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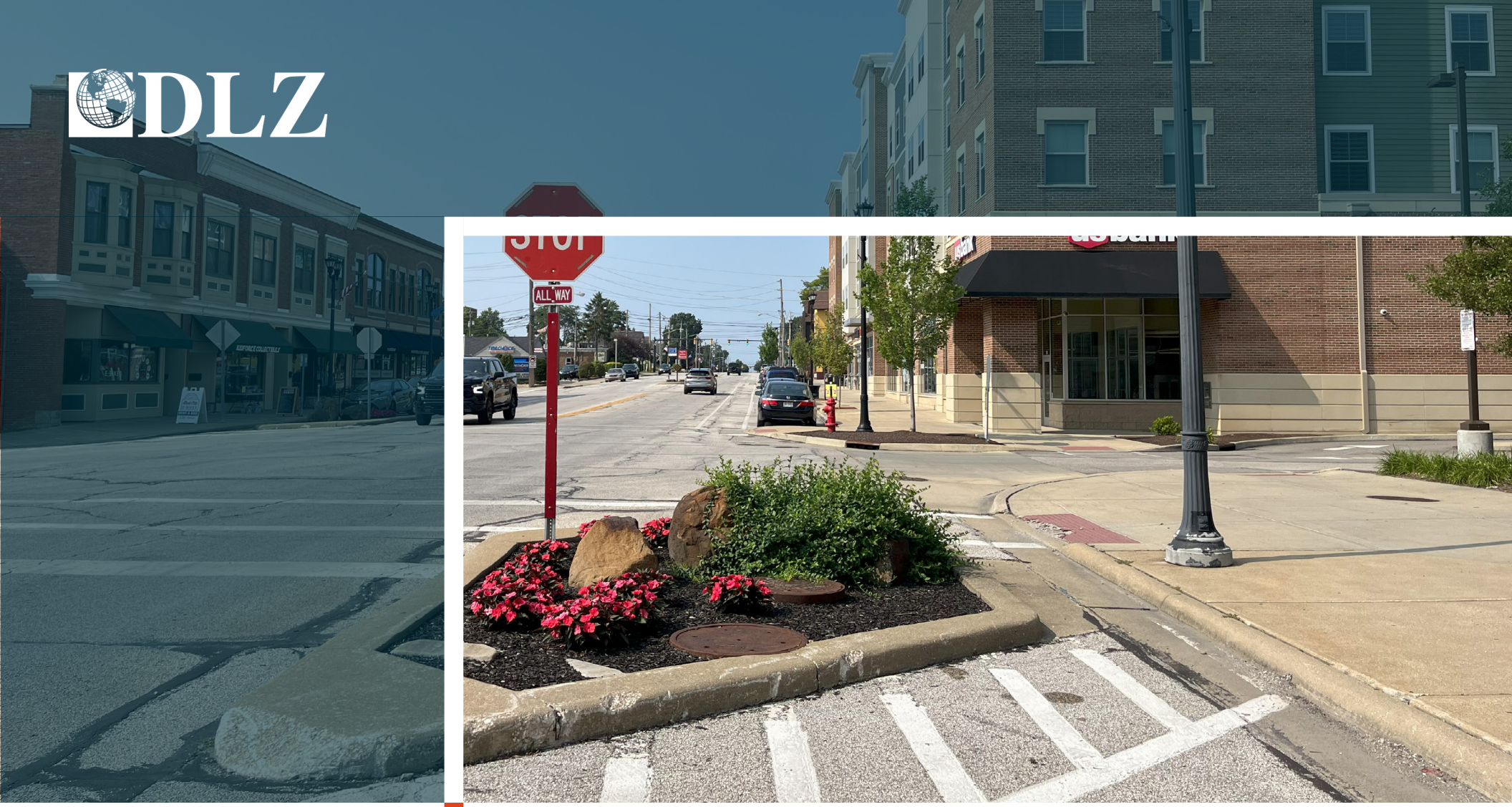

NOACA
Northeast Ohio Areawide Coordinating Agency

CITY OF BEREA
The Grindstone City
1836

DOWNTOWN BEREA MULTIMODAL TRANSPORTATION IMPROVEMENT PLAN

August 2024

Acknowledgements

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This study was prepared by DLZ and Lawhon in partnership with the City of Berea and NOACA as part of the TLCI Program.

DLZ

LA Lawhon & Associates, Inc.

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Project Background and Purpose

NOACA's Transportation for Livable Communities (TLCI) program seeks to assist localities in thinking through concrete improvements to infrastructure that can make a real impact in the lives of their residents. A thriving downtown area with a diversity of businesses that enjoy ready access by patrons, whether they are local residents or regional visitors, can be key to fostering and maintaining a high quality of life for residents in the broader city, not only the downtown area. Major components of a thriving downtown include functional and safe transportation systems for a variety of users and modes ranging from delivery of goods to retail stores via large trucks to pedestrian and bike access to and within the area.

Downtown Berea is already a thriving destination for many people, which at times results in a level of congestion that can be a deterrent for some and a safety concern for others. The purpose of this effort is to provide a data-driven process to identify what transportation improvements are needed to foster the continued growth of Berea's downtown area so that it can continue to function as both the daily center of the community for residents and students as well as a regional destination for Northeast Ohioans.

Goals

The overall goals of this study are as follows:

- Improve the efficiency and safety for all modes of transportation.
- Enhance accessibility and mobility for all modes of travel.
- Promote non-motorized modes of travel.

Objectives

The following objectives were identified to support the achievement of these goals.

- Reduce the number of crashes involving pedestrian, cyclist, and other non-motorized modes of travel.
- Develop coordinated wayfinding and signage designed to guide all modes of travel.
- Provide all residents, students, visitors, and the business community with better and safer access to, from, and within the Downtown core.
- Develop new infrastructure to promote non-motorized modes of travel.

The purpose of this effort is to provide a data-driven process with community input to identify what transportation improvements are needed to foster the continued growth of Berea's downtown area.

Plan Location

The City of Berea is a historic community located approximately 12 miles South of Downtown Cleveland, Ohio and 2 miles South of Cleveland's Hopkins International Airport in Cuyahoga County. It is home to just under 20,000 people, and features a rich history in sandstone quarries, education, and transportation. The city is also home to Baldwin Wallace University, Cuyahoga County Fairgrounds, and the training facility for the Cleveland Browns.

The study area is located in the City of Berea with the following Boundaries:

- Western Boundary is State Route 237 from West Street to Bagley Road
- Northern Boundary is Bagley Road from Mulberry Street to Beech Street
- Eastern Boundary is Beech Street from Bagley Road to East Center Street
  - East Center Street to Eastland Road
  - East Bridge Street
  - Southern border of Coe Lake by Baldwin Creek
- Southern Boundary is Baldwin Creek along southern border of Coe Lake, and North Quarry Lane

Figure 1 shows the boundary for this project as described above.

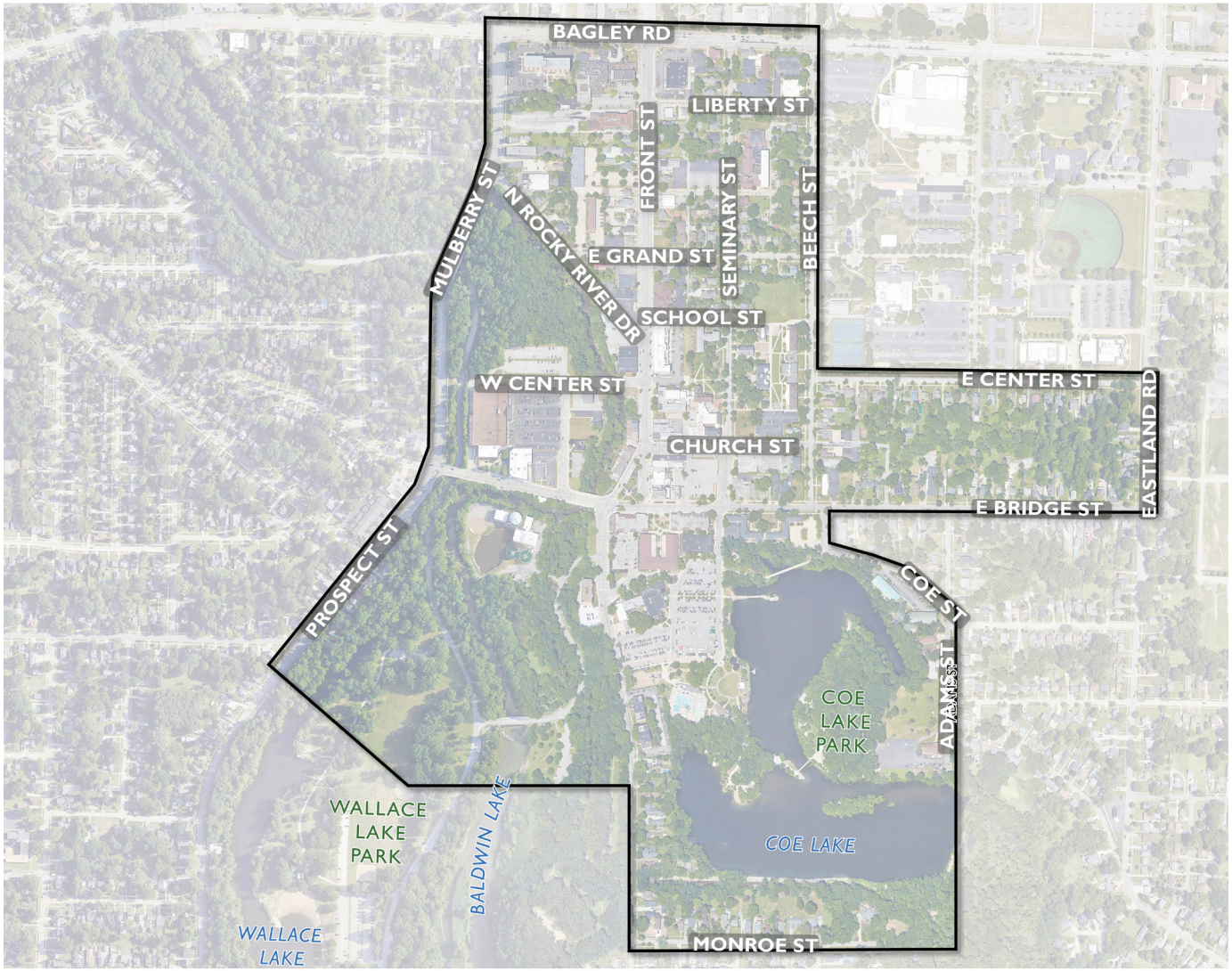


Figure 1 - Project Location Map

02

Existing Conditions

Key Facts & Figures

The City of Berea has a population just under 20,000. The socioeconomic data can be found in the figure below.

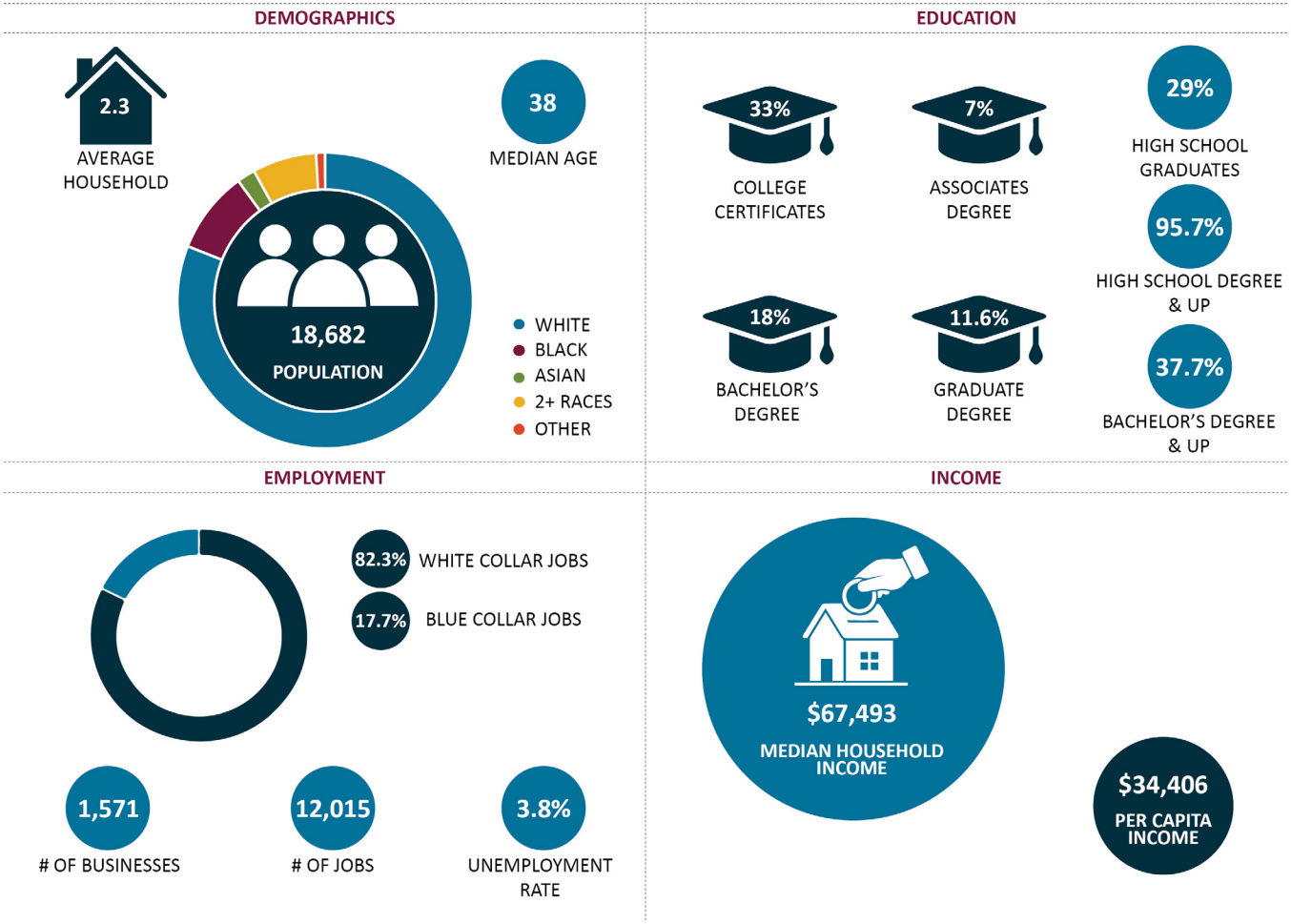


Figure 2 - Key Facts and Figures

Sources: https://www.cityofberea.org/323/Demographics
https://www.census.gov/quickfacts/fact/table/bereacityohio/SEX255222

According to the US Census Bureau, the City of Berea has a 2020 population of just under 20,000 with an estimated population of 70,000 in the cities immediately adjacent to the City of Berea (The cities of Strongsville, Middleburg Heights, and Olmsted Falls). The socioeconomic data for the City of Berea can be found in the figure to the left. The demographics indicate a relatively young population given a median age of 38 years compared to an average median age of 46.3 years old in the adjacent cities, and a mix of family sizes and living arrangements with an average household size of 2.3 individuals. The City of Berea demonstrates an average degree of educational achievement compared to the adjacent cities with 95.7% of its residents having graduated high school or attained higher education, and 37.7% holding a bachelor's degree or higher. Economically, the city has a lower median household income of $67,493 compared to the adjacent cities that have an average median household income of $89,000. Employment is an asset of Berea with 1,571 businesses in the city that provides over 12,000 jobs, contributing to a low unemployment rate of 3.8%. This data highlights Berea as a city with a solid educational foundation, solid economic performance, and a diverse, well-educated population.

Land Use Types

The study area consists of a mix of zoning districts including standard single family residential, multiple family district, college district, transitional office district, commercial center district, and downtown district zones. Figure 3 shows the location of these land use types and how the areas are split. The figure shows that the different zone types are of relatively the same size compared with one another representing an even distribution of land uses apart from the transitional office district type which is smaller in size. This is notable in that the study area is not defined by one dominant zoning designation or land use type. The various land uses -- college district, single family residential and commercial and downtown districts -- are all adjacent and in close proximity to one another. This has contributed to a vibrant, urban area for residents, students and businesses which has great economic and quality of life benefits. This proximity and vibrancy can also create challenges when it comes to transportation, mobility, and parking.

Land within the study area is generally built out with limited opportunity for significant development. Some underutilized buildings are in the process of being redeveloped for reuse. These include the residential building south of Bridge Street at Seminary which is undergoing renovations for Baldwin Wallace student housing and the redevelopment of a building on the west side of Front Street at Liberty Street.

These projects can be expected to generate moderate changes in vehicular, pedestrian and bicycle related traffic locally at the individual sites and could benefit from improved pedestrian crossings in their respective immediate areas. However, these projects are not expected to have material impacts on traffic within the study area overall.

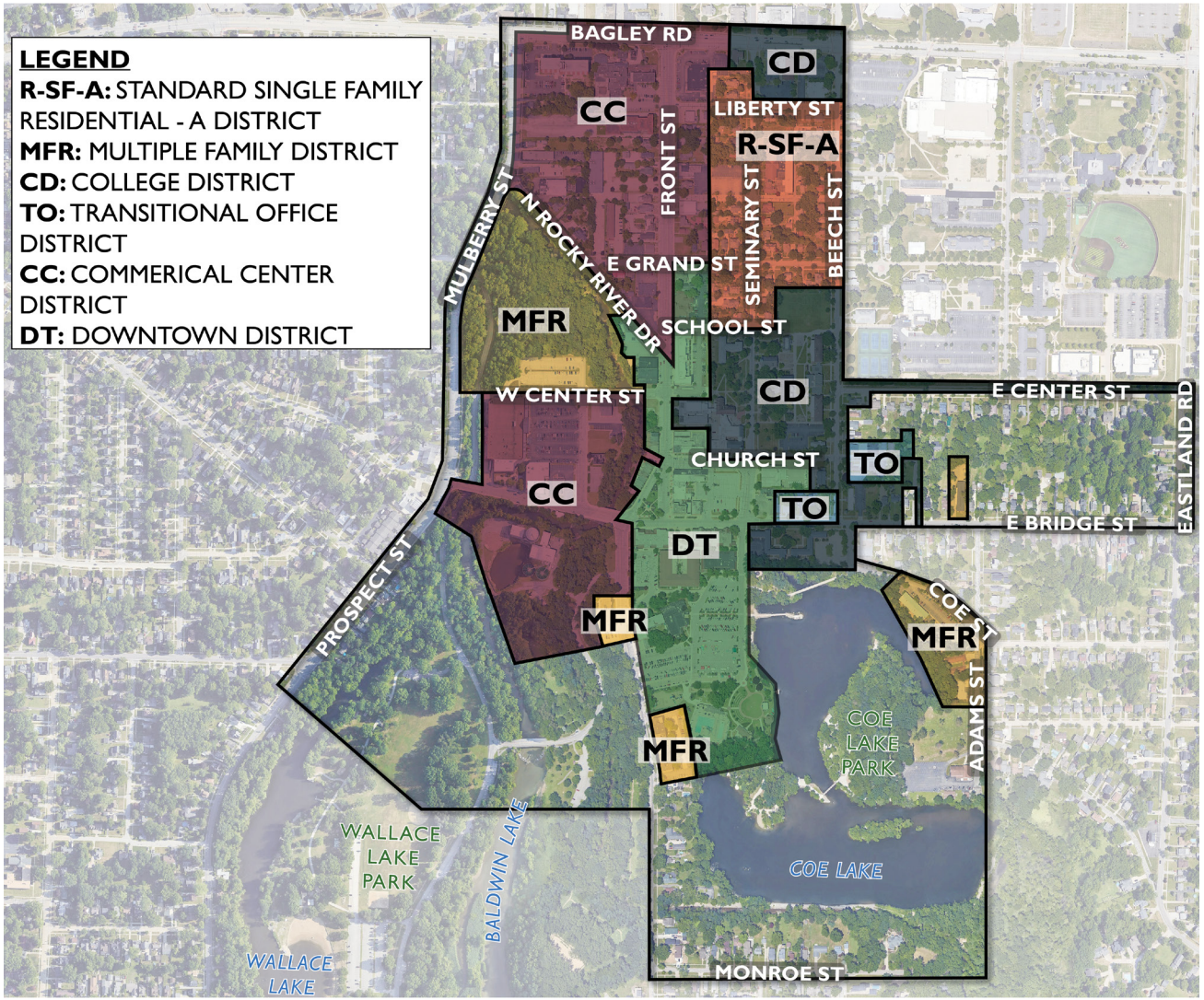


Figure 3 - Land Use Zoning Map

Source: City of Berea

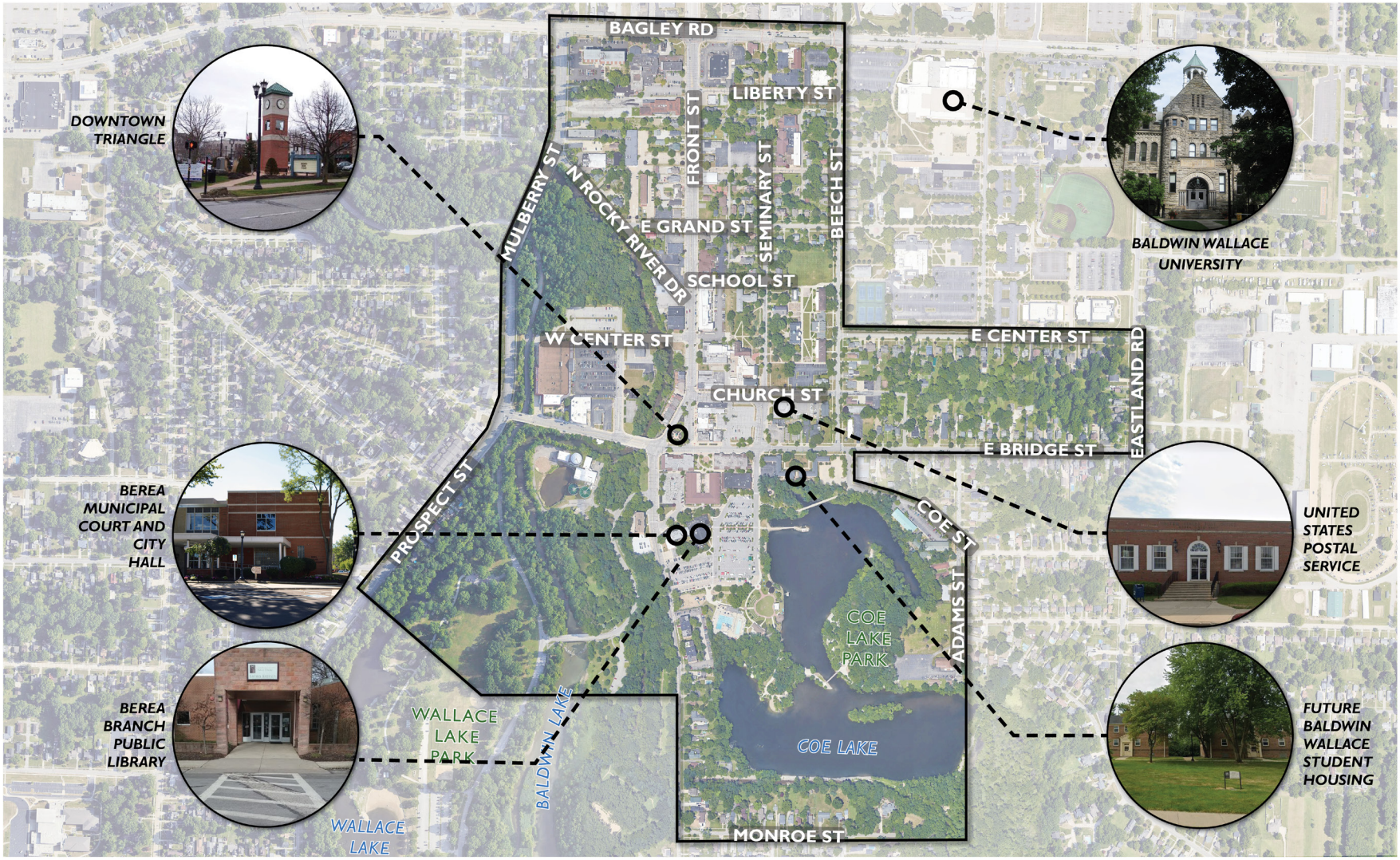


Figure 4 - Downtown Business District

Downtown Business District

The Downtown Business District is the main destination area within our project study area. The Downtown area includes municipal buildings, Baldwin Wallace University, restaurants, parks and more. Some key Downtown buildings that serve as traffic generators are identified in Figure 4.

As part of the study, this core downtown area was analyzed for various improvements for both motorized and non-motorized modes of transportation.

Environmental Justice Communities

Figure 5 shows the project study area outlined in white with black hatching inside. The red shading on the map distinguishes the areas that are environmental justice (EJ) communities. EJ communities are defined by NOACA as those where either the minority population or low income population is greater than or equal to the lesser of the regional or national average. By identifying these areas, NOACA is adhering to Federal and State guidelines for the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income. Figure 5 shows that the majority of our project area is located within an EJ community. This fact should be considered when developing plans to improve infrastructure and obtain funding for those improvements.

