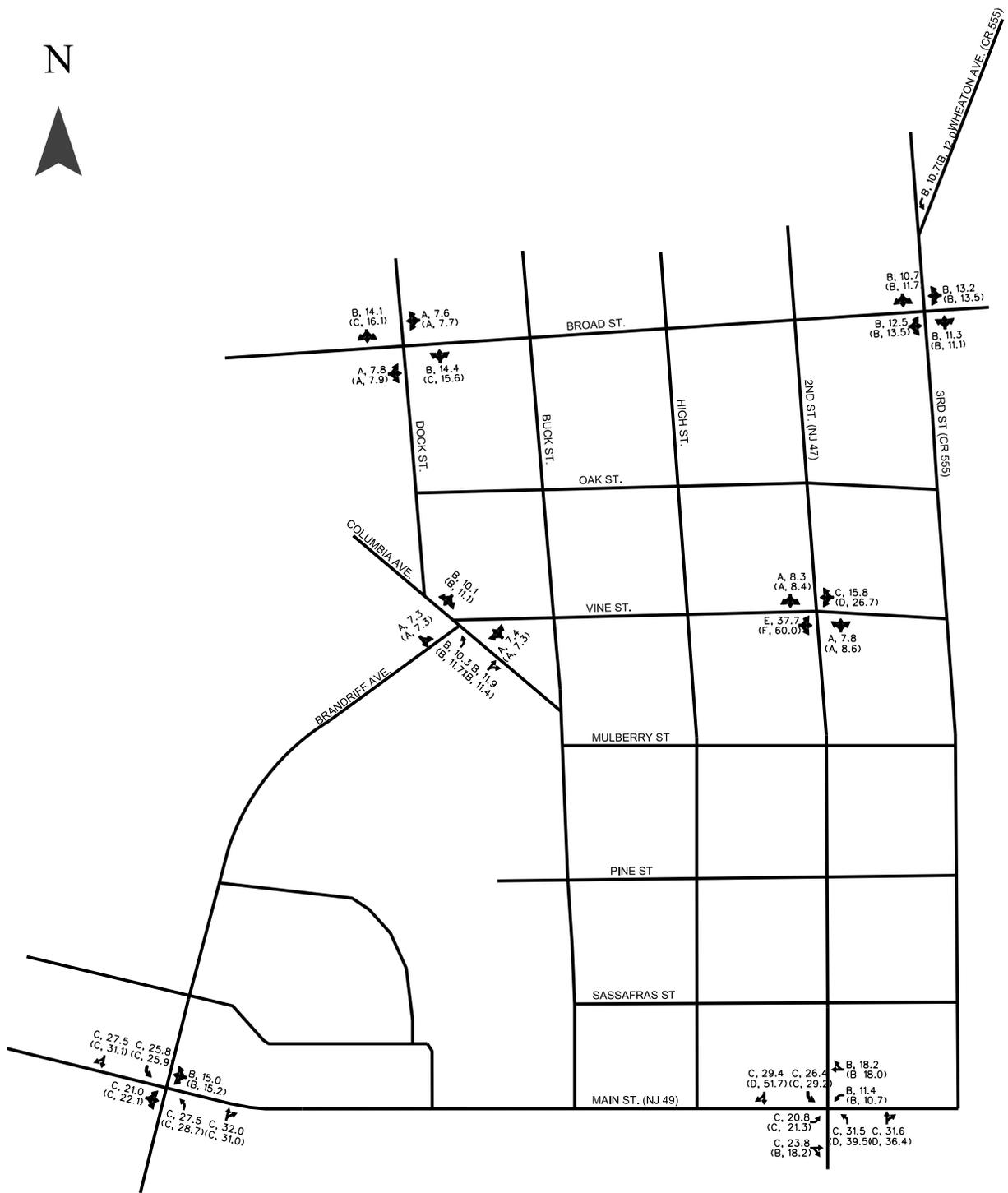
Table 1: Levels of Service Classifications

Level of Service	Signalized Intersection Average Delay per Vehicle (seconds)	Unsignalized Intersection Average Delay per Vehicle (seconds)
A	0 to 10	0 to 10
B	10.1 to 20	10.1 to 15
C	20.1 to 35	15.1 to 25
D	35.1 to 55	25.1 to 35
E	55.1 to 80	35.1 to 50
F	Over 80	Over 50

Levels of service and the associated average delay for study area intersections are presented in **Figure 3**. As indicated, delays are modest for most of the intersections, typically no worse than LOS C. As noted in the previous section, the heaviest volumes are seen at the intersection of Main Street and 2nd Street, and this intersection also has the longest delays among signalized intersections studied. The LOS is C in both the morning and evening peak periods. Delays are longer for motorists on 2nd Street than Main Street, in part because those approaches are given less green time than the latter. Although the delay as measured by Level of Service would be considered reasonable, the study team noted the regular presence of traffic queues on Main Street in the PM peak period, extending for several blocks.

The highest delays for motorists in the study area are seen at the intersection of Vine Street and 2nd Street. The Vine Street approaches are stop-controlled, and operate at LOS D for the westbound approach, and LOS F for the eastbound approach.

N



Overall Intersection Level of Service & Delay			
Intersection	LOS	Delay	Stop/Signal
NJ Route 49 & Brandriff Ave.	C, (C)	22.0, (23.3)	Signal
NJ Route 47 & NJ Route 49	C, (C)	23.9, (28.3)	Signal
Columbia Ave. & Brandriff Ave./Vine St.	N/A	N/A	Stop
Broad St. & Dock St.	N/A	N/A	Stop
3rd St. & Broad St.	B, (B)	12.0, (12.6)	Signal
NJ Route 47 & Vine St.	N/A	N/A	Stop
3rd St. & Wheaton Ave.	N/A	N/A	Stop

Milville Transportation Improvement Study
Figure 3: Level of Service and Average Delay
 Wednesday, November 2, 2011
 AM Peak Hour (PM Peak Hour)
 December 2012

LEGEND
 a.# = Level of Service and Average Seconds of Delay, 7:15-8:15 AM
 (a.#) = Level of Service and Average Seconds of Delay, 3:45-4:45 PM



2.2 Crashes

A crash analysis was conducted at key intersections within Millville for the period of January 1, 2008 through December 31, 2010. The study team first identified intersections with the highest number of crashes using the Rutgers University Plan4Safety Database, and then reviewed crash reports provided by the Millville Police Department for those intersections. Intersections with at least 15 crashes are listed in **Table 2** and shown in **Figure 4**.

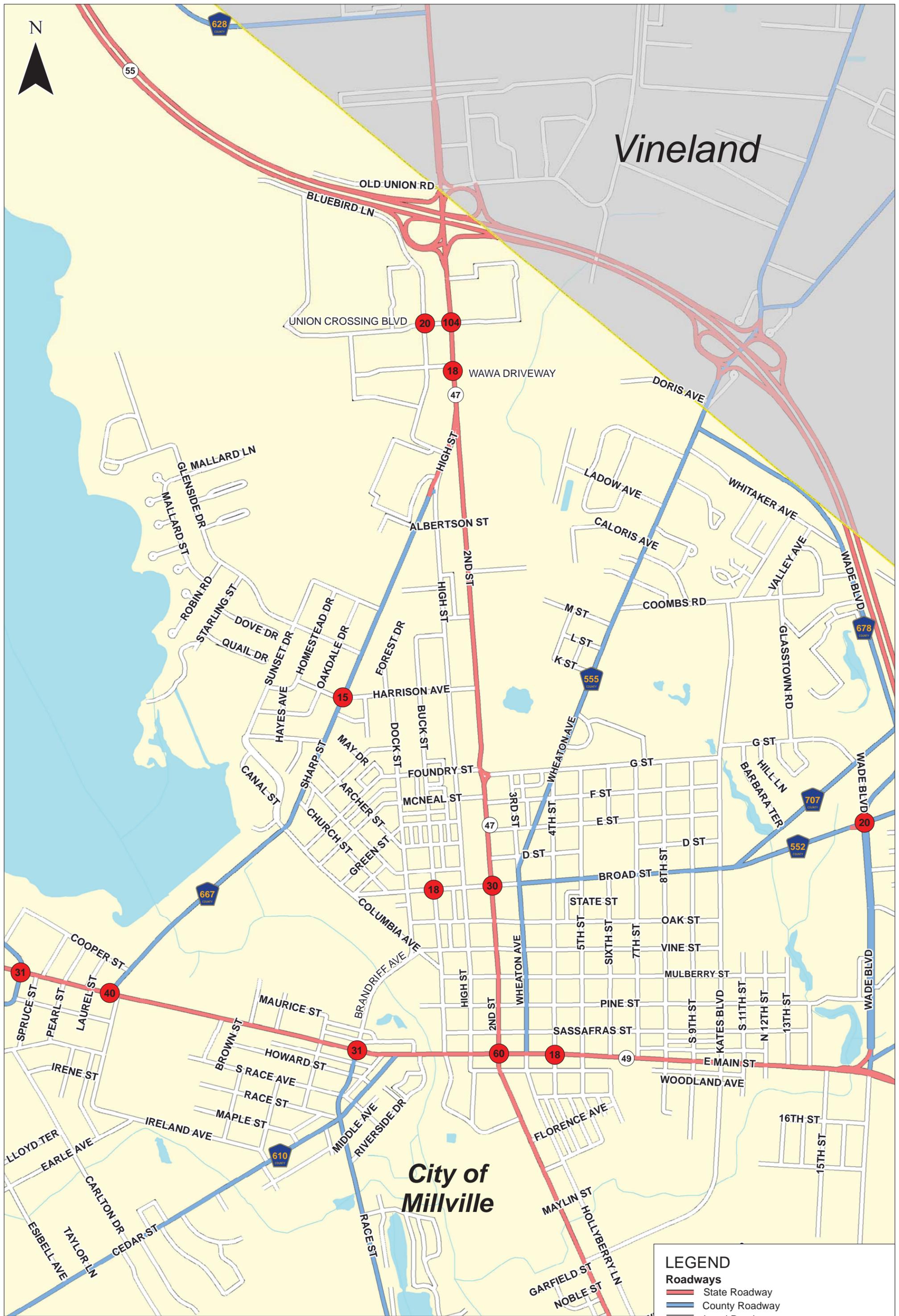
Table 2: Top Crash Intersections 2008-2010

Intersection	Number of Crashes	Predominant Crash Type
2 nd St (NJ 47) and Union Crossing Blvd	104	69 rear-end (36 SB, 22 NB); 23 left turn (11 NB, 10 SB, 2 both directions); 9 angle
W. Main Street (NJ 49) and 2 nd Street (NJ 47)	60	42 rear end (12 WB east of intersection; 11 WB west of intersection; 6 SB)
W. Main Street (NJ 49) and Sharp Street (CR 667)	40	24 rear end (10 SB, 7 EB, and 7 WB); 5 left turn (4 EB)
W. Main Street (NJ 49) and Brandriff Avenue	31	19 rear end (8 EB, 5 SB); 7 angle (4 SB and WB)
Main Street (NJ 49) and Beech Street/ Carmel Road	31	15 rear end (9 EB, 5 WB); 6 left turn (4 EB)
2 nd Street (NJ 47) and Broad Street	30	9 rear end; 4 related to tractor trailer movements
Union Crossing Blvd and Bluebird Lane	20	12 angle (5 NB and WB, 5 SB and EB); 5 sideswipe (all WB)
Broad Street and Wade Boulevard	20	9 rear end (4 NB)
2 nd Street (NJ 47) and Wawa Driveway	18	14 angle (12 NB and WB, 2 SB and WB)
W. Main Street (NJ 49) and 4 th Street	18	11 angle (4 SB and EB; 3 SB and WB)
Broad Street and Buck Street	18	15 angle (6 WB and NB; 4 EB and NB); 3 left turn
Sharp Street (CR 667) and W. Harrison Avenue	15	9 angle



Vineland

City of Millville



LEGEND

- Roadways**
- State Roadway
 - County Roadway
 - Local Roadway

- Crash Location**
- # Number of Crashes

0 0.25 0.5 Mile



Millville Transportation Improvement Study
Figure 4: Top Vehicle Crash Intersections (2008-2010)

May 2013

Following is a discussion of intersections with prominent crash patterns.

NJ 47 and Union Crossing Boulevard

This is the first signalized intersection on 2nd Street (NJ 47) south of the NJ 55 off-ramps, and is heavily trafficked by motorists heading into Millville from the north, with many seeking to access the retail centers on either side of the highway. As is common for heavily trafficked intersections, the rear end was the predominant crash type with 69, with slightly over half of these crashes occurring on the southbound approach. During stakeholder interviews, officials had expressed concern about the motorists entering Millville on NJ 47 having to quickly merge into the dedicated right turn lane in order to access Union Lake Crossing, and motorists entering Millville from NJ 55 having to move across two lanes to access the left turn lane into Cumberland Crossing. The crash analysis identified a number of crashes resulting from this pattern. Based on crash reports, five crashes occurred when southbound vehicles were attempting to move to their right to access the right-turn lane. There are no reported crashes involving vehicles moving to their left. In addition to the large number of rear end crashes, there were 23 left turn crashes.

Main Street and 2nd Street

There were 42 rear end crashes, with westbound crashes predominant at 23. The westbound crashes were split between crashes occurring at the intersection (12) and occurring west of the intersection (11). The latter crash type likely reflects congested traffic conditions westbound on the corridor.

2nd Street and Broad Street

The activity of tractor trailers led to four crashes. In two crashes, trucks clipped the northeast corner when turning right from Broad Street onto 2nd Street; in the two other crashes, vehicles backed up to avoid trucks turning left, leading to rear end crashes with vehicles behind them.

Union Crossing Boulevard and Bluebird Lane

Angle crashes accounted for 12 of the 20 crashes, precipitated by northbound vehicles trying to cross Union Crossing Boulevard to access Union Lake Crossing, and striking westbound vehicles; or southbound motorists attempting to turn left onto Union Crossing Boulevard. There were also five westbound sideswipe crashes, caused by motorists attempting to turn onto Bluebird Lane to access the commercial uses on either side of Union Crossing Boulevard.

2nd Street and Wawa Driveway

Angle crashes accounted for 14 of the 18 crashes. Twelve (12) angle crashes resulted from motorists departing the northern Wawa driveway and attempting to turn left, colliding with northbound motorists. In four of these crashes, northbound motorists stopped in traffic in the outer lane motioned for the motorists to depart the Wawa driveway, but northbound motorists in the inner lane not stopped in traffic collided with the exiting vehicle.

West Main Street and 4th Street

There were 11 angle crashes at this unsignalized intersection, with seven resulting from southbound vehicles crossing West Main Street.

Broad Street and Buck Street

Of the 18 crashes at this unsignalized intersection, 15 were angle crashes. The majority involved northbound vehicles, accounting for 10 of the 15 crashes.

2.3 Parking

Stakeholders indicated that vehicular parking was an issue primarily along High Street in the central business district, coinciding with the Glasstown Arts District. Parking demand is high in the area, particularly on the third Friday of every month when restaurants, galleries and shops are open until 9 PM or later. To evaluate the adequacy of parking during this time, a parking count was conducted on Friday, May 18, from 1 PM to 7 PM. The count focused on on-street parking spaces on High Street from Broad Street to Smith Street, and the four public parking lots from Powell Street to Smith Street. The results are indicated in Table 3. As indicated in **Table 3**, parking occupancy for on-street and off-street spaces increases gradually throughout the day, peaking at 7 PM in the evening, as people arrive to eat dinner and visit galleries. At this hour, 94% of the on-street spaces and 54% of off-street spaces were occupied. The off-street parking occupancy is skewed to some degree by the parking lot north of Broad Street. This lot lies on the periphery of the downtown area, and is sparsely used, with occupancy varying from 0% to 16%.

Parking occupancy at the peak hour of 7 PM is illustrated in **Figure 5**.

Table 3: Parking Occupancy along High Street

Boundary Streets	Spaces	1:00 PM		3:00 PM		5:00 PM		7:00 PM	
		Vehicles	Percent	Vehicles	Percent	Vehicles	Percent	Vehicles	Percent
On-Street Parking									
Broad St to Oak St	23	15	65%	11	48%	18	78%	23	100%
Oak St to Vine St	20	14	70%	17	85%	13	65%	16	80%
Vine St to Mulberry St	19	11	58%	12	63%	15	79%	19	100%
Mulberry St to Pine St	22	15	68%	19	86%	20	91%	22	100%
Pine St to Sassafras St	24	7	29%	16	67%	17	71%	21	88%
Sassafras St to Main St	16	9	56%	10	63%	9	56%	16	100%
Main St to Smith St	18	17	94%	10	56%	17	94%	17	94%
Total	142	88	62%	95	67%	109	77%	134	94%
Off-Street Parking Lots									
South of Main St and east of High St	33	19	58%	17	52%	19	58%	22	67%
North of Sassafras St and east of High St	43	14	33%	24	56%	28	65%	31	72%
South of Vine St and west of High St	15	4	27%	6	40%	5	33%	8	53%
North of Broad St and east of High St	31	0	0%	0	0%	2	6%	5	16%
Total	122	37	30%	47	39%	54	44%	66	54%
Grand Total	264	125	47%	142	54%	163	62%	200	76%



LEGEND

Parking Occupied

- 90%-100%
- 70%-89%
- <70%

/ # Vehicles/Spaces
 #% Percentage Occupied

0 0.05 0.1 Miles

Millville Transportation Improvement Study
Figure 5: Peak Parking Occupancy
 Friday Evening, May 18, 2012
 December 2012

3.0 Bicycle and Pedestrian Conditions

3.1 Crash Activity

The Millville Police Department provided reports for pedestrian and bicycle crashes in Millville for the period of January 1, 2008 through December 31, 2010. During this period, there were 47 pedestrian crashes, and 36 bicycle crashes. Crash locations are illustrated in **Figure 6**. As seen, pedestrian and bicycle crash locations are relatively diffuse. However, the intersection of East Main Street and 2nd Street was the site of four crashes, and there were four crashes in the vicinity of 2nd Street and F Street. Main Street has the highest number of crashes, with 23 crashes on the roadway or in close proximity. 2nd Street has the second highest number of pedestrian and bicycle crashes, with 18. There was one fatal pedestrian crash, on Silver Run Road (CR 555) 200 feet south of Poplar Avenue.

3.2 Bicycle Compatibility

State, county and key local roadways in Millville were evaluated for bicycle compatibility, using *NJDOT Bicycle Compatible Roadways and Bikeways* guidelines (April 1996). “Bicycle compatible” refers to roadway conditions that, taken together, are considered suitable for a fairly wide range of bicyclists. Criteria used to determine bicycle compatibility are: lane width, shoulder width, traffic volume, speed limit, character of the area (urban or rural), presence or absence of on-street parking, and truck volumes. Traffic volumes and speed are important factors; generally, as either increase on a roadway, it is recommended that a travel lane shared by motorists and bicyclists increase in width, or that shoulders or bike lanes be available for use by bicyclists. Bicycle compatible roadway pavement widths are indicated in **Table 4**.

Table 4: Bicycle Compatible Pavement Widths

Condition I: AADT 1,200 – 2,000			
	Urban w/ Parking	Urban w/o Parking	Rural
<30 mph	SL 12 ft	SL 11 ft	SL 10 ft
31-40 mph	SL 14 ft	SL 14 ft	SL 12 ft
41-50 mph	SL 15 ft	SL 15 ft	SH 3 ft
50 mph	NA	SH 4 ft	SH 4 ft
Condition II: AADT 2,000 – 10,000			
	Urban w/ Parking	Urban w/o Parking	Rural
<30 mph	SL 14 ft	SL 12 ft	SL 12 ft
31-40 mph	SL 14 ft	SL 14 ft	SH 3 ft
41-50 mph	SL 15 ft	SL 15 ft	SH 4 ft
50 mph	NA	SH 6 ft	SH 6 ft
Condition III: AADT Over 10,000 or Trucks Over 5%			
	Urban w/ Parking	Urban w/o Parking	Rural
<30 mph	SL 14 ft	SL 14 ft	SL 14 ft
31-40 mph	SL 14 ft	SH 4 ft	SH 4 ft
41-50 mph	SL 15 ft	SH 6 ft	SH 6 ft
50 mph	NA	SH 6 ft	SH 6 ft

Source: *NJDOT Bicycle Compatible Roadways and Bikeways: Planning and Design Guideline*, April 1996

SH = shoulder SL = shared lane



Millville Transportation Improvement Study
Figure 6: Bicycle and Pedestrian Crashes (2008-2010)
 December 2012



Roadways that are identified as bicycle compatible are often attractive candidates for incorporating into a planned bicycle network. However, it should be emphasized that roadways are open to bicyclists whether or not the roadway meets compatibility criteria, nor is the compatibility evaluation intended to assess safety.

Bicycle compatibility conditions for key roadways are illustrated in **Figure 7**. Compatibility category A includes roadways that meet NJDOT guidelines with no conditions. Category B includes roadways that may not technically meet guidelines since on-street parking is permitted, but since parking is seldom used, these roadways are in actuality quite compatible. In general, roadways were found to be bicycle compatible outside the Millville CBD, and incompatible inside the CBD. The major difference is that roadways outside the CBD typically have shoulders, while roadways inside the CBD permit on-street parking, and the shared travel lane for vehicles and bicyclists in this area typically does not meet the NJDOT recommended width of 14 feet. Main Street is considered bicycle compatible between Brandriff Avenue and 3rd Street due to the presence of 14 foot outside travel lanes.

3.3 Sidewalk and Other Facilities Inventory

Key roadways were inventoried to determine the presence and condition of sidewalks. The inventory was based on field views conducted by the study team, as well as data from New Jersey's County



Roadway Sidewalk Inventory (CRSI). In some respects, the sidewalk inventory can be seen as the inverse of the bicycle compatibility evaluation for Millville. Roadways within the Millville CBD typically have sidewalks considered to be in good condition, whereas roadways outside the CBD are often missing sidewalks. There are some prominent exceptions, however. 2nd Street (NJ 47) has sidewalks on at least one side of the roadway between the CBD and the northern city limit. In some sections, the sidewalk is in good condition. Since 2nd Street is the primary retail corridor in Millville, sidewalks on this roadway are particularly welcome. The presence of sidewalks is also noted on other roadways outside the CBD, including Main Street (NJ 49), Wheaton Avenue (CR 555), and Race Street (CR 555). The results of the sidewalk inventory are depicted in **Figure 8**.

Missing sidewalk section on Cedar Street.

It was also noted that basic pedestrian infrastructure – crosswalks, and pedestrian signals at signalized intersections – is missing at many intersections.



City of Millville

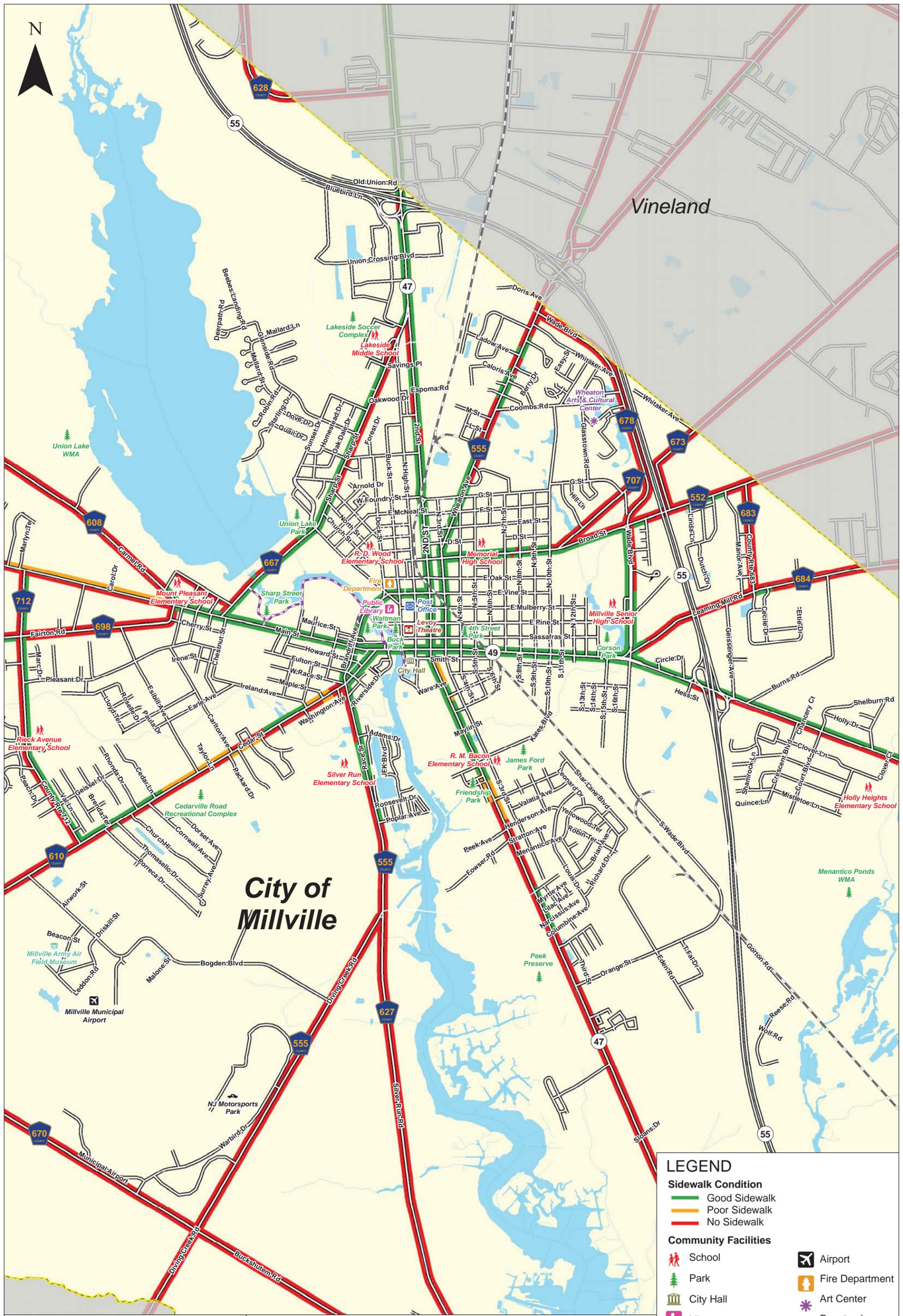
Vineland

LEGEND

- Bicycle Compatibility**
- Bicycle Compatible - Category A
 - Bicycle Compatible - Category B
 - Not Bicycle Compatible
- Community Facilities**
- School
 - Park
 - City Hall
 - Library
 - Post Office
 - Theatre
 - Museum
 - Airport
 - Fire Department
 - Art Center
 - Racetrack
 - Railroad Track
 - Existing Bicycle and Pedestrian Trail



Millville Transportation Improvement Study
Figure 7: Existing Bicycle Compatibility
December 2012



City of Millville

LEGEND

Sidewalk Condition

- Good Sidewalk
- Poor Sidewalk
- No Sidewalk

Community Facilities

- School
- Park
- City Hall
- Library
- Post Office
- Theatre
- Museum
- Airport
- Fire Department
- Art Center
- Racetrack
- Railroad Track
- Existing Bicycle and Pedestrian Trail

0 0.5 1 Mile



Baker

Millville Transportation Improvement Study
Figure 8: Existing Sidewalk Condition
December 2012

4.0 Transit

The City of Millville is served by three NJ Transit (NJT) fixed-route bus routes: 313, 408, and 553. The Route 408 provides circulator service within the community, and along with the other routes provides connections to outlying destinations.