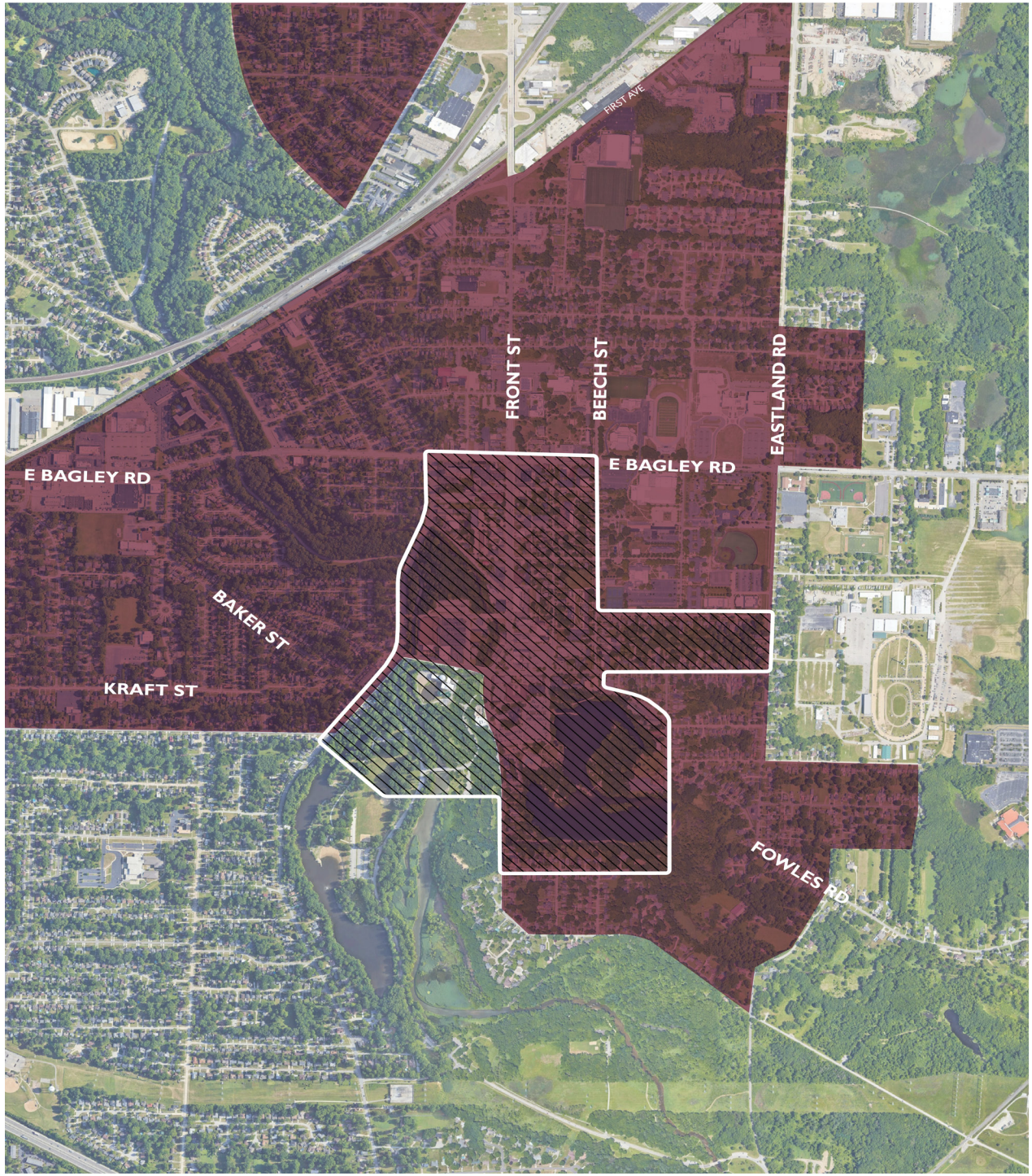


Figure 5 - Existing Environmental Justice Communities

Source: NOACA

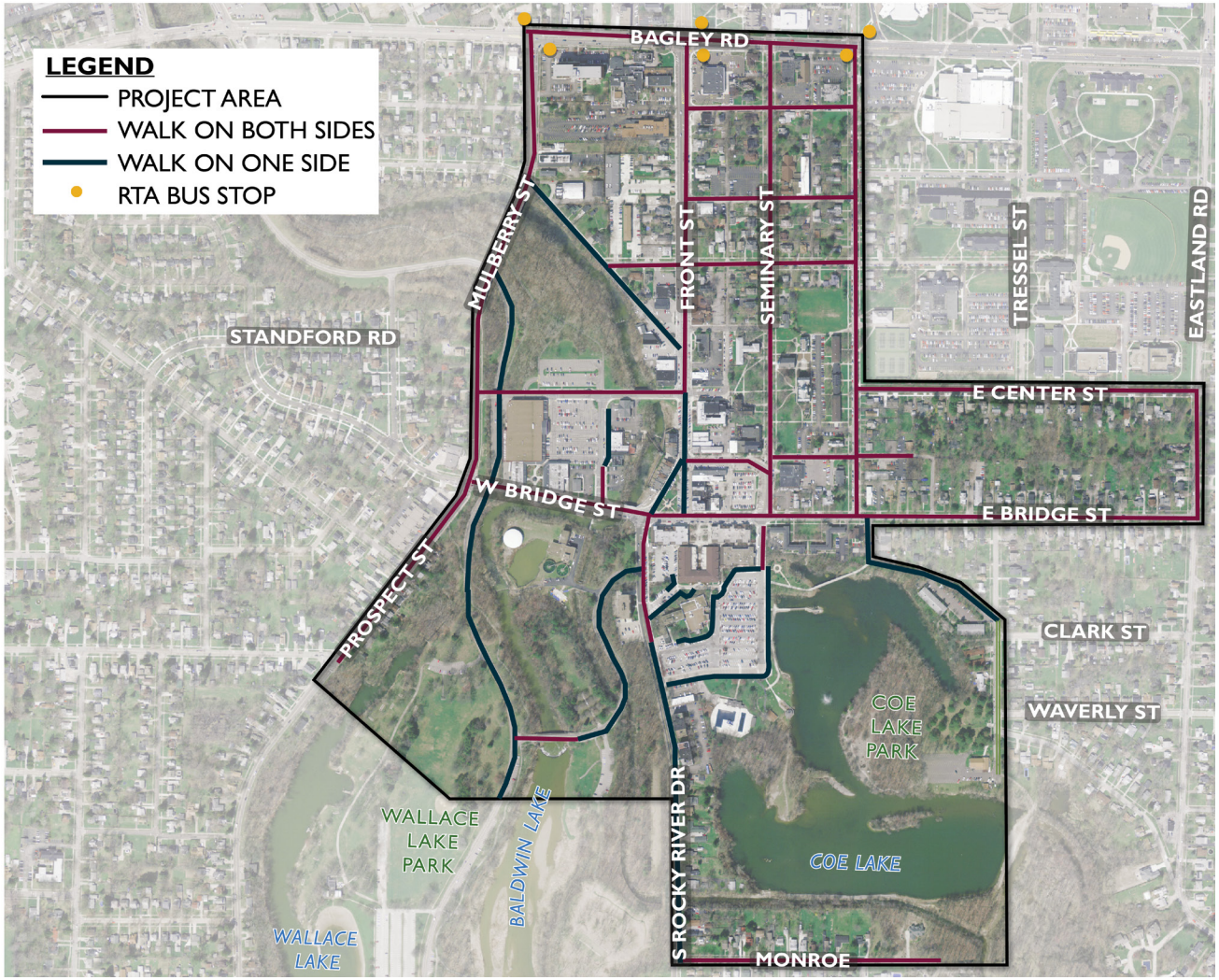


Figure 6 - Existing Sidewalks and Bus Stops

Existing Pedestrian Network

Sidewalks

An inventory of the existing sidewalks within the study area was conducted and is illustrated in Figure 6. The study area is fully served by urban sidewalks on one or both sides of the street. Sidewalks in the downtown area were generally observed to be in good condition. Some portions of the sidewalk in residential areas were observed to be in fair condition but not in need of immediate repair.

Sidewalks are generally of sufficient width and separated from the roadway with a buffer. Exceptions include the sidewalk along North Rocky River Drive which does not have a buffer but does have sufficient width. Sidewalks along Spring Street and Liberty Street are narrower, have no buffer and lack curb ramps at alleys.

Gaps in the sidewalk network were identified at a few locations:

- North Rocky River Drive has no sidewalk on the west side of the street
- Riverside Drive between Bridge Street and Church Street has no sidewalk on the east side of the street
- Front Street between Bridge Street and Church Street has no sidewalk on the west side of the street
- A 120’ gap in the sidewalk exists on the west side of Front Street south of W Center Street

The sidewalk gap on the west side of Front Street south of Center Street should be completed to maintain a continuous pedestrian network in that area. Pedestrians currently must enter the street and walk behind parked cars to continue where this sidewalk gap exists.

The areas identified above where sidewalk exists on only one side of the street were not found to impact the continuity of the pedestrian network so no suggested improvements in those areas were identified.

Crosswalks and Curb Ramps

Marked pedestrian crossings of roadways were inventoried throughout the study area and are shown on Figure 7. Unmarked crosswalks where sidewalk curb ramps exist on either side of the roadway exist with no marked crossing were also identified and are shown on the figure.

Where marked crossings exist, curb ramps were inventoried and shown in Figure 8. It is important to note that these curb ramps were categorized using Google Maps and were not evaluated for existing cross slopes or other ADA compliance considerations aside from whether or not detectable warning surfaces were visible. The red circles on the figure indicate that a pedestrian crossing is marked, but a curb ramp does not exist. The blue circles on the figure indicate that an existing curb ramp is present without a detectable warning. It is recommended that curb ramps that do not currently have detectable warning surfaces be upgraded along with adjacent sidewalk or roadway improvement projects as they occur. Where there is a marked pedestrian crosswalk and no curb ramp exists, it is recommended that a curb ramp be constructed in the near term.

Two locations with the need for curb ramps in the near term were identified:

The east end of the crosswalk on the north leg of the intersection of Front Street and North Rocky River Drive

- The northwest corner of the intersection of Front Street and Center Street

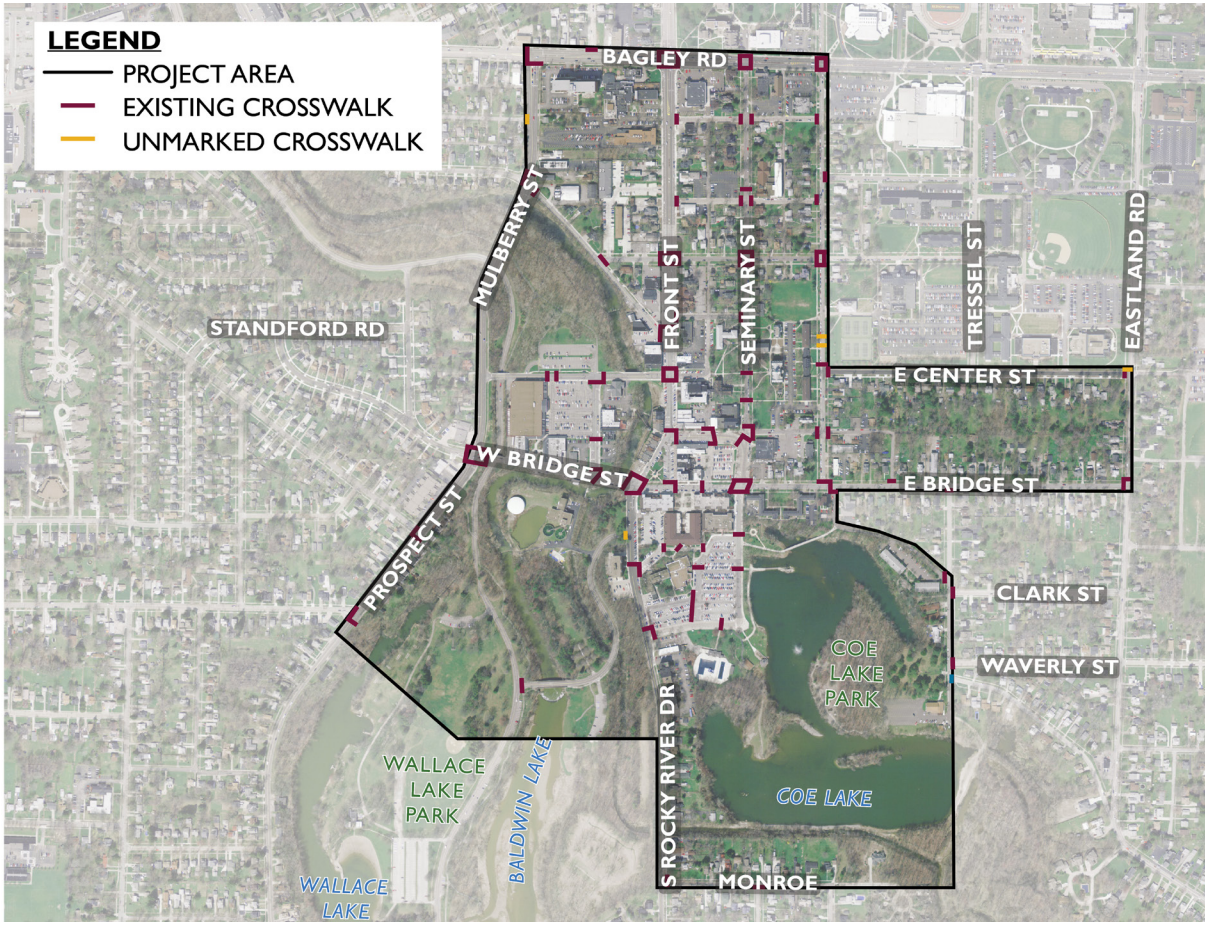


Figure 7 - Existing Crosswalks

- A curb ramp exists on this corner but does not have detectable warnings and does not align with the crosswalk for the north leg of this intersection

Some locations were identified as pedestrian crossing locations that do not currently have marked crossings. Certain streets have well connected sidewalks and crosswalks for pedestrians traveling north and south, but not east and west. Many students are observed walking east and west between campus buildings and downtown. Businesses along Front Street are beginning to attract more pedestrian traffic north of Grand Street which is expected to further increase pedestrians walking east-west along Spring and Liberty Streets, for example. The following locations were identified as significant yet unmarked pedestrian crossings.

- The north leg of Beech Street at Liberty Street where pedestrian access to the parking lot exists
- Pedestrian crossing of Beech Street in the vicinity of the tennis courts between Grand Street and Center Street
- A marked pedestrian crossing of Front Street does not exist in a 1,000’ segment between Bagley Road and Grand Street

» Crossings for pedestrians traveling east and west across Beech Street and Seminary Street at Liberty Street and Spring Street

Other existing, pedestrian crossings were identified that are currently marked but where improvements could be considered:

» Two midblock crossings of Seminary Street between Church Street and School Street

» An angled crossing of Beech Street through its intersection with Center Street

» Midblock crossing of Seminary Street north of Spring Street (at the Berea United Methodist Church)

» Two midblock crossings of South Rocky River Drive

» Long pedestrian crossings at the intersection of Bridge Street and Seminary Street due to the radius of the northeast curb line

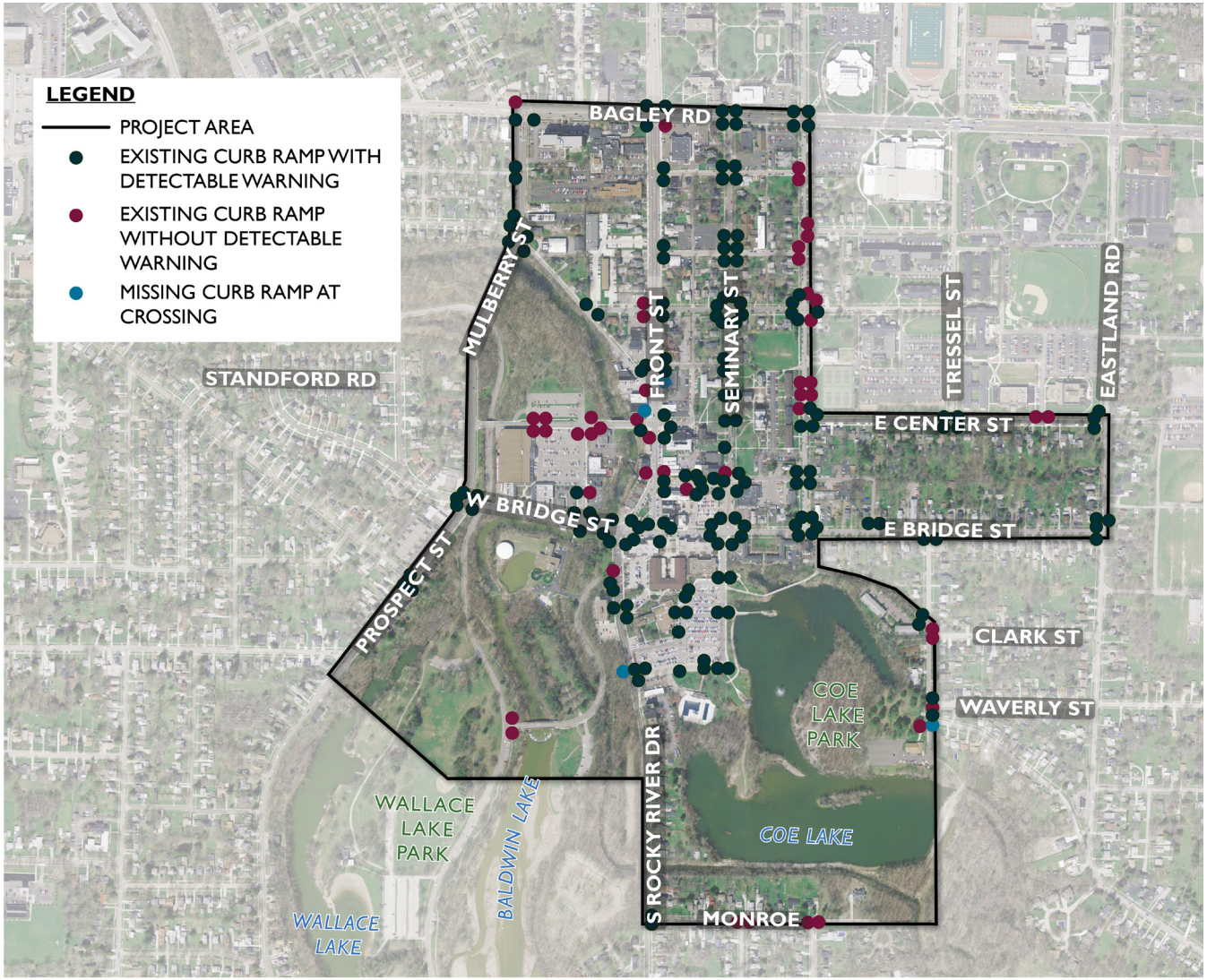


Figure 8 - Existing Curb Ramps

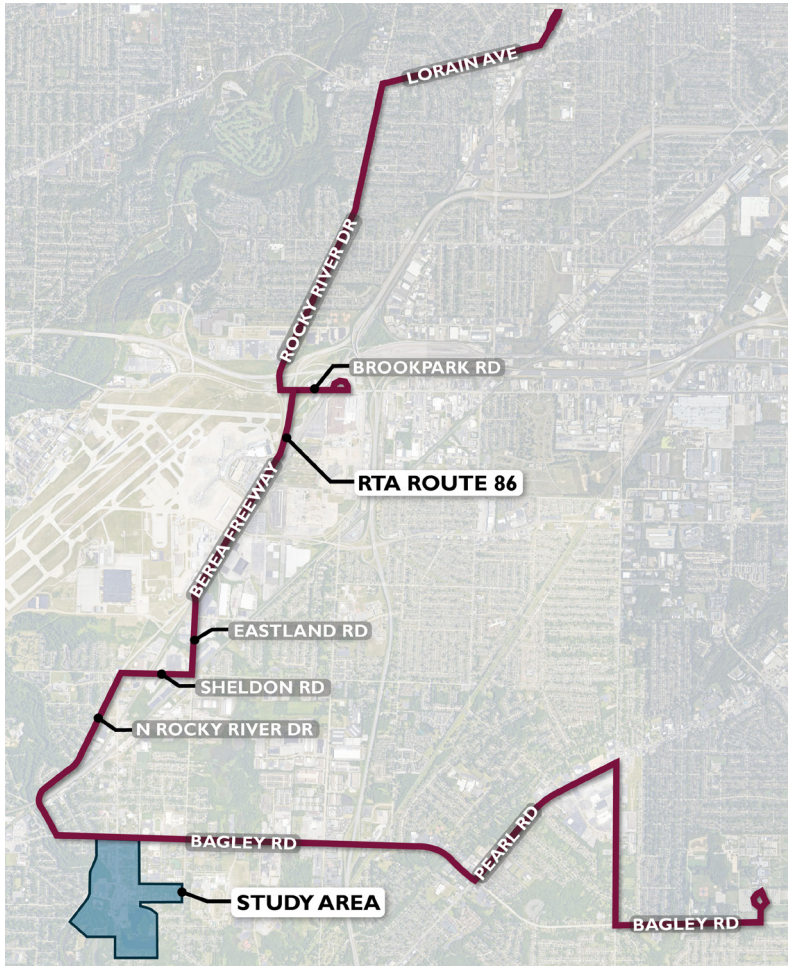


Figure 9 - RTA Route 86

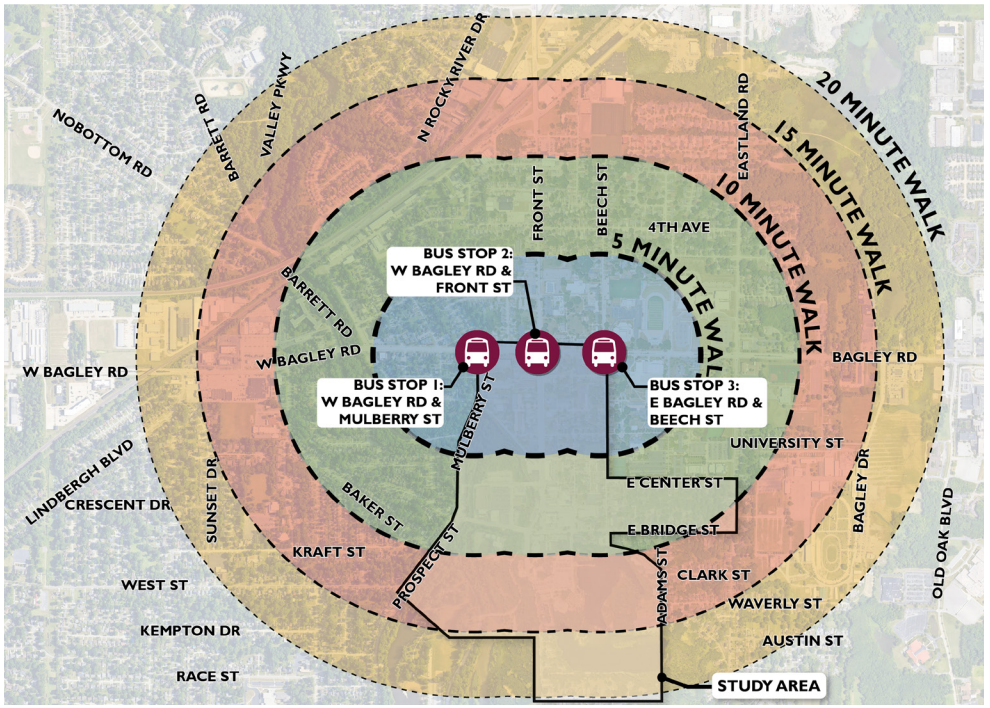


Figure 10 - RTA Bus Stop

Transit

Transit is closely tied to the quality and extensiveness of the pedestrian network. There are 6 bus stops (3 on each side) on Bagley Road between Mulberry Street and Beech Street. The stops serve RTA route 86 which mainly operates along Rocky River Drive and Bagley Road connecting to Brookpark and West Park RTA rail stations to the north and to Tri-C's western campus to the rest of the study area. The study area lies on the southern edge of the RTA service area and no other RTA bus stops or routes serve the study area. RTA Route 86 is shown in Figure 9 in relation to the study area.

Most residences and businesses within the study area are within a 10-minute walk of an RTA bus stop as shown in Figure 10 which combined with the extensive sidewalk network provides the study area with quality access to the Greater Cleveland transit system. For seniors and disabled residents who may lack the mobility to access these transit stops, the city offers an on-call jitney service that provides service within Berea as well as to Middleburg Heights and Strongsville.

Existing Bicycle Network

The study area includes some infrastructure for bicyclists and residents can be observed riding bikes throughout the area. Riders were observed to range from elementary school age to adult. The majority of bicyclists were observed to ride on the sidewalk rather than within the roadway. Where marked bicycle lanes exist on the street, more riders used those lanes, but some continued to use sidewalks.

Figure 11 shows where bicycle infrastructure exists. Front Street provides dedicated bike lanes between Center Street and Bagley Road. These bicycle lanes continue north of the study area along Front Street until its intersection with North Rocky River Drive 1.09 miles north of the study area.

Bike trails exist along Valley Parkway in the Metroparks that runs through the western edge of the study area. Connections to these trails are provided via Center Street and at South Rocky River Drive at Quarry Lane.

Several roadways with the study area that do not have dedicated bicycle infrastructure were identified as “bike friendly” due to their relatively low traffic volumes and low posted speed limits. These factors contribute to the “level of traffic stress” (LTS) that a bicyclist feels when riding within a roadway. LTS ratings range from 1 to 5 with 1 being comfortable for all ages and 5 being uncomfortable and the road should be avoided by bicyclists. NOACA has rated some of the roadways within the study area for the LTS as shown in Figure 12. Rated roadways and their LTS are as follows:

- Bagley Road: 5
- Prospect Road (SR 237): 5
- Front Street: 2 & 3
- North Rocky River Drive: 2

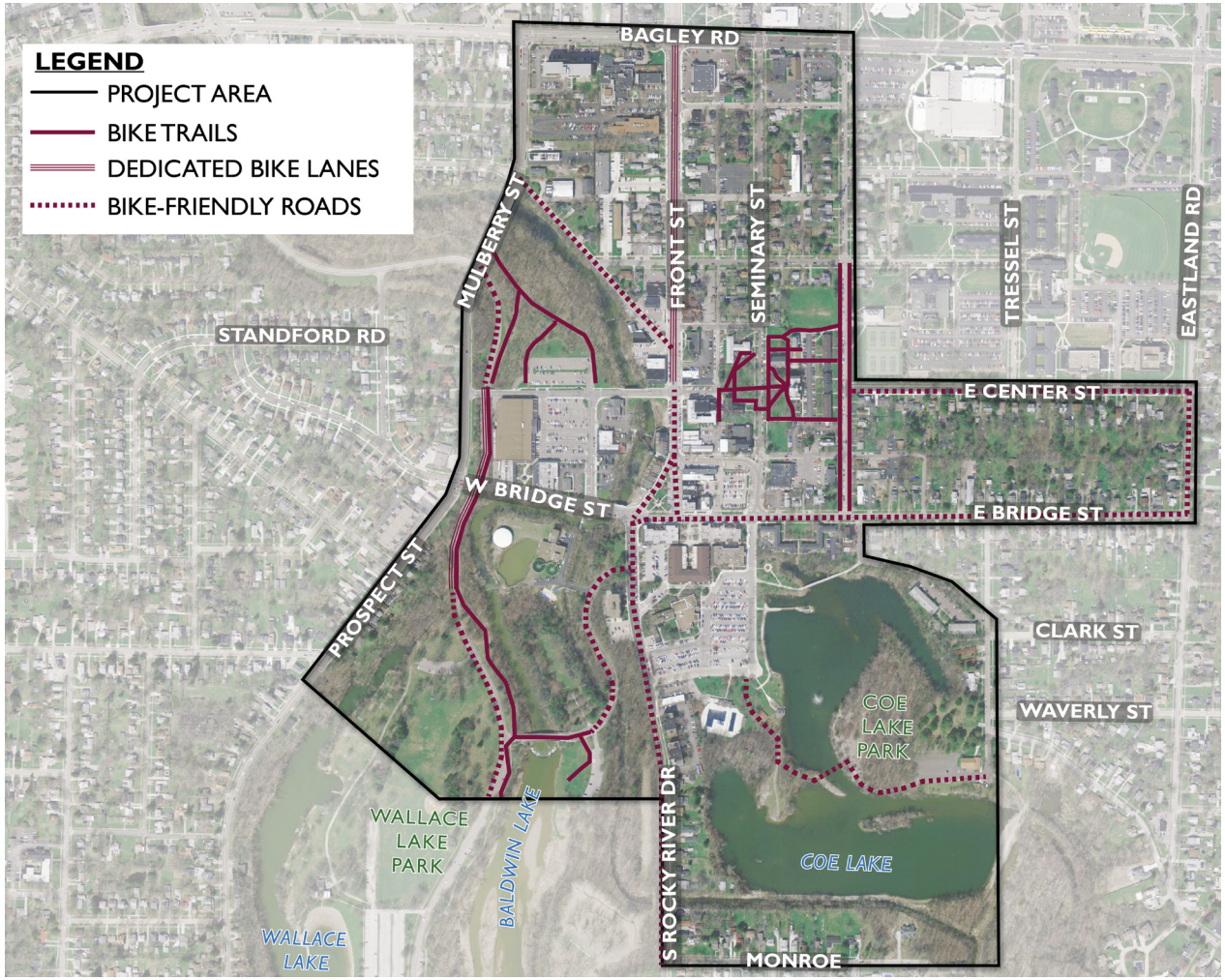


Figure 11 - Existing Bicycle Facilities

Source: Google Maps

- Bridge Street: 2 & 3
- South Rocky River Drive: 2

Where marked bicycle lanes exist on Front Street, the LTS rating for most of the street is 2 – Comfortable for Most Adults. However, the segment of Front Street nearest to Bagley Road has a rating of 3 – Comfortable for Confident Cyclists even though there are marked bicycle lanes. This would suggest that improvements to the bicycle lanes in this segment could improve LTS.