In June 2012, the Cumberland County Office of Employment and Training initiated two free shuttle routes under the heading of Millville Area Connector (MAC): Center City Millville Area, and Airport-Laurel Lake Area. Both routes operate only during the morning and evening peak periods. Both routes are “deviated fixed routes,” so deviations from the fixed routes are permitted as time allows.

The route schedules for these services are summarized in Table 5. The routes and bus stop locations are illustrated in Figure 9.

Table 5: Transit Service Details

Route	Termini	Main Routes	Schedule	Trips Per Weekday / Sa. / Su.	Peak Headway	Daily Ridership
NJT 313	Center City Philadelphia to Cape May/Wildwood	NJ 50, NJ 47, US 9	Service begins from Center City 6:30am – 9:35 pm (daily) – irregular schedule not conducive for commuting	7 / 7 / 7	N/A	304 (2005)
NJT 408	Center City Philadelphia to Millville	NJ 47	Service begins from Millville 4:00am – 8:07pm (weekdays)	19 / 10 / 8	Less than 30 minutes	1,302 (2005)
NJT 553	Upper Deerfield to Atlantic City	NJ 47, NJ 49, Landis Avenue, Atlantic City Expressway	Service begins from Millville 3:09am – 1:12am	38 / 36 / 35	15 minutes	NA
MAC Center City	Cumberland Green (loop route)	10 th Street, 3 rd Street, Wheaton Avenue	6:03am – 8:29am , and 1:50pm – 4:25pm	6/6/0	1 hour	NA
MAC Airport-Laurel Lake	Riverside Drive (loop route); 1 trip in AM and PM to Schooner Landing Road	2 nd Street, Cedar Street	6:07am – 8:17am, 2:52pm – 5:05pm	6/6/0	1 hour	NA



LEGEND

- Bus Routes**
- █ NJ Transit Line 313
 - █ NJ Transit Line 408
 - █ NJ Transit Line 553
 - █ Airport/Laurel Lake Area
 - █ Center City Millville Area
 - Millville Bus Stop Location
- Community Facilities**
- School
 - Park
 - City Hall
 - Library
 - Post Office
 - Theatre
 - Museum
 - Airport
 - Fire Department
 - Art Center
 - Racetrack
 - Railroad Track
 - Existing Bicycle and Pedestrian Trail
 - Municipal Boundary

0 0.5 1 Mile



Millville Transportation Improvement Study

Figure 9: Transit Facilities

December 2012

5.0 Stakeholder Issues

Interviews were conducted with the following local stakeholders to discuss various topics of interest to this study.

- Bob Brewer, County Planner
- Bryce Kell, Millville Board of Education
- John Knoop, City Engineer
- Chief Kurt Hess, Fire Department
- Marianne Lods, Glasstown Arts District
- Sergeant Kevin McLaughlin, Police Department
- Rich Romanik, former Parks and Recreation Director
- Tim Shannon, Mayor
- Stan Shewlakow, Planning Board Chairman
- Phil Van Embden, Developer of Levoy Theatre
- Doug Whitaker, Assistant County Engineer

Following is a summary of issues raised in the stakeholder interviews:

Vehicular

- Facilitate east-west traffic on Broad Street.
- Facilitate traffic flow from Dock to Broad Street.
- Evaluate use of 4th Street to connect NJ 49 to Wheaton Avenue.
- Evaluate connection of Nabb Avenue to Buckshutem Road.
- Address safety and congestion of NJ 47 at Bluebird Lane.
- Address need for cross-river vehicular movement.
- Improve intersection of Cedar Street and Main Street.
- Extend Vinelands Boulevard to NJ 47, or examine other options for connections under NJ 55.
- Install pedestrian safety improvements to encourage motorists to stop for pedestrians.
- Address tight geometry of Sharp Street at NJ 47.
- Connect Wade Boulevard to NJ 47.
- Address improvements to accommodate truck turning movements.
- Address need for continuous County road network through center city.

Bicycle and Pedestrian

- Improve pedestrian facilities downtown.
- Enhance bicycle network. Connect bike routes to the pedestrian bridge near riverfront and bike trails, and other land uses such as the Union Lake Boat Launch.
- Address pedestrian safety at NJ 47 and High Street.
- Install bike parking.
- Increase the number of streets with sidewalks to enhance potential for walking to school, and bike routes to enhance ability to bike to school.

Transit

- Provide transportation for residents of the center city to travel to jobs in outlying areas.
- Provide shuttle system for tourists.
- Provide bus stop shelters.

6.0 Vehicular Concepts

The vehicular recommendations in this report are intended primarily to address two major issues:

- Improve the overall roadway network, and provide more route options to motorists in Millville.
- Improve safety.

This section covers a wide range of strategies intended to improve mobility and safety, ranging from the construction of new roads to signal upgrades at key intersections.

6.1 Brandriff Avenue to Broad Street Corridor

Millville stakeholders have expressed interest in making better use of the overall roadway network, particularly in shifting traffic volumes from the Main Street corridor to the Broad Street corridor. Average daily traffic volumes on Broad Street are currently about 5,000 to 7,000 vehicles, and there is ample capacity for accommodating an increase in traffic. Conversely, the average daily traffic volume on Main Street reaches about 18,000 vehicles, and decreasing volume here would reduce delays on this corridor. To attract more motorists to Broad Street, it is recommended that changes be made along the route of Brandriff Avenue to Dock Street to Broad Street; in this manner, eastbound motorists on Main Street can be diverted from this roadway before the more congested section east of Cedar Street. In a like manner, the number of westbound motorists on Main Street would also be reduced. The overall improvement is illustrated in **Figure 10**.

As shown in **Figure 10**, the enhancement of the Brandriff Avenue to Broad Street corridor will involve improvements in three locations/ segments:

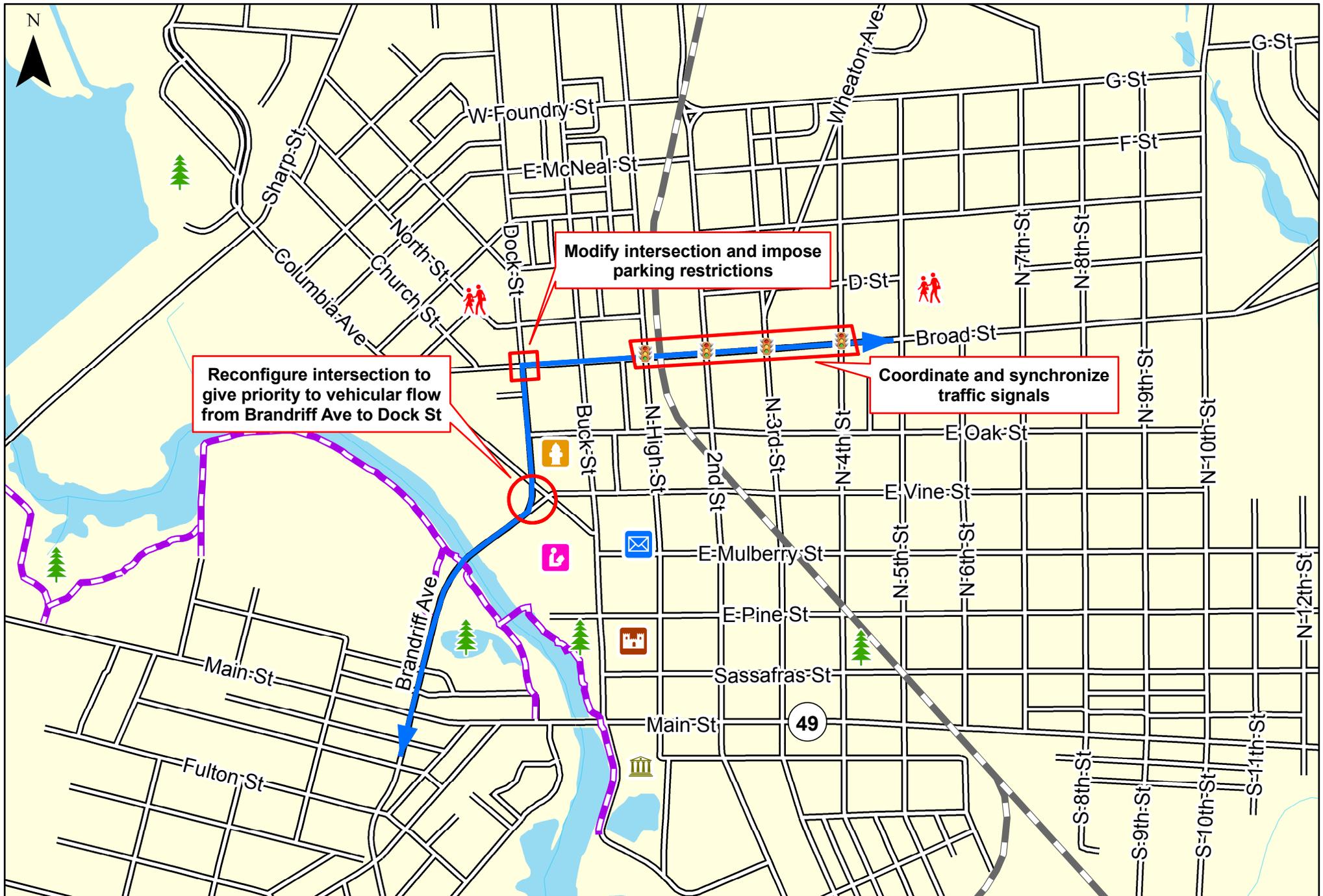
- Intersection of Brandriff Avenue, Columbia Avenue, Vine Street, and Dock Street
- Intersection of Dock Street and Broad Street
- Signal coordination along Broad Street

These will serve to facilitate traffic movement, and should attract more motorists to the corridor. The improvements are discussed below.

6.1.1 Intersection of Brandriff Avenue, Columbia Avenue, Vine Street, and Dock Street

Although Brandriff Avenue and Dock Street have higher traffic volumes than Columbia Avenue, the geometry of this intersection results in Brandriff Avenue and Dock Street being the stop-controlled approaches. The offset nature of the intersection creates an awkward movement for northbound Brandriff Avenue traffic, which must turn left on Columbia Avenue followed by a quick turn right onto Dock Street.

Two alternatives are proposed to address this issue: a roundabout or a realigned intersection. Two options are presented for the roundabout alternative. All concepts assume the closure of Columbia Avenue between Brandriff Avenue/Vine Street and Buck Street. The segment of Columbia Avenue between Broad Street and Brandriff Avenue/Vine Street would be made one-way southbound. At its terminus with Dock Street, the roadway would be necked down to reinforce that Columbia Avenue traffic must stop for Dock Street, unlike existing conditions.



6.1.1.1 Roundabout Option 1

Figure 11 illustrates a potential roundabout design that could be installed at this intersection. Columbia Avenue southbound would be stop-controlled at Dock Street, and Columbia Avenue northbound would be closed, making Brandriff Avenue, Dock Street, and Vine Street the only roadways with direct access to the roundabout. This will serve to expedite movement from Brandriff Avenue to Dock Street. It is proposed to close the driveway leading from the residence/ hair salon (Block 352, Lot 53) north of Brandriff Avenue to Columbia Avenue, as a motorist on this driveway would be making a difficult turn onto Dock Street.

6.1.1.2 Roundabout Option 2

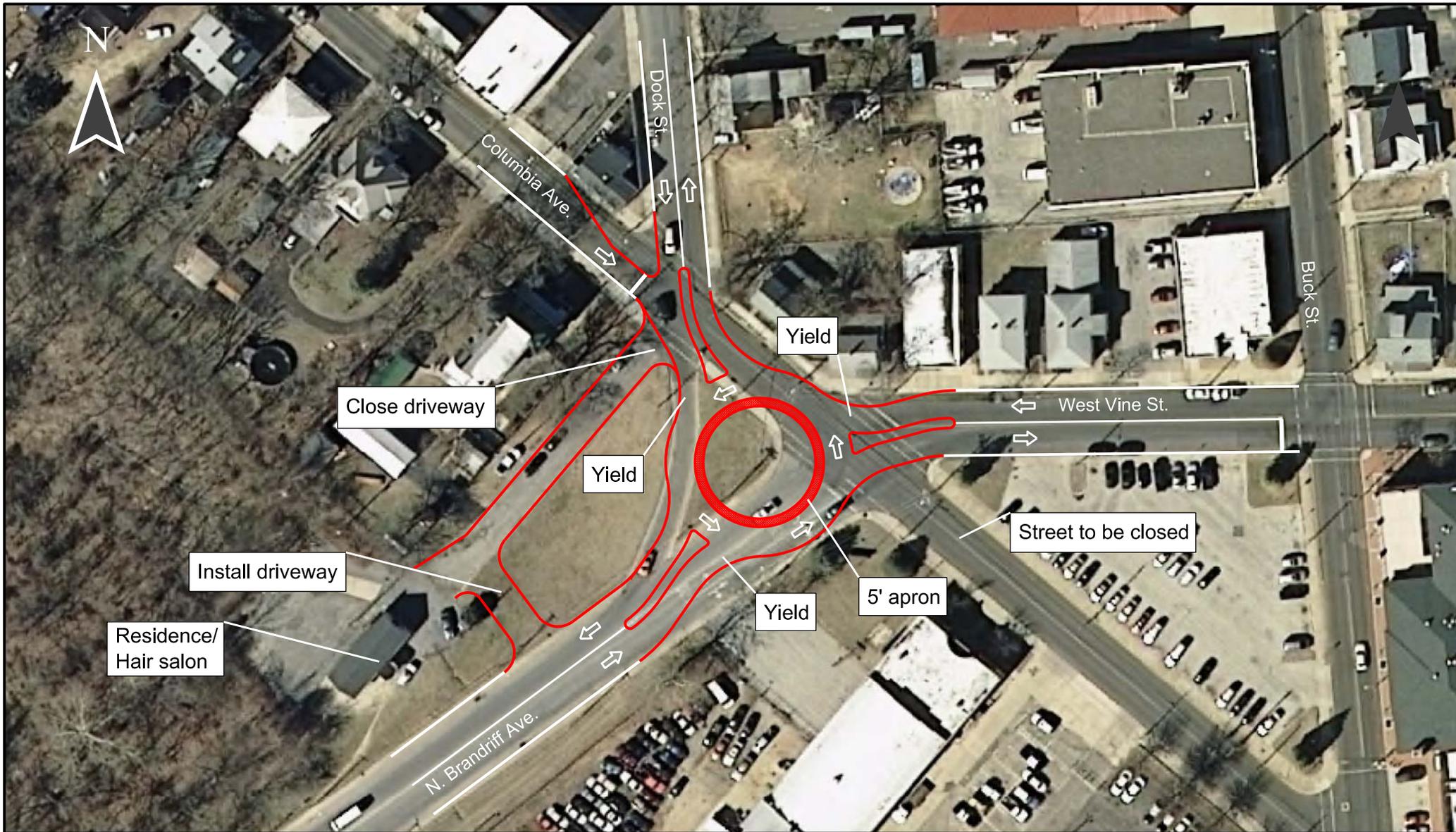
Figure 12 presents an alternative roundabout design if the City is unable to move the driveway of the residence/ hair salon. By shifting the roundabout to the east, vehicles from the existing driveway could access Dock Street in a safe manner.

The roundabout options differ primarily in how access is provided to the residence/ hair salon. Option 1 proposes access via a drive across land owned by the City (Block 352, Lot 52) to Brandriff Avenue. Option 2 provides access from Dock Street, with the driveway located in between the Columbia Avenue stop bar and the roundabout itself. The center of the Option 2 roundabout is approximately 60 feet southeast of Option 1 and requires more land from the Overlook redevelopment area.

Either proposed roundabout has an inscribed diameter of 115 feet, which places it mid-range in the sizes recommended for urban single lane roundabouts (FHWA, *Roundabouts: An Informational Guide*, 2000.) The 5 foot mountable “apron” in the roundabout will facilitate the movement of trucks and buses. Further, the roundabout can host a landscaping treatment, and thus serve as an attractive “gateway” into the redevelopment area.

6.1.1.3 Intersection Realignment

Figure 13 illustrates an alternative intersection configuration if a roundabout is determined to be infeasible. As is the case with the roundabout options, Columbia Avenue at Dock Street is proposed to be stop-controlled, and Columbia Avenue is closed south of Vine Street. The intersection is redesigned to make Brandriff Avenue an extension of Dock Street, with Vine Street westbound stop-controlled and ending at Dock Street. Like the roundabout concept, this concept will also serve to facilitate vehicular movement from Brandriff Avenue to Dock Street.



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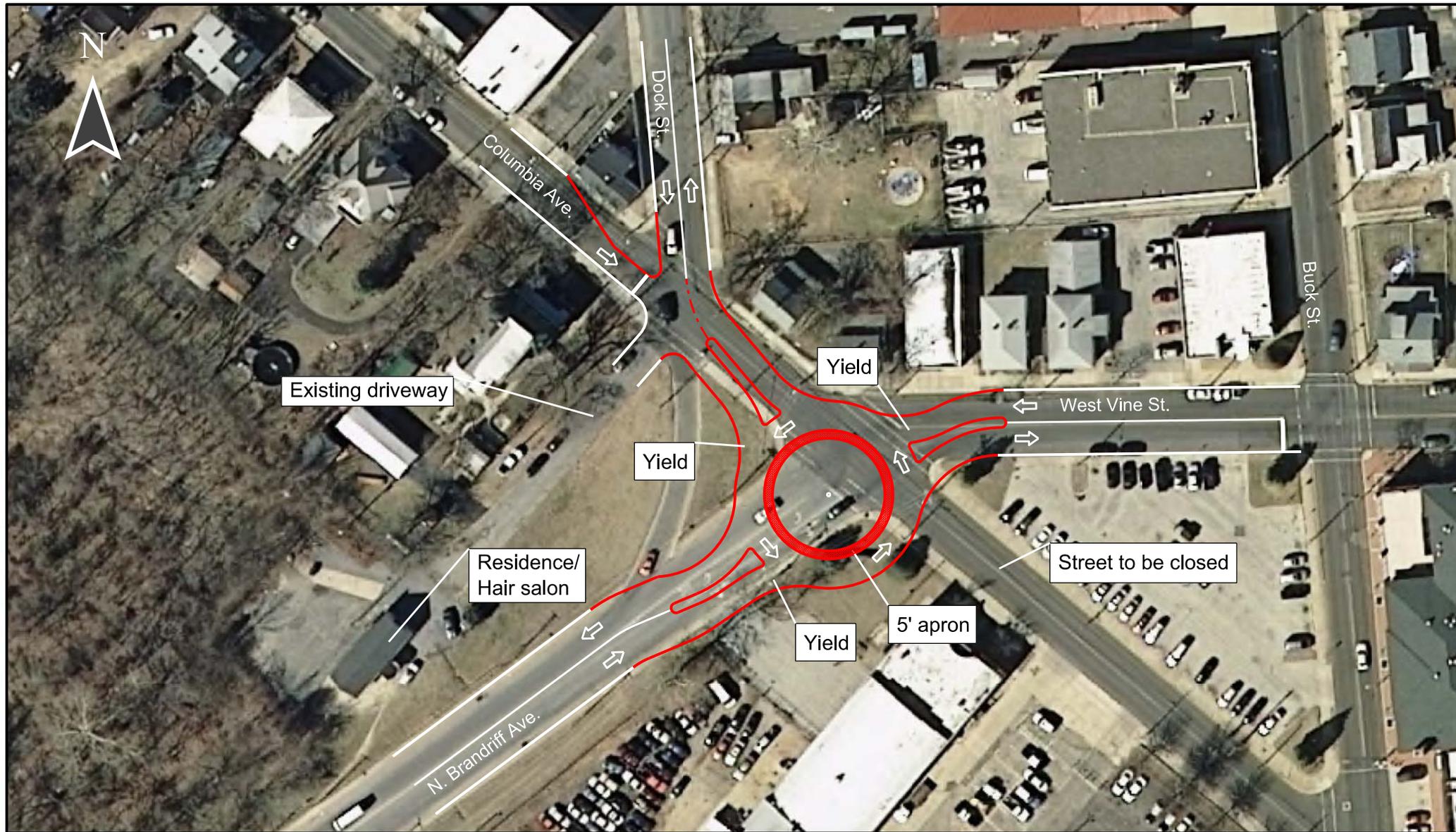
Millville Transportation Improvement Study
Figure 11: Dock St and N. Brandriff Ave Intersection Improvement
Roundabout Option 1

January 2013

LEGEND:

- Existing conditions
- Proposed conditions

Not to Scale



Baker

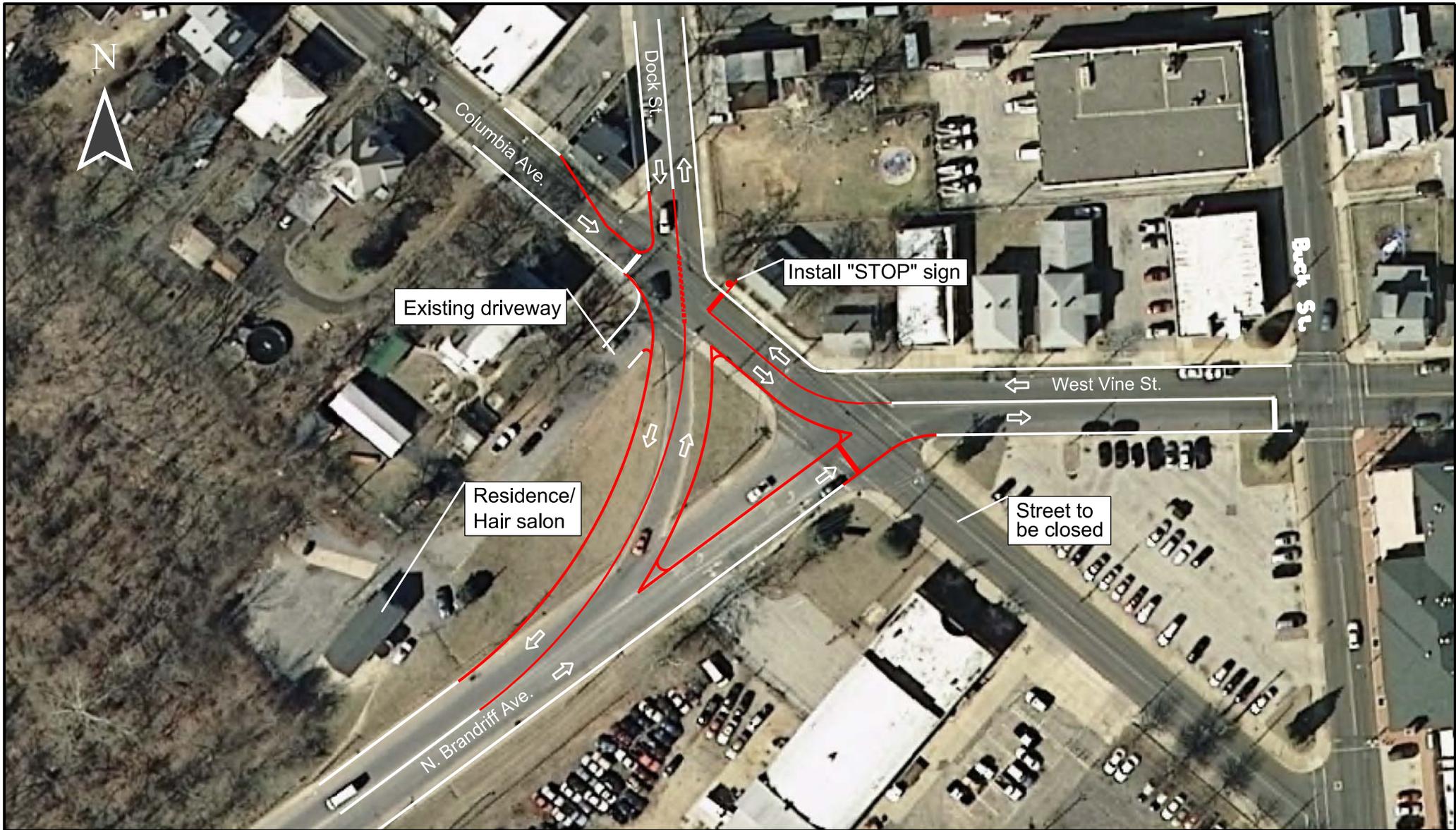
Millville Transportation Improvement Study
**Figure 12: Dock St and N. Brandriff Ave Intersection Improvement
 Roundabout Option 2**

January 2013

LEGEND:

- Existing conditions
- Proposed conditions

Not to Scale



Millville Transportation Improvement Study
**Figure 13: Dock St and N. Brandriff Ave Intersection Improvement
 Intersection Realignment**

January 2013



Baker

LEGEND:

- Existing conditions
- Proposed conditions

Not to Scale

6.1.2 Intersection of Dock Street and Broad Street

Improvements are recommended for the intersection of Broad Street and Dock Street in order to facilitate traffic movements. The narrow width of Dock Street, combined with permitted parking on the southbound side and the small curb radii at this intersection, make turning from Broad Street difficult, particularly for larger vehicles. The following strategies are recommended to address this issue.

6.1.2.1 Increase Parking Restrictions

Dock Street is relatively narrow, at 30 feet wide, with parking permitted on the southbound side more than 25 feet from the crosswalk. Because the “no parking” yellow marking has faded, motorists have been observed to occasionally park within this no parking zone. It is recommended that “No parking” signs and yellow curb markings be installed, and that parking restrictions be extended for a minimum of 100 feet from the intersection with Broad Street. Ideally, parking restrictions would be imposed for the two blocks of Dock Street between Broad Street and Brandriff Avenue.