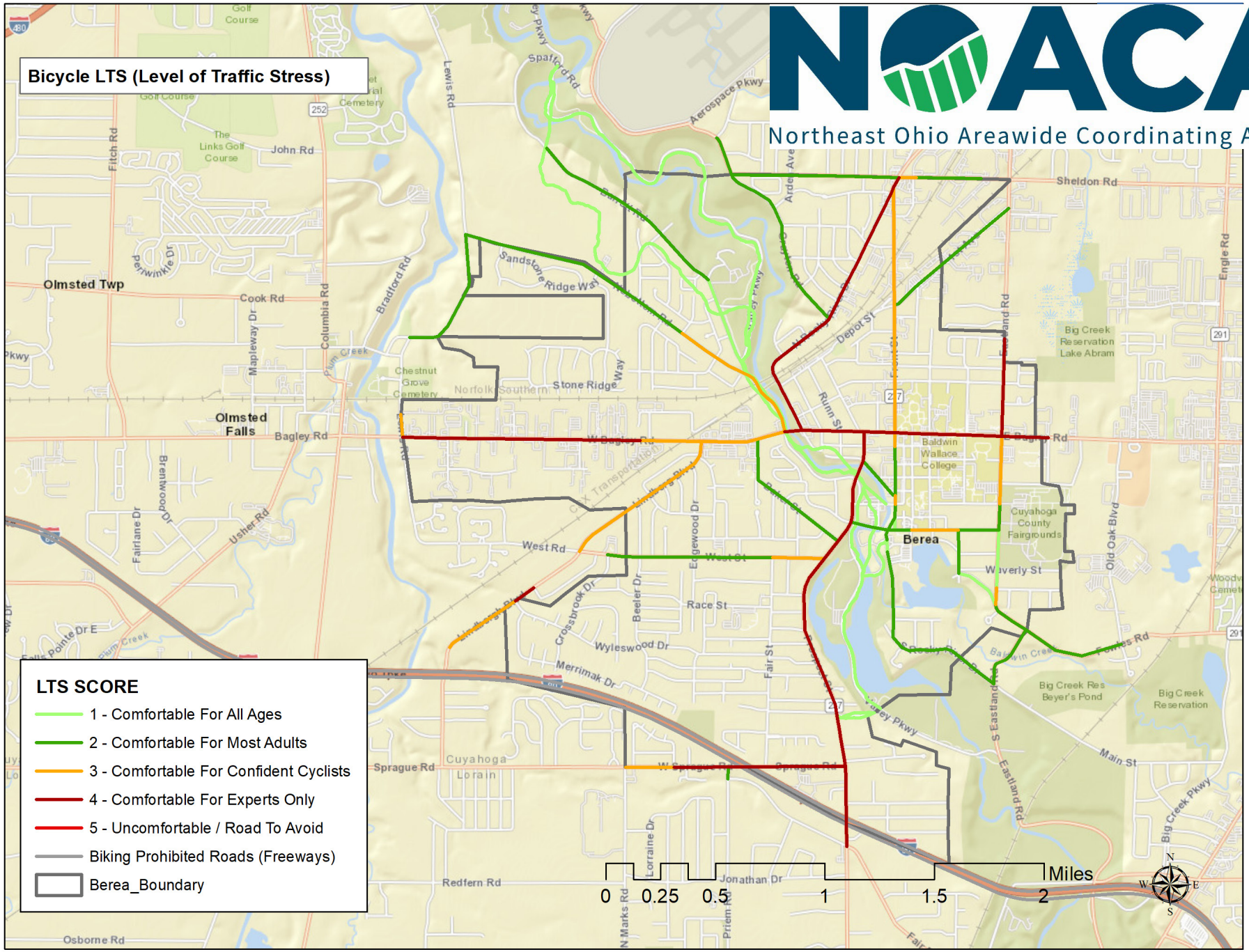


Figure 12 - Existing Bicycle Level of Traffic Stress

Source: NOACA

Bicycle Use Patterns

Two methods were used for identifying patterns of bicycle use within the study area. Traffic counts, including bicycle counts, were collected at key intersections identified in Figure 19. Additionally, Strava data was used to create an activity heat map shown in Figure 13 which includes both joggers/runners and bicyclists. The red areas in the heat map are the areas that are most frequently used by joggers and bicyclists, and according to the figure, this red area is the existing Valley Parkway All Purpose Trail. The blue areas are rarely used by joggers and bicyclists, and according to the figure, are mainly east-west residential streets, Coe Lake, and a southbound portion of Front Street. The purple areas on the map show streets where jogging and bike activity is prevalent and includes Front Street, Seminary Street, Beech Street, Bridge Street and South Rocky River Drive. These are streets where additional or improved bike infrastructure could be beneficial.

Bicycle traffic captured by traffic counts is illustrated in Figure 22. This figure includes data over a 13-hour period from 6am to 7pm on a typical weekday. Notably from this data, Front Street with its dedicated bicycle lanes experiences a similar volume of cyclists as Seminary Street one block to the east. From Church Street, 10 bicyclists were observed to continue northbound on Seminary Street which has its next intersection to the north at Grand Street. (Ten bicyclists were also observed moving southbound on Seminary Street as well, mainly on the east-side sidewalk). On Front Street, where bicycle lanes exist north of Center Street, 12 northbound bicyclists were observed over the 13-hour period.

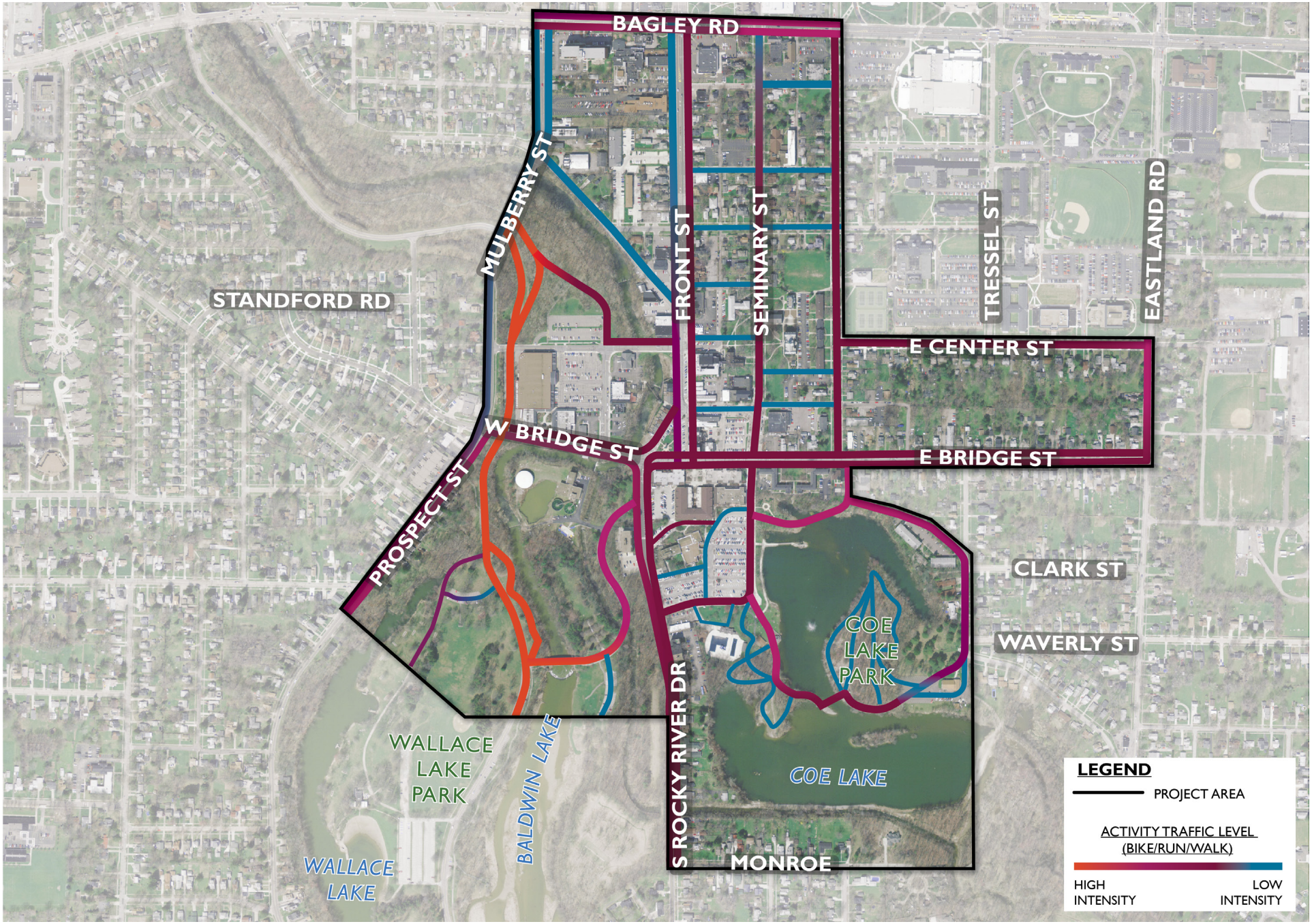


Figure 13 - Existing Run/Walk/Bike Activity Intensity Map

Source: https://www.strava.com

Baldwin Wallace Student Bike Survey

In March of 2023, a survey was sent out to the Baldwin Wallace University student body by a group of Baldwin Wallace University sustainability students to ask how the City of Berea could improve transportation infrastructure for bicyclists on campus. The results of the survey were provided to the project team for review and consideration as part of this study. Baldwin Wallace University has a total of 3,327 students, of which, 421 students responded to the bicycle survey. The bicycle survey included questions to help gauge what the current student body thinks about the existing bicycle infrastructure on and off campus. The survey also asked for suggestions that might encourage more students to ride bicycles and help them feel more comfortable and safer.

Out of the 421 students who responded, only 105 students responded that they own a bicycle on campus. Responses for two key questions from the survey are illustrated in Figure 14. Of the 105 students who stated that they own a bicycle, 9 students said they ride their bicycle every day, 25 students ride most days of the week, 18 students ride two to three times a week, 15 students ride once a week, 13 students ride once a month, and 25 students ride less than once a month. Seventeen respondents stated that they had been involved in a bicycle related crash on campus. Eleven people stated that they have had their bicycle stolen on campus or within the Berea area. Three quarters (299) of the respondents stated that they strongly agree or agree that they would bike more often if the local streets were more bike friendly.

Students were also asked what they think the City or University could do to make the campus and local area streets safer for bicycle riders. The top answers were a combination of having better and larger sidewalks or designated bicycle lanes, better signage, additional lighting, lowering the speed limit, and additional security for bicyclists. The students also do not want to ride a bicycle on campus because of poor sidewalk conditions, lack of bicycle storage near class buildings, and the absence of bicycle lanes.

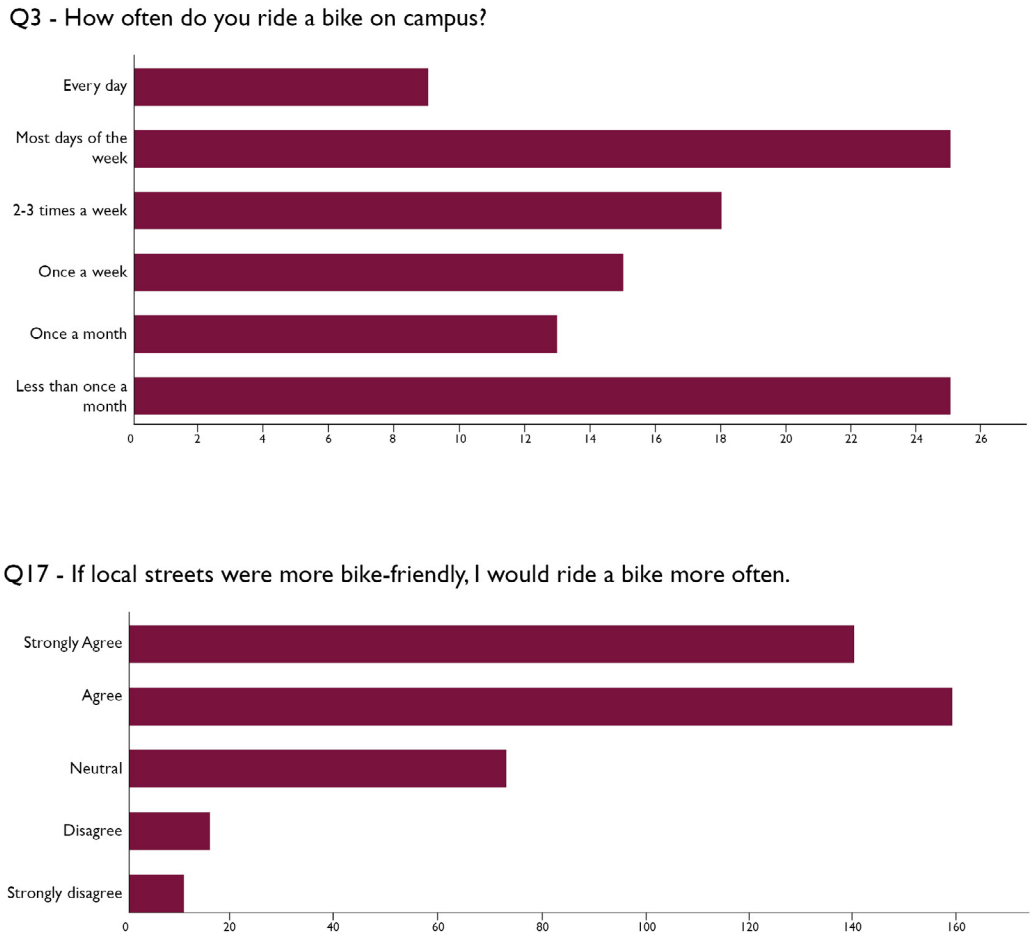


Figure 14 - BW Bike Survey Responses

Source: Baldwin Wallace University

The survey engaged a significant proportion (12%) of the student body. It is notable that about three quarters of the respondents to this bike survey do not own or ride a bicycle on campus. This is indicative of the interest in biking amongst the student body. This interest level and the suggestions that students made for bike-friendly features within and around campus were taken under consideration when developing alternatives and recommendations.

Some of the bicycle survey questions and responses are summarized above. The full results of the bicycle survey can be found in **Appendix A.**

Bicycle Network Summary

While some bicycle infrastructure exists, a comprehensive, connected bicycle network with signed bike routes and accompanying infrastructure does not exist within the study area. Many of the streets within the study area were found to be comfortable for most adults or confident cyclists according to level of traffic stress (LTS) data and scoring. None were found to be comfortable for all ages. Traffic data found that about half of cyclists ride on sidewalks rather than in the roadway where it is preferable for bicyclists to ride. A Baldwin Wallace Student Bike Survey found that many students cited the lack of on-street bike infrastructure and sharing crowded sidewalks with pedestrians as barriers to biking within the study area.

Existing Vehicular Network

The study area is served by a largely grid-based street network that was also influenced by the Rocky River and Coe Lake. Major access to the study area is provided via Bagley Road and State Route 237 which serve as regional arterials and exist on the north and west sides of the study area, respectively. SR 237 almost purposefully skirts around the study area in what appears to be an attempt to not burden the historic downtown area with significant levels of through traffic. Based on existing Average Annual Daily Traffic Volumes (AADTs) shown in Figure 17, the design appears to do just that with the majority of north-south through traffic utilizing the SR 237 and Front Street north of Bagley Road. East-West through traffic utilizes Bagley Road at the north edge of the study area.

Bridge Street, Front Street and Rocky River Drive serve as collector roadways within and through the study area with other roadways operating as local streets.

Bridge Street connects to SR 237 to the west and ends at Eastland Road to the east. Between Riverside Drive/South Rocky River Drive and Seminary Street, Bridge Street is a one-way commercial street with angled parking on the south side of the roadway. East of Beech Street, Bridge Street is residential with multiple driveways, one cross street and parking allowed on the north side of the roadway. The posted speed limit is 25mph.

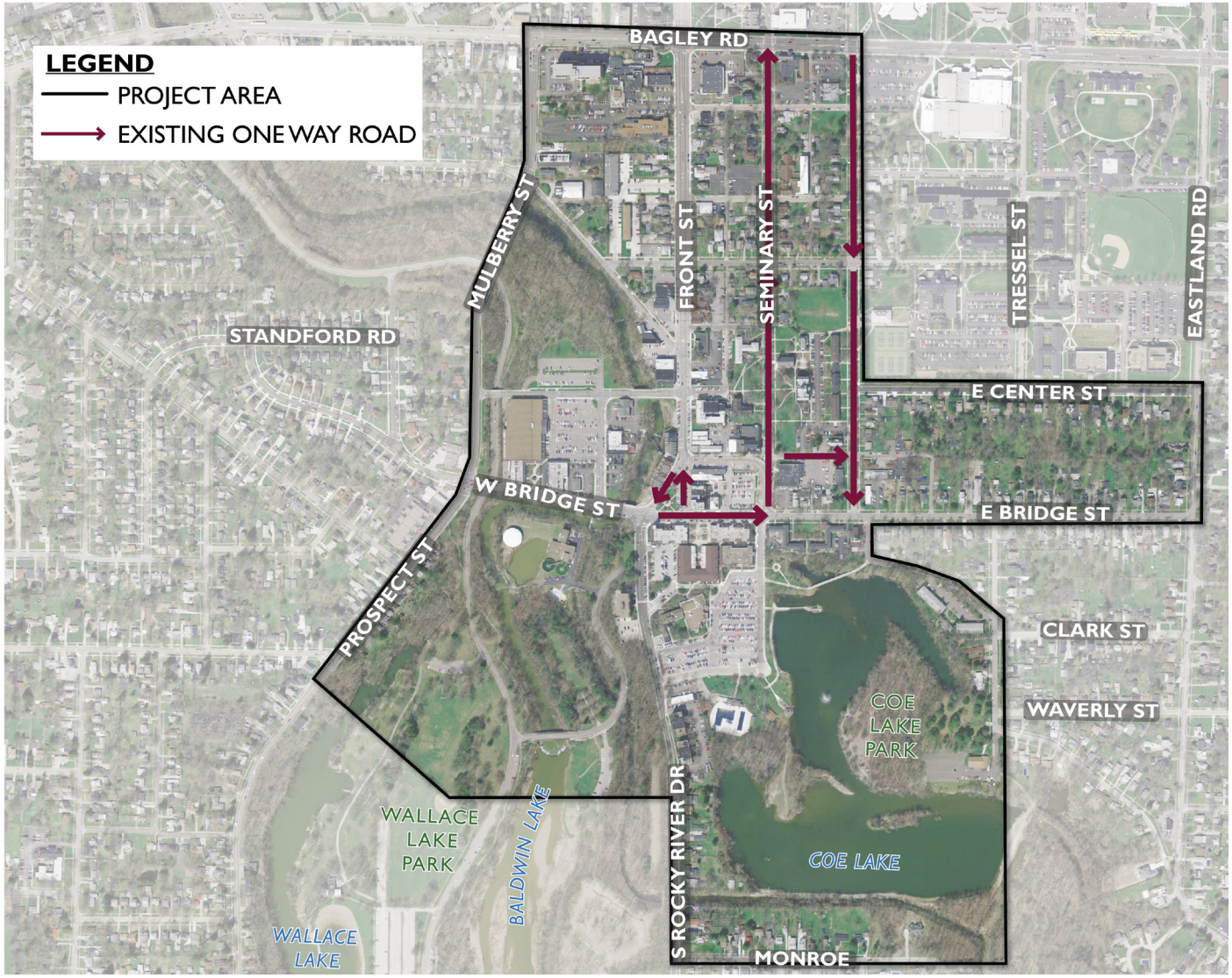


Figure 15 - One-Way Streets

Front Street is a commercial street within the downtown area for its full lengths and operates one-way between Church Street and Bridge Street. Parallel parking exists on both sides of the roadway with bike lanes marked between the parking and travel lanes. South of Center Street, there are no bike lanes and angled parking is provided. The posted speed limit on Front Street is 25mph.

North Rocky River Drive and South Rocky River Drive border the Metroparks and provide connections to SR 237 and connections south of the study area. The posted speed limit for these roadways within the study area is 25mph. Some streets operate one-way within the project area as shown in Figure 15.

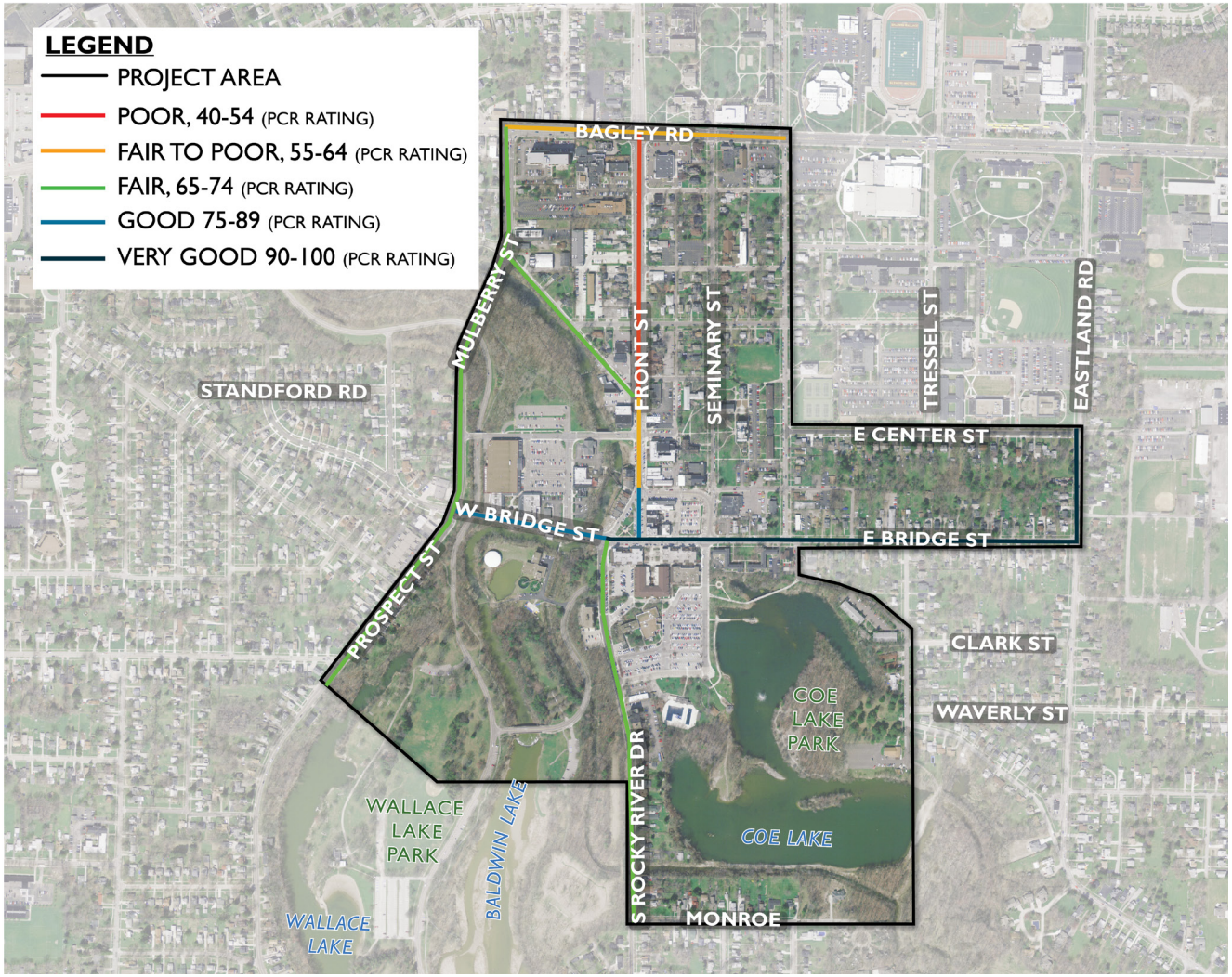


Figure 16 - Pavement Condition Ratings

Source: NOACA

Seminary Street and Beech Street work as a one-way pair with Seminary one-way northbound, and Beech Street one-way southbound.

East Bridge Street is also one-way eastbound for the portion between Front Street and Seminary Street. Riverside Drive and the south end of Front Street are also one-way at the Berea Triangle with Riverside Drive one-way southbound, and Front Street one-way northbound. Church Street is also one-way eastbound between Seminary Street and Beech Street. This configuration provides a counterclockwise traffic operation in the triangle area of downtown which, it is understood, has served the area well for decades.

Pavement condition for the roadways was found to generally be in good shape with the exception of Front Street between Bagley Road and North Rocky River Road which has a “poor” pavement condition rating (PCR). Bagley Road and Front Street south of North Rocky River Road are showing signs of wear and have a PCR of “fair to poor.” Figure 16 illustrates the pavement conditions for roadways for which data was available.

Traffic Volumes

Existing and forecasted traffic volumes were obtained from NOACA's Travel Forecasting Model. Existing Bidirectional Average Annual Daily Traffic (AADT) volumes were available from the year 2022 model and forecasted volumes were available for the year 2040. Passenger vehicle and heavy vehicle AADTs are illustrated in Figure 17 and Figure 18.

High volume roadways exist on the periphery of the study area – Bagley Road and Prospect Street (SR 237). Bagley Road provides connections to the Interstate 71 to the east and to Interstate 80, the Ohio Turnpike, to the west. SR 237 provides regional connections north and south through the study area but notably bypasses the downtown. As a result, traffic volumes within the study area are significantly less than along these arterials.

The 2040 traffic forecast model indicates expected traffic growth along the arterials in the study area, but within the study area, the forecast model expects a modest decline in traffic. These forecasted volumes within the study area are a reflection of the built-up nature of the study area. Significant changes in land use are not expected that would materially affect traffic for the downtown Berea area.

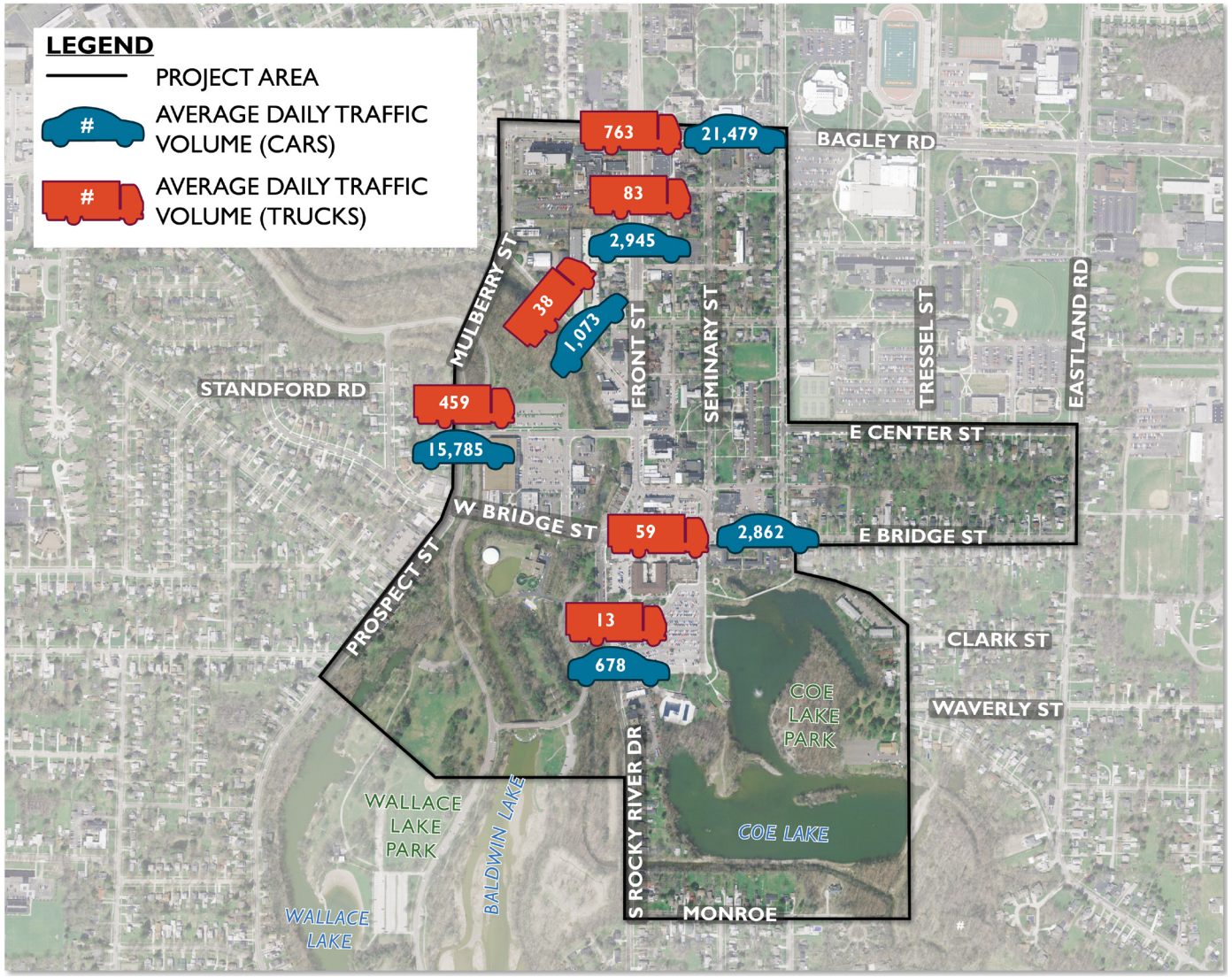


Figure 17 - 2022 AADT Volumes

Source: NOACA

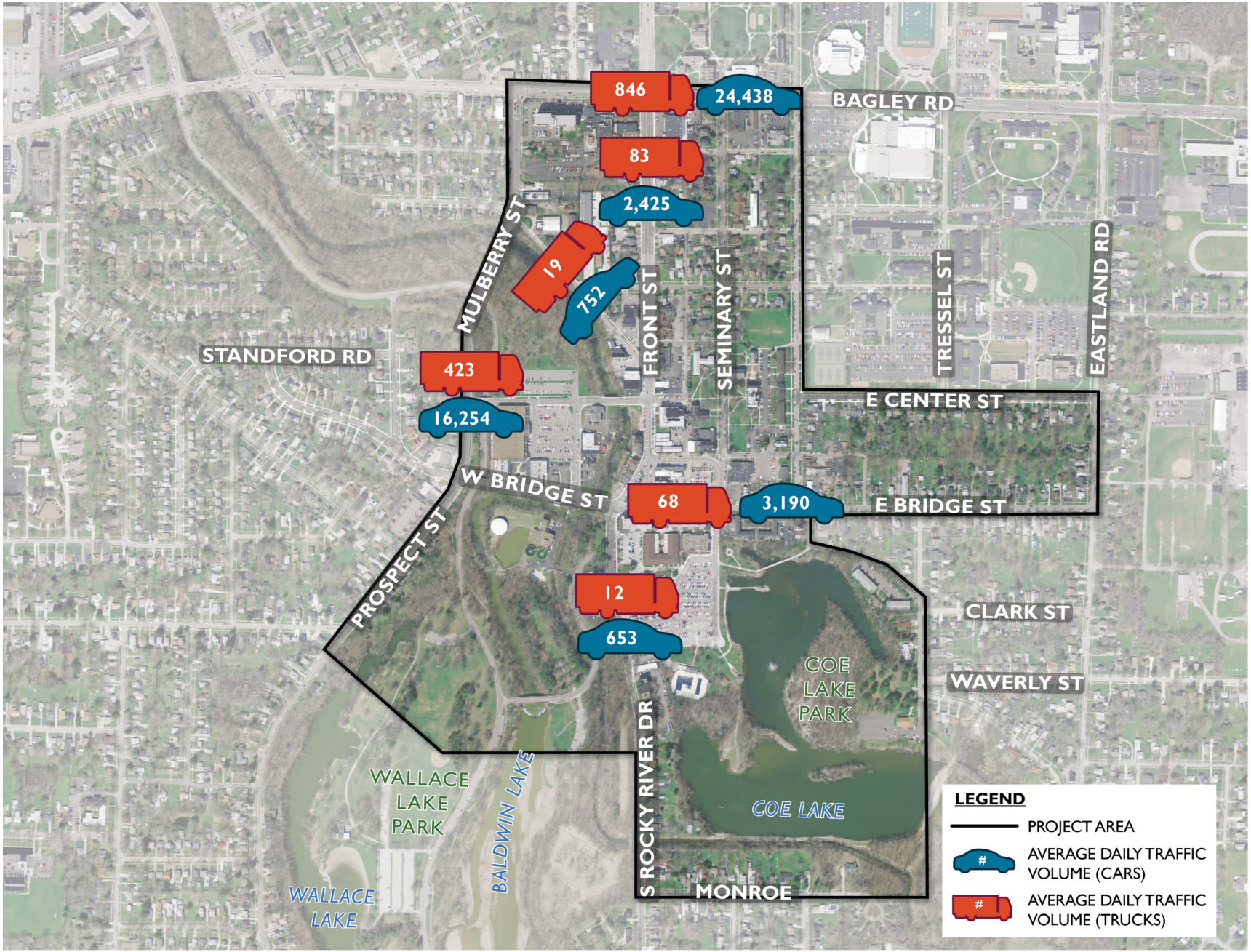


Figure 18 - 2040 Forecasted AADT Volumes

Source: NOACA

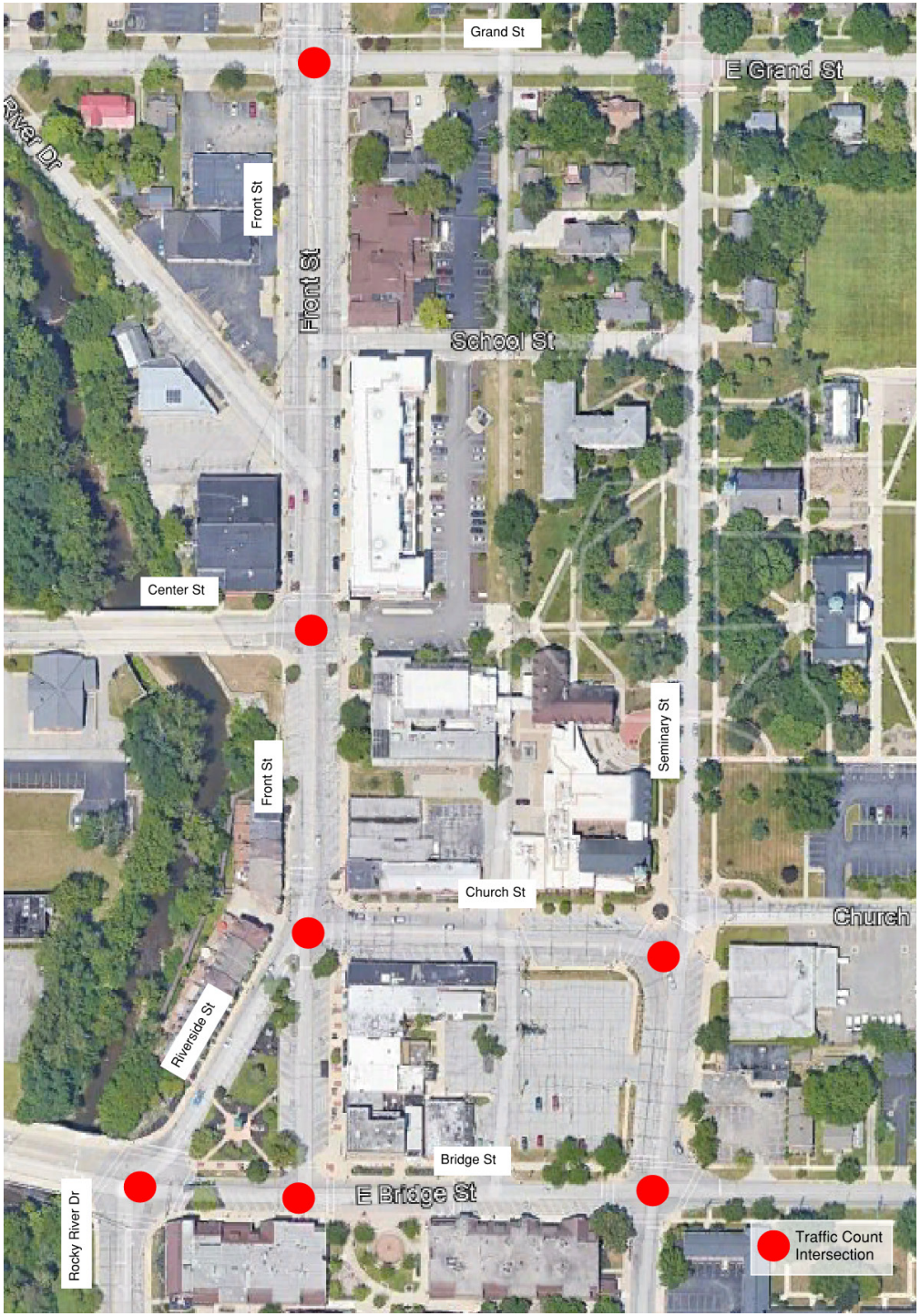


Figure 19 - Turning Movement Count Locations

Turning movement counts were provided by NOACA for the following intersections:

- Front Street and Grand Street
- Front Street and Center Street
- Front Street and Church Street/Riverside Drive
- Bridge Street and Riverside Drive
- Bridge Street and Front Street
- Bridge Street and Seminary Street
- Church Street and Seminary Street

The data included vehicular, pedestrian and bicycle traffic volumes and were conducted during a 13-hour period from 6AM to 7PM on a typical weekday. The data was used to assess existing operations as well as potential improvement alternatives. Figure 20 illustrates peak hour vehicular turning movement volumes at the intersections. Figure 21 includes total volumes of pedestrian crossings observed during the entire 13-hour count period. Figure 22 illustrates the total bicycles observed during the 13-hour period. Reviewing the total 13-hour volumes for pedestrians and bicyclists helps identify patterns for non-motorized users. Some key findings from a review of this data include the following:

- Bicycle traffic is comparable between Front Street and Seminary Street despite the lack of bike lanes on Seminary Street
- Where bike lanes do not exist, more than half of cyclists ride on the sidewalks rather than on the roadway
- The stop-controlled intersection of Front Street and Center Street experiences the highest volume of pedestrian crossing traffic
- The intersection of Seminary and Church Street experiences the second highest volume of pedestrian traffic

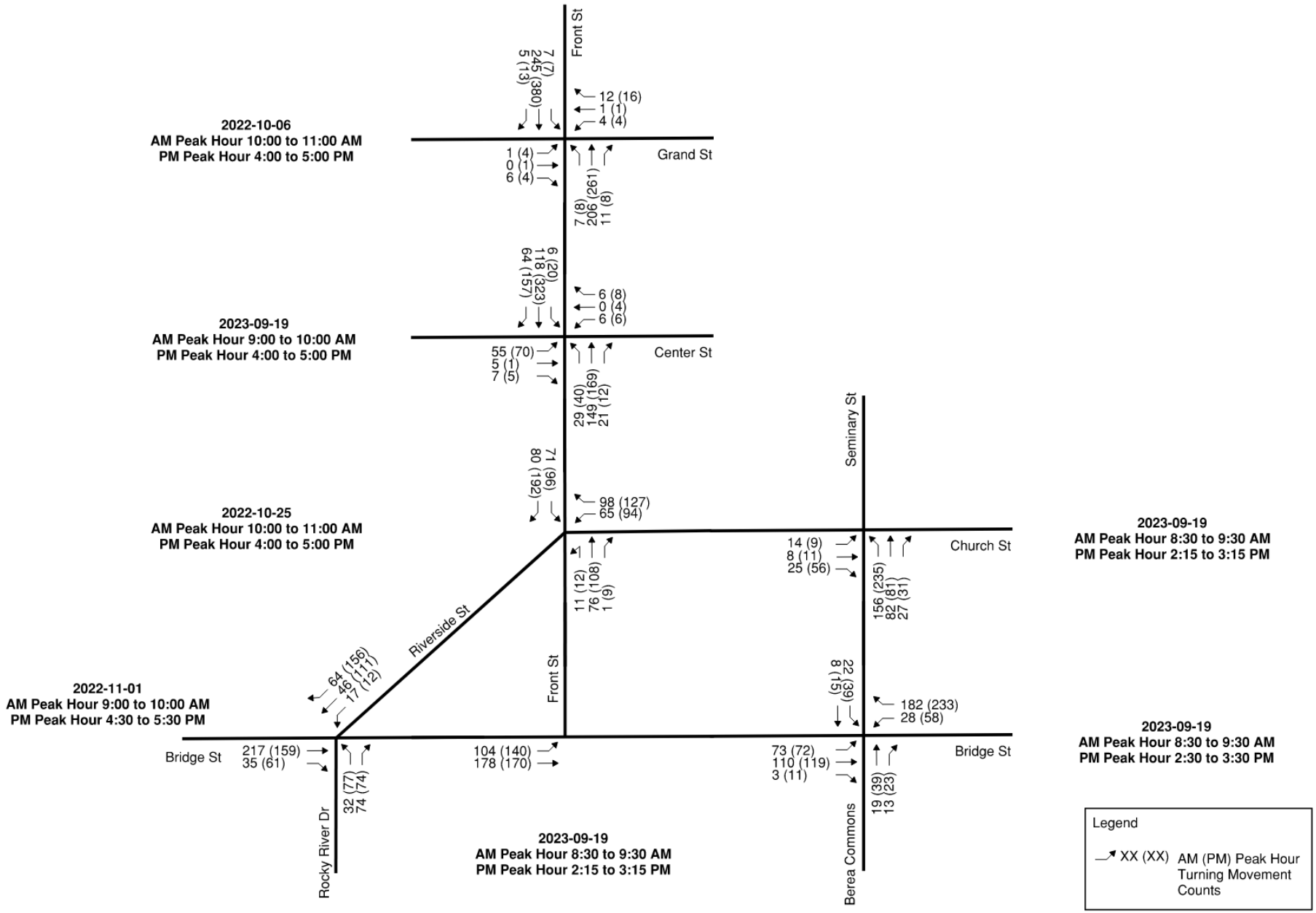


Figure 20 - Peak Hour Intersection Vehicular Turning Movement Volumes

Source: NOACA

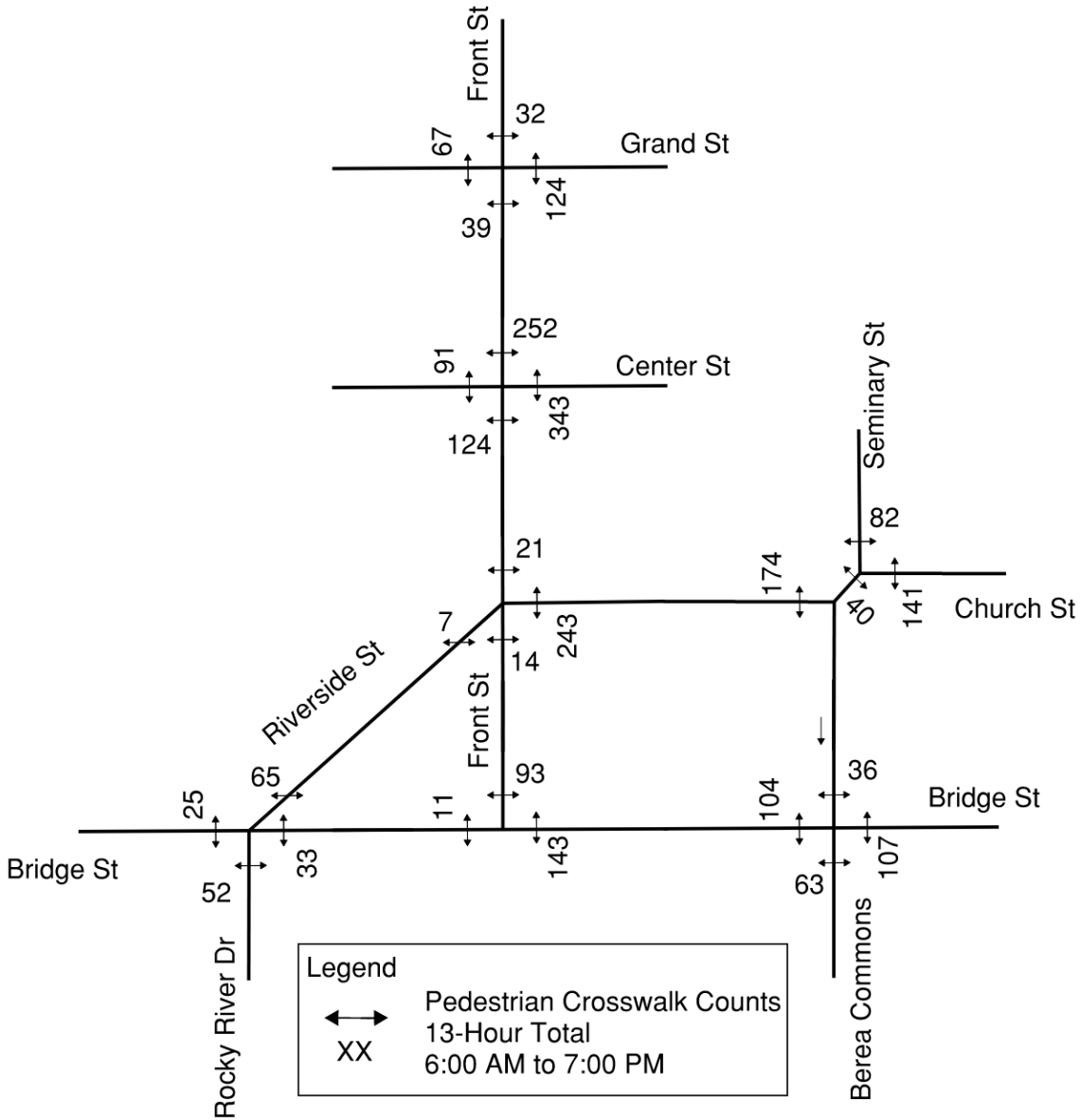


Figure 21 - 13-Hour Intersection Pedestrian Crossing Volumes

Source: NOACA

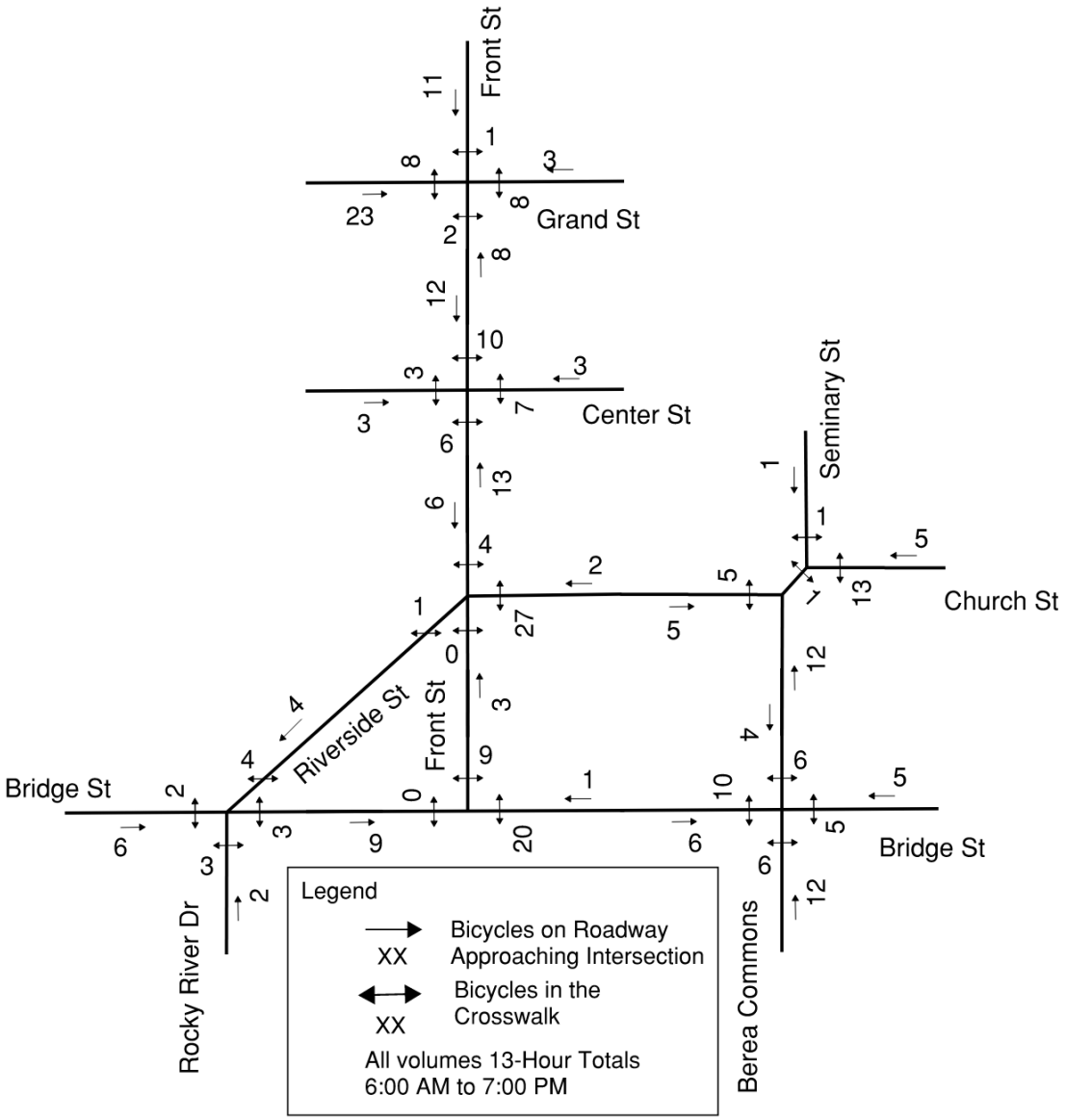


Figure 22 - 13-Hour Intersection Bicycle Volumes

Source: NOACA

Traffic Analysis

Capacity analyses were completed using the latest version of the Synchro (11th edition) traffic analysis software. Level of Service (LOS) was used to evaluate each of the intersections discussed above. LOS is a qualitative measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Operational LOS reflects delays experienced by the motorist and is designated a letter grade of A through F. LOS A represents the best operations and LOS F reflects the worst. LOS D or better during peak hours is generally considered within acceptable limits. The Highway Capacity Manual (HCM) defines level of service for signalized and unsignalized intersections as a function of the average vehicle control delay in seconds per vehicle (sec) as summarized in the table.

Traffic signal timing plans were obtained for the signalized intersections where turning movements counts were obtained. The AM and PM peak hour traffic operations were modeled with existing lane configurations along with traffic control information and peak hour vehicular turning movements and pedestrian crossings at the intersections identified in Figure 20 through Figure 22.

The analysis found that these intersections operate well during both the AM and PM peak commuting hours with LOS of D or better. These results are summarized in the following table and full Synchro reports are included in the appendix.

Table 1 - Level of Service Definitions

Level of Service Grade	Signalized Intersection (sec)	Unsignalized Intersection (sec)
A	<10	<10
B	10-20	10-15
C	20-35	15-25
D	35-55	25-35
E	55-80	35-50
F	>80	>50

Table 2 - Existing Conditions Capacity Analysis Results

Intersection	AM Peak Hour LOS	PM Peak Hour LOS
Front Street and Grand Street	A	A
Front Street and Center Street	A	D
Front Street and Church Street/Riverside Drive	B	B
Bridge Street and Riverside Drive	B	B
Bridge Street and Seminary Street	A	A
Church Street and Seminary Street	B	B

Parking

Parking is available and well distributed throughout the study area. Available parking supply includes on-street parking, off-street parking in private and public parking lots and private residential parking. Figure 23 includes a generalized illustration of the available parking supply throughout the study area.

On-Street parking throughout the downtown commercial areas includes parallel and angled parking spaces. Many of these spaces have parking duration restrictions during daytime hours to ensure parking availability for area businesses. Some businesses have private parking lots for their patrons.

A free municipal parking lot with over 300 parking spaces exists near Coe Lake and behind Berea Commons, the police station, courthouse, and public library.

Observations found that the existing parking supply appears sufficient for day-to-day uses and operations in the area. Feedback from residents and city officials included a desire for more on-street parking near where businesses are more concentrated around the Berea Triangle including the possibility of converting parallel parking to angled. Additional signing pointing drivers to the large, free municipal parking lot could alleviate some of these parking concerns in this area.

Some residents expressed concerns with angled parking where it is difficult to see oncoming traffic when backing out of spaces. Angled parking can be a concern for bicyclists on the roadway for this reason as well. Back in angled parking could be considered to address these concerns. Existing spaces could be converted to back-in spaces, or the design could be considered where angled parking is being added.