6.1.2.2 Increase Turn Radius

Given the existing small curb radius on the southeast corner, two alternative strategies are recommended for consideration:

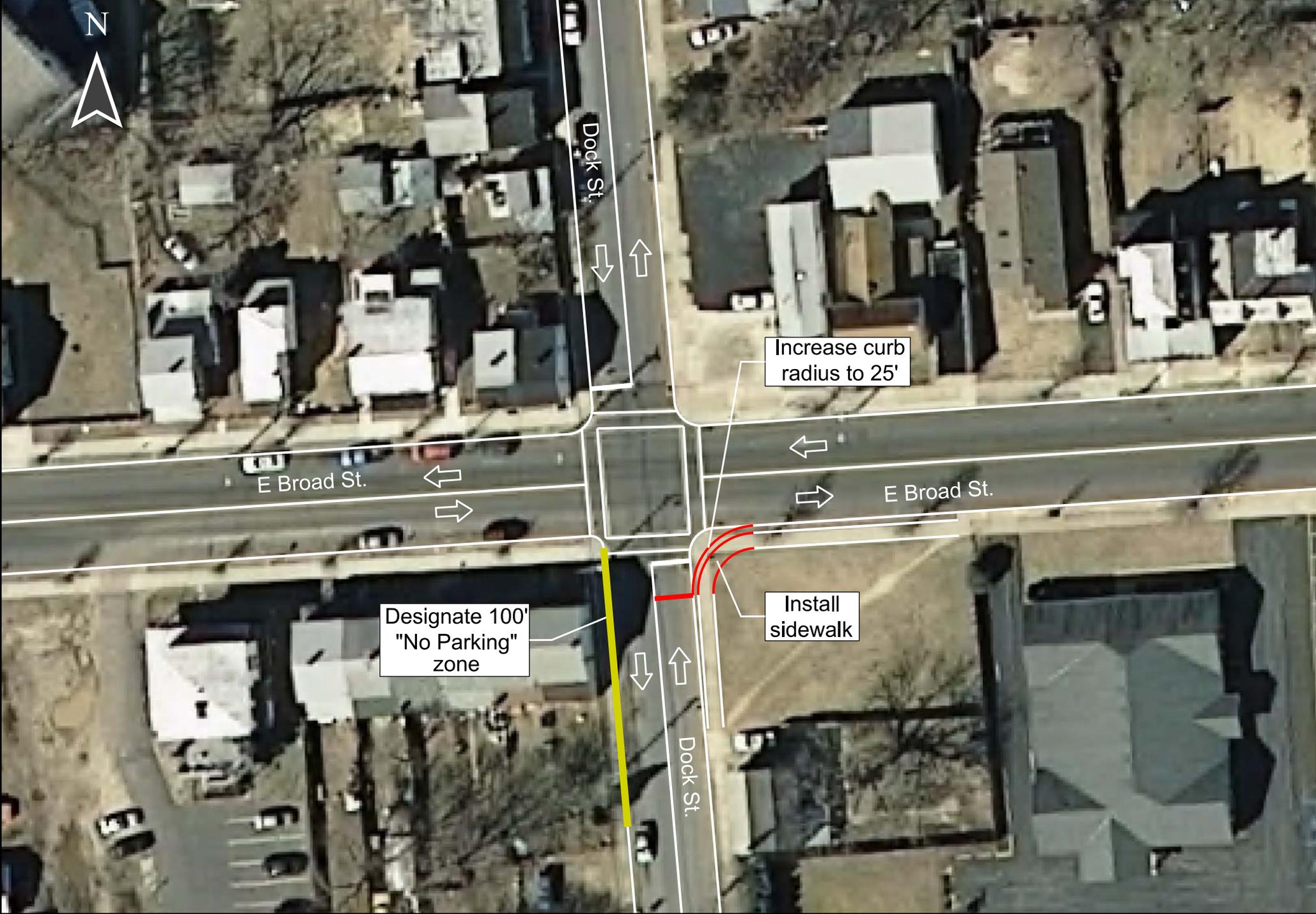
- Increase this curb radius to 25 feet, as shown in **Figure 14**.
- Install a channelized right turn lane, as shown in **Figure 15**. This would require a modest property taking from the lot on the southeast corner of the intersection.

These two improvements – imposing parking restrictions on Dock Street, and increasing the turning radius on the southeast corner – would facilitate vehicular turning movements.

6.1.3 Broad Street Signal Coordination

The four signalized intersections on Broad Street from High Street through 4th Street are uncoordinated; as a result, motorists traveling along this roadway must typically stop multiple times. Flexibility exists to better coordinate the signals along Broad Street, since the only intersection tied into another signal network is Broad Street and 2nd Street; this signal is coordinated with 2nd Street and G Street.

To coordinate the signals, the signal cycle length at intersections along Broad Street should be set at 90 seconds. (The cycle length is currently 45 to 57 seconds at Broad Street and 3rd Street, and Broad Street and 4th Street, but 90 seconds at the intersections of Broad Street with High Street and with 2nd Street.) The four signals should then be synchronized. Based on an analysis using Highway Capacity Software (HCS+ release 5.3), this improvement would cut corridor travel time from 55 seconds to 44 seconds.



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Millville Transportation Improvement Study
Figure 14: Broad Street and Dock Street Intersection Improvement Option 1
 January 2013

Not to Scale



Baker

Millville Transportation Improvement Study
Figure 15: Broad Street and Dock Street Intersection Improvement Option 2
 January 2013

Not to Scale

6.2 Improvements to County Route 555

3rd Street between Main Street and Wheaton Avenue, and Wheaton Avenue between 3rd Street and 4th Street are currently designated as CR 555. Stakeholders expressed interest in improving conditions on CR 555, citing the narrow cross-section of 22 feet on Wheaton Avenue between 3rd Street and 4th Street. Further, the stop control condition of Wheaton Avenue southbound at 3rd Street presents operational issues. As an alternative to improving the roadways currently designated as CR 555, the county route designation could be applied to other roadways in the vicinity. Both alternatives are discussed below, and illustrated in **Figure 16**.

6.2.1 Improvement of Existing CR 555

Under this alternative, the main improvement proposed for existing CR 555 is at the intersection of Wheaton Avenue and 3rd Street. Currently, southbound traffic on Wheaton Avenue is stop controlled at 3rd Street, despite the fact that volumes on Wheaton Avenue are 2.5 times greater than volumes on 3rd Street. This traffic control is due to the intersection geometry, since 3rd Street is the straight street. Two options are proposed to address this condition:

- Install chokers on 3rd Street
- Close 3rd Street

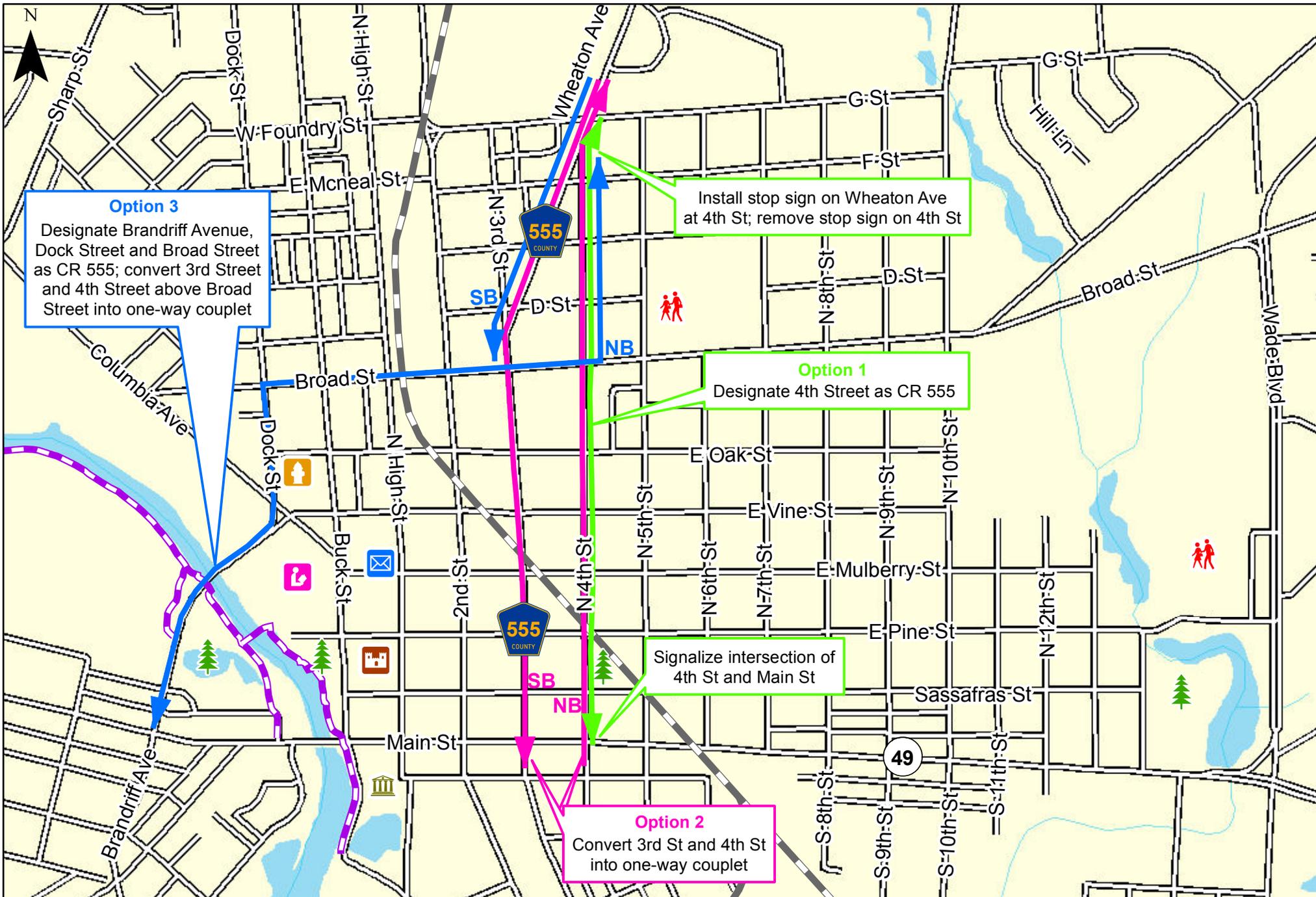
6.2.1.1 Install Chokers

As shown in **Figure 17**, chokers could be installed on 3rd Street to narrow the roadway and re-align the 3rd Street approach to Wheaton Avenue, in order to emphasize that Wheaton Avenue is the predominant roadway, and that southbound vehicles on 3rd Street must stop. The realignment would bring the southbound 3rd Street approach to a 90-degree angle with Wheaton, resulting in safer sight distance for waiting motorists. **Figure 18** presents this choker concept as a one-lane roadway; under this scenario, 3rd Street between D Street and Wheaton Avenue would be a one-way roadway southbound. Motorists that currently travel northbound using 3rd Street would be diverted to other roadways, such as 2nd Street.

6.2.1.2 Close 3rd Street

Alternatively, 3rd Street between D Street and Wheaton Avenue could be closed, as shown in **Figure 19**. This design would further reduce potential conflicts that might otherwise result from making Wheaton Avenue the primary roadway at this intersection. However, by preventing the passage of both northbound and southbound vehicles, more traffic would be diverted to other roadways. In the evening peak hour, 69 vehicles head southbound on 3rd Street. The large majority of these motorists were likely traveling south on 2nd Street before moving to 3rd Street. Under the closure scenario, many motorists would remain on 2nd Street through D Street, and begin filtering into downtown Millville at Broad Street or south.

It should be noted that the concepts proposed above maintain access to the houses on the west side of 3rd Street with existing curb cuts; this will be a major design issue under any scenario.



0 0.125 0.25 Mile



Baker

Millville Transportation Improvement Study
Figure 16: County Route 555 Alternatives

March 2013

LEGEND

- Existing Bicycle and Pedestrian Trail
- Railroad Track



Baker

Millville Transportation Improvement Study
Figure 17: Two Lane Choker on 3rd Street
 January 2013

LEGEND:

- Existing conditions
- Proposed curb line
- Proposed striping

Not to Scale



Baker

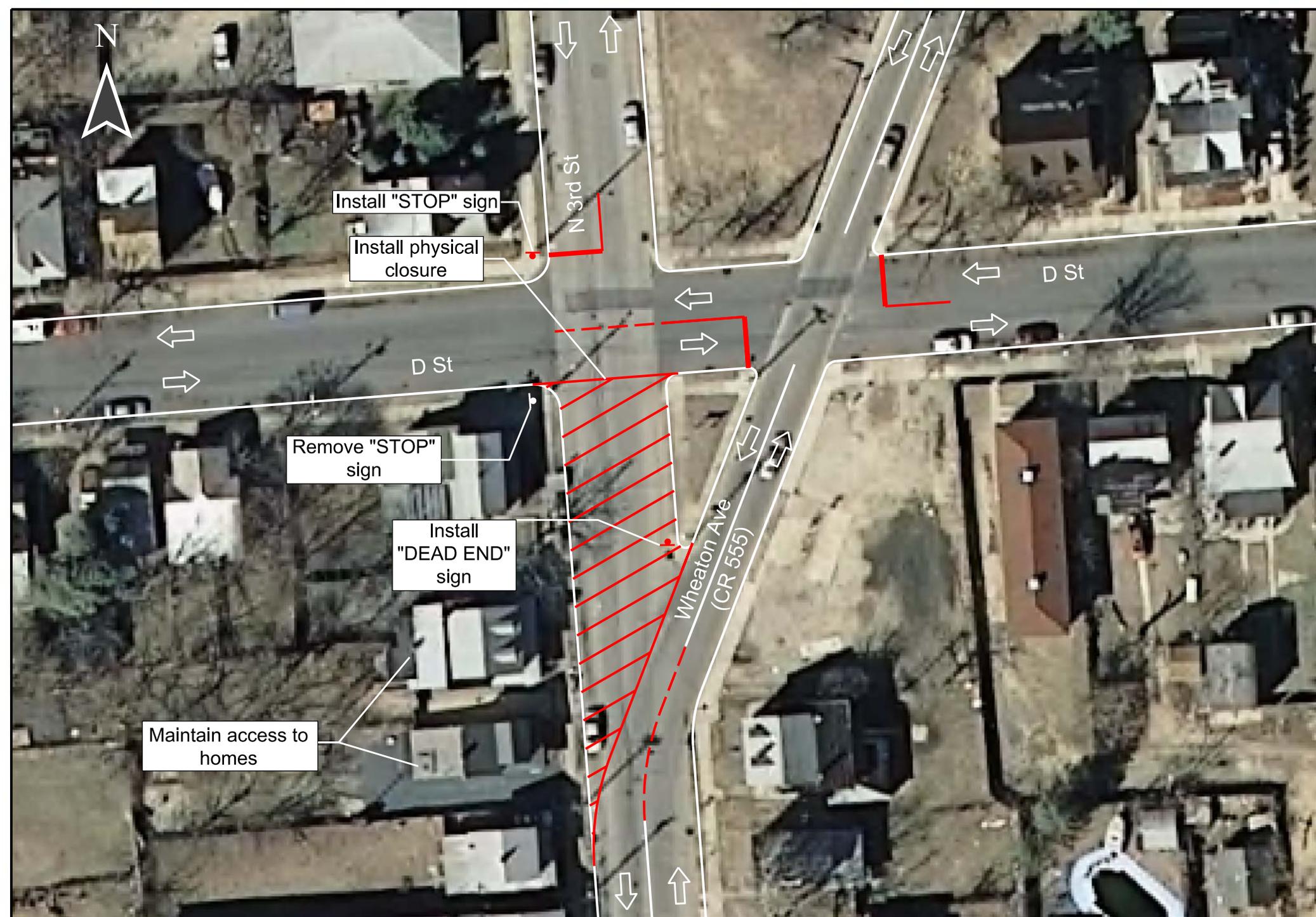
Millville Transportation Improvement Study
Figure 18: One Lane Choker on 3rd Street

January 2013

LEGEND:

- Existing conditions
- Proposed curb line
- Proposed striping

Not to Scale



6.2.2 Designation of Other Roadways as CR 555

Under the alternative of designating other roadways as CR 555, there are three options:

- Designate 4th Street as CR 555
- Designate 4th and 3rd Streets as CR 555 (one-way couplet)
- Designate Brandriff Avenue, Dock Street, Broad Street, and 3rd and 4th Streets (one-way couplet) above Broad Street as CR 555

6.2.2.1 Designate 4th Street as CR 555

Under this scenario, 4th Street from Main Street to the intersection of Wheaton Avenue and G Street would be designated CR 555. The 4th Street cross-section is 40 feet wide, much wider than the 22-foot wide cartway of Wheaton Avenue between 3rd Street and G Street. The only control for 4th Street traffic between Main Street and Wheaton Avenue is at the signalized intersection with Broad Street, as opposed to the current CR 555 traffic, with a signalized intersection at Broad Street and stop control for southbound Wheaton Avenue traffic at 3rd Street. However, there are drawbacks to this alternative. The designation of 4th Street as CR 555 would likely have consequences for the crash incidence at Main Street. Fourth Street is stop-controlled at Main Street. This intersection has been determined as one of the crash hot spots in Millville, with 18 crashes from 2008 through 2010. Eleven crashes were angle, and seven of these involved southbound vehicles. The potential for angle crashes will increase with the rise in traffic volumes on 4th Street. It would likely be necessary to signalize the intersection of 4th Street and Main Street in order to mitigate the potential for an increase in angle crashes. It should be noted, however, that NJDOT might not approve signalizing the intersection of 4th Street and Main Street, given the proximity to the signalized intersection of 3rd Street and Main Street.

A further concern with designating 4th Street as CR 555 is the possibility that some southbound motorists entering Millville on Wheaton Avenue will simply choose to stay on 3rd Street. That route offers a more direct path to the west, which is where most southbound motorists are heading. Of the southbound motorists on 3rd Street in the evening peak hour, about two-thirds turn west onto Main Street.

6.2.2.2 Designate 3rd Street and 4th Street as CR 555

Another option for re-designating other roadways as CR 555 would involve converting 3rd and 4th Street into a one-way couplet, with 3rd Street southbound and 4th Street northbound. Making 4th Street one-way northbound would eliminate the number of angle crashes currently associated with southbound vehicles entering Main Street, and thus would represent a safety improvement at the intersection of 4th Street and Main Street. This concept would increase the number of vehicles turning from Main Street onto 4th Street, but a Highway Capacity Software (HCS+ release 5.3) analysis indicates that delays would be minimal for both eastbound and westbound traffic, with the average delay only 8 to 9 seconds. A left turn lane would need to be striped on the eastbound approach, similar to Main Street at 3rd Street. It should be noted that one issue with restriping Main Street to provide a left turn lane is that on-street parking would need to be prohibited where the new striping plan is installed. This is a concern since not all of the homes along Main Street have driveways, and these residents depend upon on-street parking.

Under this scenario, the improvement at Wheaton Avenue and 3rd Street, providing priority to Wheaton Avenue traffic, would be recommended.

One concern with one-way streets is that they are often associated with slightly higher vehicular speeds than two-way streets. This concern would be prominent on 3rd and 4th Streets, given the width (40 feet) of these two roadways. To address this concern if the one-way couplet is implemented, the City has proposed narrowing the roadways to 30 feet in width, and using the increased width of the “pedestrian realm” for streetscaping enhancements, illustrated in Figure 44. Another possibility would involve striping bike lanes on 3rd and 4th Streets to reduce the vehicular travelway.

6.2.2.3 Designate 3rd Street and 4th Street above Broad Street as CR 555

A final option for CR 555 would take advantage of the proposed enhanced Brandriff Avenue to Dock Street to Broad Street corridor, described in Section 6.1. With the improvements proposed in this report, this corridor would be able to accommodate greater traffic volumes, and could be designated as CR 555. As part of this option, 3rd Street and 4th Street to the north of Broad Street would be set up as a one-way couplet and designated as CR 555. Fourth Street would be one-way northbound, and 3rd Street would be one-way southbound. Under this scenario, it would be recommended to stripe a left-turn lane eastbound on Broad Street at 4th Street. It should be noted that since Broad Street east of 3rd Street is currently designated as CR 552 Spur, this roadway would be designated as both CR 552 and CR 555 for one block.

6.3 Nabb Avenue Extension

The City has expressed interest in extending Nabb Avenue from its current southern terminus at Route 49 to Buckshutem Road for the purpose of providing an alternative route to the Motorsports Park. This would enable motorists driving to Millville from the north to take the following route: Route 55 to CR 552 to Nabb Avenue to Buckshutem Avenue to the Motorsports entrance on Dividing Creek Road. Currently, the typical visitor heading to the Motorsports Park would exit from Route 55 at Main Street and travel through the Millville downtown to Cedar Street. A concept of the proposed extension is shown in **Figure 20**. An extension constructed wholly within Millville would be about 2.35 miles long, while an extension built within Millville and Fairfield Township would be about 1.57 miles long.

However, there are two issues with this proposed improvement:

- **No clear advantage in time.** Based on an analysis of the proposed route, there likely would be little time difference between the proposed route and a route using the existing roadway network. In the age of vehicular navigator systems, motorists could be directed to use the existing network to access the Motorsports Park, even if Nabb Avenue were extended.
- **Feasibility.** The land south of Fairton Road is in a farmland preservation program, presenting an impediment to roadway construction.

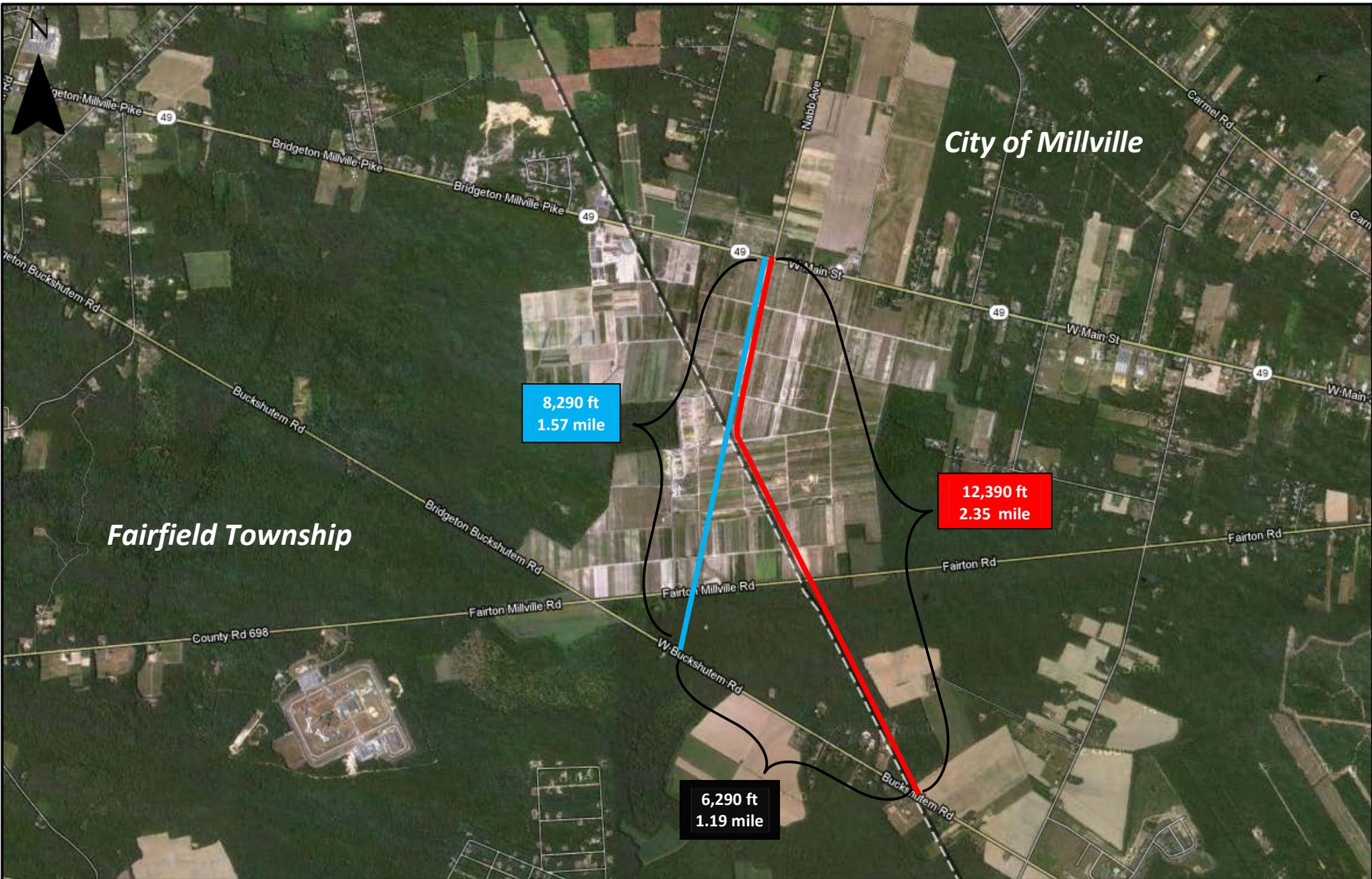
Further, it should be acknowledged that traffic generated by the Motorsports Park has not presented a significant impact on the Millville roadway system. Visitation to Motorsports events tends not to be

concentrated within a narrow time window, and the attendance of the events, in the range of 10,000 for a typical event, is not overly large.

For this reason, and for the issues cited above, this westerly route to the Motorsports Park is less important than other network improvements discussed in this report, and is acknowledged by project stakeholders to be a low priority. The value of the Nabb Avenue extension would increase if it were needed to accommodate NASCAR events, or if it were shown to be helpful in attracting development to the industrial park in south Millville.

6.4 Safety Improvements

As noted earlier, safety is an important issue, and should be considered in all vehicular improvements. High crash locations were identified through analyzing crash reports for the years 2008, 2009 and 2010. To address the safety issues identified in the crash analysis, the following improvements are recommended.



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**Millville Transportation Improvement Study
Figure 20: Nabb Avenue Extension**

January 2013

LEGEND

- Millville option
- Millville-Fairfield option

6.4.1 Main Street and 2nd Street

Two key issues were identified at this intersection: a high number of rear-end crashes, and the difficulty of large vehicles in maneuvering through the intersection. Six of the 60 crashes at this intersection in the study period involved large vehicles making turns, or vehicles backing up to avoid being hit by large vehicles making turns. Further, Millville stakeholders identified turns by large vehicles at this intersection as being a major issue. It is therefore recommended to restripe Main Street at this intersection, as shown in **Figure 21**. Major components of the improvement include:

- Narrow the left turn lane from 12 to 10 feet, and widen the receiving lane at the approaches from 14 to 16 feet (or narrowing both outside lanes to 15 feet). A 10 foot lane is adequate for a left turn lane, and making wider receiving lanes would provide more leeway for vehicles to make turns. This change should also be implemented on the westbound approach at High Street, and the eastbound approach at 3rd Street. Not only would this facilitate turns by large vehicles; it would also make the outside lanes more compatible for bicycle travel.
- Pull back the stop bar of left turn lanes at affected approaches by 10 feet, also to provide more room for turning vehicles. The stop bar for the northbound approach is currently offset by 10 feet, but this has not been replicated on the other three approaches. This change should also be implemented on the westbound approach on Main Street at High Street, and the eastbound approach on Main Street at 3rd Street.
- Increase the curb radius of the northwest corner to 15 or 20 feet, up from the current 10 feet.

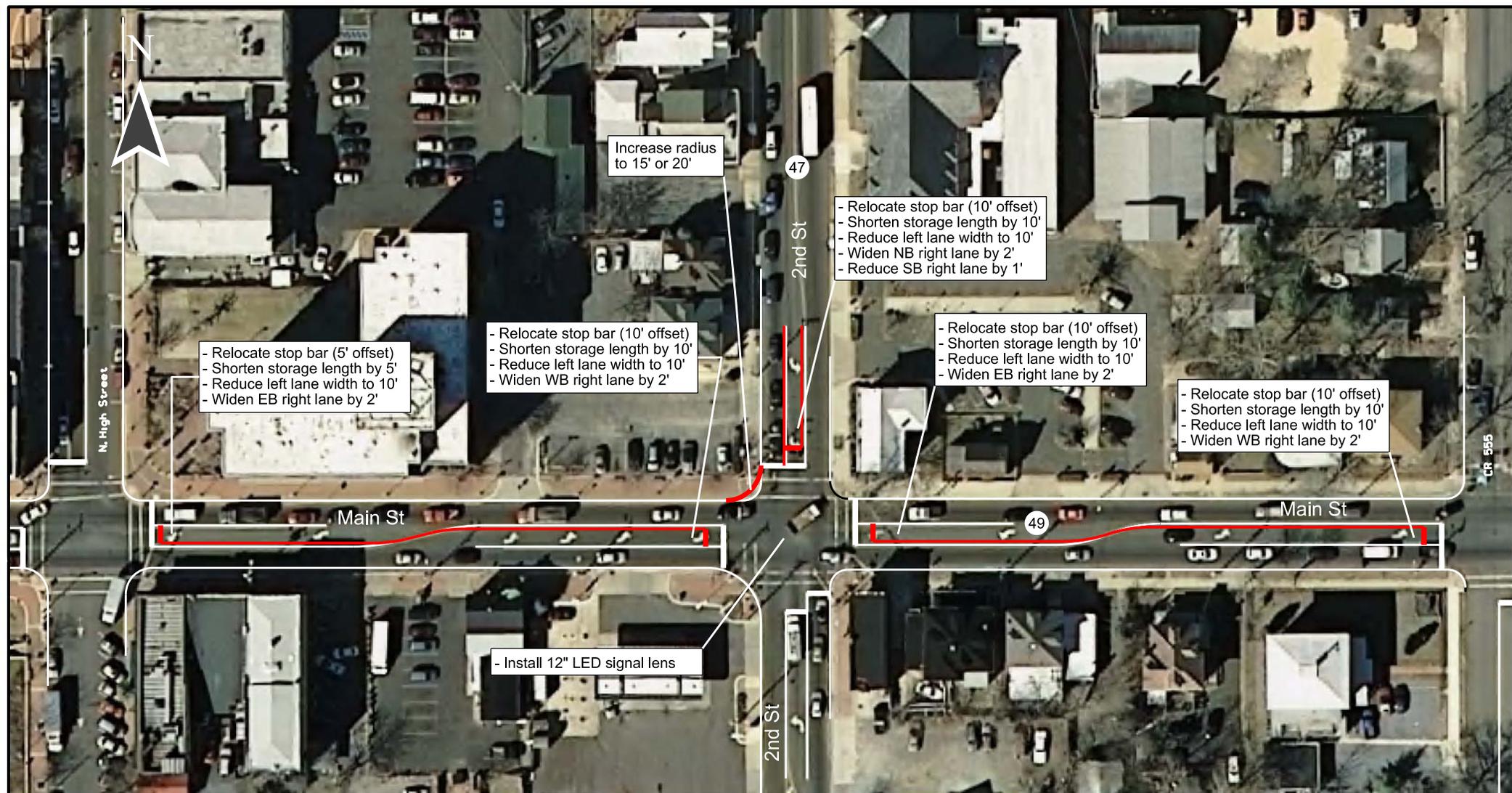
To address the issue of rear-end crashes, the replacement of the existing 8-inch incandescent signal lens with 12 inch LED signal lens is recommended. Studies have shown that this improvement can reduce the number of rear-end crashes at signalized intersections. The Manual of Uniform Traffic Control Devices (MUTCD), 2009 Edition, recommends the use of 12 inch lens at high volume intersections, and their use will also be recommended for other intersections discussed below.

6.4.2 Second Street at Bluebird Lane and 2nd Street at Wawa driveway

These two intersections were both identified as crash hot spots, and both are in the northern Millville retail corridor along 2nd Street. As discussed later, the improvement of a complementary roadway network in northern Millville should serve to reduce traffic volumes and conflicts at these two locations, and thus the number of crashes.

6.4.3 Main Street and Sharp Street

There were 24 rear end crashes at this intersection, with 10 of these crashes on the southbound approach. There were also three southbound sideswipe crashes. The geometry of this intersection contributes to southbound crashes. Many southbound motorists treat the shoulder as being the right turn lane, sometimes leading to conflicts with motorists queued up in the actual travel lane who are also turning right. To alleviate these issues, it is recommended that this intersection be reconfigured with a designated right turn lane and left turn lane on the southbound approach, as illustrated in **Figure 22**.

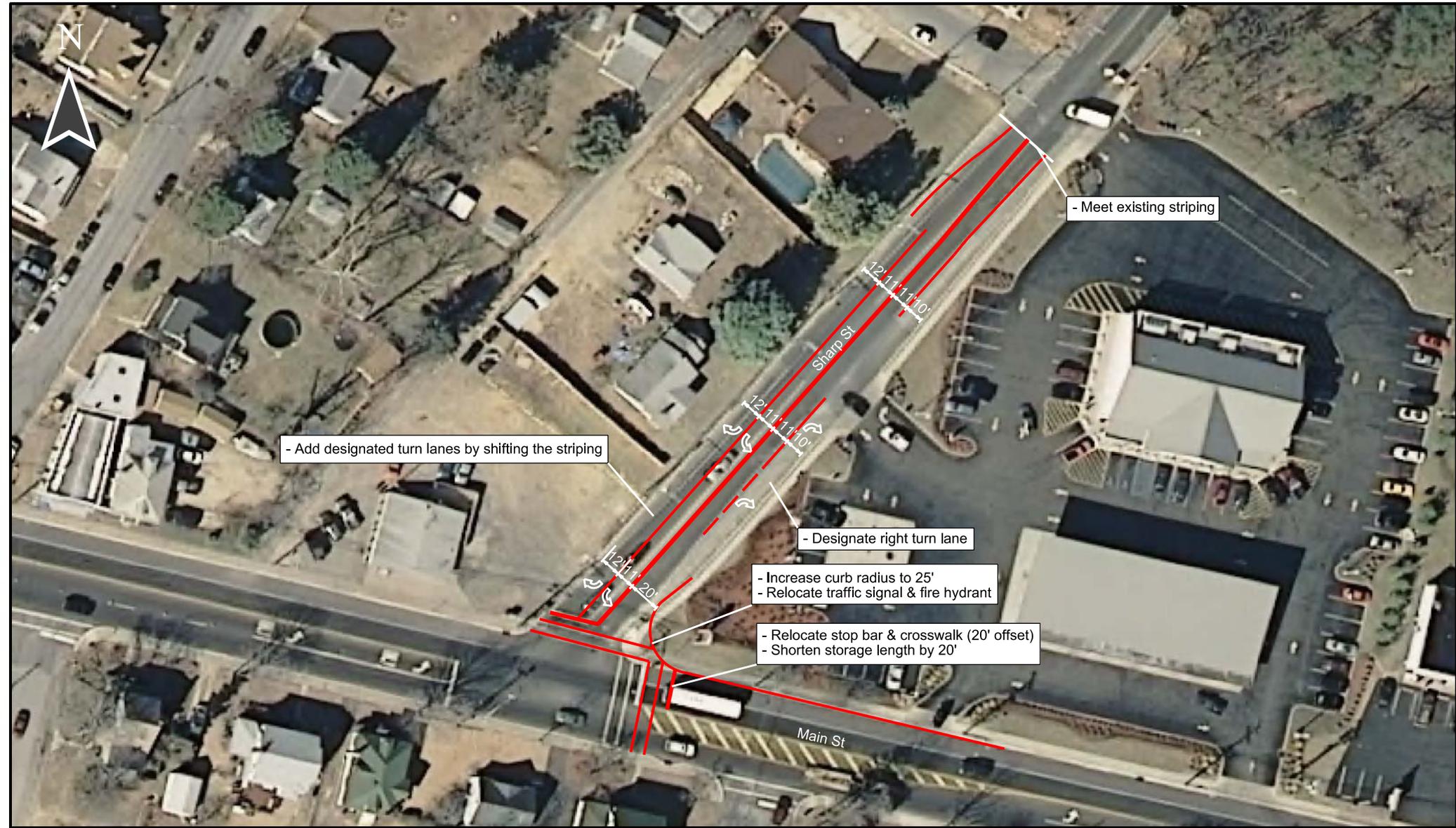


Baker

Millville Transportation Improvement Study
Figure 21: Main Street and 2nd Street Intersection Improvement

January 2013

Not to Scale



Baker

Millville Transportation Improvement Study
Figure 22: Main St and Sharp St Intersection Improvement

January 2013

Not to Scale

As part of this restriping, the right turn lane northbound at the Wawa driveway could be formalized. It is further recommended that the curb radius of the northeast corner be increased to 25 feet, to facilitate right turns by westbound vehicles. This will require moving the traffic signal and fire hydrant on this corner, however. In addition, the 8-inch incandescent signal lens should be replaced with 12-inch LED lens.

6.4.4 Main Street and Brandriff Avenue

To help address the 2008-2010 crash history of 19 rear end crashes and 7 angle crashes, it is recommended that the 8-inch incandescent signal lens be replaced with 12-inch LED lens.

6.4.5 Broad Street and Buck Street

Given the crash history at this intersection (15 angle crashes from 2008 through 2010), this intersection qualifies for signalization based on warrants in the MUTCD. The intersection currently has a warning flasher, which flashes yellow for Broad Street and red for Buck Street. Based on the crash history, it is apparent that the warning flasher has not been as effective as desired. In addition, it is also recommended that pavement markings be re-striped at this intersection, as they have grown faint.

6.5 Network Improvements in Northern Millville

The need for improvement of the roadway network is especially pronounced in northern Millville, which has seen the most rapid development in the City in recent years, centered on the growth of the Route 47 retail corridor. Improvements for this section of the city are presented in **Figure 23**. Most of the concepts presented here were developed by the City of Millville as part of their master planning process; those concepts are included to provide a comprehensive overview of needed improvements, as well as to validate their contribution to the overall goal of a more functional network. Following is a summary of the main concepts for roadway improvements in northern Millville.

Extension of Wade Boulevard west of Wheaton Avenue. Wade Boulevard (CR 678) serves as a major relief route circling the eastern side of the city. Extension of Wade Boulevard to the north would enhance the network, but would face several major obstacles, including:

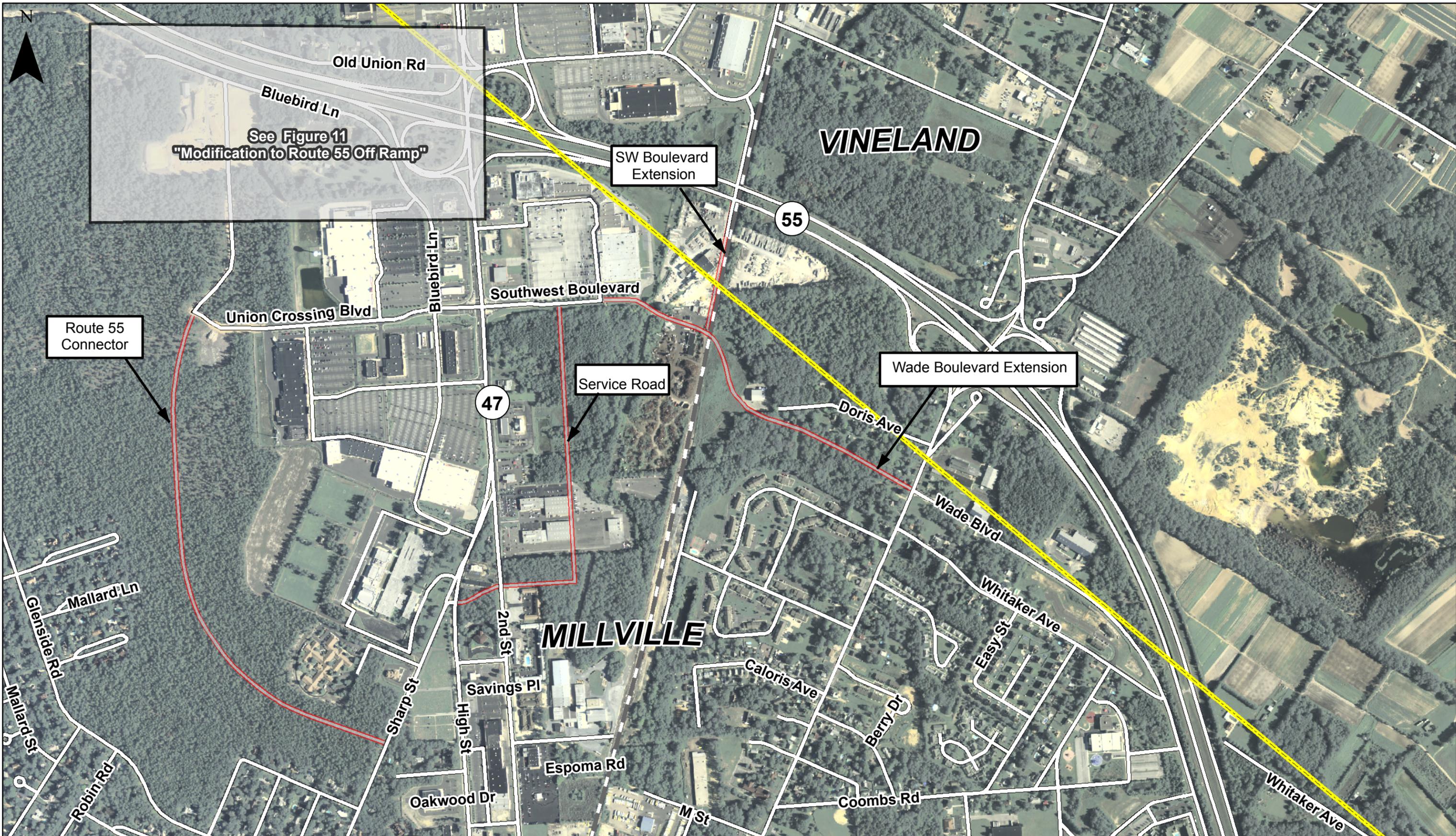
- Acquisition of the residential property on the west side of Wheaton Avenue at its intersection with the current terminus of Wade Boulevard.
- Travel through, or bypass of, the hazardous waste clean-up site, Nascolite.
- Environmental permits for passage through the wetland centered on the rail line.
- Acquisition of land needed through the Cumberland Recycling Corporation facility west of the rail line.
- At-grade intersection with the Winchester & Western rail line. In general, it can be difficult to secure the necessary approval by NJDOT for an at-grade crossing of a roadway with a rail line. One means of doing so is to engage in a “swap” of an existing at-grade crossing; that is, a municipality offers to close an existing roadway where it crosses a rail line in exchange for a new roadway crossing. Fortunately, in the case of Millville, it has many non-essential roadway crossings of the rail line downtown that could be used in this sort of exchange if desired.

Extension of SW Boulevard from Vineland to intersect with the proposed extension of Wade Boulevard. This extension would enable vehicular movement from the Union Crossing Shopping Center and Cumberland Crossing Mall to the north without having to use Route 47. However, the extension of this roadway would require passage through the Cumberland Recycling Corporation facility.

Service road parallel to and east of Route 47. As noted in the crash analysis, one of the crash hot spots in Millville is the intersection of the Wawa driveway with Route 47, as a result of vehicles turning left from that driveway to head south. Development of a service road would permit visitors to the Wawa (and other existing and future land uses along the east side of Route 47 between High Street and Southwest Boulevard) to head south without traveling on Route 47. South of Wawa, the service road is proposed to be constructed immediately to the east of the car dealerships along Route 47. South of the car dealerships, the service road would turn to the west in order to intersect with Route 47 opposite the proposed future extension of Sharp Street to Route 47.

Because of the existing presence of the car dealerships, the extension of a service road to the south of Wawa would be a long range proposal. However, there is no current impediment to constructing a service road between Wawa and Southwest Boulevard to the north. The property to the north of Wawa is undeveloped, and construction of a service road could be requested by the Millville Planning Board as part of a future development. This would enable vehicles from Wawa to drive north along the service road, and make left turns onto Southwest Boulevard and then Route 47, as an alternative to conducting left turns onto Route 47.

Route 55 Connector. This is another improvement identified as part of the Millville master planning process. This connection would remove trips from Route 47, and permit greater access to the land uses at the Union Crossing Shopping Center and vicinity.



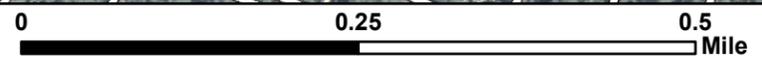
See Figure 11
"Modification to Route 55 Off Ramp"

SW Boulevard Extension

Route 55 Connector

Service Road

Wade Boulevard Extension



Millville Transportation Improvement Study
Figure 23: Proposed Roadway Network Improvement in Northern Millville

January 2013

LEGEND

— Proposed Roadway

6.6 Modifications to Route 55 Off-Ramp

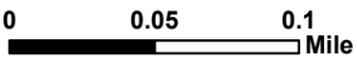
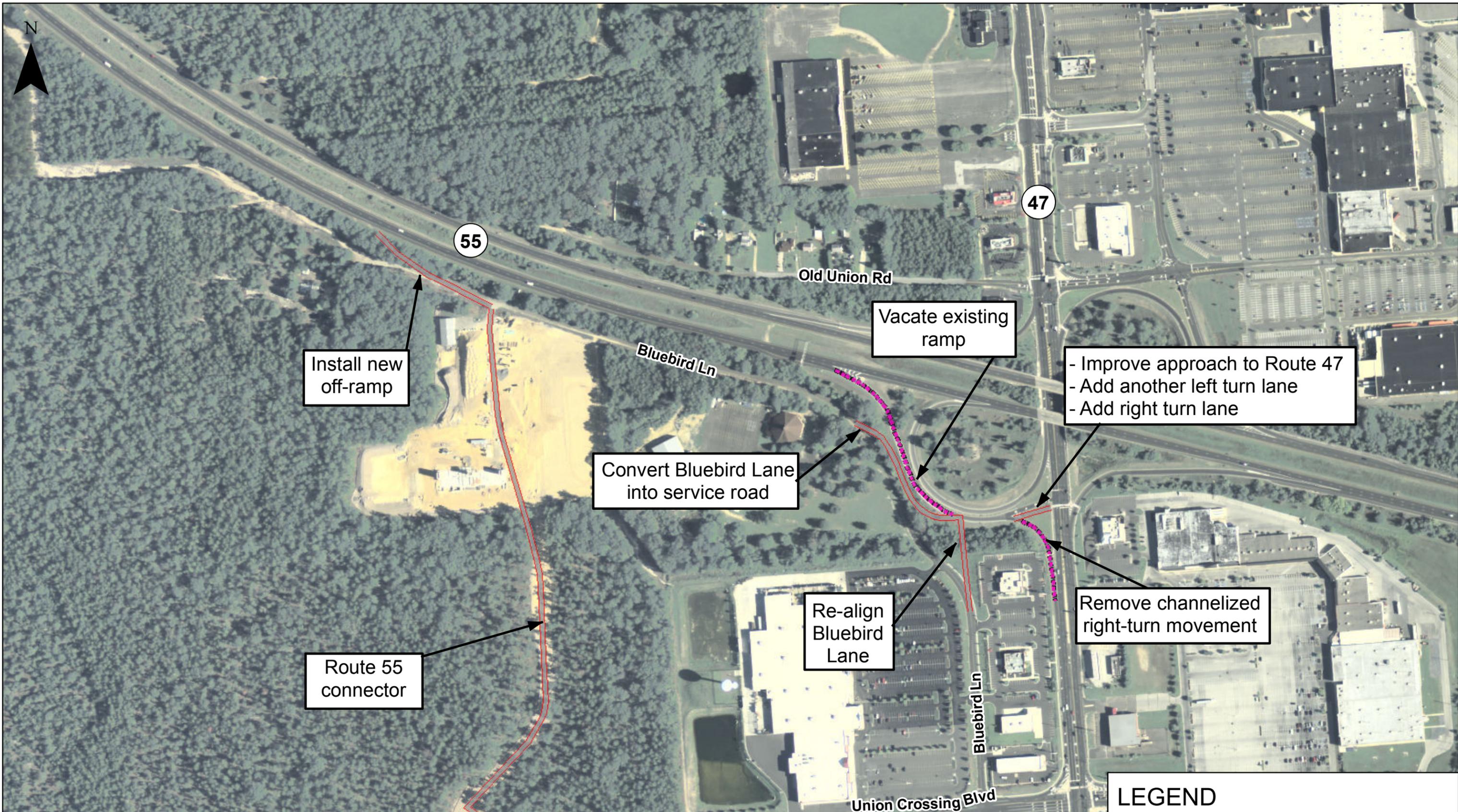
Millville stakeholders expressed concerns about vehicular safety on Route 55 south of Route 47, and vehicular mobility in this area. Millville proposed roadway improvements to address the issues at this interchange in 2009. The concept is illustrated in **Figure 24**. The overall concept would encompass a number of roadway modifications, including:

- Vacating the existing southbound off-ramp.
- Construction of a new off-ramp linking to Bluebird Lane west of the Route 55 Connector.
- Re-alignment of the east-west segment of Bluebird Lane, to feed into the remaining segment of the Route 55 southbound off-ramp. The east-west section of Bluebird Lane, from the Route 55 Connector to Route 55, would be one-way eastbound.
- Re-alignment of the north-south segment of Bluebird Lane, to tee into the realigned east-west segment;
- Re-alignment and reconfiguration of the eastern end of the Route 55 southbound off-ramp, to create a dual left turn lane onto Route 47, and to provide a new right turn lane controlled by the signal. The existing free-flow right turn lane would be vacated.

Based upon the analysis conducted as part of this plan, this improvement would have a number of benefits. They include:

- By controlling vehicles turning onto southbound Route 47 from Route 55 with a traffic signal, the improvement will meter the flow of southbound vehicles heading onto Route 47. This should help to mitigate conflicts between vehicles entering Millville southbound on Route 47 and on the Route 55 ramp.
- Reduction in the number of vehicles turning right onto Route 47 from Route 55, since some motorists will elect to travel on the Route 55 Connector or Bluebird Lane to the Union Lake Crossing Center. This effect by itself would serve to reduce conflicts between vehicles heading south into Millville.
- Reduction in the number of southbound Bluebird Lane vehicles turning left at Union Crossing Boulevard. This will reduce the delays experienced by motorists on southbound Bluebird Lane, which can be extensive. Although delays will be reduced, it should be noted that long delays will likely persist during the mid-day Saturday peak hour. The delays at Bluebird Lane and Union Crossing Boulevard can be further mitigated by installing a traffic signal at this intersection. Since this intersection is less than 300 feet from Route 47, it will need to be coordinated with the intersection of Bluebird Lane and Route 47.
- The reduction in traffic volume on Bluebird Lane should also have the effect of reducing crashes at Bluebird Lane and Union Crossing Boulevard. This would be particularly welcome, since this intersection has the 7th highest number of crashes at Millville intersections.
- Finally, by reducing volumes, this improvement will have the effect of reducing delays at the intersection of Route 47 and Bluebird Lane.

The expected reduction in conflicts on Route 47 is highly desirable, since Route 47 between Route 55 and Main Street was identified by the NJDOT Safety Management System as a high crash corridor.



Baker

Millville Transportation Improvement Study
Figure 24: Modifications to Route 55 Off Ramp

January 2013

LEGEND

- New or modified roadway
- Sharp Street Connector (existing)
- - - Vacated roads

7.0 Transit Concepts

Based on stakeholder interviews, the need for transit improvements was considered less critical than improvements to other modes of transportation. Stakeholders identified the need to provide transportation for residents of the center city to travel to jobs in outlying areas, as well as a shuttle system for tourists. Shortly following the stakeholder interviews in the winter of 2012, the Cumberland County Office of Employment and Training introduced a new shuttle to address this concern. A shuttle now links downtown to the Millville Airport, the Airport Business Park, the Motorsports Park, as well as to Laurel Lake, a residential development. The success of this new transit service should be monitored and evaluated, but there is no need for other transit service modifications at the current time.

There are very few bus shelters in Millville. It is noted that vandalism concerns have discouraged efforts to install bus shelters in many locations. High durability bus stops are recommended for future installation, focusing on high profile locations, such as along Main Street at City Park Drive.

8.0 Bicycle Concepts

Bicycle strategies are an important element in the development of a comprehensive transportation plan. An emphasis is placed on state and county roadways, and higher-order municipal roadways, since bicyclists like to travel these roadways for the same reason as motorists – they provide the best access to, and the most direct route between, important land uses. Further, the designation of bicycle facilities is less critical for lower-order roadways with low speeds and volumes, since these tend to be compatible for bicycle travel even without special signs and markings.

A comprehensive bicycle network is proposed for the City of Millville. Many of the roadways in Millville are currently compatible for bicyclists. By providing appropriate treatments on these roadways, the bicycle network aims to encourage more bicycle traffic and to bring the attention of motorists to bicyclists. Other roadways may not be optimal for bicycle travel at the current time, but can be made more compatible through the use of roadway striping and signage treatments, some quite modest. The recommendations proposed in the bicycle network are intended to address both kinds of roadways.

8.1 Bicycle Facility Types

The Plan proposes enhancing roadways in the network for the use of bicyclists through appropriate signing, striping and markings. NJDOT's *Planning and Design Guidelines for Bicycle Compatible Roadways and Bikeways* outline the types of on-road bicycle facilities that were considered for the City's roadway network: Bicycle Lane, Paved Shoulder, Shared Lane, and Shared Use Path. Specific roadway attributes (pavement width, parking provisions, traffic volumes, posted speed limit, etc.) were inventoried and assessed to determine the feasibility of each facility.

Following is a description of each facility:

Bike Lane. Bicycle lanes are designated travel lanes for exclusive or preferential use by bicyclists, and are typically 5 to 6 feet in width. Bicycle lanes are often located on roadways in urban settings with moderate to high vehicular traffic volumes, moderate to high posted speeds and permitted or designated on-street parking. Bicycle lanes must include the words "bike lane" or the bike lane symbol; they may be accompanied by bike lane signs. Studies have shown that bike lanes have many safety benefits, and one study concluded that they were the safest type of bike facility.¹

They decrease the number of bicyclists riding on the sidewalk, and they increase the compliance of bicyclists with traffic controls.²



¹ Moritz, W. "Adult Bicyclists in the United States: Characteristics and Riding Experience in 1996." *Transportation Research Record 1636*. Transportation Research Board, 1998, pp. 1-7.

² Hunter, W, J.R. Stewart, J. Stutts, H. Huang, and W. Pein. "A Comparative Analysis of Bicycle Lanes Versus Wide Curb Lanes: Final Report." Report No. FHWA-RD-99-034. FHWA, US Department of Transportation, December 1999

Paved Shoulders. A paved shoulder accommodates bicyclists on the roadway shoulder adjacent to vehicular travel lanes. Paved shoulders can be located on urban or rural roadways with moderate to high vehicular traffic volumes and moderate to high posted speeds. Paved shoulders for bicyclists typically range in width from 4 to 6 feet, and are occasionally supplemented with ‘Share the Road’ warning signs. Shoulders are used in a variety of circumstances. Bicyclists appreciate them because they indicate an area of roadway in which motorists normally do not encroach. On roadways where 5-foot bike lanes cannot be fit, 3- to 4-foot shoulders can sometimes be striped. Studies show that on roadways without on-street parking, the effect of shoulders is similar to bike lanes.