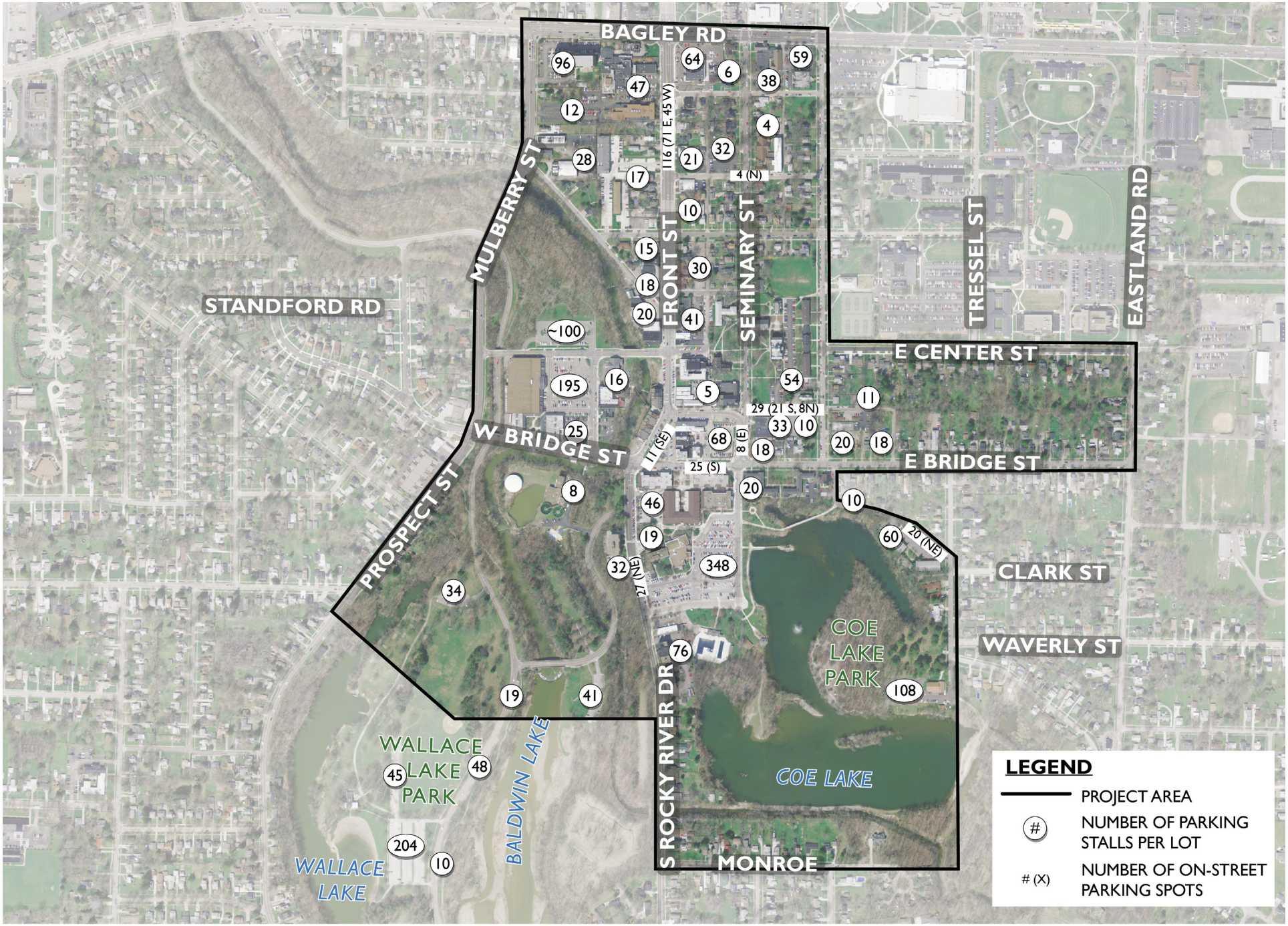


Figure 23 - Parking Supply and Distribution

Existing Wayfinding Signage

Figure 24 includes an inventory of existing wayfinding signage within our project area. Such directional signing is generally lacking within the study area. Signing that does exist, which appears to be directed at drivers entering the area, has smaller font and more lines of text than can be discerned by the average driver. It is recommended that a wayfinding signage plan be developed that provides a cohesive branding experience for residents and patrons of the area and considers the wayfinding needs of people traveling by different modes including cars, bikes, and walking.

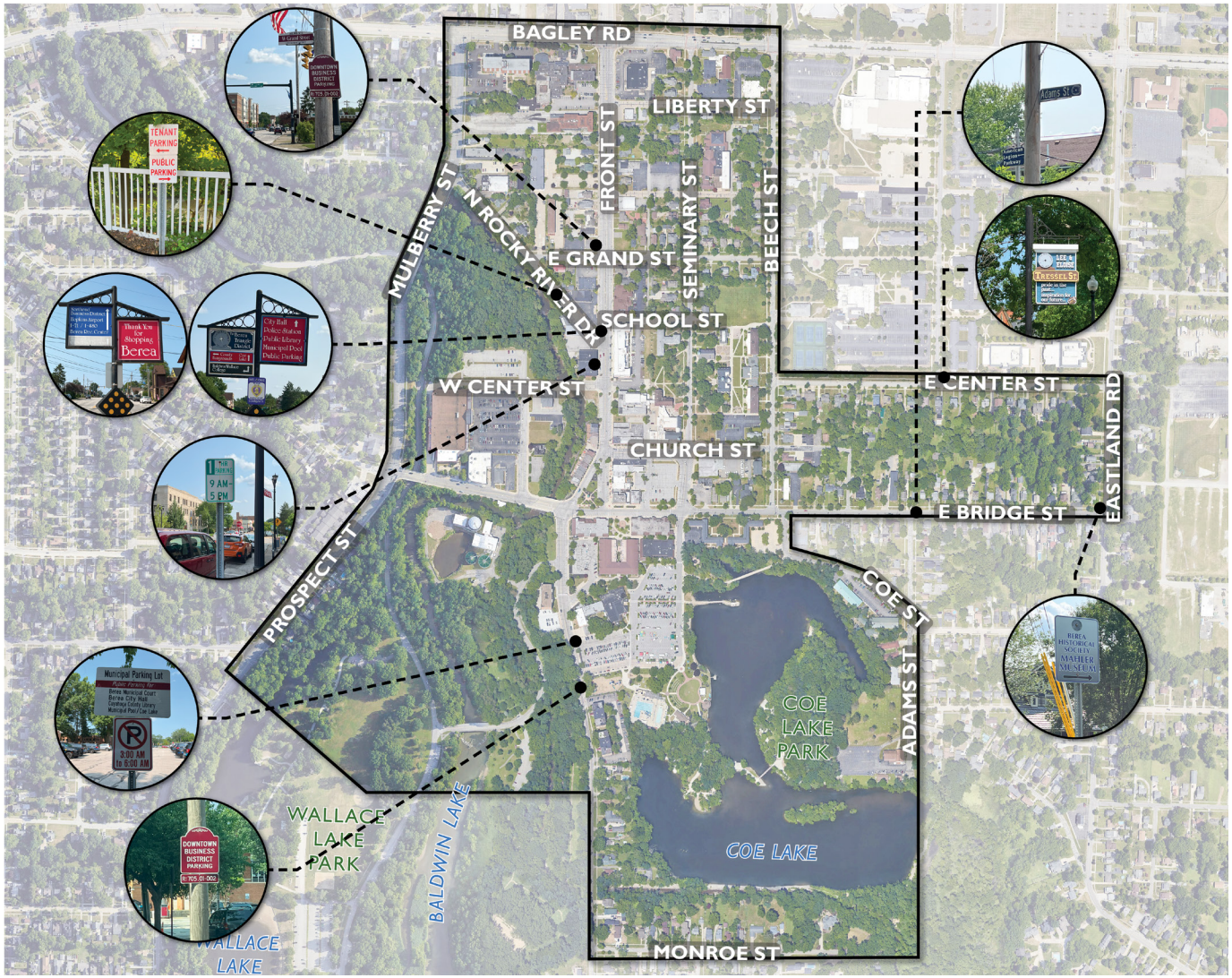


Figure 24 - Existing Wayfinding Signage

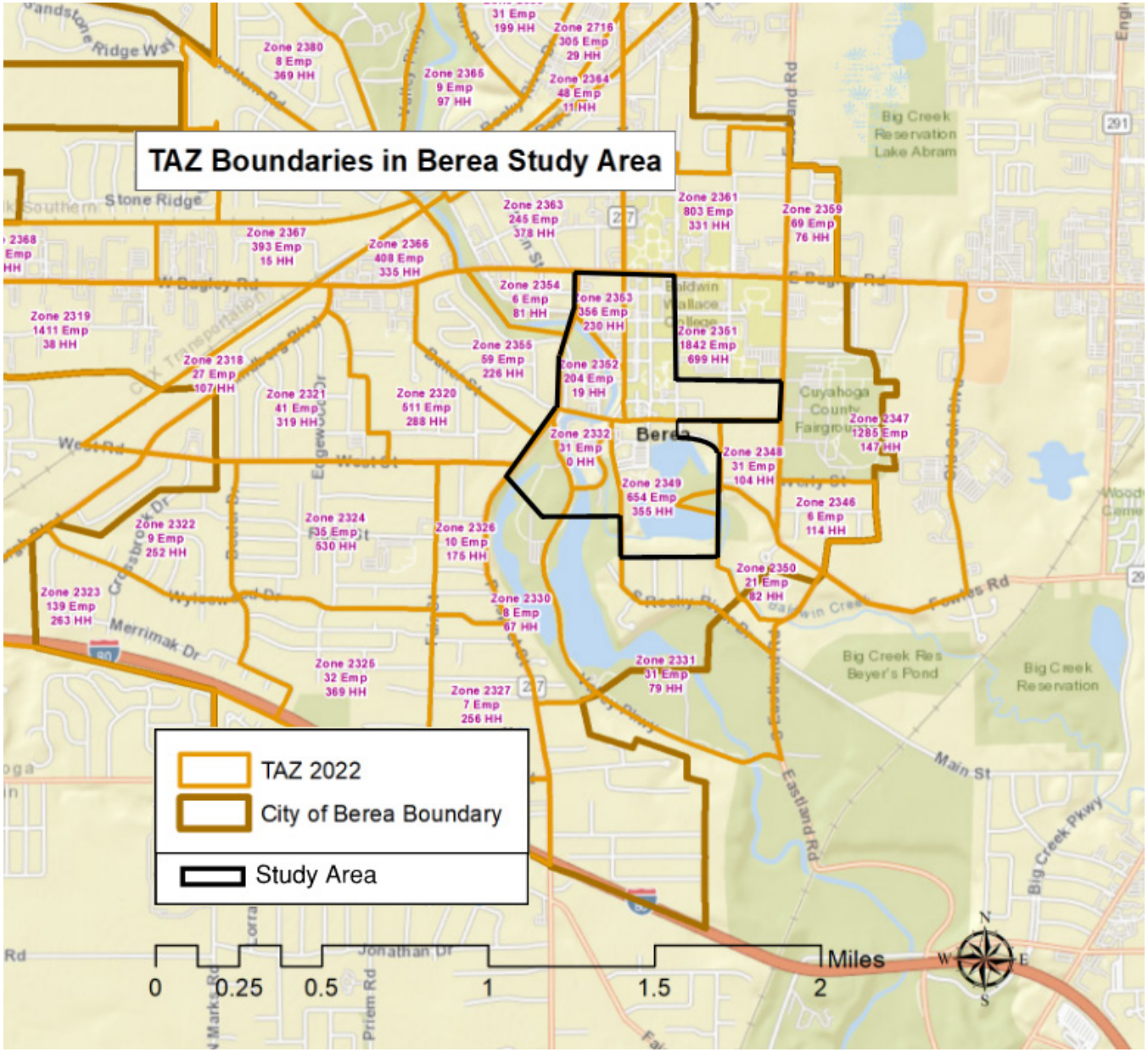


Figure 25 - TAZ Boundaries

Source: NOACA

Existing Traffic Analysis

Analyses of the traffic generation and attraction characteristics of the land uses within the study area were conducted based on data available from NOACA's Transportation Forecasting Model. NOACA's model is comprised of traffic analysis zones (TAZs). The following is a summary of the data provided by NOACA for the study area:

- Street map and imagery maps showing the TAZ boundaries.
- Year 2022 socioeconomic Data by TAZ for the entire City of Berea, including TAZ size, households, population, and employment.
- Year 2022 vehicular trip generation and attraction by TAZ, including truck trips, work trips and non-work trips.
- Year 2022 directional auto and truck volumes on NOACA travel demand model network, including daily volumes, AM peak period volumes (6 AM to 9 AM), and PM peak period volumes (3 PM to 7 PM).
- Year 2040 directional auto and truck volumes on NOACA travel demand model network, including daily volumes, AM peak period volumes (6 AM to 9 AM), and PM peak period volumes (3 PM to 7 PM).

The project study area either includes or overlaps eight TAZs: 2030, 2331, 2332, 2349, 2350, 2351, 2352, and 2353. TAZs 2030, 2031, 2349, 2350, and 2351 are partially inside the study area. When the TAZ is bolded in the following tables, this signifies that the TAZ is entirely within the study area. TAZs that are partially in the study area are left unbolded.

Year 2022 TAZ socioeconomic data is shown in Table 3.

Table 3 - TAZ Socioeconomic Data

TAZ	Sq. Miles	Households	Population	Employment	Household per Sq. Miles	Population per Sq. Miles	Employment per Sq. Miles
2030	0.136	67	132	8	493	971	59
2331	0.302	79	133	31	262	440	103
2332	**0.029**	**0**	**0**	**31**	**0**	**0**	**1,069**
2349	0.177	355	569	654	2,006	3,215	3,695
2350	0.077	82	121	21	1,065	1,571	273
2351	0.209	699	1,250	1,842	3,344	5,981	8,813
2352	**0.044**	**19**	**41**	**204**	**432**	**932**	**4,636**
2353	**0.03**	**230**	**298**	**356**	**7,667**	**9,933**	**11,867**

TAZ 2351, which includes areas east of Front Street and north of Bridge Street, has the highest number of households, population, and employees, out of the zones that touch the study area. This area includes portions of Baldwin Wallace University that are not necessarily within the project study area. However, the numbers are indicative of the traffic demand that exists in the northeast portion of the study area. Other zones with notable population data include TAZ 2349, east of South Rocky River Drive and south of Bridge Street, and TAZ 2353 in the northwest area of the study area north of North Rocky River Drive and west of Front Street. TAZ 2353 is also the most densely populated portion of the study area with the highest households, populations, and number of employees per square mile. TAZ 2332 encompasses an area where only the Dr. Ramadonoff Water Treatment Plant exists with no households or population, but 31 employees.

Vehicular trip data from the year 2022 model for trip generation and attraction was also reviewed and is summarized in Table 4.

Table 4 - TAZ Vehicular Trip Generations and Attractions

TAZ	Truck Trip Generations	Work Trip Generations	Non-Work Trip Generations	Truck Trip Attractions	Work Trip Attractions	Non-Work Trip Attractions
2030	0.2	2	29	0.2	3	34
2331	0.2	4	36	0.2	4	42
2332	**0.3**	**2**	**8**	**0.3**	**2**	**6**
2349	2.9	55	366	2.8	54	335
2350	0.1	2	24	0.1	3	28
2351	4.1	141	674	4.1	130	617
2352	**1.4**	**16**	**126**	**1.4**	**15**	**93**
2353	**0.5**	**32**	**153**	**0.5**	**29**	**162**

TAZ 2351 generates and attracts the highest truck trips, work trips and non-work trips. TAZs 2349 and 2353 are the next highest trip generation and attraction zones. The vast majority of vehicular trips within the study area are non-work related which is indicative of the residential, recreational and educational nature of the land uses within the study area.

Traffic data from roadway links within the model were analyzed to assess total vehicles entering and exiting the study area during the morning commuter peak period and the afternoon peak period. The directional volumes from NOACA's travel demand model network are summarized in Table 5. It shows the total vehicles in AM and PM peak periods for Years 2022 and 2040.

Table 5 - Study Area Entering and Exiting Traffic

Total Vehicles (Auto + Truck)		2022				2040			
Roadway	Location	AM		PM		AM		PM	
		IN	OUT	IN	OUT	IN	OUT	IN	OUT
Front Street	North of Bagley Road	366	1,792	3,556	1,439	367	1,745	3,310	1,307
Bagley Road	West of Front Street	2,277	1,028	2,005	4,645	2,284	1,100	2,273	4,442
Bagley Road	East of Front Street	1,059	2,464	4,415	2,204	1,136	2,521	4,308	2,210
Baker Street	West of Prospect Street	181	107	371	318	181	111	405	335
West Street	West of Prospect Street	990	88	291	1,320	831	107	338	1,431
Prospect Street	South of West Street	1,327	424	1,294	1,778	1,436	416	1,282	2,001
Rocky River Drive	North of South Boundary	68	14	109	188	64	14	98	172
Adams Road	East of East Boundary	65	147	54	352	63	130	91	351
Eastland Road	South of Bridge Street	315	30	206	840	311	33	177	648
Eastland Road	North of Center Street	273	544	1,049	665	232	515	870	608
Totals		6,921	6,638	13,350	13,749	6,905	6,692	13,152	13,505

In the morning, there are approximately 300 more vehicles entering the study area than there are exiting. These are drivers going to work or school in the morning and parking within the study area. In the afternoon, the opposite was found to be true with approximately 400 more vehicles exiting the study area than entering. This is an expected pattern for an area such as downtown Berea area with commercial and university buildings within the study area. With this pattern, it is expected that parking demand within the area would increase during the day and dissipate in the evening, which matches observations.

Parking Demand and Supply Analysis

The existing parking availability in the study area is shown in Figure 23 - Parking Supply and Distribution and, while this was not an exhaustive inventory of parking supply, totals approximately 1,700 spaces. The number of parking stalls per trip attractions, including work trip and non-work trip, are calculated for each TAZ in the study area and shown in Table 6.

Table 6 - TAZ Parking Analysis

TAZ	Number of Parking Stalls	Parking Stalls per Trip Attraction
2330	360	9.7
2331	141	3.0
2332	**40**	**4.7**
2349	509	1.3
2350	108	3.4
2351	467	0.6
2352	**356**	**3.3**
2353	**233**	**1.2**

When the number of parking stalls per attraction is greater than 1.0, the indication is that there is sufficient parking to meet demand. That is the case in each of the above TAZs except for TAZ 2351, most of which encompasses the BW campus northeast of the study area. Not all parking spaces in that TAZ were included in the parking supply inventory since major parking lots in that zone are outside of the study area.

It is noted that the majority of TAZs have parking ratios greater than 3.0 and as high as 9.7. This indicates that parking is generally abundant in the study area but does not indicate the ability for that parking to adequately serve its intended users. Such determinations would be a part of a parking study that looks at locations and types of parking facilities along with how those spaces are managed along with their proximity to destinations. The high ratios of parking stalls to trip attractions do indicate, however, that with proper management and wayfinding signage, the existing parking supply appears to be adequate to accommodate both everyday parking demand within the study area as well as additional supply to accommodate periods of higher demand such as during special events.

Crash Analysis

Table 7 - Crash Data Summary

Type	Number	Property Damage	Injury	Fatal
Rear End	55	43	12	0
Backing	27	27	0	0
Angle	20	12	8	0
Sideswipe - Passing	20	17	3	0
Fixed Object	16	12	4	0
Left Turn	15	14	1	0
Parked Vehicle	12	12	0	0
Right Turn	10	9	1	0
Pedestrian	7	0	7	0
Pedalcycles	6	0	6	0
Animal	4	4	0	0
Unknown	3	3	0	0
Other Non-Collision	2	1	1	0
Head On	2	0	1	1
Total	199	154	44	1

Crash data was obtained for the most recent five years of data available from the Ohio Department of Transportation's (ODOT) online database. A full five years of data were obtained for the years 2018 through 2022 and available data to-date for 2023 (partial). Table 7 provides a summary of the types of crashes observed and their severity.

Rear end crashes were the most common crash type over the nearly six-year period which is typical for an urban roadway network. With no serious injuries resulting from rear end crashes, their overall frequency was not found to be remarkable. Backing crashes were the second-most common which is a notable statistic since these types of crashes are usually rare.

A review of the backing crashes found that 40% of them (11 of the 27 crashes reported) were due to drivers backing out of angled parking spaces in the downtown area. While none of these crashes involved injuries, the prevalence of these crashes related to angled parking on the street suggests that alternatives such as back-in angled parking should be considered.

With back-in angled parking, drivers back-in to the parking space much as they would for parallel parking spaces which helps to ensure drivers have a clear view when leaving the parking space. It was noted that only 2 of the 27 backing crashes were related to parallel parking spaces on streets in the downtown area.

Thirteen of the nearly 200 reported crashes over the nearly six-year period involved pedestrians and bicyclists. All thirteen of these crashes resulted in injury. Seven of these crashes occurred at intersections at Bagley Road. Four of the six bicycle crashes involved cyclists in a crosswalk or traveling the wrong way on the one-way portion of Bridge Street. (The crash on Bridge Street involved a driver that was subsequently arrested for intoxication.) The pattern of bicycle crashes speaks to the lack of infrastructure for bicyclists to ride within the roadway where drivers expect to encounter them. Only two pedestrian crashes over the nearly six-year period occurred within the study area away from Bagley Road. One involved a left turning vehicle at Front Street and Church Street and the other involved an eastbound vehicle striking a pedestrian crossing Bridge Street on the east leg of its intersection at Seminary Street. This pedestrian crossing at Bridge Street and Seminary Street is one that was identified for potential improvement.

The one fatal crash identified in Table 7 involved a head on crash on Bagley Road in 2021.

It is noted that the COVID-19 pandemic impacted travel patterns, behavior that are reflected in a change of patterns of crashes in years 2020 and beyond. As a result, the number of crashes were observed to decline in 2020 and 2021. In 2020 and 2021, while the absolute number of crashes decreased, the number of severe injury crashes in relation to those totals increased. Total numbers of crashes and the proportion of severe injury crashes were observed prior to the pandemic in 2022 and 2023 data.

Existing Conditions Analysis Summary

The Existing Conditions Analysis effort resulted in the identification of areas where modifications to the transportation network within the study area could improve mobility and safety for non-motorized users.

The City of Berea is a historic community that is home to just under 20,000 people, and features a rich history in sandstone quarries, education, and transportation. It is home to Baldwin Wallace University, the Cuyahoga County Fairgrounds, and the training facility for the Cleveland Browns football team. The study area is the center of this community and includes single family residences, multi-family housing, academic and student residential buildings that are part of BW, the Downtown Business District, municipality buildings, Coe Lake, and the Valley Parkway All Purpose Trail. Nearly the entire study area is designated an Environmental Justice Community.

The Existing Conditions Analysis resulted in other key findings that include areas of concern or where improvements may be recommended. The following is a summary of these findings.

The study area was found to contain an extensive and well-connected network for pedestrians that provides ease of access and mobility for a wide variety of users supporting access to the varying land uses within the study area. This pedestrian network connects to the three main bus stops that serve the study area via

sidewalk and controlled crossings of Bagley Road. Improvements to address sidewalk gaps, missing curb ramps and additional or improved pedestrian crosswalks were identified that could help to complete and further enhance the existing pedestrian network.

Gaps in the sidewalk network were identified at a few locations:

- North Rocky River Drive has no sidewalk on the west side of the street
- Riverside Drive between Bridge Street and Church Street has no sidewalk on the east side of the street
- Front Street between Bridge Street and Church

Street has no sidewalk on the west side of the street

» A 120' gap in the sidewalk exists on the west side of Front Street south of West Center Street

Two locations with the need for curb ramps in the near term were identified:

» The east end of the crosswalk on the north leg of the intersection of Front Street and North Rocky River Drive

» The northwest corner of the intersection of Front Street and Center Street

Some locations were identified as pedestrian crossing locations that do not currently have marked crossings.

» Pedestrian access to the parking lot at the intersection of Beech Street and Liberty Street

» Pedestrian crossing of Beech Street in the vicinity of the tennis courts between Grand Street and Center Street

» A marked pedestrian crossing of Front Street does not exist in a 1,000' segment between Bagley Road and Grand Street

» Crossings for pedestrians traveling east and west across Beech Street and Seminary Street at Liberty Street and Spring Street

Other existing, pedestrian crossings were identified that are currently marked but were considered for potential improvements:

» Two midblock crossings of Seminary Street between Church Street and School Street

» An angled crossing of Beech Street through its intersection with Center Street

» Midblock crossing of Seminary Street north of Spring Street (at the Berea United Methodist Church)

» Two midblock crossings of South Rocky River Drive

» Long pedestrian crossings at the intersection of Bridge Street and Seminary Street due to the radius of the northeast curb line

The analysis of the study area's bicycle network found that while some bicycle infrastructure exists, a comprehensive, connected bicycle network with signed bike routes and accompanying infrastructure does not exist within the study area. Many of the streets within the study area were found to be comfortable for most adults or confident cyclists according to level of traffic stress (LTS) data and scoring. None were found to be comfortable for all ages. Traffic data found that about half of cyclists ride on sidewalks rather than in the roadway where it is preferable for bicyclists to ride.

Analysis of crash data over the most recent five-year period found a pattern of pedestrian and bicycle related crashes at intersections along Bagley Road. Bicycle crashes primarily involved riders in crosswalks or traveling the wrong way on one-way streets which can be tied to the finding from traffic counts referenced above. A pattern of pedestrian crashes away from Bagley Road was not identified but one pedestrian crash did occur within a crosswalk on the east leg of Bridge Street at Seminary Street which has been identified for improvement.

The vehicular analysis for the study area found that operations and parking were generally found to be sufficient with acceptable levels of service at intersections and both on-street and off-street parking distributed throughout the study area in sufficient supply based on an analysis of data from NOACA's travel demand model. Some concerns about backing out of angled parking spaces within the downtown were mentioned by residents which was corroborated by crash data identifying a pattern of property damage only backing crashes.

The existing conditions analysis revealed opportunities for improvements listed below.

» Opportunities to fully connect the pedestrian network within the study area including missing sidewalk, curb ramps, and crosswalks;

» Opportunities for adding midblock pedestrian crossings and improving existing ones;

» Opportunities to improve the existing bicycle infrastructure within the study area including new dedicated bicycle lanes, sharrows, and upgraded pavement markings;

» Opportunities to upgrade the existing wayfinding signage and add new signage for a complete wayfinding network, and;

» Opportunities to reduce pavement widths and turn radii at intersections within the downtown business district.

03

Alternatives Analysis

These opportunities for improvement are discussed further in the Alternatives and Recommendations sections of the report.

In the Existing Conditions Analysis portion of the project, the multimodel transportation network and operations within the study area were analyzed and results discussed with stakeholders, the community and City officials. That portion of the project resulted in the identification of areas of concern and areas for improvement. Several alternatives were developed and explored as potential improvements to mitigate the concerns identified through the Existing Conditions Analysis. This portion of the study discusses the alternatives that were considered, their expected effectiveness in addressing the identified concerns and input received on these potential alternatives from stakeholders, the community and the City. Figure 26 is a summary map of these areas of concern that was presented to stakeholders and the public. The following sections of this report discuss the alternative improvements considered.