Shared Lane. A shared lane accommodates bicyclists and motorists in the same travel lane. Shared lanes can be located on roadways with low to moderate vehicular traffic volumes and low posted speeds, and are occasionally supplemented with ‘Share the Road’ warning signs. Wide (12 feet to 15 feet) outside travel lanes are often desired for shared lane facilities.



Shared Lane Markings. Informally referred to as “sharrows,” shared lane markings are a sub-category of shared lanes; bicyclists shared the road with motorists, but markings guide bicyclists with lateral positioning, unlike the typical shared lane. The sharrow markings comprise two chevrons together with a bicyclist symbol, with the center of the chevron marked 11 feet from the curb on streets with parking, and 4 feet from the curb on streets without parking. These markings are placed after intersections and spaced at intervals of at least every 250 feet. They should be accommodated by “Bicycles May Use Full Lane” signs (Manual on Uniform Traffic Control Devices R4-11). They are particularly recommended for use on urban streets with on-street parking where bike lanes cannot be accommodated. They are a relatively new marking, having just been approved for inclusion in the 2009 MUTCD. Initial studies show a number of safety benefits of sharrows. In one study in San Francisco, sharrows were shown to reduce sidewalk riding by 35% and the number of wrong-way bicyclists by 80%. They also were demonstrated to increase the distance between bicyclists and passing cars and parked cars.³



³ San Francisco Department of Parking and Traffic, *San Francisco's Shared Lane Pavement Markings: Improving Bicycle Safety*, 1984.

Shared Use Paths. Shared use paths are dedicated rights of way for sole use by bicyclists and pedestrians. These paths provide a separate facility for the movement of bicycles and pedestrians in areas where roadway accommodations may not be available, or are less desirable. They can provide valuable connections between existing facilities. Shared use paths vary in width, from 8-10 feet and typically provide bi-directional traffic for bicyclists and pedestrians.



8.2 Bicycle Network

The proposed bicycle network is depicted in **Figure 25**. The bicycle network was designed to accomplish a number of goals:

- Provide movement across the city and facilitate regional bicycle trips. Bike compatible shoulders are thus recommended for major routes, such as Route 49 and CR 552.
- Provide access to schools. Bike lanes are recommended in the vicinity of Lakeside Middle School, Millville Senior High School, and most of the elementary schools.
- Provide access to commercial centers. For example, bike compatible shoulders are proposed for Bluebird Lane and the main north-south service road within the Union Crossing Shopping Center. The only bicycle facility in the City of Millville at the current time is a bike lane on Route 47 south of Route 55 – a route that very few bicyclists heading to the Route 47 retail corridor would feel comfortable traveling on, due to high traffic volume and speed.
- Provide access to major recreational destinations. For example, bike lanes are proposed for Carmel Road leading to the Union Lake WMA, and on roadways leading to the Wheaton Arts & Cultural Center.
- Provide access to community facilities, such as the City Hall and the Library.

In short, the bicycle network will provide bicyclists with viable connections to identified trip generators and land uses in the City of Millville, and will serve to facilitate functional trips which would include running errands and commuting to work and school. Given the many parks and open space areas throughout the City, a bicycle network in Millville also offers great potential for encouraging recreational trips, as well.

Table 6 provides a summary of existing and proposed cross-sections and treatments on roadways proposed for the network. The cross-section and facility type is detailed for 46 different roadway sections, but it should be noted that some roadways have multiple cross-sections, often due to fairly minor changes in roadway width. It should further be noted that of the 46 sections, no changes in roadway cross-section are necessary for 24, or slightly over half. Many of the roadways included in the network that are outside the downtown already have bike compatible shoulders, and on these roadways, minimal signage is the only improvement recommended. Even for a number of the roadways recommended for bike lanes, it will not be necessary to change the cross-section width. For example,

Race Street between the Silver Run School and Cedar Street currently has 6 foot shoulders; it is recommended to maintain this cross-section, and install bike lane markings and signage.

Conceptual drawings were prepared to illustrate the proposed cross-section on a number of roadways for which the cross-section is proposed to be changed. These do not include all roadways on which bike facilities are proposed, but do include some of the more important. Following is a discussion of some of these concepts.

8.2.1 Main Street

As one of the few continuous east-west roadways through Millville, Main Street receives regular bicycle travel, although the heavier traffic volumes make the roadway less desirable from the perspective of inexperienced bicyclists. As illustrated in **Figure 26**, to make the roadway more comfortable for bicyclists from Sharp Street through Cedar Street, the roadway should be restriped from its existing cross-section of 12 foot lanes and 10 foot shoulders/parking lanes, to 14 foot lanes with sharrows and 8 foot shoulders/parking lanes. Sharrows are also recommended for Main Street from Buck Street to 3rd Street. Further, as part of the Main Street and 2nd Street restriping improvements (see **Figure 23**), Main Street should be restriped with wider outside lanes, thus providing a more bike compatible roadway.

8.2.2 Brandriff Avenue

As a potentially important connection from north to south Millville, Brandriff Avenue would benefit from bike lanes. A potential cross-section is illustrated in **Figure 27**. South of Howard Street, Brandriff Avenue could be restriped with 12.5 foot travel lanes, 5 foot bike lanes, and an 8 foot parking lane on the southbound side. Bike lanes are briefly dropped between Howard Street and Main Street due to the presence of a turning lane. North of Main Street, the 40 foot cross-section permits use of 5 foot bike lanes together with an 8 foot parking lane and 11 foot travel lanes. There is little demand for on-street parking on this section of Brandriff Avenue, making it possible to permit parking on only one side. North of the Waltman Park driveway, there is no need for on-street parking, and this is reflected in the lack of a parking lane on this section, with 14 foot travel lanes and 6 foot bike lanes.

8.2.3 Sharp Street

This roadway provides connections to the Lakeside Middle School and the major retail district in northern Millville and is one of the major north-south connections in Millville. Given the moderately high traffic volumes, providing a bike lane would be desirable to increase bicyclist comfort. Between Main Street and the Maurice River, the roadway has 7 foot shoulders and is already bicycle compatible, with only bike lane markings needed. **Figure 28** illustrates treatments that could be applied to Sharp Street in three different sections to the north of this point. Between Maurice River and Columbia Avenue, the roadway could be restriped from 12 foot travel lanes and 4 foot shoulders to 11 foot travel lanes and 5 foot bike lanes. From Columbia Avenue to Archer Street, there is some use of on-street parking, so the use of sharrows should be considered, with the existing roadway cross-section. Finally, north of Archer Street, 6 foot bike lanes should be striped together with 12.5 foot travel lanes.



Vineland

City of Millville

LEGEND

- Bicycle Lane
- Bicycle Lane on Proposed Roadway Improvement
- Shoulder
- Shoulder on Proposed Roadway Improvement
- Bicycle Sharrows (Shared Lane Markings)
- Bicycle Path
- Proposed Bicycle and Pedestrian Trail
- Existing Bicycle and Pedestrian Trail
- Railroad Track

Community Facilities

- School
- Park
- City Hall
- Library
- Post Office
- Theatre
- Airport
- Fire Department
- Art Center
- Racetrack
- Museum



Millville Transportation Improvement Study
Figure 25: Proposed Bicycle Network
April 2013

Table 6: Proposed Bicycle Network Matrix

Roadway	From	To	Existing Roadway Cross-Section				Proposed Roadway Cross-Section	Proposed Facility
			Lane/Shoulder Width (SB//NB)	Lane/Shoulder Width (WB//EB)	On-Street Parking / Width / Striped	Total Pavement Width		
South Second Street (NJ 47)	Municipal Border	Whitall Ave	8'/12'//11.5'/8.5'		N	40'	No change	Bike compatible shoulders
	Whitall Ave	East Main St (NJ 49)	14.5'//14.5'		N	29'	4'/10.5'//10.5'/4'	Bike compatible shoulders
East/West Main Street (NJ 49)	Municipal Border	Carmel Rd (CR 608)		10'/12'//12'/10'	N	44'	No change	Bike compatible shoulders
	Carmel Rd (CR 608)	Sharp St (CR 627)		10'/12'//13'/12'	N	47'	No change	Bike compatible shoulders
	Sharp St (CR 627)	Cedar St (CR 610)		10'/12'//12'/10'	Y / 10'//10' / Y	44'	8'PL/14'//14'/8'PL	Sharrows
	Cedar St (CR 610)	Buck St		14'//12'TL//14'	N	40'	No change	Sharrows
	Buck St	3rd St		14'//12'TL//14'	N	40'	15'//10'TL//15'	Bike compatible lanes
	3rd St	14th St		20'//20'	Y / - / N	40'	No change	Sharrows
	14th St	Grant Ave		13'/12'//12'/15'	N	52'	No change	Bike compatible shoulders
	Grant Ave	Geissinger Ave		3'/12'//12'//12'/15'	N	54'	No change	Bike compatible shoulders
	Geissinger Ave	Forest Glen Dr		8'/12'//12'/15'	N	47'	No change	Bike compatible shoulders
	Forest Glen Dr	Municipal Border		9'/11.5'//11.5'/9'	N	41'	No change	Bike compatible shoulders
East Broad Street (CR 552S)	10th St	NJ 55		8'/11'//11'/8'	Y / - / N	38'	No change	Bike compatible shoulders
	NJ 55	Manor Ave		8'/12'//12'/18'	Y / - / N	50'	No change	Bike compatible shoulders
	Manor Ave	Municipal Border		9'/12'//12'/9'	Y / - / N	42'	No change	Bike compatible shoulders
Diving Creek Road (CR 555)	Buckshutem Rd	Silver Run Rd (CR 627)	10'/12'//12'/9'		N	43'	No change	Bike compatible shoulders
Race Street (CR 555)	Silver Run Rd (CR 627)	Silver Run School	7'/13'//13'/6'		Y / - / N	39'	No change	Bike compatible shoulders
	Silver Run School	Cedar St (CR 610)	6'/12'//12'/6'		Y / - / N	36'	No change	Bike lanes
Wheaton Avenue/3rd Street (CR 555)	G St	Municipal Border	7'/13'//13'/7'		N	40'	No change	Bike lanes
Carmel Road (CR 608)	Municipal Border	Main St (NJ 49)		3'/12'//12'/3'	N	30'	5'/11'//11'/5'	Bike lanes, widen to 32'
Cedar Street (CR 610)	Bogden Blvd	Race St		8'/12'//12'/8'	Y / - / N	40'	No change	Bike compatible shoulders
Sharp Street (CR 667)	East Main St (NJ 49)	Bridge over Maurice River	7'/12.5'//12.5'/7'		N	39'	No change	Bike lanes
	Bridge over Maurice River	Columbia Ave	4'/12'//12'/4'		N	32'	5'BL/11'//11'/5'BL	Bike lanes
	Columbia Ave	Archer St	12'//12'		Y / 8'//8' / Y	40'	8'PL/12'//12'/8'PL	Sharrows
	Archer St	High St	5'/12'//12'/8'		N	37'	6'BL/12.5'//12.5'/6'BL	Bike lanes
Brandriff Avenue	Cedar St (CR 610)	Howard St	9'/12'//12'/10'		Y / - / N	43'	8'PL/5'BL/12.5'//12.5'/5'BL	Bike lanes
	Howard St	West Main St (NJ 49)	15'//12'/12'		N	39'	15'/10'//14'	Bike compatible lanes
	West Main St (NJ 49)	Waltman Park Driveway	20'//20'		Y / - / N	40'	8'PL/5'BL/11'//11'/5'BL	Bike lanes
	Waltman Park Driveway	Columbia Ave	20'//20'		Y / - / N	40'	6'BL/14'//14'/6'BL	Bike lanes
Rieck Avenue	West Main St (NJ 49)	Cedar St	6.5'/12'//12'/8.5'		N	39'	No change	Bike lanes
Bogden Boulevard	Cedar St	Driving Creek Rd (CR 555)	8'/12'//12'/8'		N	40'	No change	Bike compatible shoulders
Kates Boulevard/10th St	Second St (NJ 47)	Woodland Ave	8'/12'//12'/8'		Y / - / N	40'	No change	Bike lanes
	Woodland Ave	G St	20'//20'		Y / - / N	40'	8'PL/5'BL/11'//11'/5'BL	Bike lanes
Orange St/Wade Boulevard	Second St (NJ 47)	Broad St	10'/12'//12'/10'		N	44'	No change	Bike compatible shoulders
	Broad St	Wheaton Ave	9'/12'//12'/7'		N	40'	No change	Bike compatible shoulders
High Street	East Main St (NJ 49)	Broad St	8'/14'//14'/8'		Y / 8'//8' / Y	44'	7'PL/5'BL/10'//10'/5'BL/7'PL	Bike lanes
	Broad St	Foundry St	20'//20'		Y / - / N	40'	8'PL/12'//12'/8'PL	Sharrows
	Foundry St	Elizabeth St	31'/11'//11'/11'		Y / 8'//8' / Y	64'	8'PL/16'Striping/6'BL/14'//14'/6'BL	Bike lanes
	Elizabeth St	Sharp St	8'/12'//12'/8'		N	40'	6'BL/14'//14'/6'BL	Bike lanes
G Street	2nd St	10th St		20'//20'	Y / - / N	40'	5'BL/11'//11'/5'BL/8'PL	Bike lanes
	10th St	Glasstown Rd		18'//18'	Y / - / N	36'	6'BL/12'//12'/6'BL	Bike lanes
Glasstown Rd	Coombs Rd	G St	17'//19'		Y / - / N	36'	5'BL/13'//13'/5'BL	Bike lanes
Coombs Rd	Glasstown Rd	Wheaton Ave		24'	Y / - / N	24'	No change	Sharrows
School St	Carmel Rd (CR 608)	Cooper St		28'	Y / - / N	28'	5'BL/5'BL/11'One-Way/7'PL	Bike lanes
Cooper St	School Dr	Sharp St		28'	Y / - / N	28'	5'BL/5'BL/11'One-Way/7'PL	Bike lanes
Bluebird Ln	High St	North of Union Crossing Blvd	15'//15'		N	30'	4'/11'//11'/4'	Bike compatible shoulders
Pine Street	Dock St	Millville Senior High School		40'	N	40'	20'//20'	Sharrows

BL - Bike Lane

PL - Parking Lane

TL - Turning Lane



Install sharrows

8' Shoulder

14' Travel Lane

14' Travel Lane

8' Shoulder

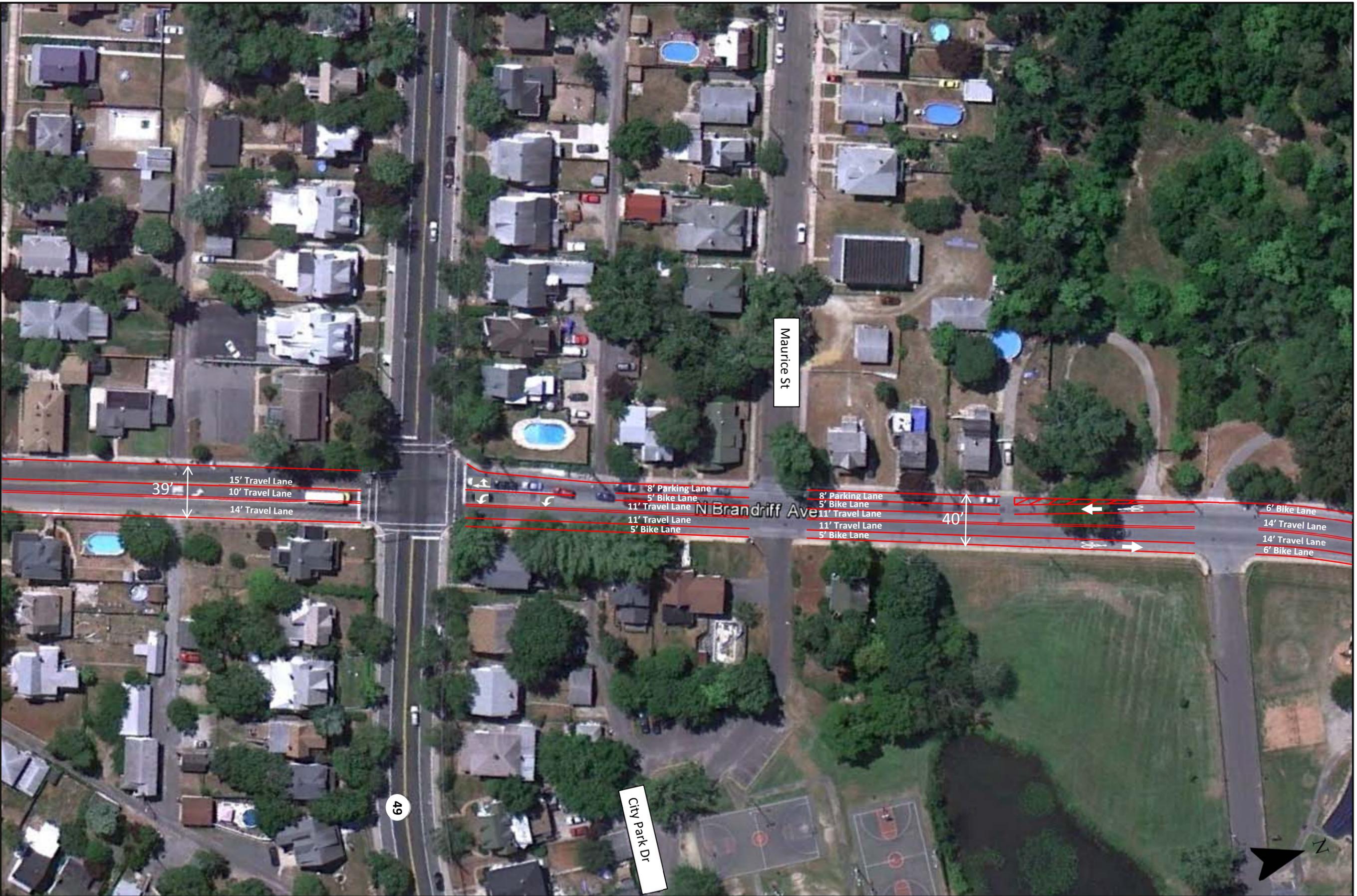
Main St

44'



Millville Transportation Improvement Study
**Figure 26: Restriping of Main St (Rt 49)
between Sharp St & Cedar St**
January 2013

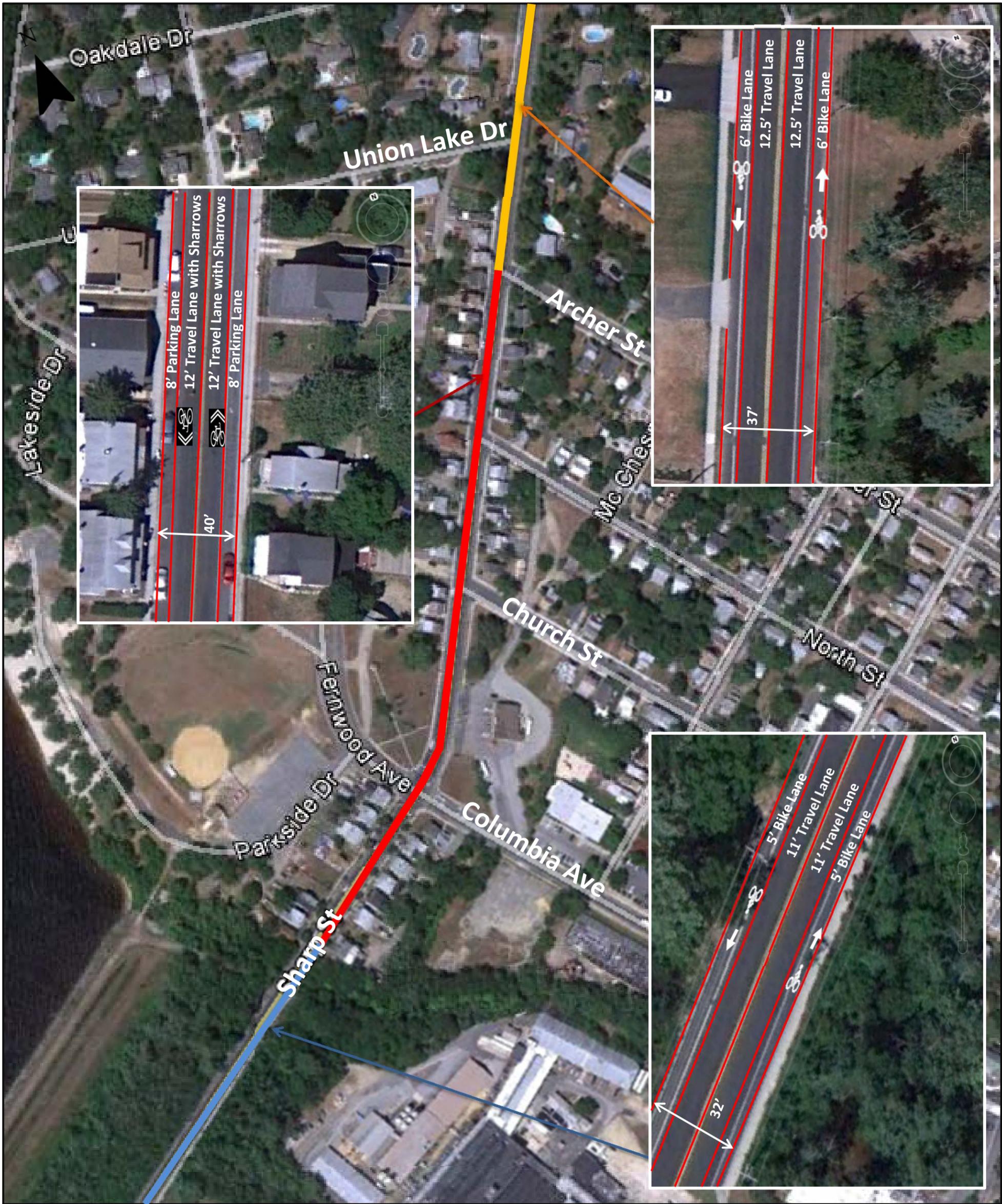
Not to Scale



Baker

Millville Transportation Improvement Study
Figure 27: Bike Lanes on Brandriff Avenue
 December 2012

Not to Scale



Baker

Millville Transportation Improvement Study
Figure 28: Bike Lanes and Sharrows on Sharp Street

September 2012

Not to Scale

8.2.4 High Street

This is one of the two major connections between northern Millville and Main Street, and a key corridor in the Glasstown retail district. It is desirable to increase bicycle travel on this roadway as a means to promote visitation downtown. Because the width of High Street changes throughout the City, along with the permissibility of on-street parking, four different cross-sections are proposed, and are illustrated in **Figure 29**. As shown, on the northern segment, 14 foot travel lanes could be striped together with 6 foot bike lanes. This cross-section could be carried through the unusually wide section of High Street from Elizabeth Street through Foundry Street; the wide parking area here is shown striped out, but angle parking could be provided instead if desired. From Foundry Street to Broad Street, the roadway narrows to 40 feet, and on-street parking is desirable, so 13 foot lanes with sharrows and 7-foot parking lanes are recommended. Finally, below Broad Street, a slight widening of High Street, to 44 feet, permits a cross-section with 7 foot parking lanes, 10 foot travel lanes, and 5 foot bike lanes. This is a somewhat tighter cross-section than seen elsewhere in this plan, but it is a well-accepted roadway design, widely used in cities such as Philadelphia and Chicago.

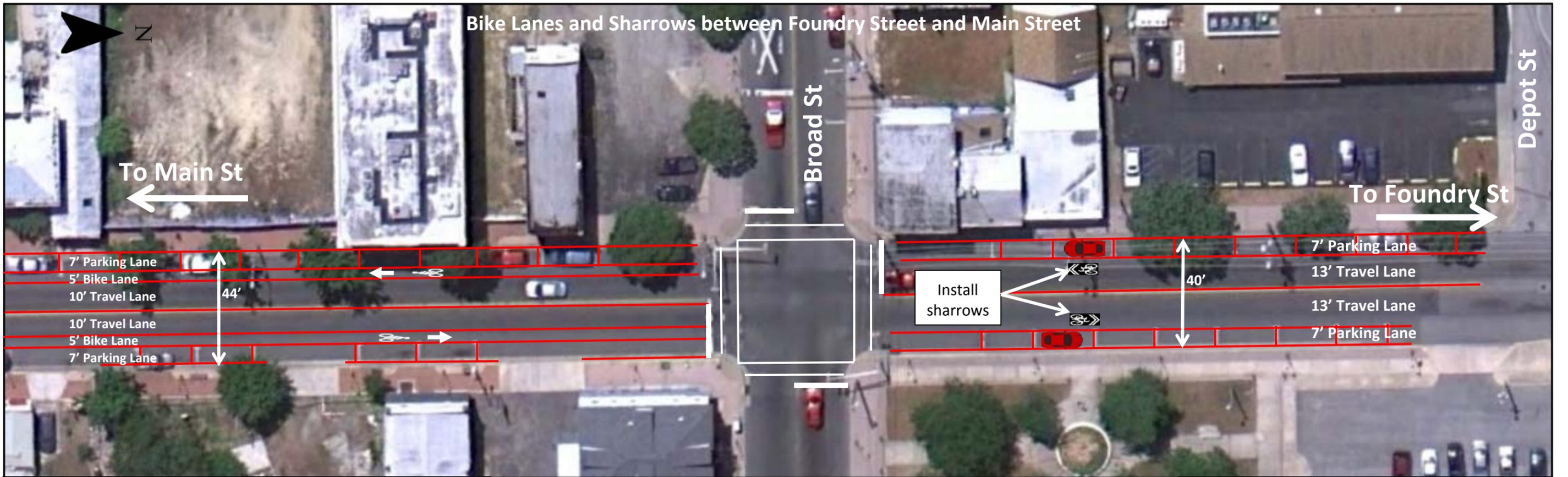
8.2.5 G Street and 10th Street

Figure 30 illustrates two different cross-sections for G Street, west and east of 10th Street. West of 10th Street, G Street is 40 feet wide. Parking is permitted, but is seldom used, except for the block between 5th Street and 6th Street. Further, on-street parking is virtually never occupied along the north side of G Street. Therefore, on this roadway, it would be possible restrict on-street parking to the south side. Under this scenario, a cross-section of 11 foot travel lanes and 5 foot bike lanes could be installed, with an 8 foot wide parking lane on the south side of the road. To the east of 10th Street, where G Street is 36 feet wide and parking absent, 12 foot travel lanes and 6 foot bike lanes could be installed. G Street would be one of the few east-west bike routes in Millville, and thus could play an important role in the network. Unlike all other east-west roadways in downtown Millville, which are stop-controlled at north-south roadways, G Street is not stop-controlled at any intersection; and unlike Broad Street and Main Street, the volumes are very low, and bike lanes feasible. This route would be one of the few east-west bike routes in Millville, and would be a route by which bicyclists could reach the Wheaton Arts & Cultural Center, thus aiding tourism.

8.2.6 Bike Route to Union Lake WMA

The existing bike path that runs through downtown currently terminates at Sharp Street. It would be desirable to extend the bike route through the Union Lake Wildlife Management Area, to expand bicyclist access to this valued recreational resource. There are two possibilities for doing so:

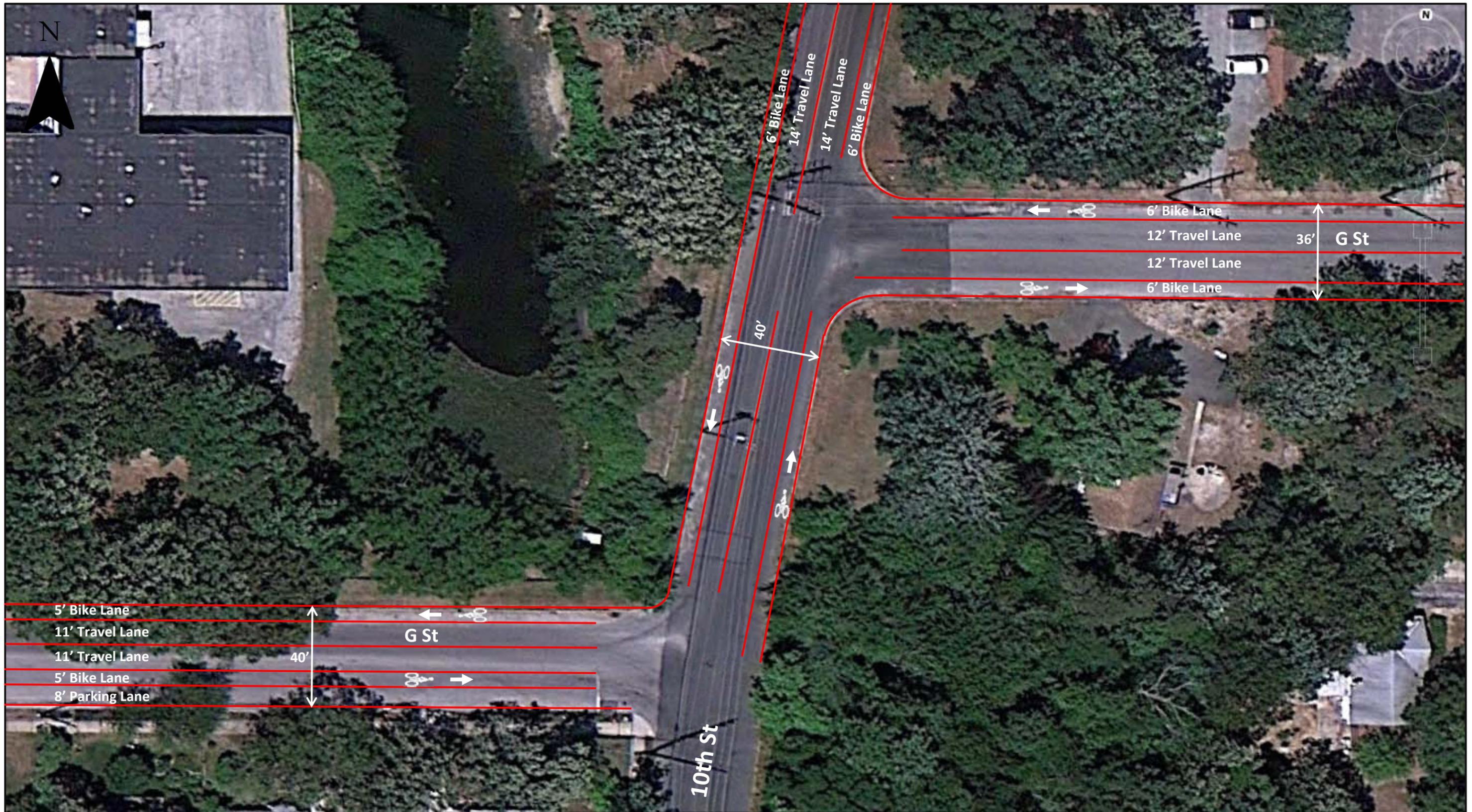
- Negotiate an easement with the owners of the large Wawa tract on the south side of Union Lake, and install a path on this property to the Union Lake WMA driveway (**Figure 31**).
- Develop bike lanes along the north side of Cooper Street and west side of School Drive, before connecting to a bike compatible shoulder or bike lanes along Carmel Road (**Figure 32**). The existing one-way westbound flow of traffic on Cooper Street between Sharp Street and Laurel Street would be retained, and it is recommended to make the rest of Cooper Street one-way westbound, and School Drive one-way southbound. Given the short blocks here, it is easy for motorists to reach their destination even in the presence of one-way traffic flow.



Baker

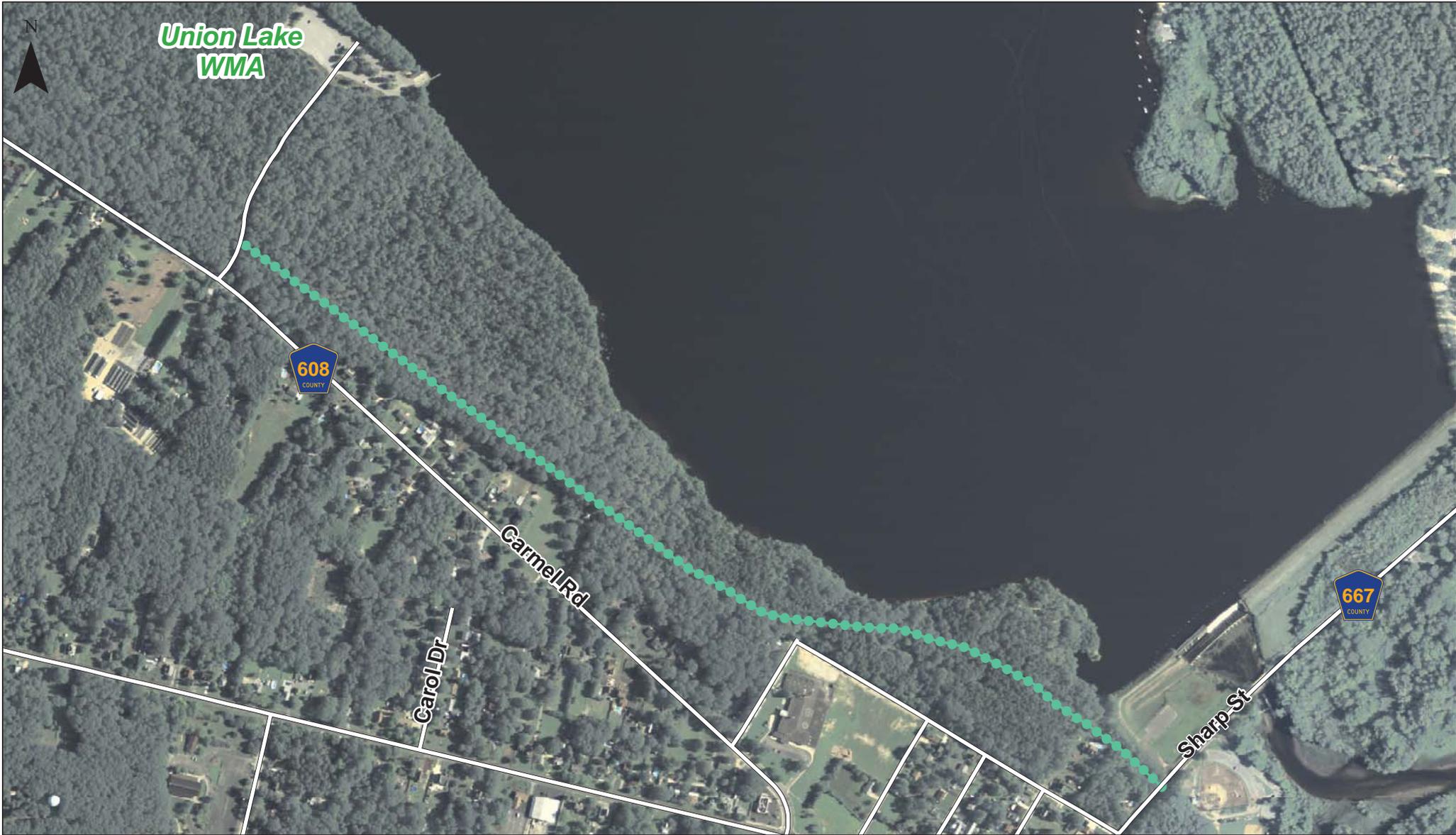
Millville Transportation Improvement Study
Figure 29: Bike Lanes and Sharrows on High Street
 January 2013

Not to Scale



Millville Transportation Improvement Study
Figure 30: Bike Lanes on G Street and 10th Street
 December 2012

Not to Scale



0 0.125 0.25 Mile



Baker

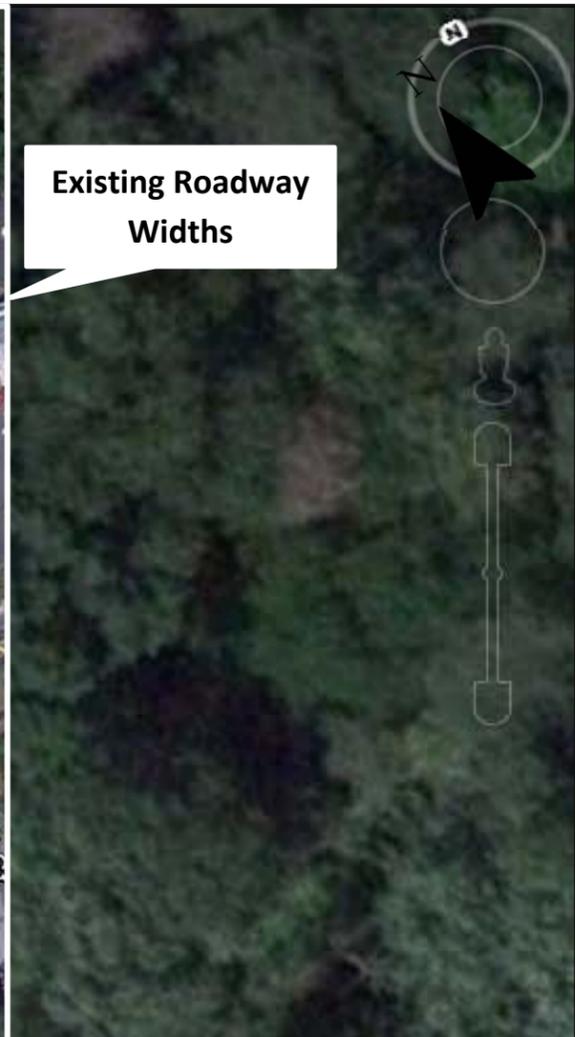
Millville Transportation Improvement Study

Figure 31: Proposed Bike Path from Sharp Street to Union Lake WMA

December 2012

LEGEND

●●●● Proposed bike path



Proposed Typical Cross-Section



Millville Transportation Improvement Study

Figure 32: Bike Lanes on Cooper Street

December 2012

Not to Scale

Contra-flow bike lanes would be installed along the length of Cooper Street and School Drive. The bike lanes would be 5 feet wide in each direction, along with a 2 foot buffer from passing traffic, making this a comfortable environment for bicyclists. On-street parking is not used very extensively along Cooper, making it feasible to restrict it to the westbound side. It is noted that Cooper Street narrows from 30 feet to 24 heading westbound, so modest widening would be required to accommodate the proposed cross-section. School Drive, which is 24 feet in width, would also require widening.

As another element of the bike route to Union Lake, bike lanes are proposed for installation along Carmel Road. This road currently has 12 foot lanes and shoulders varying in width from about 2 to 3 feet. Modest widening would be needed to create 5 foot bike lanes. The travel lanes could also be narrowed to 11 feet, which would reduce the amount of physical widening required.

Pine Street. Sharrows are proposed for Pine Street. Just as there are relatively few vehicular east-west crossings of Millville, it is also the case that there are relatively few opportunities for striping bike facilities on east-west roadways through Millville. For trips through the heart of downtown Millville, Pine Street is the best option since it has low traffic volumes, and connects valued land uses on the west side of the downtown – such as the Levoy Theatre and Buck Park – with important land uses such as the Senior High School and Corson Park on the east side of downtown. However, because Pine Street is stop-controlled at every north-south roadway, it will either discourage bicyclist travel or, if it does attract bicyclists, will likely see a fair share of rolling bicycle stops. If this roadway is designated as a bike route, the evaluation of the reversal of stop signs at a number of intersections along Pine Street is thus recommended.

9.0 Pedestrian Improvements

Walking is an important travel mode in Millville. This section discusses needed improvements to the pedestrian infrastructure, including installation of sidewalks where missing, and upgrades to the infrastructure at intersections.

9.1 Sidewalk Priority

Sidewalks are the most basic component of the pedestrian infrastructure, and their presence is encouraged along any roadway with pedestrian activity. The installation of sidewalks should be a fundamental part of all new land use developments, with the one exception being very low-density residential districts. **Figure 33** indicates the presence of sidewalks along key Millville roadways, and the assignment of priority of sidewalk installation to roadways lacking them. The highest priority was assigned to roadways in the vicinity of:

- **Schools.** Sidewalks are absent proximate to Lakeside Middle School, Mount Pleasant Elementary School, Holly Heights Elementary School, and Silver Run Elementary School, and should be installed. **Figure 34** illustrates a recommended high-priority sidewalk installation by the Lakeside Middle School along Sharp Street, and a short segment of High Street. A sidewalk extension is needed to the north in order to connect to the Route 47 commercial center, and to the residential uses to the south. Further, crosswalks are absent at the intersection of Sharp Street and High Street, and should be installed. Stop bars will need to be relocated to accommodate crosswalks.
- **Medium- to high-density residential developments.** The east side of Wade Boulevard south of Broad Street, and sections of Wheaton Avenue were placed in the high priority category for sidewalk installation, due to the presence of residential developments. Cumberland Green is a large residential complex along Wheaton Avenue, and is served by the new Millville Area Connector transit service, so sidewalks on this corridor would be highly desirable.
- **Commercial districts.** Second Street south of Sharp Street is placed in the high priority category due to the commercial uses along this roadway, as well as the fact that this is immediately south of the popular malls in northern Millville.

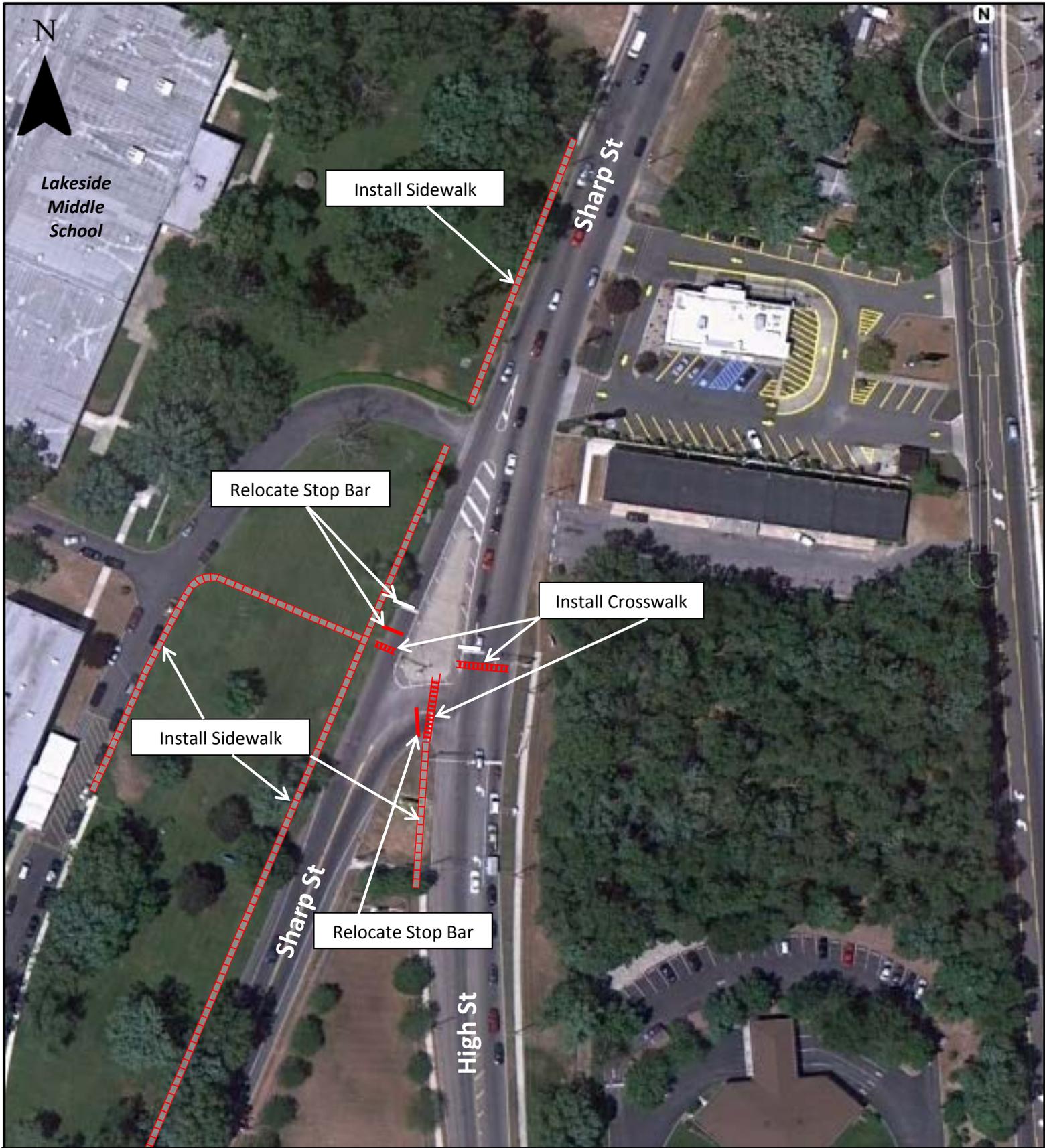
Priority 2 sidewalk installation is typically assigned to roadways proximate to low-density residential areas. **Figure 33** also indicates those roadways where sidewalk installation is currently not considered a priority, due to expected low usage; this could change in the future depending upon the nature of land use development.

9.1.1 Sidewalk Maintenance



A priority plan for sidewalk improvements would enable targeted resources and enforcement against property owners under Chapter 61 of the City's Code to be brought to bear in the most crucial areas.

Example of an existing sidewalk in need of repair



Millville Transportation Improvement Study
Figure 34: Sidewalk and Crosswalks at Lakeside Middle School
 March 2013

Not to Scale

9.2 Intersection Improvements

Improvement of the pedestrian infrastructure is needed at many intersections in Millville. Pedestrian signals are absent from signalized intersections, and crosswalks are often faded or absent. Because this is a widespread problem, it would be costly to improve all intersections in the near future. Prioritization is thus recommended, and **Figure 35** indicates the intersections that should be the first to be upgraded. Most of these intersections were selected since they were the site of pedestrian or bicycle crashes within the last three years, and the improvements were selected primarily to remediate the type of crash indicated. Other intersections may not have experienced crashes, but see relatively high pedestrian and vehicular volumes.

Improvements were categorized into five different strategies:

Crosswalks across major street. The placement of crosswalks across major streets at uncontrolled intersections or midblock locations should be reserved for locations where there is regular pedestrian activity across the major street, and/ or where major pedestrian generators are present. They should be high visibility crosswalks – such as the “Continental” marking – and accompanied by pedestrian crossing signs.



The Continental marking is recommended for key pedestrian crossings.

Crosswalks across major streets are recommended:

- Across Broad Street at N. 6th Street – This would provide access to Memorial High School.
- Across 2nd Street below F Street – This is a major pedestrian crossing, and the highest pedestrian crash cluster in the city. Pedestrian activity is high here, in part, because this is one of the few locations in this part of town where pedestrians can cross the railroad tracks. It is a quarter-mile from here to the next railroad crossing to the south, at Broad Street. It is noted that the Millville Police Department has proposed relocating the bus stop at this location to the south. This would help reduce the level of pedestrian crossings, but only by a modest amount. A pedestrian count conducted by Baker from 1:30 to 3:30 PM on Tuesday, September 11, 2012, indicated that 29 pedestrians crossed 2nd Street at F Street, compared to only 8 pedestrians crossing 2nd Street from the bus stop. The bus stop also generated five pedestrians heading south along 2nd Street. Since most pedestrian activity is not due to the bus stop, a mid-block crossing is still recommended. To enhance safety, a rectangular rapid flashing beacon (RRFB) should be installed here as well. The concept for this improvement is illustrated in **Figure 36**.

- Across Main Street at City Park Drive – This is a major pedestrian crossing. A pedestrian count conducted by Baker from 3:30 to 5:30 PM on Tuesday, September 11, 2012 showed that 22 pedestrians crossed Main Street immediately east of City Park Drive, and 16 pedestrians crossed Main Street immediately west of City Park Drive. Based on this count, a high-visibility crosswalk across Main Street is recommended east of City Park Drive. Further, crosswalks are recommended along Main Street at Cedar Street and at Riverside Drive. In both locations, a pedestrian crossing the side street was struck by a northbound vehicle advancing toward Main Street. The common denominator in the crashes is that both side streets lack a crosswalk at the intersection with Main Street. Indeed, at Cedar Street, the stop bar is striped in the place where a crosswalk should be striped, presenting an impediment to crossing pedestrians. The stop bar should thus be relocated. To enhance safety, a rectangular rapid flashing beacon (RRFB) should be installed here as well. The concept for a pedestrian improvement is presented in **Figure 37**. A longer-term improvement, with a proposed relocation of City Park Drive to be aligned with Riverside Drive, is discussed later in the report and shown in **Figure 41**.
- Across Sharp Street at Cooper Drive – A crosswalk here would provide access to the proposed extension of bike path to Union Lake WMA.

Crosswalks along major street. Crosswalks are desirable along major streets at uncontrolled intersections, to alert motorists to be mindful of crossing pedestrians. Given the current pedestrian activity, and history of pedestrian crashes, crosswalks are recommended to be added to the following locations in particular:

- High Street at Foundry Street – crosswalks were once painted here, but are badly faded.
- 2nd Street at McNeal Street and F Street. See **Figure 36**.
- 3rd Street at Oak Street.
- Main Street at 5th Street.
- Main Street at Riverside Drive.
- Main Street at Cedar Street.

Crosswalks and pedestrian signals. Pedestrian signals are absent from a number of signalized intersections, along with crosswalks. Both facilities should be included in all signalized intersections in Millville. Based on pedestrian activity and historic pedestrian crash activity, key priorities include the following intersections:

- Intersection of Sharp Street and High Street. This would benefit students of Lakeside Middle School. Crosswalk improvements here were described above in **Figure 34**.
- High Street and Broad Street.
- Broad Street and 3rd Street.
- Main Street and 3rd Street.

Turning Vehicle Stop for Pedestrian signs. At signalized intersections, crashes commonly occur from motorists turning left into pedestrians crossing the street. Studies have shown that the placement of

“Turning Vehicle Stop for Pedestrian” signs can be effective in increasing the yielding rate of turning motorists to pedestrians. Based on crash history, they are recommended at the following locations:

- Facing Main Street at High Street
- Facing Main Street at 2nd Street

Turning Vehicle Stop for Pedestrian signs and pedestrian signals. Two locations would benefit both from Turning Vehicle Stop for Pedestrian signs, and from the installation of pedestrian signals. Signs are recommended:

- Facing Main Street traffic at Sharp Street
- Facing Broad Street traffic at 2nd Street



LEGEND

- Crosswalks across major street
- Crosswalks along major street
- ◆ Crosswalks and pedestrian signals
- ▲ "Turning Vehicle Stop for Pedestrians" sign
- "Turning Vehicle Stop for Pedestrians" sign and pedestrian signals
- Existing Bicycle and Pedestrian Trail
- Proposed Bicycle and Pedestrian Trail
- Railroad Track

Community Facilities

- 👤 School
- 🌳 Park
- 🏛️ City Hall
- 📖 Library
- 📧 Post Office
- 🏠 Theatre
- ✈️ Airport
- 🚒 Fire Department
- ✳️ Art Center