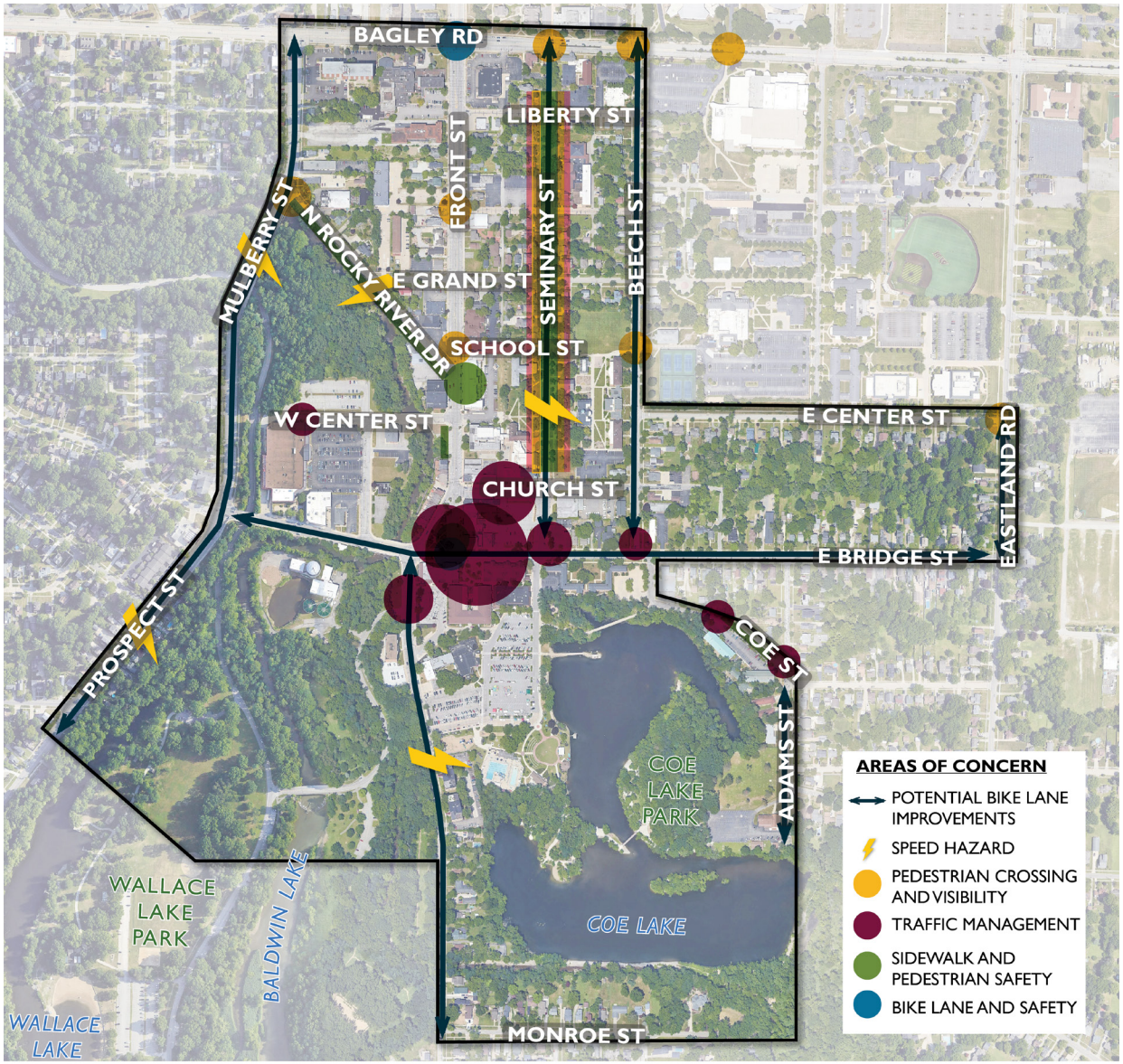


Figure 26 - Areas of Concern

Midblock Crossings

There are areas in our project area that were identified as having a significant number of pedestrian crossings where features could be added or enhanced to provide more visibility for pedestrians and motorists. These locations include Front Street near Liberty Street, Front Street near Spring Street, Beech Street near School Street, Seminary Street near School Street, Bagley Road near Baldwin Wallace University, and Seminary Street near Baldwin Wallace University Buildings. Figure 27 shows a summary of these locations.

Figure 27 - Midblock Crossing Potential Locations

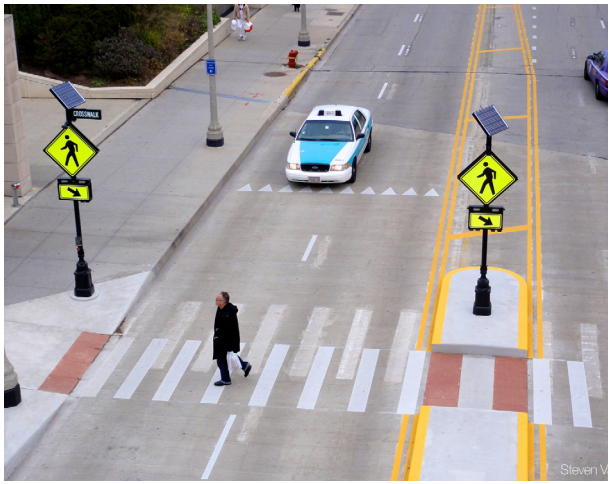
Improvement alternatives that were considered at these locations include curb bump-outs, pedestrian refuge islands, and raised pedestrian crosswalks, examples of which are included below. The curb bump-outs are a better way for drivers to see if pedestrians are needing to cross. The curb bump-outs can also be a way to narrow the traveled way and it also allows the pedestrians to have a shorter crossing distance. Pedestrian refuge islands are mainly used for heavier trafficked streets at uncontrolled, marked crossings and allow for pedestrians to only have to look for gaps in traffic and cross one direction of traffic at a time. The pedestrian refuge islands could be used when there is an existing two-way left turn lane where the turn lane is not being used for left turners. Another option for midblock crossings is raised pedestrian crosswalks. These raised pedestrian crosswalks are helpful in locations where increased pedestrian visibility is desired. These crosswalks also act as a speed table. For this study specifically, drainage needs to be considered for any additional items added to the existing roadway.

Curb Bump-Outs

Pedestrian Refuge Island

Raised Pedestrian Crosswalk

For pedestrian crossings that are heavily trafficked with a high volume of vehicles, Rectangular Rapid Flashing Beacons (RRFB) or High Intensity Activated Crosswalk (HAWK) can be considered to make it easier and safer for pedestrians to cross. These options should be considered at locations where existing pedestrians are having difficulties crossing and/or reported incidents have occurred at certain crossings. Both the RRFB and HAWK systems have been proven to increase driver yield rates and reduce pedestrian collisions. When the RRFB is activated, the pedestrian crossing signs will flash and alert drivers to yield to any pedestrians crossing the area. When the HAWK is activated, pedestrians have a clear indication on when to cross with pedestrian signal heads, and drivers will have a red signal indication to alert them to stop before the crossing.



Rectangular Rapid Flashing Beacon (RRFB)

High Intensity Activated Crosswalk (HAWK)

Street Design Options

There are a few streets within the study area where improvements are being considered. These streets include Seminary Street, Church Street, and East Bridge Street. Figure 28 shows a summary of these locations to be discussed.

The existing northeast corner of Seminary Street and East Bridge Street currently has a large curb radius from East Bridge Street. At this location, there is a stop sign immediately before the turn, so drivers should be stopping and making the right turn from a dead stop. From our public meetings, we have heard that drivers typically do a rolling stop at this location which may be encouraged by the wide radius. A smaller curb radius could help to slow traffic making the right turn on to Seminary Street as well as shorten the pedestrian crossing. It is noted that one of the severe pedestrian injury crashes involved a pedestrian at this crosswalk. The new curb radius will be determined through an evaluation of the space needed for trucks to make that turn without encroaching on other travel lanes or the sidewalk. With the revision of this curb radius, the southbound lanes of Seminary Street could also be reduced to one lane to ensure the turning truck does not overlap with the opposing lane. This would also allow the pedestrian crossing of the north leg of the intersection to be shortened.

Figure 28 - Street Design Areas of Concern

The existing intersection of Seminary Street and Church Street is also an area that was identified as a location for potential improvements. The current layout allows for northbound vehicles on Seminary Street to either continue on Seminary Street or turn left onto Church Street without any restrictions. This free-flowing traffic makes it difficult for angle parked vehicles to back up and exit the parking spots. Seminary Street at Church Street was investigated for the potential of adding a stop sign for northbound traffic to provide for an additional pedestrian crossing. If the Level of Service and queuing are found to be acceptable, adding a stop sign at this intersection will help with slowing traffic down and will allow for easier in-and-out access to the parking spots. The public meeting also had some additional concerns about too many vehicles accessing Seminary Street as a way to cut through to Bagley Road. The existing curb radius at the northwestern portion of the intersection can also be tightened up to try to deter cut through traffic from using this residential street. Revising the curb lines at Seminary Street and Church Street will also help shorten the pedestrian crossings. The potential additional stop bar installation on Seminary Street will also allow for a new pedestrian crossing to be installed near the parking lot area.

Figure 29 shows a preliminary sketch of Seminary Street from East Bridge Street to Church Street.

Figure 29 - Preliminary Sketch of Seminary Street at Bridge Street and Church Street

Traffic Calming Options

There are several locations within the project area that received public comments regarding speeding concerns. These streets are Seminary Street, South Rocky River Drive, North Rocky River Drive, and Prospect Street. Figure 30 to the right summarizes these locations.

Figure 30 - Traffic Calming Areas of Concern

Traffic calming measures have been proven to decrease the travel speed of vehicles. There are several different methods of calming traffic and some of these methods are being considered for our project study purposes. These measures are speed humps, speed tables, and lane narrowing.

Speed humps are typically used in low volume low speed roads and are intended to slow traffic speeds. Speed humps have been proven to reduce speeds 15 to 20 miles per hour. Speed humps shall also not be placed in front of a driveway or intersection and should be spaced no more than 500 feet apart.

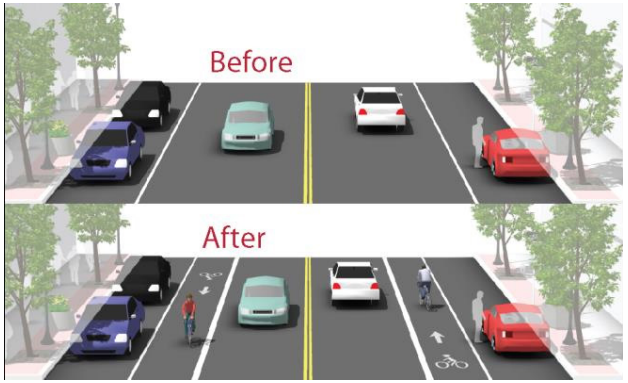
Speed tables are typically used midblock. Speed tables are typically longer than a speed hump and have a flat top. These are used on streets ranging from 25 to 45 miles per hour and usually are not residential type streets. When placing speed tables, if they are located near a pedestrian crossing, the pedestrian crossing should become a raised pedestrian crossing to act as both a speed table and pedestrian crossing.

Lane narrowing can also be used to calm traffic. The smaller the lane width, the more likely the driver will drive at a slower speed. The excess pavement can also be considered for things like a bicycle lane, parking lanes, wider sidewalks, wider tree lawns, etc.

Examples of each of these traffic calming devices are shown below.

Speed Hump

Speed Table



Lane Narrowing

Seminary Street was identified through the community engagement process for concerns regarding vehicle speeds and cut-through traffic. Seminary Street is a residential street with four Baldwin Wallace University buildings (Boesel Musical Arts Center, Gamble Auditorium, Marting Hall, and the Lindsay Crossman Chapel) and the Berea United Methodist Church. The street has a mix of vehicles, pedestrians, cyclists, and parked vehicles from the students and residents. During this study, the City of Berea Police Department placed a radar speed sign on Seminary Street to collect speed data. The device is a dynamic speed feedback sign that uses radar to track an approaching vehicle's speed and then displays that travel speed for the driver. These devices have been studied and proven to slow vehicle speeds and encourage drivers to obey posted speed limits. The below table shows the 85th percentile speeds, average speeds, and total number of vehicles for each day of a two-week period in December 2023. It is important to note that during this two-week period, Baldwin Wallace University students were not in session due to the Christmas holiday, so the results could potentially be skewed.

Table 8 - 12/14 to 12/27 Speed Data

Study Date	85th Percentile Speed (mph)	Average Speed (mph)	Total Number of Vehicles
12/14/23	26	17.9	1093
12/15/23	26	18.1	1076
12/16/23	26	18.2	970
12/17/23	26	15.7	821
12/18/23	25	18.5	777
12/19/23	27	19.1	730
12/20/23	26	19.3	649
12/21/23	27	19.9	671
12/22/23	26	18.7	729
12/23/23	26	19.0	537
12/24/23	27	19.8	453
12/25/23	27	18.6	301
12/26/23	27	19.4	592
12/27/23	26	19.0	638

Source: City of Berea

The City of Berea also conducted an identical radar speed study again in January 2024 when the Baldwin Wallace University students were back to campus and classes were in session. The below table shows the 85th percentile speeds, average speeds, and total number of vehicles for each day for the two-week period in January 2024.

Table 9 - 1/18 to 1/31 Speed Data

Study Date	85th Percentile Speed (mph)	Average Speed (mph)	Total Number of Vehicles
1/18/24	26	17.8	743
1/19/24	24	15.7	658
1/20/24	25	16.8	963
1/21/24	26	18.3	810
1/22/24	24	16.8	1654
1/23/24	25	17.2	1443
1/24/24	24	17.4	1423
1/25/24	24	17.2	1483
1/26/24	25	17.6	1331
1/27/24	25	17.7	1148
1/28/24	27	19.4	813
1/29/24	26	18.1	1389
1/30/24	25	18.1	1425
1/31/24	25	17.9	1438

Source: City of Berea

The results from the speed data on Table 8 and Table 9 show that the 85th percentile speed is close to the speed limit, and the average speeds are lower than the posted speed limit. This could be a result of drivers slowing down when they know they are being watched. The data shows that the radar speed sign is effective in encouraging drivers to travel the posted speed limit. It is recommended that the City of Berea conduct a typical speed study on Seminary Street. Typical speed studies are conducted in such a manner that drivers are not aware the study is taking place. This is usually done with tubes or other devices. If a typical speed study is conducted and shows that Seminary Street does have an issue regarding speeds when no radar feedback sign is present, a combination of speed humps and curb bump-outs, etc. could help calm traffic. The speed radar sign can also be used more often to encourage drivers to travel at the posted speed limit.

Figure 31 to the right shows locations for traffic calming devices that were considered. As shown in the figure, Seminary Street and Beech Street shows a combination of raised pedestrian crossings and speed humps, and Front Street shows two additional pedestrian refuge islands.

Locations where pedestrian refuge islands were considered are indicated by blue circles, speed humps by yellow triangles, and raised pedestrian crossings by red squares.

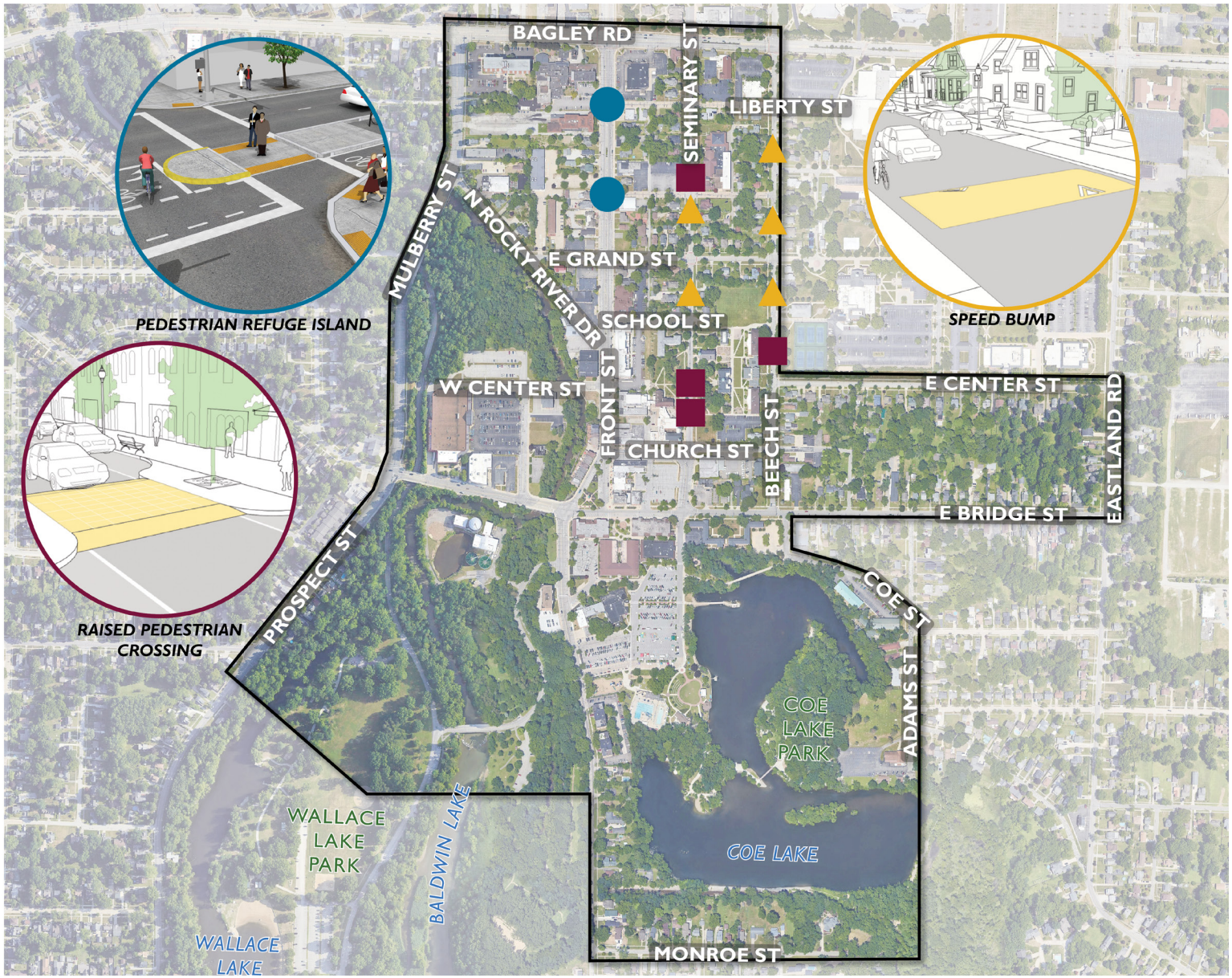


Figure 31 - Traffic Calming Preliminary Locations

Figure 32 - Alternative Bicycle Facility Location Map

Bicycle Facility Options

As part of this study, additional bicycle facilities are being considered throughout the study area. Figure 32 shows the locations that were identified for review of potential new facilities or changes to existing ones. The north end of Front Street at Bagley Road has a dedicated bicycle lane, but its design could be improved to better accommodate the unavoidable conflict that exists between right turning vehicles and through cyclists continuing north on Front Street. Additional facilities were also considered on Seminary Street, Beech Street, Bridge Street, and Prospect Street.

Cuyahoga County has created a Cuyahoga Greenways plan that is a county wide initiative to plan and implement greenways and urban trails throughout the county. Some of our project study area is included as part of the Cuyahoga Greenways plan and can be seen in Figure 33. As shown in the figure, the study area has three proposed connector routes that are part of the county's plan: the Bagley Parkway Connector, Front Street Connector, and the County Fairgrounds Connector. The Bagley Parkway Connector would be a three-mile on-street route that starts at the Cuyahoga County corporation line and continues through Middleburg Heights until the street name changes to Pleasant Valley Road. The County Fairgrounds Connector would be a 1.5-mile off-street route that starts at North Quarry Lane and continues east to the Big Creek Lake Trail. The Front Street Connector is also shown in the figure as an on-street future route, and it looks like the dedicated bicycle routes have been constructed up to the intersection of Front Street and Center Street. The remaining connection from Front Street and Center Street to Front Street and North Quarry Lane still needs to be implemented. Figure 33 also shows the existing Valley Parkway All Purpose Trail.

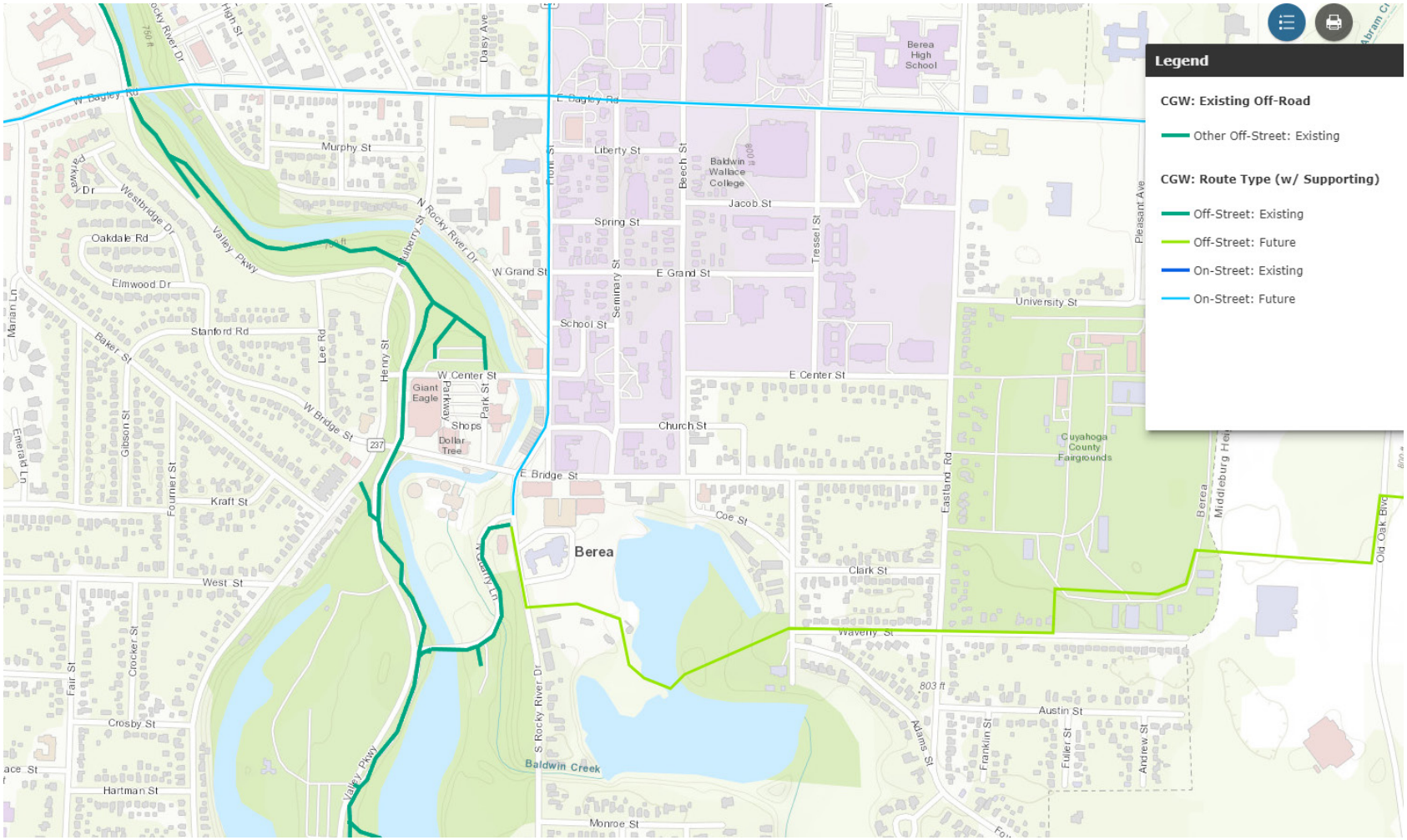
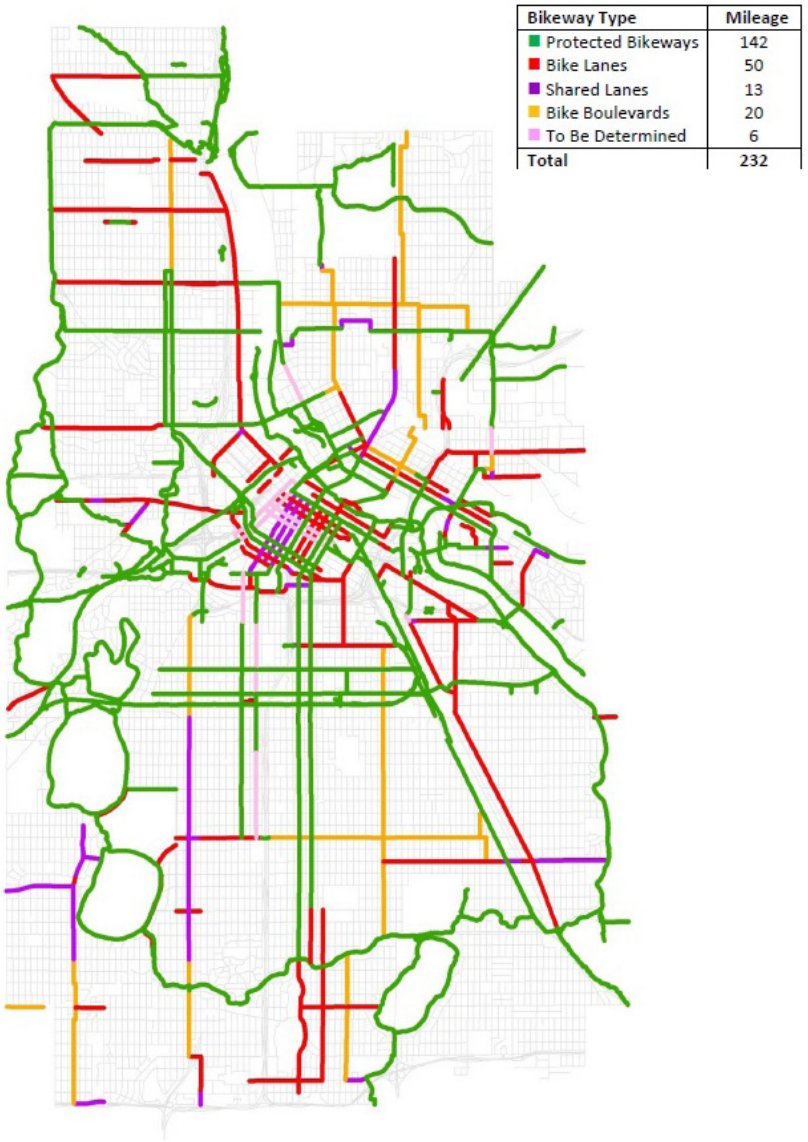


Figure 33 - Cuyahoga Greenways Plan

Source: CUYAHOGA GREENWAYS: Framework Plan
https://countyplanning.maps.arcgis.com/apps/MapSeries/index.html?appid=dd4234b156d44f81a16e16bfba674493



Source: Protected Bikeway Update to the Minneapolis Bicycle Master Plan - 4/17/2015

Figure 34 - City-Wide Bike Plan Example

The existing bicycle network can be found on Figure 11. As shown on the figure, dedicated bicycle facilities are lacking within the project study area. More specifically, there are a lack of east/west bicycle routes which make it unclear to cyclists what streets/routes they should be taking if they are trying to get to an east/west destination. The Cuyahoga Greenways initiative proposes a couple more connection routes on the border of the study area, but a full bicycle connectivity plan would determine how cyclists would access these main bicycle routes. This plan could consider additional connection routes throughout the city or identify bike friendly streets to be dedicated as part of signed routes for cyclists. The streets discussed below for bicycle improvements will also need to be considered in the city-wide plan. An example of a city-wide network plan is in Figure 34 and shows where different types of bicycle facilities can be implemented to provide cyclists with a connected network.

Figure 34 illustrates an urban street network with different types of bicycle infrastructure indicated by the different colors. These facilities appear to include those that align with the existing street grid as well as off street trails. Some infrastructure is likely existing and some proposed in order to provide a complete network of interconnected infrastructure for bicyclists.