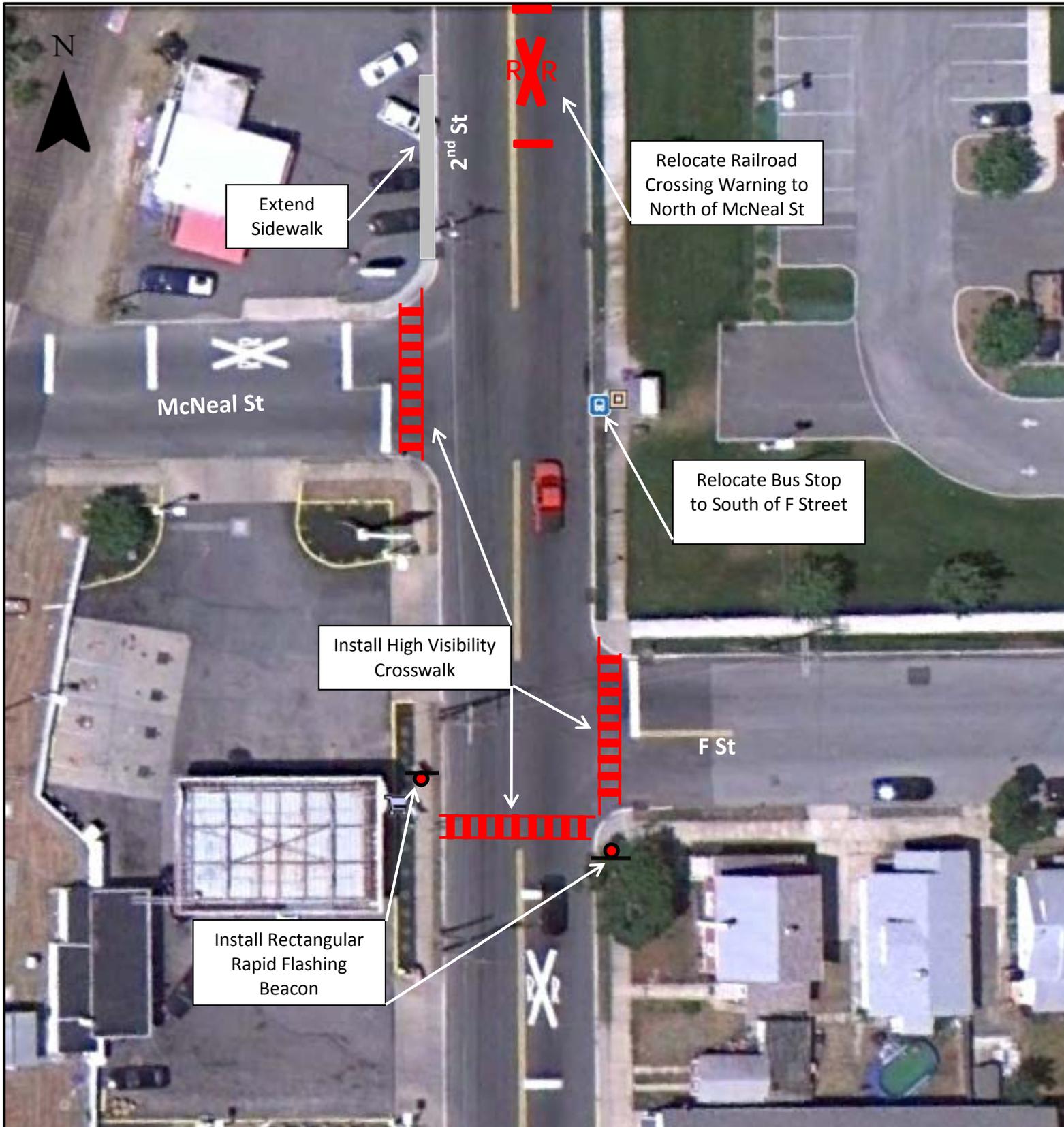
City of Millville

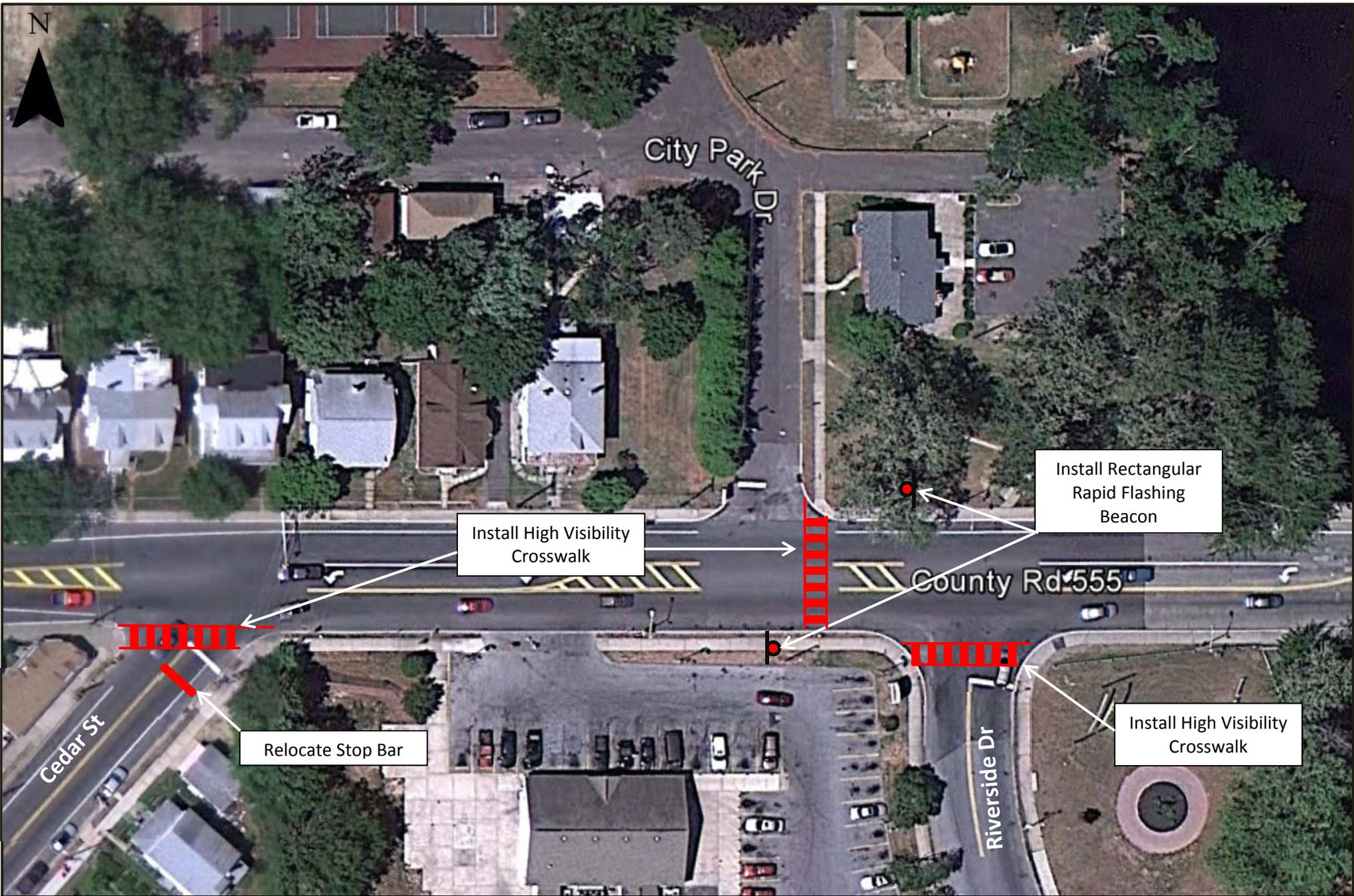
Millville Transportation Improvement Study
Figure 35: Pedestrian Intersection Improvements

December 2012

0 0.25 0.5 Mile





Baker

Millville Transportation Improvement Study

Figure 37: Crosswalk and RRFB across Main Street at City Park Drive

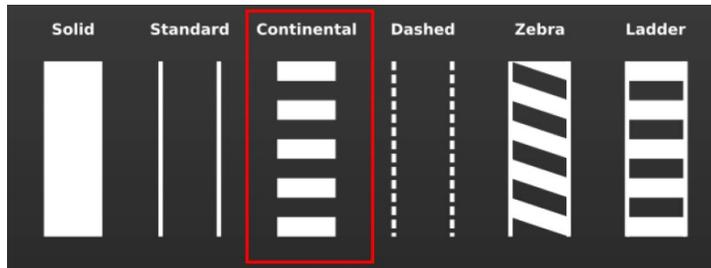
December 2012

Not to Scale

9.3 Typical Pedestrian Crossing Improvements

9.3.1 Crosswalks

Reinforcement of the requirement for motorists to stop for pedestrians at crosswalks is encouraged by utilizing high visibility crosswalks and appropriate signage. The “continental” crosswalk design is recommended for application as a high visibility crosswalk, in contrast to the standard two 4-inch paint stripes, that use the least amount of traffic marking paint. Signage reinforces the need to stop for pedestrians in the crosswalk, especially when the paint is worn or obscured by snow or leaves.



9.3.2 Flashing Warning Signs

Where there are heavy traffic volumes, the use of flashing lights can help alert oncoming motorized traffic to pedestrian movements. Lighted and flashing signs are means of accomplishing this objective to create safer pedestrian street crossings.



9.3.3 Pedestrian Signals

For major intersections, such as those near the Lakeside Middle School, crosswalks and pedestrian signals can improve pedestrian comfort and safety. A countdown timer informs the pedestrian of the time remaining to safely cross the street. Educational plaques at signals provide information that describes in graphics and text the signal cycle, particularly helpful to pedestrians unfamiliar with this type of signal.



9.4 Complete Streets Policy

Finally, it is highly recommended that Millville adopt a Complete Streets policy. According to the National Complete Streets Coalition, “The Complete Streets movement aims to develop integrated, connected networks of streets that are safe and accessible for all people, regardless of age, ability, income, ethnicity, or chosen mode of travel. Complete Streets makes active transportation such as walking and bicycling convenient; provide increased access to employment centers, commerce, and educational institutions.” The Coalition also notes that “Complete Streets means changing transportation planning, design, maintenance, and funding decisions.” A Complete Streets policy is a means for a municipality to commit to advance Complete Streets as part of future roadway improvements.

Millville has a number of different options for adopting a Complete Streets policy.

- It can incorporate the essentials of the New Jersey Complete Streets Policy, which has been recognized as a good example by the National Complete Streets Coalition. However, it should be noted that some of the New Jersey policy is more applicable to a state-level DOT. The policy can be simplified for adoption by a municipality.
- It can create its own policy, guided by the National Complete Streets Coalition summary of the elements to be incorporated into a good policy: <http://www.smartgrowthamerica.org/documents/cs-local-policy-workbook.pdf>.

- It could emulate one of the policies adopted by a municipality that has been recognized as a good example. The National Complete Streets Coalition prepared a Policy Analysis in 2011 which recognized jurisdictions with the best Complete Streets policies, and provided links to those policies. Millville could review examples of local policies and model its own policy after those found to be most appropriate to its circumstances and goals. <http://www.smartgrowthamerica.org/documents/cs/resources/cs-policyanalysis.pdf>

Besides improving conditions for pedestrians and bicyclists in the future, passage of a Complete Streets policy will also serve to add 1 point to Millville's score when it applies for funding under NJDOT Local Aid programs.

10.0 Streetscape Improvement Concepts

This chapter provides examples of streetscape concepts as they might be applied to locations in downtown Millville.

10.1 Broad Street and 3rd Street Improvements

Suitable for many intersections, proposed improvements for the intersection of Broad Street and 3rd Street (**Figure 38**) include pedestrian signals, high visibility crosswalks and stop bars, delineated parking spaces and streetscape amenities, including planting strips, street trees and patterned concrete sidewalks. Patterned and colored concrete can be used to differentiate different parts of the City, for example, the Glasstown Arts District from northern High Street.

10.2 Main Street and 3rd Street Improvements

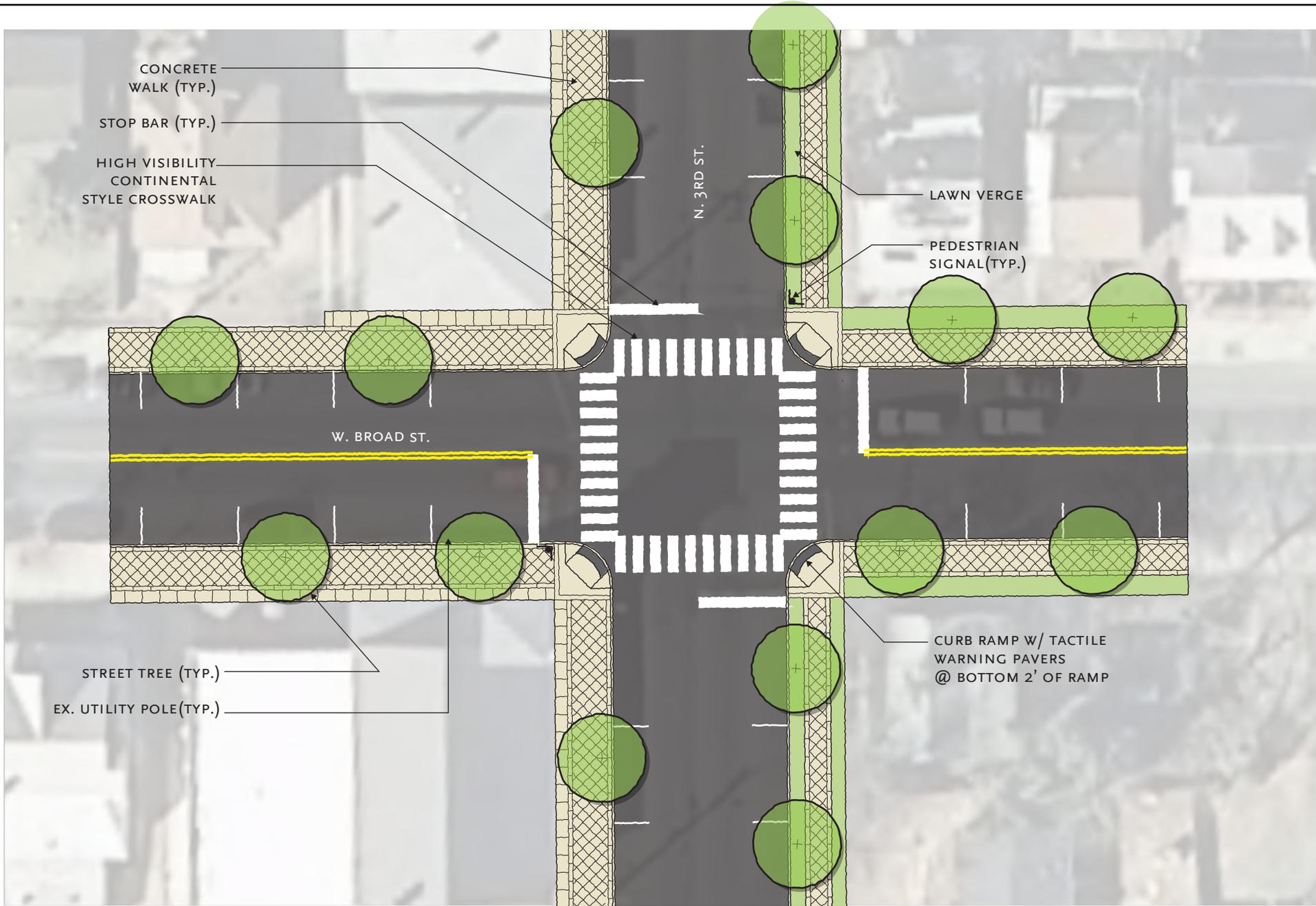
The improvements suggested for the intersection of Main Street and 3rd Street (**Figure 39**) include the use of two curb ramps at each corner. The corner itself is laid with durable granite blocks, or cobblestones, and bollards are set to prevent encroachment over the curb by trucks. The figure further demonstrates the means to accommodate a turning lane and receiving lane on Main Street that has applicability to other intersections.

10.3 Broad Street and Dock Street Improvements

Increasing the curb radius on the turning movement from northbound Dock Street to eastbound Broad Street would be beneficial in improving east/west travel through the City. The illustration in **Figure 40** depicts how the curb ramp can be increased in width, and how the crosswalks can converge without misalignment, as the curb radius increases. Improvements are also proposed on either side of the curb ramp for granite block paving against the curb and bollards to prevent run-over by trucks.

10.4 Main Street and City Park Drive Improvements

The entrance to Waltman Park from Main Street is between intersections with Cedar Street and Riverside Drive. Heavy volumes of traffic on Main Street during peak hours create difficult turning movements into the park traveling eastbound. The recent relocation of the Millville Development Corporation from an administration building in the park and its present vacancy presents the opportunity to realign the park's entrance with Riverside Drive. This would eliminate an offset of 90 feet and also create a more attractive entrance to the park. A design could also be developed that retains the building and relocates its parking to the former entrance, though it is less satisfactory since it requires a 90° turn. The proposed design (**Figure 41**) creates a landscaped island on Main Street that functions as a refuge for pedestrian crossings on the busy street. With a proposed high visibility crosswalk on Riverside, a more direct connection between Waltman Park and Riverside Park would be established.

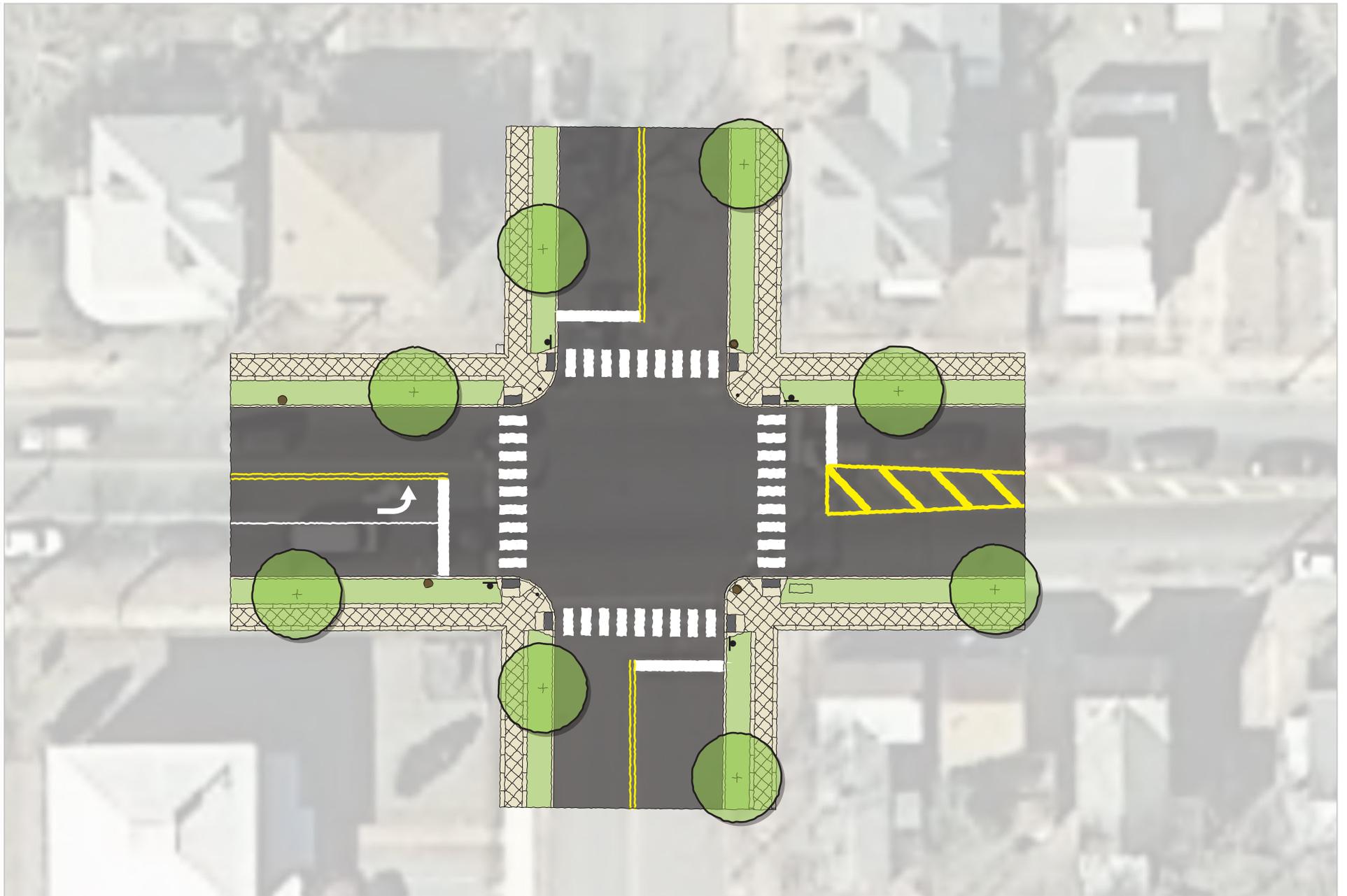


0'-0"
SCALE 30'-0"



Clarke Caton Hintz ● ● ■

Millville Transportation Improvement Study
Figure 38: Prototype 1 Intersection Improvement: Broad Street At 3rd Street
 December 2012

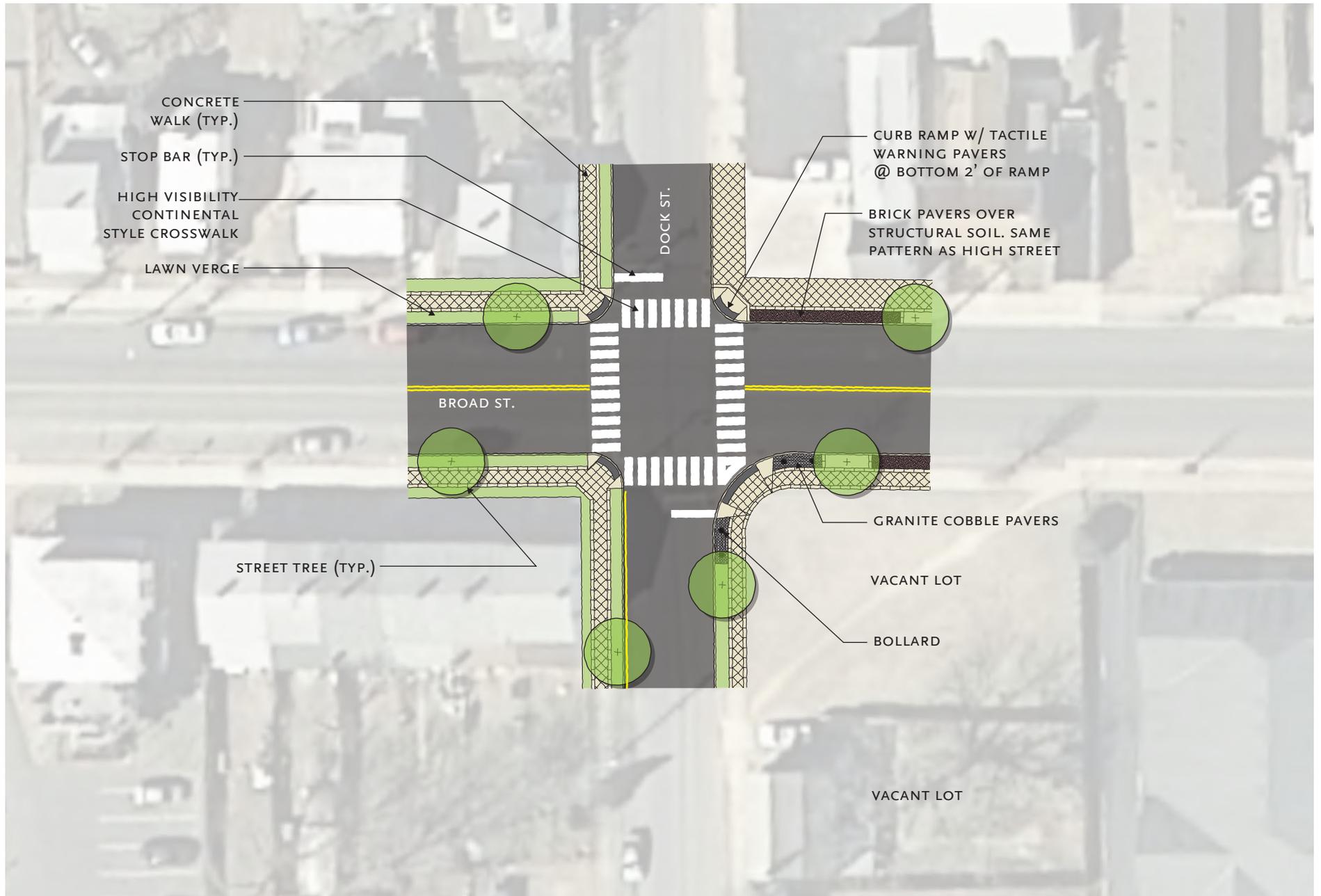


0'-0" 30'-0"
SCALE



Clarke Caton Hintz ● ● ■

Millville Transportation Improvement Study
Figure 39: Prototype 2 Intersection Improvement: Main Street At 3rd Street
 December 2012



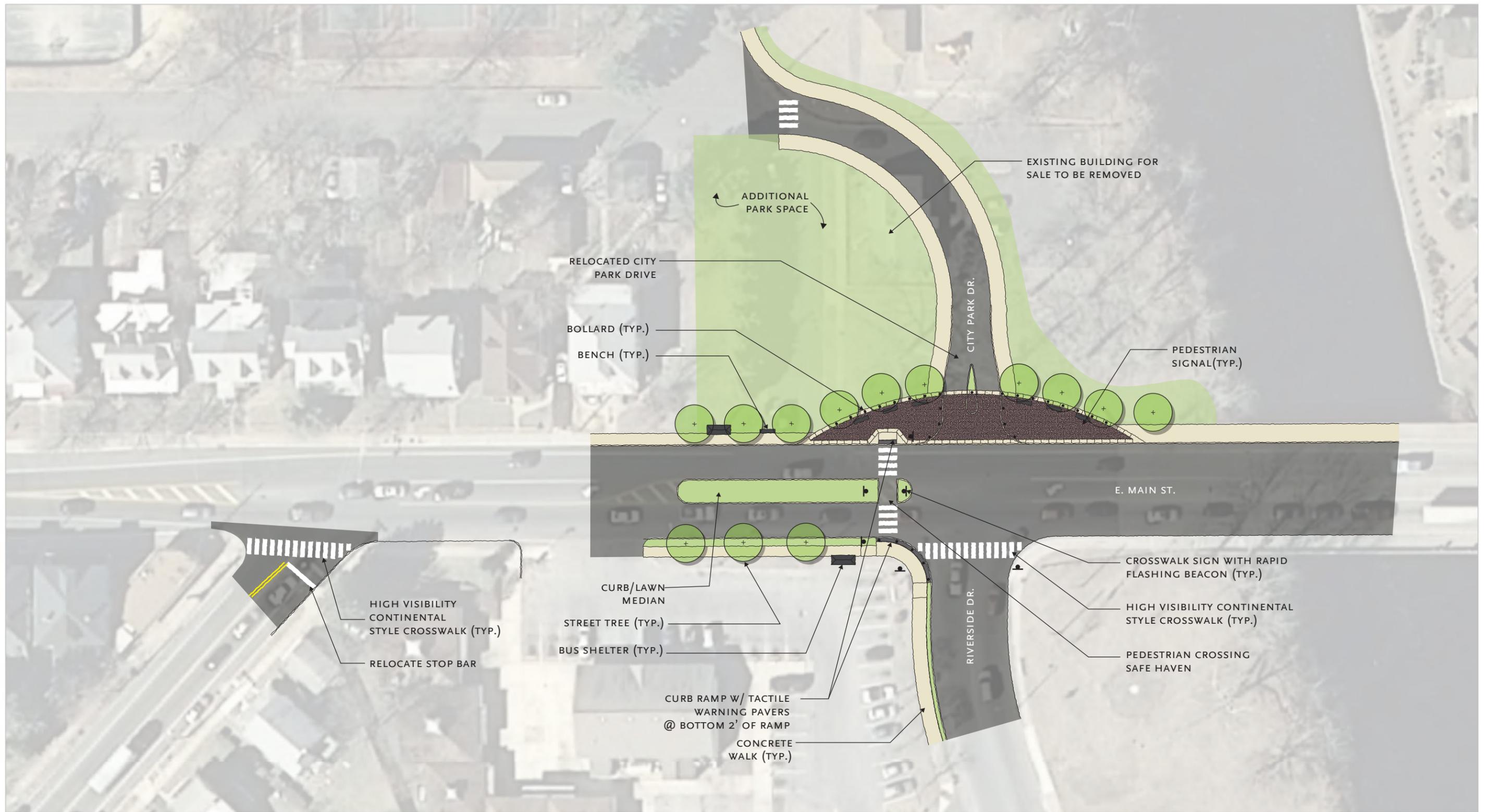
0'-0" 40'-0"
SCALE



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Millville Transportation Improvement Study
Figure 40: Broad Street at Dock Street Intersection Improvement

December 2012



0'-0" 50'-0"
SCALE



Clarke Caton Hintz ● ● ■

Millville Transportation Improvement Study
Figure 41: Main Street at City Park Drive
 December 2012

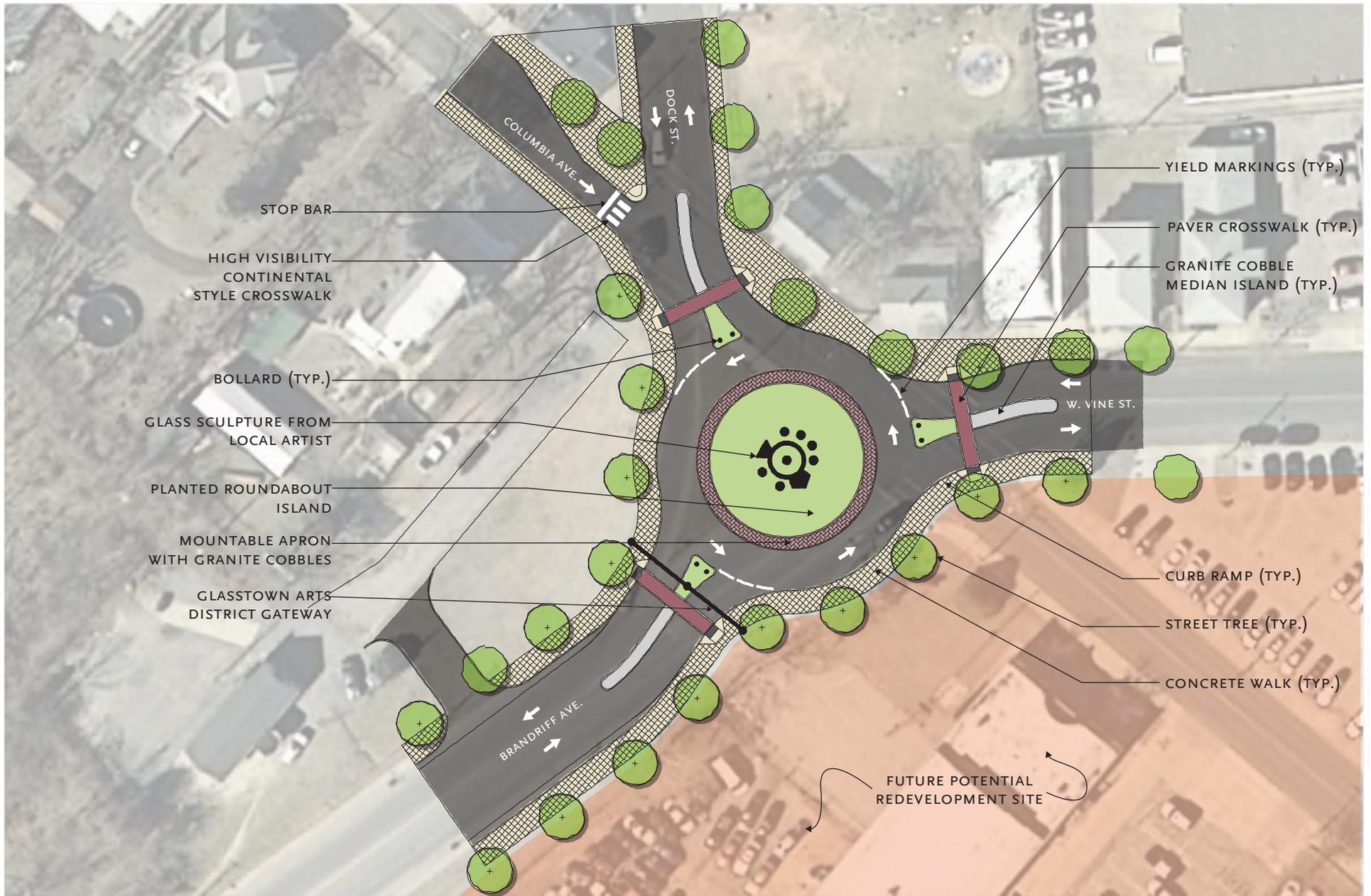
10.5 Roundabout Concepts

As discussed in Section 6.3.1, a roundabout design is proposed at the intersection of Columbia Avenue, Dock Street, W. Vine Street, and Brandriff Avenue. The Brandriff Avenue Bridge, a short distance to the southwest, is viewed in the Millville Circulation Element as a relief valve for the more heavily traveled bridges on Main and Sharp Streets, and as the logical crossing point to improve east/west travels through the City. Further, this convergence occurs directly to the north of the City's Overlook redevelopment area where hotel, restaurant, office, institutional and residential uses are contemplated. A roundabout is proposed to tie these streets together, improve east-west travel utilizing Dock Street and Brandriff Avenue, and support the creation of the proposed redevelopment.