Figure 35 - Existing Front Street and Bagley Road Reconfiguration

The northbound lanes of Front Street approaching Bagley Road currently include a dedicated bicycle lane to the right of a through/right turn lane. The current location of the bicycle lane can result in a conflict between a right turning vehicle and a cyclist traveling through the intersection. Based on data shown in Figure 13, the northbound lane of Front Street is a high intensity activity area. To avoid the right hook issue, the lanes can be reconfigured to have the dedicated bicycle lane to the left of the right turn lane. This will mimic the existing lane configuration at Front Street for southbound lanes at the intersection and will help prevent right hook crashes with cyclists. Figure 35 shows the existing configuration at Front Street and Bagley Road. Figure 36 is an illustration of the recommended layout of a through bicycle lane from NACTO with the turn lane to the right of the dedicated bicycle lane.

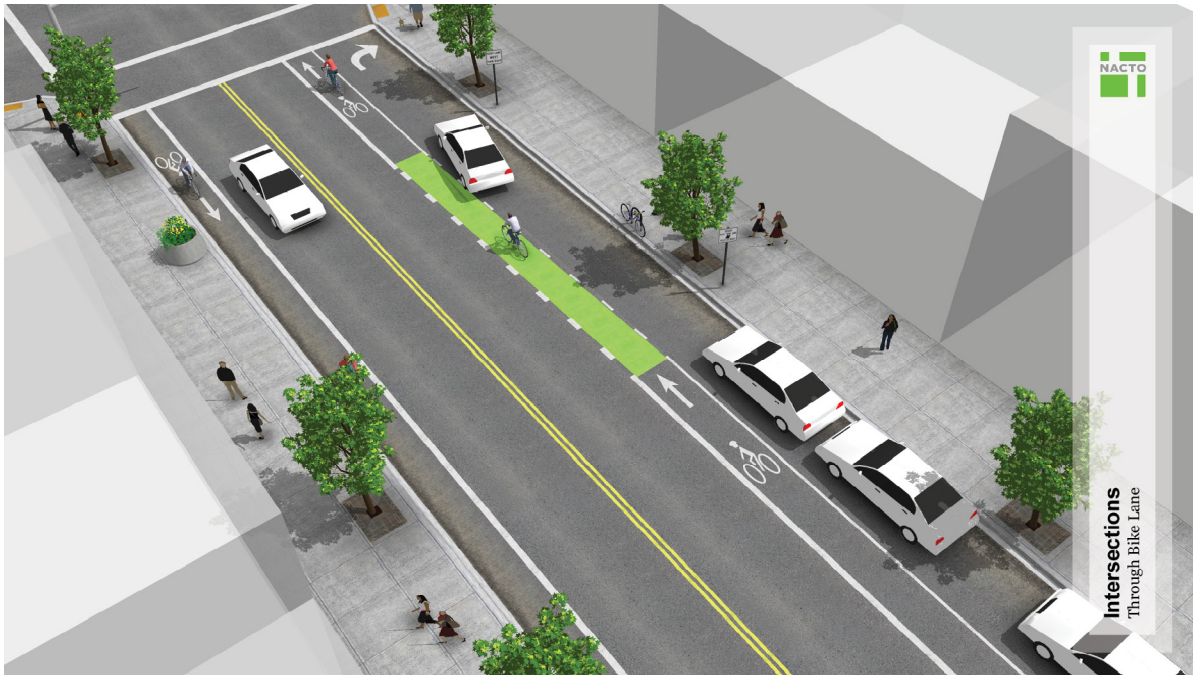
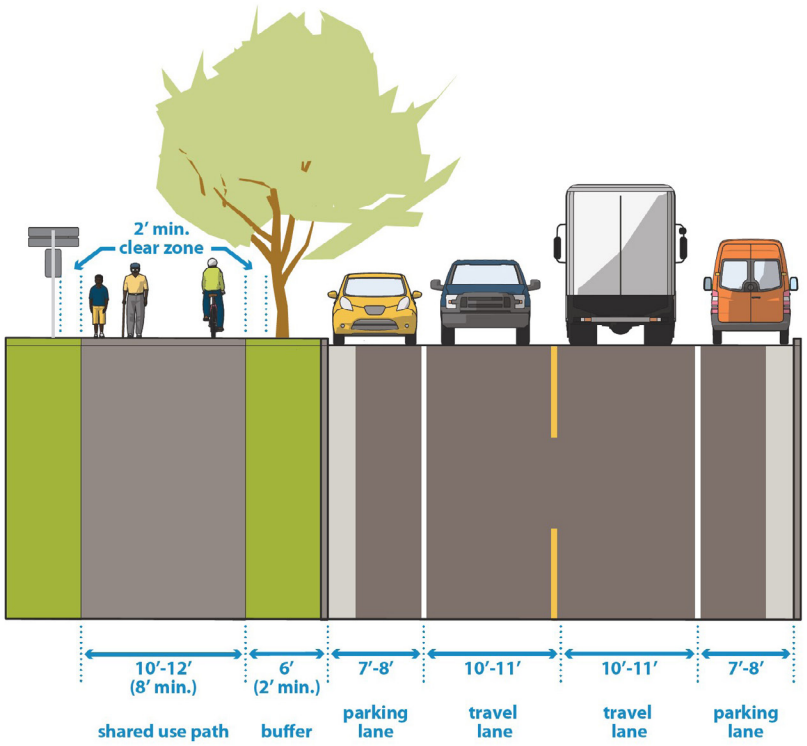


Figure 36 - NACTO Bike and Turn Lane Configuration

Additional bicycle facilities are being considered on Seminary Street, Beech Street, and West Center Street near the metroparks and can include shared bicycle lanes, dedicated bicycle lanes, or shared use paths. Both Seminary Street and Beech Street have multiple Baldwin Wallace University buildings and are heavily residential. From the student bike survey results, it is clear that more students would use their bicycles if more bicycle infrastructure existed. Comments received from the public meeting also indicated that the residents would like to see some sort of bicycle facility on both of these streets. Both streets have identical pavement widths and are both one-way. Both streets are about 24 feet wide with street parking. Figure 22 shows the bicycle volumes within the study area, and it shows that Seminary Street has a decent presence of cyclists which supports to add a dedicated bicycle facility.

Since Seminary Street and Beech Street work as a one-way pair, adding dedicated bicycle lanes to each street will allow for access to the Baldwin Wallace University buildings within the study area. A dedicated bicycle lane can be introduced to both streets while still maintaining a travel lane and dedicated parking lane. A shared use path isn't being considered for these streets since the legal speed limit is relatively low and with the streets being heavily residential, it would be better to avoid too many right-of-way takes on these streets. West Center Street near the Metroparks is a 2-lane road, with one lane in each direction.

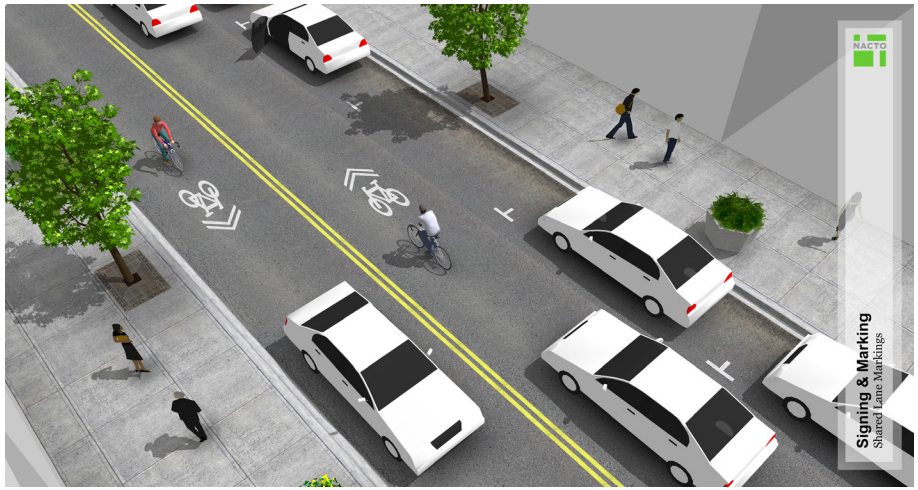
To help connect the cyclists from Front Street to the Metropark, bicycle facilities on West Center Street can be introduced. Since the section near the Metroparks is not wide enough to add in a dedicated bicycle lane, and a shared use path is not possible with the existing bridge, sharrow lane markings can be added to help guide bicyclists to the Valley Parkway All Purpose Trail. The surrounding pictures show examples of a dedicated bicycle lane, shared use path, and a shared lane.



Preferred widths shown - see chart for more information

Shared Use Path

Dedicated Bicycle Lane



Shared Lane

Sidewalk Options

As part of this study, missing sidewalk connections are being considered within the study area. Figure 37 shows the feedback received from the public meetings on areas that residents would like to see some improvements. North Rocky River Drive and Coe Street both have sidewalks on one side of the street, but some residents would like to see sidewalks on both sides of the street. On the southwest corner of Front Street and Center Street, there is a missing piece of sidewalk that residents would like to see added in.

Figure 37 - Sidewalk Options

Figure 38 - Potential Coe Street Improvements

North Rocky River Drive currently has sidewalk on the north side of the street. Residents would like for additional sidewalk to be added on the south side of the street, but the existing terrain will make it difficult to add anything on this side of the road without having to build extensive retaining walls. There is also no need to add sidewalk to the south side of the road since there aren't any destinations to walk to on that side.

Coe Street currently has sidewalk on the north side of the street. Residents would like for additional sidewalk to be added on the south side of the street, but adding this extra walk to the south would impact the existing parking which cannot be removed. According to Figure 13, Coe Street is a high intensity activity area. To accommodate pedestrians and cyclists, an option would be to widen the existing sidewalk to accommodate a shared use path for bicyclists and pedestrians to use and be able to access the lake pier. Figure 38 shows a proposed sketch of what Coe Street could look like with the addition of the shared use path.

The southwest corner of Front Street and Center Street currently has a piece of sidewalk missing near the parking strip. Since this connection is currently missing, pedestrians and cyclists are using the steep driveway entrance at the Riverside Townhomes to access the bridge area. Several comments from the public meetings indicate that this drive has been a point of conflict with pedestrians (especially ones with strollers) and cyclists since drivers do not have good visibility while going down the drive. Adding this sidewalk connection will allow for a ramp connecting the sidewalk and the bridge to be installed, further improving the access for pedestrians with strollers. Figure 39 shows the existing driveway that access the condos and Figure 40 shows an aerial view of the existing missing sidewalk connection.

Figure 39 - Existing Riverside Townhomes Driveway

Figure 40 - Existing Front Street Missing Sidewalk

Figure 41 - Southwest Corner of Front Street and Center Street

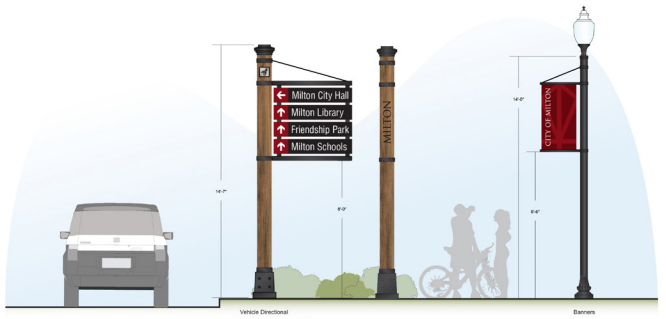
The figure above shows a preliminary sketch on how this area can be redesigned to include the additional missing sidewalk to fully connect Front Street. The additional proposed work also includes a ramp that will connect the proposed sidewalk with the existing bridge. This area was also part of the City's 2010 Master Plan, so this work is recommended to provide continuity of the pedestrian network.

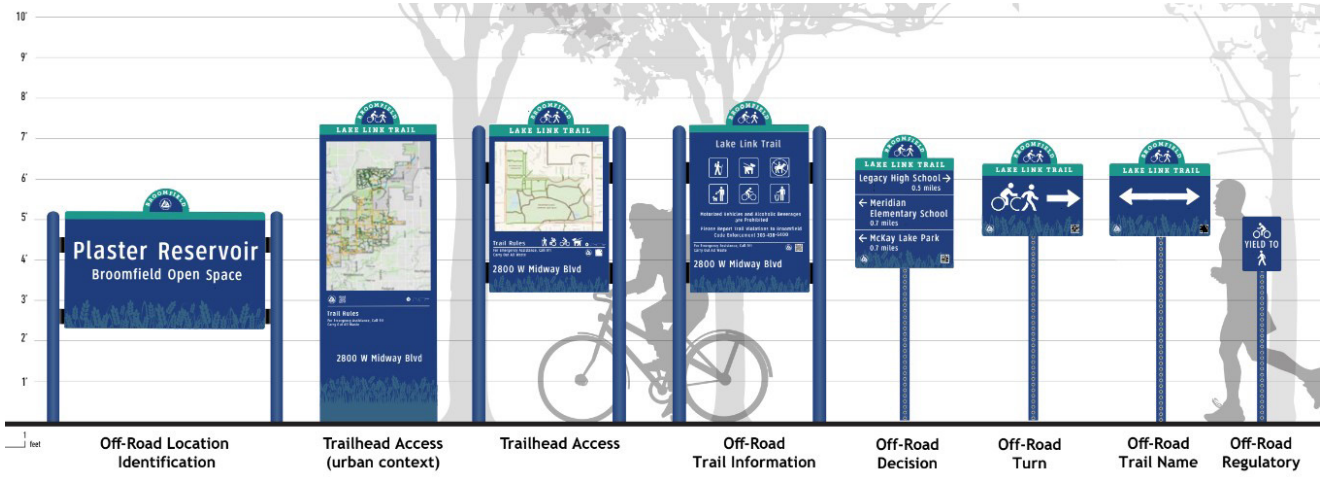
Wayfinding Signage

Wayfinding signage helps people get oriented and find their way to their destination. Wayfinding signage can include several different types of signs, including informational signs, directional signs, identification signs, regulatory signs, symbol signs, interactive signs, and waymarker signs. There have been proven benefits of installing wayfinding signage. These benefits include improvements to the city connectivity by making the city easier to understand and navigate, ease frustration for new visitors to the city, and improves the sense of community.

Based on comments received from the city and the public meetings, additional/better wayfinding signage is needed to help guide motorized and non-motorized modes of transportation, especially for the downtown core. Figure 24 shows the existing wayfinding signage, and currently there are not enough wayfinding signs for both drivers and pedestrians/cyclists. A list of key destinations provided by the city and public are summarized in Figure 42 and should be considered as destinations that need to have some wayfinding signage.

Examples of motorized and non-motorized wayfinding signage are shown to the right.





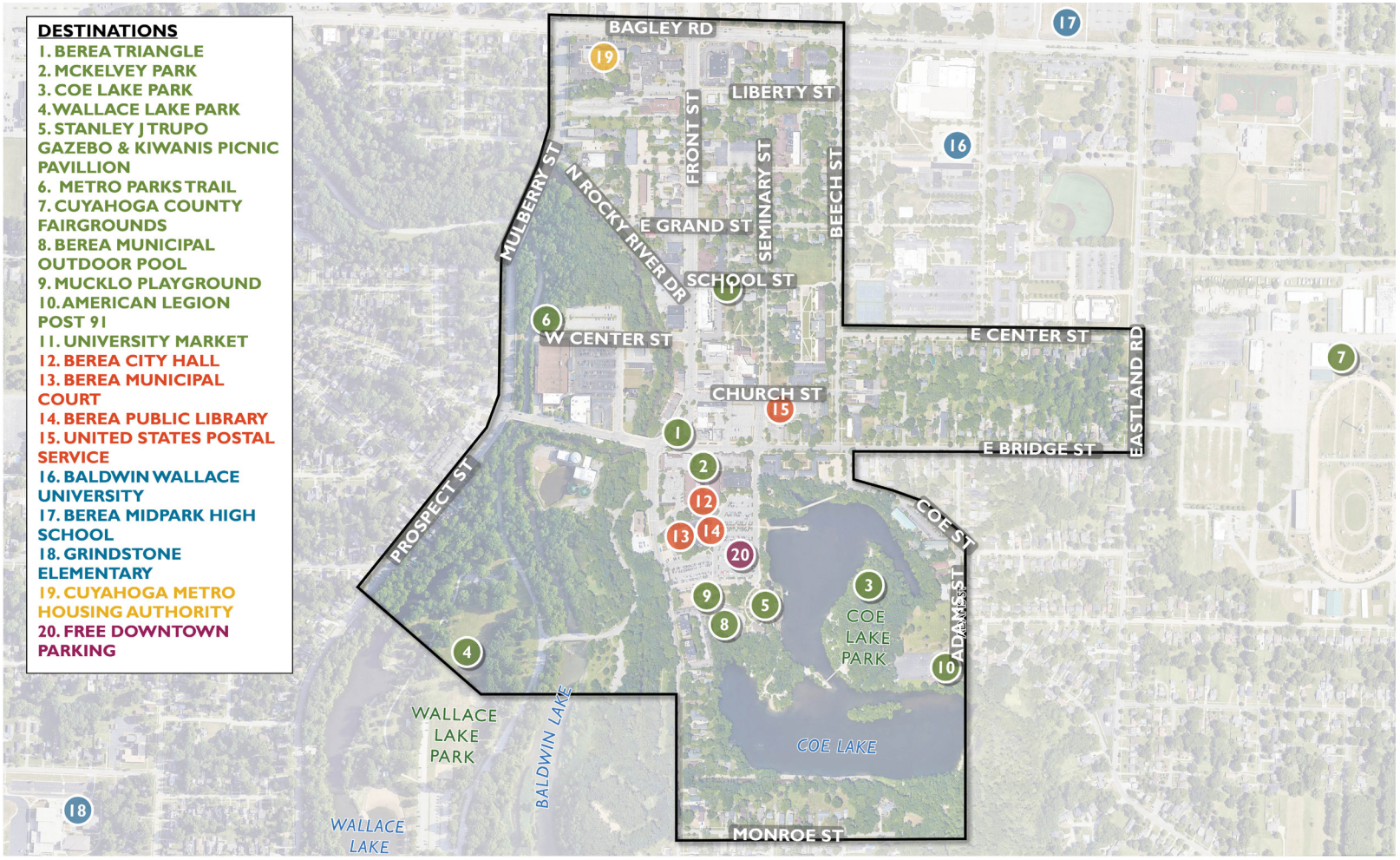


Figure 42 - Key Destinations

Key Destinations

Figure 42 shows the major vehicular and non-vehicular destinations within the project study area based on existing wayfinding signage and community and stakeholder indications of popular destinations within the study area. Most destinations are clustered within the Downtown Business District area. Numbers shown in green are parks or areas frequently visited, numbers in orange are government building locations, numbers in blue are school locations, numbers in yellow are housing assistance, and numbers in purple are the free parking lot areas within downtown. These key destinations shown below include some destinations where wayfinding signs could be helpful for motorized and non-motorized modes of travel.

04

Public Involvement Process

To implement a robust public involvement strategy, the study utilized both a small stakeholder group and community meetings in order to receive feedback throughout the study. A diverse stakeholder committee comprised of 11 representatives from various entities, including business owners, the Berea Planning Commission, City Council, Heritage Architectural Review Board, City Library, Baldwin Wallace University, City of Berea, the Berea Post Office, and residents of the study area was formed. The project team facilitated stakeholder meetings to introduce topics and gather essential feedback prior to presenting it to the public. The stakeholders also served as community liaisons throughout the process. The small group size allowed in-depth discussion regarding the different needs and perspectives of the community. Subsequently, community meetings were held throughout the planning process to actively seek public input. This ensured a comprehensive and inclusive approach to decision-making. See figure below for a summary timeline of public involvement activities.

Stakeholder and Community Meetings

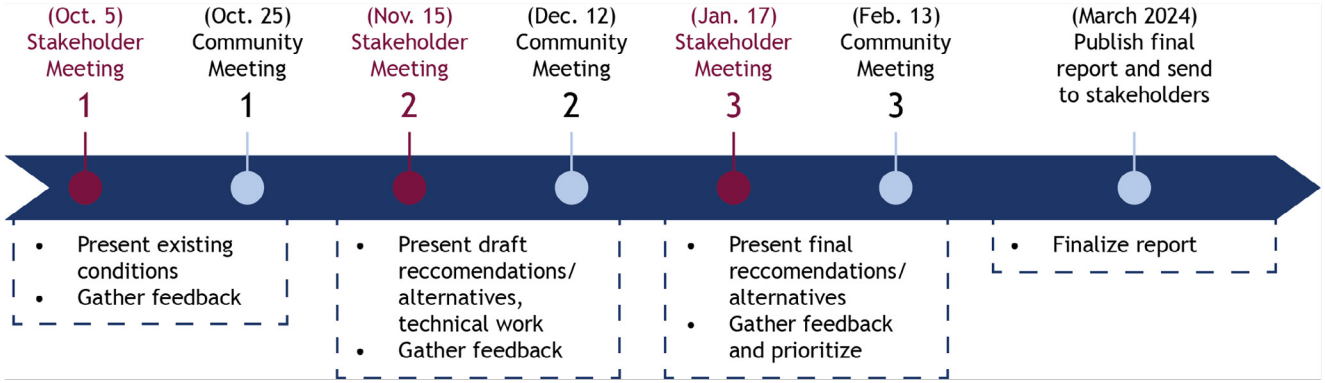
The stakeholder group met three times throughout the study process. The meetings were held virtually from 12:00 – 1:00 PM via Microsoft Teams. The meetings were facilitated via a presentation and had dedicated time for discussion throughout or following the presentation.

Three community meetings were hosted at the nearby Cuyahoga County Public Library (Berea Branch) throughout the study process. Each meeting was held in the evening from 6:00-8:00 PM. A set of notification documents including a flyer, social media graphic, press release copy, and social media post copy was created for each public meeting. The notification materials were sent to the city and NOACA to post on their established communication channels. The materials were also sent to the stakeholder group to further distribute to neighbors, constituents, and others in the community. Following the first community meeting, invitations were sent to all meeting attendees via email.

Stakeholder Meeting #1 (October 5, 2023)

The first steering committee meeting introduced the project team, overall goals, and purpose of the study, outlined the schedule, and discussed future community outreach. The project team gathered data and conducted analysis of existing conditions (including crash data and traffic operations analysis) to better understand current conditions within the study area and presented them to the group. The stakeholders provided feedback on existing issues, concerns, and knowledge of existing conditions during discussion at the end of the presentation.

All materials and notes from stakeholder meeting #1 can be found on pages 1-34 in **Appendix B.**



Community Meeting #1 (October 25, 2023)

At the first community meeting, the project team presented similar information from the first stakeholder meeting, including introducing the project team, overall goals, and purpose of the study, outlined schedule, and discussed future community outreach. The meeting began with a presentation followed by a mapping activity. The mapping activity requested participants to identify pedestrian improvement opportunity areas (green), bike improvement opportunity areas (blue), safety concern locations (red), and any other areas the team should be aware of (yellow).

A total of 26 individuals attended the first meeting and 96 comments were received. Many of the comments focused on safety issues, followed by bike improvements, “other”, pedestrian improvements, and general comments. Feedback provided from the public along with feedback from the first stakeholder meeting helped inform preliminary recommendations for the study area.

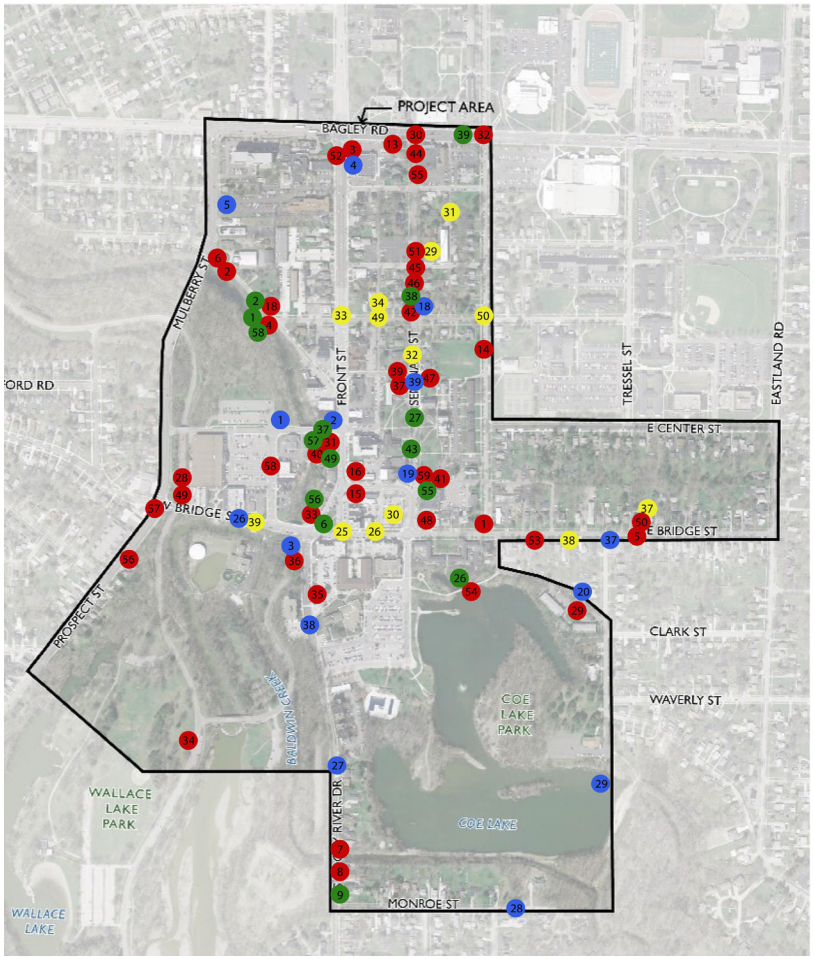
All meeting materials and a summary of comments received during community meeting #1 can be found on pages 35-92 in **Appendix B.**

Stakeholder Meeting #2 (November 15, 2023)

At the second steering committee meeting the project team presented a summary of feedback received from the first community meeting. Additionally, based on technical data collected so far and feedback received from the stakeholder group and public, preliminary recommendations for the study area were presented. The preliminary recommendations were organized into different categories including pedestrian improvements (midblock crossings, Rectangular Rapid Flashing Beacons (RRFB), High Intensity Activated Crosswalk (HAWK), curb bump-outs, refuge islands, raised crosswalks, sidewalk gaps), street design (recommendations by area), traffic calming (speed hump, speed table, lane narrowing), bicycle facilities (dedicated bike lanes, shared lanes, shared use paths), and wayfinding signage.

Time for discussion following each category was included for additional feedback. The consultant team used this feedback to refine preliminary recommendations to present to the public at the next community meeting.

All materials and notes from stakeholder meeting #2 can be found on pages 93-131 in **Appendix B.**



Community Meeting Map Activity Results

Community Meeting #2 (December 12, 2023)

The second community meeting presented similar information to the second stakeholder meeting, including a summary of feedback received from the previous community meeting and preliminary recommendations for the study area. Preliminary recommendations were presented with dedicated discussion time in between. During the discussion, notes were taken on a flip chart. Feedback was requested from the public on the preliminary recommendations, priorities, and any other questions or concerns they may have. A total of 27 individuals attended the second community meeting and 12 comments were received. The consultant team used this feedback to further refine recommendations to present to the stakeholders at the next meeting.

All meeting materials and a summary of comments received during community meeting #2 can be found on pages 132-190 in **Appendix B.**

Stakeholder Meeting #3 (January 17, 2024)

At the third stakeholder meeting, the project team presented a summary of feedback received from the second community meeting and refined recommendations for the study area. The refined recommendations were organized by specific areas within the study area. These areas included Front Street, Seminary Street, Beech Street, Bridge Street, School Street, Center Street, South Rocky River Drive, and general wayfinding throughout the study area. Time for discussion was included following the presentation. Minimal feedback from the group was received. The consultant team then made needed updates to the presentation and recommendations to present to the public at the final community meeting.