The urban designs of the two roundabout options are depicted, in **Figures 42** and **43**. The two options have common elements. The creation of the roundabout produces the opportunity to showcase the City's downtown and its connection to the glass making industry by creating a space to exhibit a sculpture or other artwork at its center. This would also serve as a visual obstacle to the motorist, producing a "traffic calming" effect and alerting him or her of the presence of the roundabout. Another common element is a proposed archway on the Brandriff Avenue leg of the intersection that would announce to the motorist an imminent arrival to the Glasstown Arts District. This could also be sculptural in nature, using perhaps the vine and leaf motif found in Joe Buck Park stretched over the roadway or as shown in a later illustration. Further urban design elements have been added, including wide sidewalks, street trees, judicious use of granite cobbles and color marked crosswalks.

10.6 Third Street and Fourth Street One-Way Travel

The study (in section 6.2.2) recommends evaluating the change of 3rd and 4th Streets into a one-way couplet, with 3rd Street one-way southbound and 4th Street one-way northbound from Main Street northward. The cartways are proposed to be narrowed to 30 feet when the streets are reconstructed. This width allows for a 14-foot wide travel lane with two 8-foot wide parking lanes. As illustrated, curb extensions are depicted at the end of the block while retaining the full 30-foot wide cartway at each entrance to the one-way system. While the curb extensions are considered optional, they enforce the one-way system by physically restricting the cartway in locations where entering traffic is forbidden. Pedestrian crossings will be easier, with only a short distance to cross. The concept is illustrated in **Figure 44**.



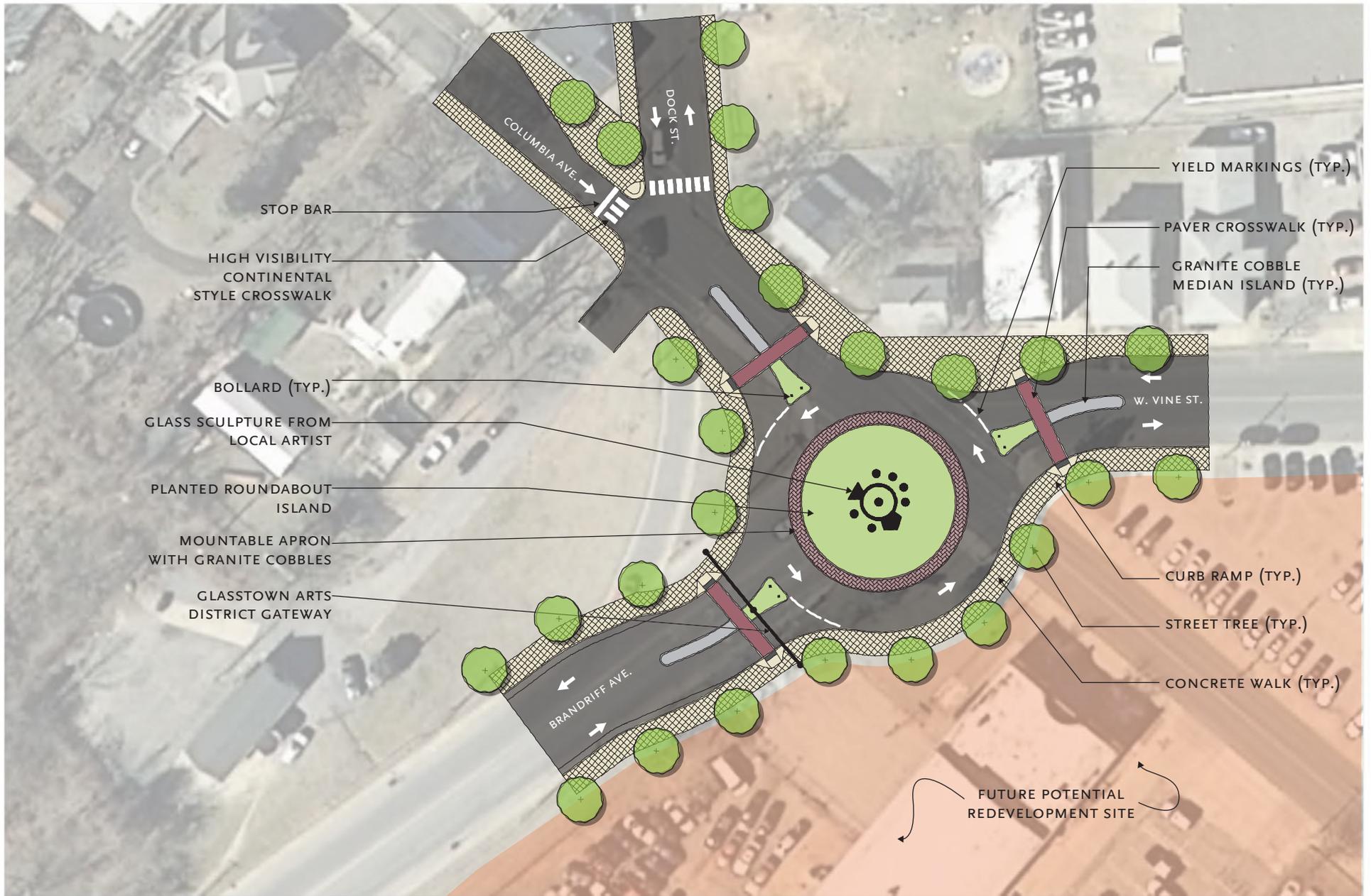
0'-0" 60'-0"
SCALE



Clarke Caton Hintz ● ● ■

Millville Transportation Improvement Study
Figure 42: Brandriff Avenue Roundabout Gateway - Concept 1

December 2012



STOP BAR

HIGH VISIBILITY
CONTINENTAL
STYLE CROSSWALK

BOLLARD (TYP.)

GLASS SCULPTURE FROM
LOCAL ARTIST

PLANTED ROUNDABOUT
ISLAND

MOUNTABLE APRON
WITH GRANITE COBBLES

GLASSTOWN ARTS
DISTRICT GATEWAY

YIELD MARKINGS (TYP.)

PAVER CROSSWALK (TYP.)

GRANITE COBBLE
MEDIAN ISLAND (TYP.)

CURB RAMP (TYP.)

STREET TREE (TYP.)

CONCRETE WALK (TYP.)

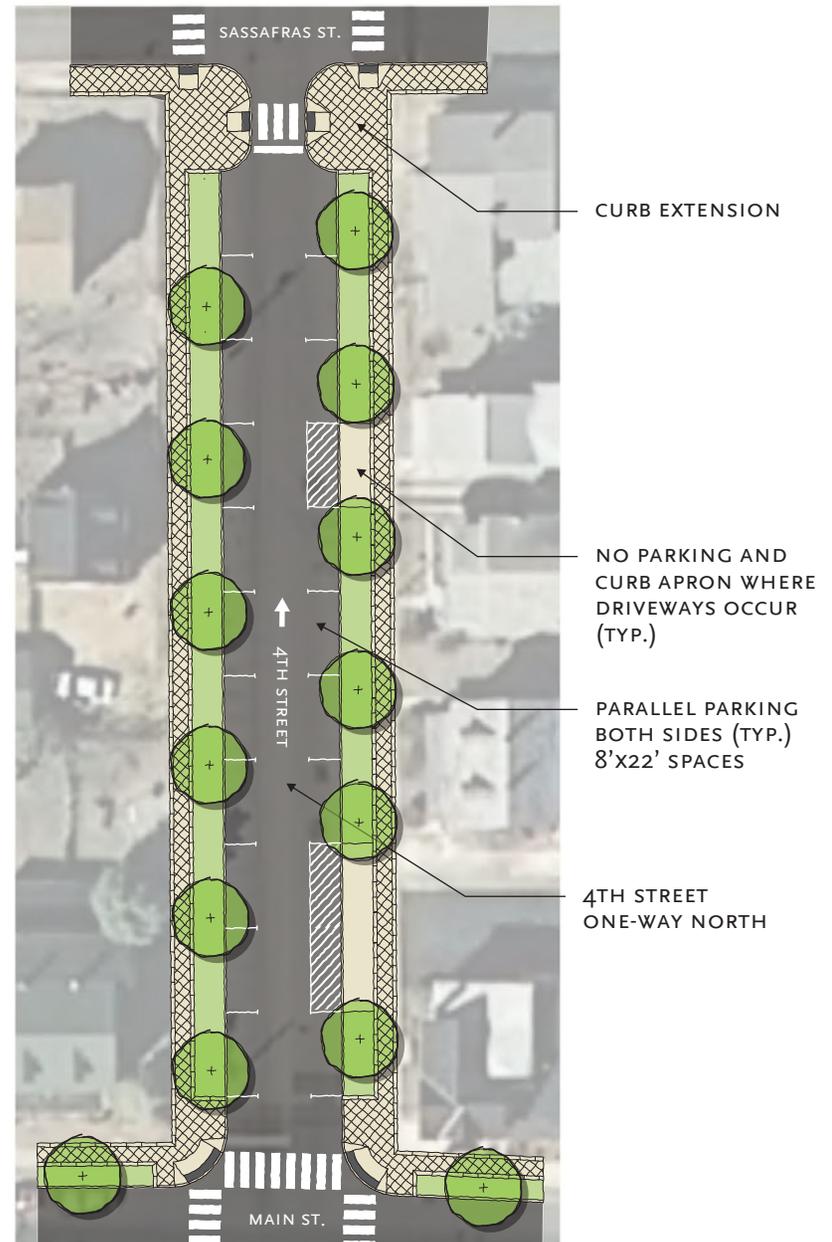
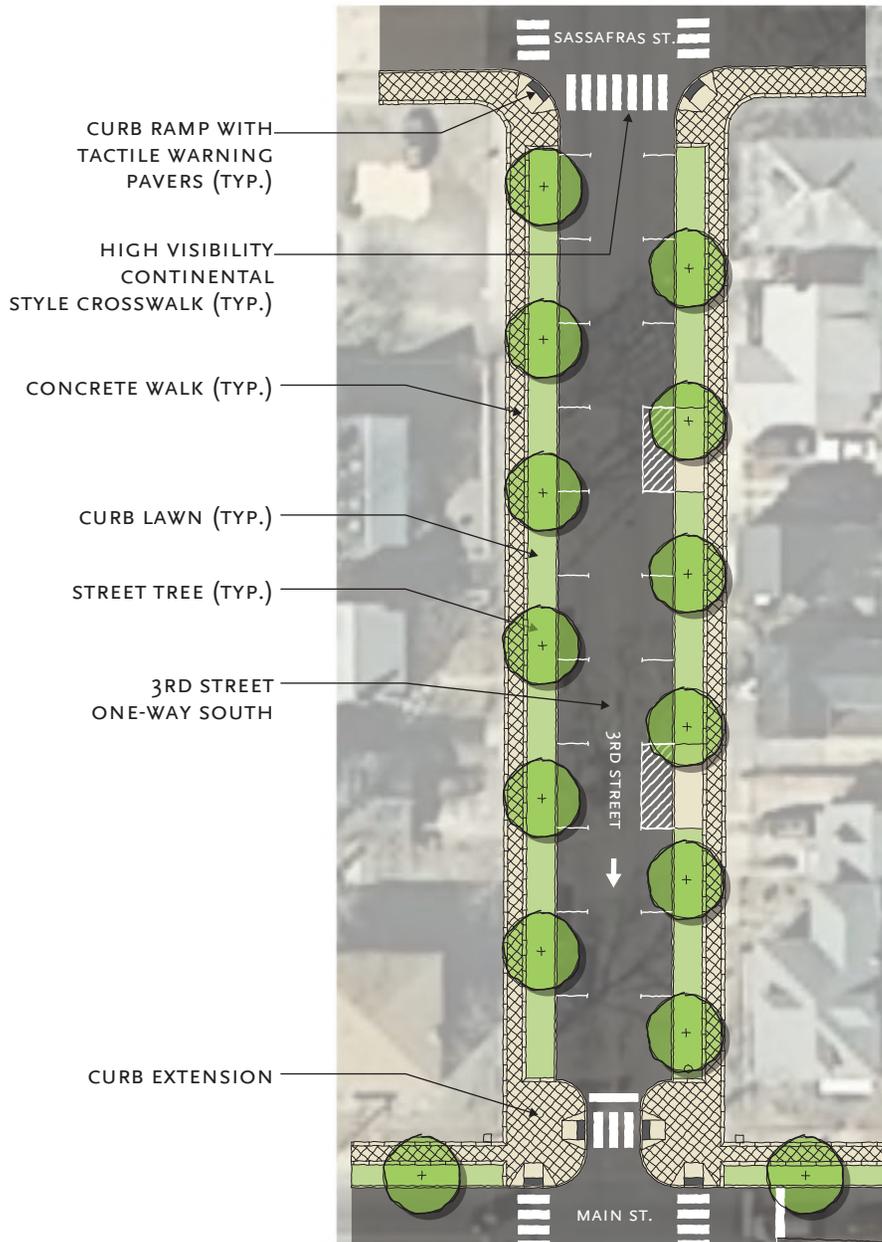
FUTURE POTENTIAL
REDEVELOPMENT SITE

0'-0" 60'-0"
SCALE



Clarke Caton Hintz ● ● ■

Millville Transportation Improvement Study
Figure 43: Brandriff Avenue Roundabout Gateway - Concept 2
 December 2012



0'-0" 50'-0"
SCALE



Clarke Caton Hintz ● ● ■

Millville Transportation Improvement Study
Figure 44: 3rd and 4th Streets - One-way Travel Concept

December 2012

10.7 Streetscape Furnishings

10.7.1 Bollard Examples

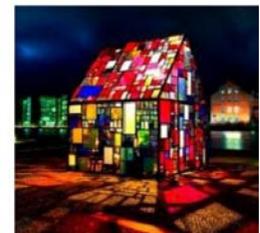


As the City has developed public spaces in recent years, it has used a number of the urban design treatments recommended above, including colored and patterned concrete, decorative bollards, and other street furniture. Bollards and street lighting can be matched in design and used to specifically identify an area of the City.

Hardscape pavers may also be used effectively to create a durable, low maintenance alternative to grass lawn verges or planting strips at corners. Bollards also serve to delineate corners and crossing areas for pedestrians.

10.7.2 Gateway and Sculpture

Examples of an arts district gateway and of several different types of glass sculpture are presented to illustrate these ideas.



10.7.3 Street Furniture and Bus Stop

The City could enhance its Arts District with attractive bus shelters and street furniture to enliven the streetscape.



11.0 Land Uses Redevelopment Concepts

The Overlook redevelopment area in downtown Millville is a collection of City owned lands – some of which are under Green Acres protection – as well as a few parcels in private ownership. Two scenarios were prepared for this redevelopment area, in order to ensure that the City’s transportation network and parking supply is sufficient to accommodate the various land uses intended for the redevelopment area.

11.1 Redevelopment Area Option 1

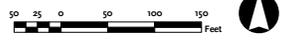
As shown in **Figure 45**, redevelopment land uses in Option 1 include a 118 room hotel, a new 20,000 square foot public library, American Legion and City Museum, retail shops including a restaurant, and 68 dwelling units. Parking needs would be addressed by a 264 space parking garage and 140 surface spaces. The parking is also proposed to meet the needs of the rebuilt Levoy Theatre on High Street. The trip distribution analysis indicates that this redevelopment option can be accommodated by the existing street network.

11.2 Redevelopment Area Option 2

As shown in **Figure 46**, the second redevelopment scenario has many of the same elements as the first, but increases the number of dwellings by four and increases the restaurant area by 50%. Option 2 adds offices as an additional land use compared to Option 1. Parking in Option 2 is addressed primarily through surface parking, unlike Option 1. The proposed parking deck is closer to the Levoy Theatre in this redevelopment scenario. The trip distribution analysis indicates that this redevelopment option can be accommodated by the existing street network.



Source: The Overlook Arts and Entertainment District Parcel Identification Map, Prepared by R/C May 2007
 This map was developed using New Jersey of Environmental Protection Geographic Information Systems digital data, but this secondary product has not been NJDEP verified and is not State authorized.



Legend

- Redevelopment Area
- Water
- Green Acres Land
- City Owned Parcels
- Other Parcels



Clarke Caton Hintz ● ● ■

Millville Transportation Improvement Study
Figure 45: Redevelopment Area Land Use - Option 1
 December 2012



Source: The Overlook Arts and Entertainment District Parcel Identification Map, Prepared by R/C May 2007
 This map was developed using New Jersey of Environmental Protection Geographic Information Systems digital data, but this secondary product has not been NJDEP verified and is not State authorized.



Legend

- Redevelopment Area
- Water
- Green Acres Land
- City Owned Parcels
- Other Parcels



Clarke Caton Hintz ● ● ■

Millville Transportation Improvement Study
Figure 46: Redevelopment Area Land Use - Option 2
 December 2012

11.3 Parking Deck on Pine Street

The parking deck concept for Option 2 takes advantage of the sloping topography from Pine Street south to Sassafras Street. The deck is at grade on Pine Street and about 12 feet high at Sassafras Street. The deck is also sloped towards Sassafras Street to ensure adequate drainage. Portions of the land under the deck towards Pine Street will need to be excavated to create sufficient head room for vehicles to park underneath the deck. The existing southernmost parking lots can substantially retain their existing configurations, resulting in lower costs. The deck could provide 62 spaces and the under deck area 50 spaces. This concept is illustrated in **Figure 47**.

12.0 Implementation Plan

Table 7 summarizes the improvements recommended in this study, along with the responsible party, order-of-magnitude cost range, and general time frame. The three governmental jurisdictions of Millville, Cumberland County, and NJDOT will need to coordinate on many of the improvements.

It should be emphasized that the cost estimates are planning-level, “order-of-magnitude” estimates. It is likely that estimates will change as improvements are actually designed. It should not be assumed that actual costs would be higher than the estimates listed below. The costs will also differ depending upon whether the work is performed by private contractors or public agency forces, and depending upon the context of the improvement. For example, roadway restriping projects will cost less if conducted as part of larger roadway resurfacing projects, instead of being initiated by themselves.

Cost estimates for typical pedestrian and bicycle improvements are provide in Table 8, below. Since there is a large number of discrete pedestrian and bicycle improvements, typical unit costs are provided, rather than costs per site.

Given the extensive list of proposed improvements, and the needed involvement of different jurisdictions, it is recommended that an “Implementation Committee” be formed to shepherd the various projects. Cumberland County and Millville representatives could meet on a regular basis (e.g., every three months) to discuss how to best effectuate the strategies summarized in this chapter, bringing in personnel from the state where coordination with the NJDOT is required.

Table 7: Implementation Matrix

Improvement	Responsible Party	Cost Estimate	Time Frame	Possible Funding Source
<i>Brandriff Avenue to Broad Street Corridor</i>				
Intersection improvement at Brandriff Ave, Columbia Ave, Vine St, and Dock St – roundabout option 1	Millville	\$275,000	Long	Redevelopment project; NJDOT Local Aid; Millville
Intersection improvement at Brandriff Ave, Columbia Ave, Vine St, and Dock St – roundabout option 2	Millville	\$281,000	Long	Redevelopment project; NJDOT Local Aid; Millville
Intersection improvement at Brandriff Ave, Columbia Ave, Vine St, and Dock St – Realigned intersection	Millville	\$114,000	Medium	Redevelopment project; NJDOT Local Aid; Millville

Enlarge southeast curb radius at Dock St and Broad St	Millville	\$31,000	Medium	NJDOT Local Aid; Millville
Install channelized right turn lane at Dock St and Broad St	Millville	\$24,000	Medium	NJDOT Local Aid; Millville
Prohibit on-street parking on Dock St	Millville	Minimal	Short	Millville
Synchronize signals along Broad Street	NJDOT	Minimal	Short	NJDOT
CR 555 Improvements				
Install one-lane choker on 3 rd St at Wheaton Ave	Millville	\$31,000	Medium	Millville
Install two-lane choker on 3 rd St at Wheaton Ave	Millville	\$29,000	Medium	Millville
Designate 4 th Street as CR 555	Cumberland County; Millville	Minimal (striping and signing costs)	Short	Cumberland County
Signalize intersection of 4 th St and Main St	NJDOT	\$165,000	Long	NJDOT
Make 3 rd Street one-way southbound and 4 th Street one-way northbound, and designate both as CR 555	Cumberland County; Millville	Varies (miscellaneous costs for signing and striping)	Medium	Millville; Cumberland County
Other Vehicular Improvements				
Extend Nabb Ave	Cumberland County, Millville, property owners	\$3,602,000	Long	Cumberland County; developers
Restripe Main St from High St to 3 rd St	NJDOT	\$2,800	Medium	NJDOT
Increase northwest curb radius at Main St and 2 nd St	NJDOT	\$17,000	Medium	NJDOT
Install LED signals at Main St and 2 nd St	NJDOT	\$9,000	Short	NJDOT
Restripe Sharp St approach to Main St; install LED signals; and increase northeast curb radius	NJDOT, Cumberland County	\$66,000	Medium	NJDOT; Cumberland County
Install LED signals at Main St and Brandriff Ave	NJDOT	\$9,000	Short	NJDOT
Signalize intersection of Broad St and Buck St	Millville	\$165,000	Long	NJDOT Local Aid; Millville
Northern Millville Network Improvements				
Extend Wade Boulevard	Cumberland	\$1,360,000	Long	Cumberland County

	County			
Extend SW Boulevard	Millville	\$299,000	Long	NJDOT Local Aid; Millville
Route 47 Service Road	Millville, through coordination with landowners	\$1,315,000	Long	Developers; Millville
Route 55 Connector	Millville, through coordination with landowners	\$1,923,000	Long	Developers; Millville
Modifications to Route 55 Off-Ramp				
Vacate existing off-ramp	NJDOT	\$37,000	Long	Federal aid; NJDOT; Millville; developers
Construct new off-ramp	NJDOT	\$119,000	Long	Federal aid; NJDOT; Millville; developers
Realign Bluebird Lane	Millville	\$324,000	Long	NJDOT; Millville; developers
At eastbound approach to Route 55, close channelized right turn lane, and install new right turn lane and left turn lane	NJDOT	\$263,000	Long	Federal aid; NJDOT; Millville; developers
Pedestrian and Bicycle Improvements				
Develop comprehensive City-wide bicycle network	Depends upon roadway – NJDOT; Cumberland County; Millville	Variable for improvement – see table below	Long (to develop comprehensive network; some segments can be done short-term)	NJDOT Local Aid Bikeways; Safe Routes to School
Install path on Wawa tract to Union Lake WMA	Millville	\$300,000	Long	NJDOT Local Aid Bikeways
Install sidewalks on priority roadways	Depends upon roadway – NJDOT; Cumberland County; Millville	Variable for improvement – see table below	Long	NJDOT Local Aid Safe Streets to Transit; Safe Routes to School; NJDOT; Cumberland County; Millville
Install pedestrian improvements at priority intersections	Depends upon intersection – NJDOT; Cumberland County; Millville	Variable for improvement – see table below	Varies	NJDOT Local Aid Safe Streets to Transit; Safe Routes to School; NJDOT; Cumberland County; Millville

Time Frame: Short <1 year
 Medium 1-3 years
 Long >3 years

Table 8: Typical Pedestrian and Bicycle Facility Costs

Improvement	Unit	Unit Cost
New sidewalk	100 linear feet	\$10,000
Crosswalk markings	1 intersection of 2 roads, both 40 feet wide	
Pedestrian signal heads	1 pedestrian signal and pedestrian push-button	\$1,900

Shared Lane Markings, including pavement markings and signs	1000 linear feet	\$2,600
Bike Lane, including pavement markings and signs	1000 linear feet	\$2,100
Share the Road shoulder treatment, including pavement markings and signs	1000 linear feet	\$2,400