All materials and notes from stakeholder meeting #3 can be found on pages 191-234 in **Appendix B.**

Community Meeting #3 (February 13, 2024)

The final community meeting presented similar information to the third stakeholder meeting, including a summary of feedback received from the previous community meeting and refined recommendations for the study area by location. Time for discussion was included following the presentation, and notes were taken on a flip chart. To gather more specific feedback related to community priorities, a worksheet was created that included recommended projects and plans and asked meeting attendees to rank what matters most to them on a scale of 1-5. A total of 17 individuals attended the second community meeting and 17 surveys were received.

All meeting materials and a summary of comments received during community meeting #3 can be found on pages 235-303 in **Appendix B.**

The input gathered throughout the public involvement process, combined with analysis and data, established a foundation for the recommendations within this study.

05

Recommendations

This project included an analysis of the existing multimodel transportation network within the study area that resulted in areas of potential improvement being identified. Improvement alternatives aimed at addressing these areas of concern were processed and evaluated for their potential effectiveness in addressing identified concerns. They were then vetted with stakeholders, the public, and City officials for desirability and feasibility. This process has culminated in a set of recommendations to be carried forward following the completion of this study.

These recommended transportation (motorized and non-motorized) improvements were identified to foster the continued growth of Berea's downtown area so that it can continue to function as both the daily center of the community for residents and students as well as a regional destination for Northeast Ohioans. The resulting recommended improvements are organized into the following four categories: bicycle, pedestrian, vehicular, and signage.

Bicycle Recommendations

Seminary Street and Beech Street

Seminary Street is a residential street with four Baldwin Wallace University buildings (Boesel Musical Arts Center, Gamble Auditorium, Marting Hall, and the Lindsay Crossman Chapel) and the Berea United Methodist Church. Beech Street is a residential street with eight Baldwin Wallace University buildings (21 Beech Resident Hall, Informational Technology building, Wallace House, Saylor Hall, Davidson Hall, Klein Hall, Student Activities Center, and the nursing building) and the Baldwin Wallace employee and student parking lots. These streets serve a mix of vehicles, pedestrians, cyclists, and parked vehicles from students and residents. The current width of both streets is about 24 feet which includes a parking lane and one driving lane with Seminary Street operating northbound and Beech Street operating southbound. The streets are currently unmarked and have available pavement width that can be used to create a marked bicycle lane.

Available traffic data indicated that these streets accommodate similar amounts of bicycle traffic as Front Street where marked bike lanes already exist. However, the data was not complete and not available for Beech Street. The BW bike survey indicated that students currently ride on the sidewalks rather than in the roadway where they should be riding. While these low volume, low speed residential streets should enjoy low levels of traffic stress, survey data and community feedback indicated otherwise. Pavement condition is

also a consideration. The existing pavement condition where a left side bike lane would be located is not ideal for a bike lane currently.

It is recommended that pavement markings and signage be added to both of these streets reminding drivers and bicyclists to share the road and that bicyclists can and should use the entire travel lane. Thereby bicyclists will be able to use the entire pavement width as needed when considering conditions such as uneven pavements, potholes or sewer grates. Pavement markings include “sharrows” discussed previously and signing includes “Share the Road” signs. These improvements will help to reduce the LTS on these streets. They will also provide the City the opportunity to observe whether bike traffic increases along these streets which can help determine whether marked bicycle lanes should be implemented the next time the City seeks to resurface these streets.

If the City does not observe an increase in the use of Seminary Street and Beech Street by bicyclists following the implementation of sharrow pavement markings and Share the Road signing, it is recommended that these improvements remain for the benefit of the bicyclists that do ride on these streets. If bicycle traffic is observed to increase, it is recommended that painted bicycle lanes be added to both streets as part of a future resurfacing project.

A future configuration that includes marked bicycle lanes along Seminary Street and Beech Street (24’ total pavement width) would include a 5-foot bicycle lane, 11-foot driving lane, and 8’ parking lane. The bicycle lane would be located on the left side of the vehicular travel lane, in the direction of travel, and be marked with a solid white lane line. It may also be beneficial to define the parking lane on the right side of the roadway with pavement markings which will serve as traffic calming for drivers when vehicles are not parked on the street and to ensure that parked cars park within the parking lane. These configurations are illustrated for Seminary Street and Beech Street in Figures 44 and 46, respectively. Both figures are preceded by an illustration of existing conditions.

This future scenario with pavement markings establishing lanes for vehicles, bikes and parking, as illustrated in Figures 44 and 46, is expected to address the issues that were defined in the existing conditions analysis and community feedback. Painted lane lines would define for both bicyclists and drivers how the roadway is intended to be shared. This will help to improve bicyclists comfort level for riding within the roadway (rather than on the sidewalk as many do today), provide drivers the cues they need for how to share the road with bicyclists, and ultimately free up sidewalk space for pedestrians.

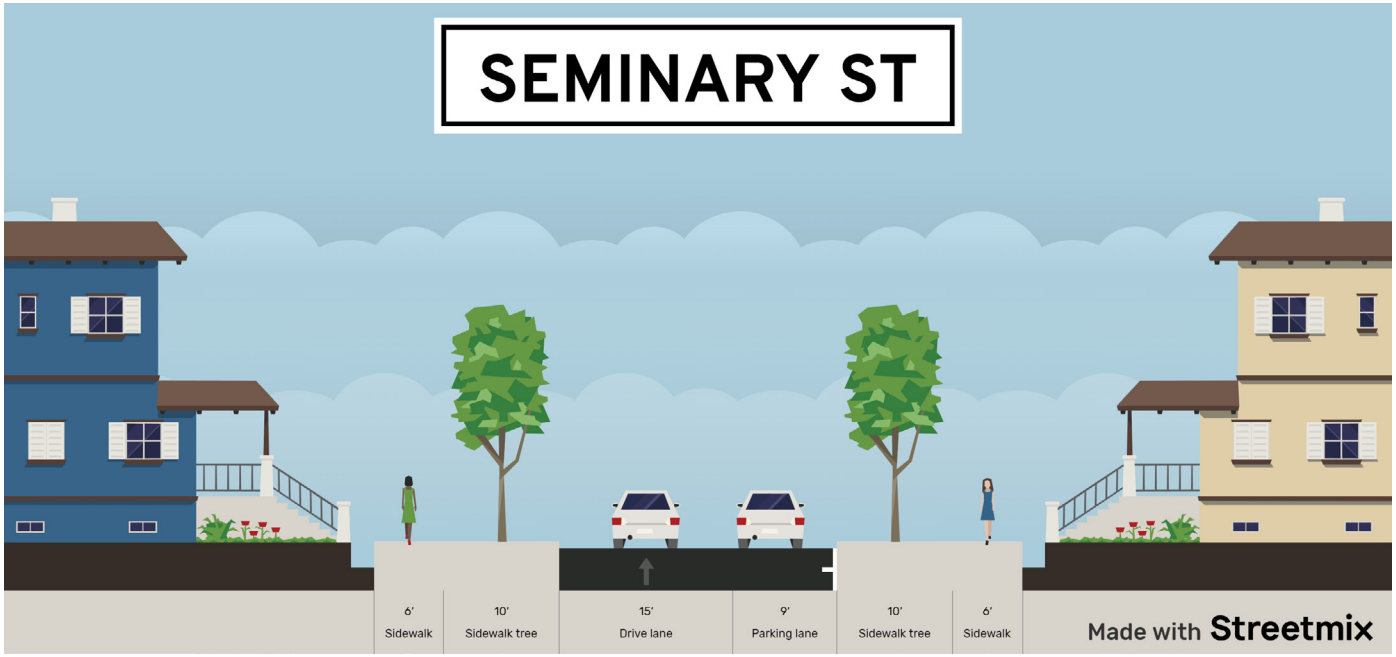


Figure 43 - Existing Seminary Street Layout (facing north)

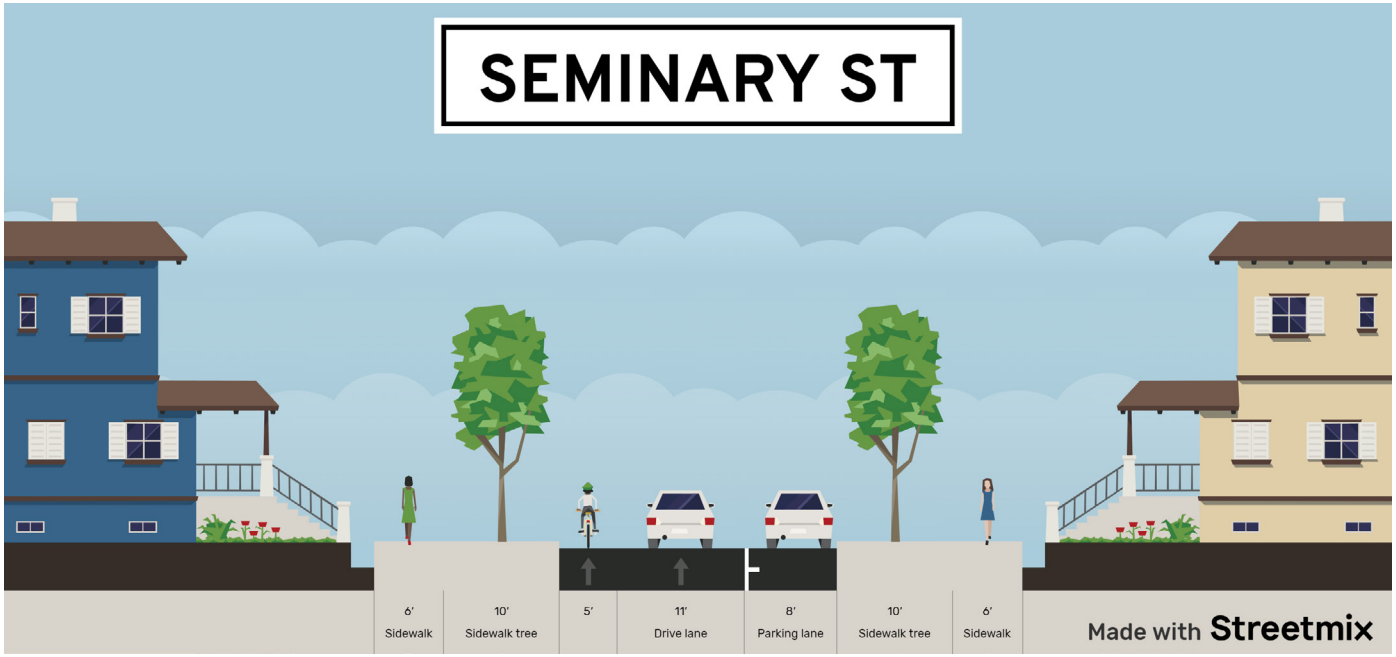


Figure 44 - Proposed Seminary Street Layout (facing north)

Figure 45 - Existing Beech Street Layout

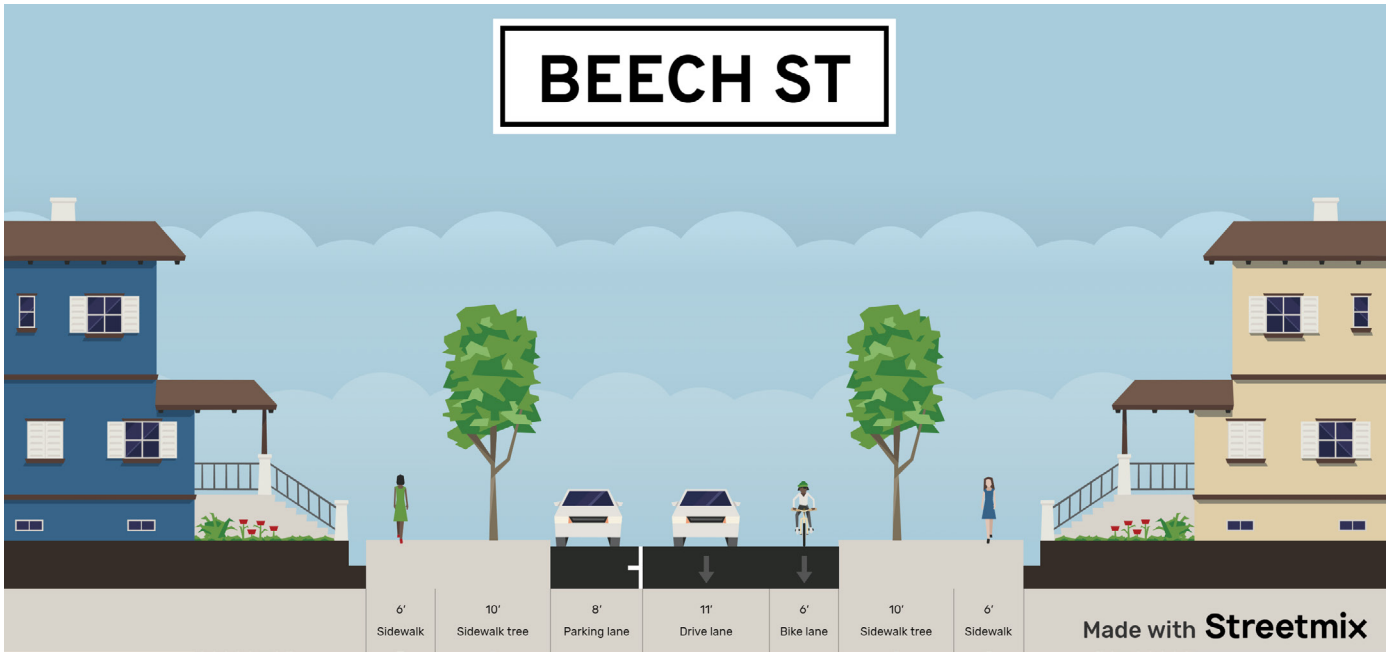


Figure 46 - Proposed Beech Street Layout

Front Street

Front Street is a commercial street that includes most of the Downtown Business District area, Baldwin Wallace University Front Street Residence Hall, and Walgreens. The existing cross section of Front Street between Liberty Street and Bagley Road is illustrated in Figure 47. It includes an 8-foot parking lane, a 5-foot bike lane, and an 11-foot through lane in the southbound direction and three 11-foot driving lanes and a 5-foot bike lane in the northbound direction. The northbound bike lane sits to the right of a shared through/right vehicular lane. The current location of the bicycle lane can result in a conflict between cyclists trying to go through the intersection and drivers turning right onto Bagley Road. The existing bike lane on the northern side of Front Street within the study area currently has a left turn lane, through lane, through/right lane, and bicycle lane. To help avoid this conflict, the northbound lanes can be reconfigured to have a dedicated left turn lane, a through lane, a bicycle lane, and a right turn only lane. This proposed layout mimics the existing lane configuration of Front Street on the north side of Bagley Road and will help prevent right hook crashes with cyclists in the future. Figure 48 shows the proposed recommended lane configuration for Front Street between Liberty Street and Bagley Road.

It is also recommended to update the pavement markings for the existing, dedicated bicycle lanes on Front Street according to the latest recommendations from the National Association of City Transportation Officials (NACTO). Proposed pavement markings would include painting the bike lane green where it crosses driveways or intersections - wherever the bike lane intersects a vehicular crossing. Figure 51 and Figure 52 shows where the green dashed markings are recommended within conflict areas along Front Street.

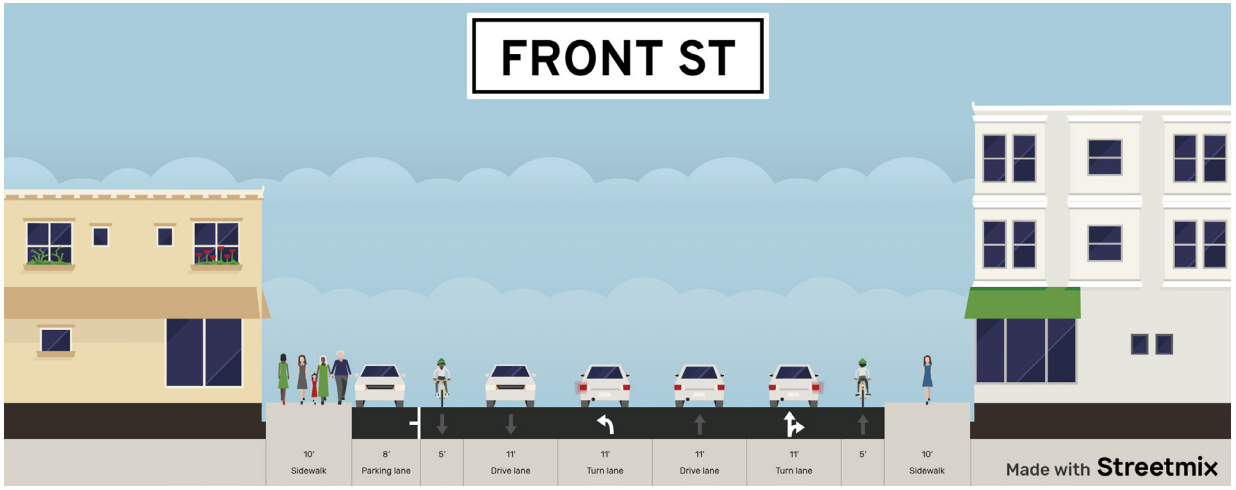


Figure 47 - Existing Front Street Layout (facing north from Liberty Street)

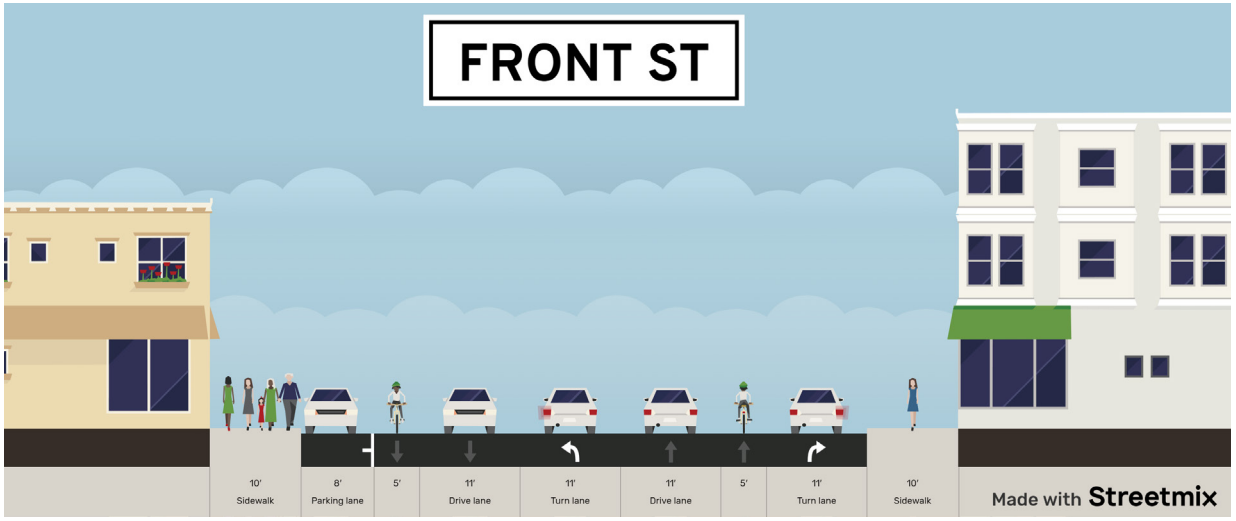


Figure 48 - Proposed Front Street Layout (facing north from Liberty Street)

West Center Street

West Center Street is a commercial street that includes Giant Eagle and access to the Valley Parkway All Purpose Trail. The existing layout of West Center Street does not include any bicycle facility markings. Since this street includes a bridge, any proposed recommendations will have to be within the existing pavement width as to not disturb the bridge. The existing pavement width does not allow for a dedicated bicycle lane since we need to ensure we maintain at least 11-foot driving lanes. Since the pavement width is not wide enough, adding sharrow markings on West Center Street is recommended to help guide cyclists from Front Street to the Metropark. Figure 49 also shows the aerial view of the proposed work on West Center Street. The end of the existing Valley Parkway All Purpose Trail does not currently connect to the existing curb ramp in an easy fashion for cyclists to cross the street. As part of the bicycle facility improvements, reconfiguring the existing Valley Parkway All Purpose Trail as shown in Figure 49 will help guide cyclists to the curb ramp to cross West Center Street. This work will need to be coordinated with the Metroparks as it is part of their property, but a preliminary sketch of what this area can look like has been provided.

City-Wide Bike Plan

The existing bicycle network can be found on Figure 11. As shown on the figure, dedicated bicycle facilities are lacking within the project study area. More specifically, there are a lack of east/west bicycle routes which make it unclear to cyclists what streets/routes they should be taking if they are traveling east/west through the study area. Cuyahoga County has created a Cuyahoga Greenways plan that is a county wide initiative to plan and implement greenways and urban trails throughout the county. Some of our project study area is included as part of the Cuyahoga Greenways plan and can be seen in Figure 33. Within the study area, there are three proposed connector routes that are part of the county's plan: the Bagley Parkways Connector, Front Street Connector, and the County Fairgrounds Connector. The Bagley Parkway Connector would be a three-mile on-street route that starts at the Cuyahoga County corporation line and continues through Middleburg Heights until the street name changes to Pleasant Valley Road. The County Fairgrounds Connector would be a 1.5-mile off-street route that starts at North Quarry Lane and continues east to the Big Creek Lake Trail. The Front Street Connector is also shown in the figure as an on-street future route that would continue south of Center Street to North Quarry Lane. This would be an extension of the current Front Street bike lanes that exist north of Center Street. Figure 33 also shows the existing Valley Parkway All Purpose Trail.

The study identified some bicycle infrastructure improvements that can be accomplished at relatively low cost without significant impacts to right of way or roadway and sidewalk configurations. More substantial improvements would need to consider the larger existing and future bicycle network and the feasibility for more substantial modifications to infrastructure that may be desired to further enhance bikability in the area. These improvements could include the creation of multi-use paths, the removal of on-street parking to support a bidirectional cycle-track, or similar projects. This level of improvement would need to be the subject of more detailed study which could be part of a city-wide bike plan.

A full bicycle connectivity plan would determine how cyclists access the main bicycle routes. This bicycle connectivity plan should consider additional connector routes throughout the city and/or identify bicycle friendly streets to be dedicated as part of a signed route for cyclists. Once a connectivity plan has been determined, preliminary design and feasibility can be looked into for the streets within the study area. Figure 34 shows an example of a city-wide bike plan in a major city.

Figure 49 - West Center Street Improvements

Pedestrian Recommendations

Front Street

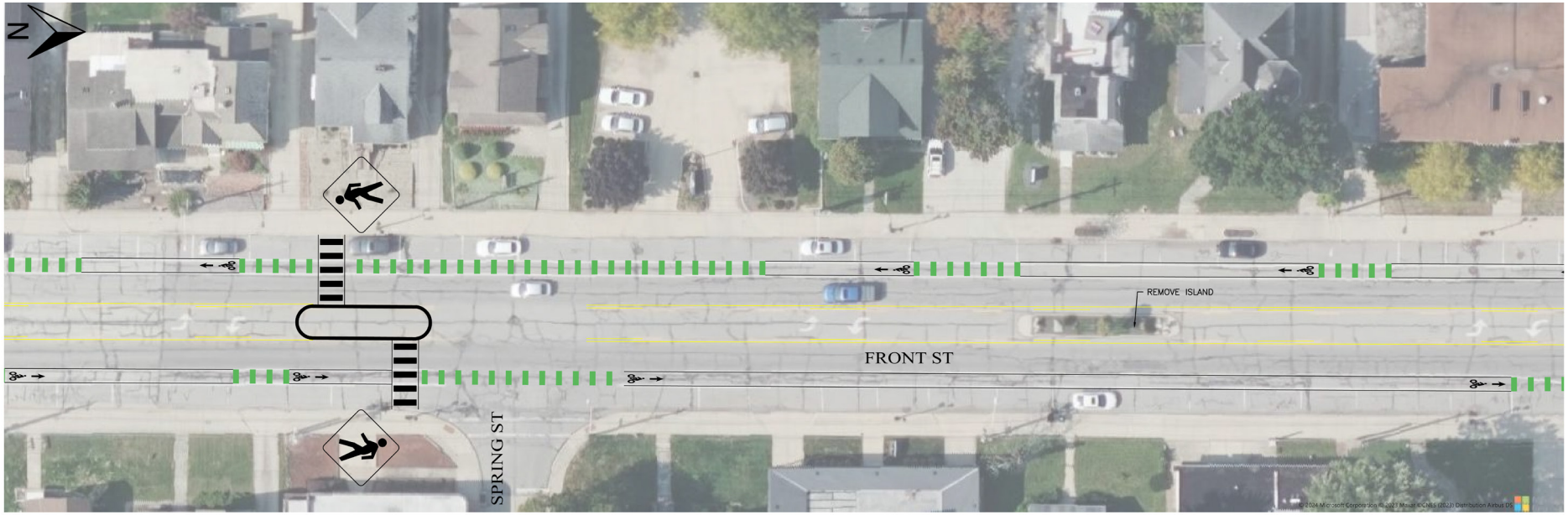
Front Street has continuous sidewalks on both sides of the road except for a missing sidewalk piece on the southwest corner of Front Street at Center Street and only sidewalk on the east side of the road between Church Street and Bridge Street. The missing sidewalk piece on the southwest corner of Front Street and Center Street results in pedestrians walking along a steep slope or out into the roadway behind parked cars – neither of which is ideal. It is recommended that this connection be completed. Completing this portion of sidewalk was also proposed as part of the City of Berea's 2010 master plan. Along with this connection, a ramp connecting this proposed sidewalk with the wooden walkway behind the adjacent townhomes is also recommended. This ramp would provide accessibility to the wooden walkway and bridge for those with strollers and mobility challenges without needing to use stairs or the driveway entrance at the Riverside Townhomes which is what often happens today. The use of this driveway as a "ramp" by cyclists and pedestrians with strollers was cited as a concern through the community engagement process. Constructing the proposed sidewalk and ramp as depicted in Figure 51 will allow for an important pedestrian connection between Front Street and the wooden bridge behind the condos, further improving the access for pedestrians with strollers and those with mobility challenges.

Front Street is a highly trafficked commercial street with consistent foot traffic and currently does not have a pedestrian crossing available on Front Street from Grand Street to Bagley Road. Two pedestrian refuge islands are proposed to be installed in the two-way left turn lane for Front Street at Liberty Street and Spring Street to allow for additional connections within the commercial area. Figure 52 shows the proposed preliminary pedestrian refuge island locations. These refuge islands would need to be located outside of any existing driveway access and should also try to be in a spot to not disturb other existing infrastructure such as light poles, signs, etc.

The pedestrian refuge islands are proposed to include warning signs for drivers. Pedestrians can cross one direction at a time and use the refuge island as a location to stop and wait for opposing traffic to clear. In the future, if pedestrians find it hard to cross at the refuge islands, Rectangular Rapid Flashing Beacon (RRFB) signs can be installed at the crossings to help indicate to drivers to yield to any pedestrians. Figure 50 shows an example of the type of pedestrian refuge islands proposed for Front Street.

Figure 50 - Pedestrian Refuge Island

Figure 51 - Front Street Improvements



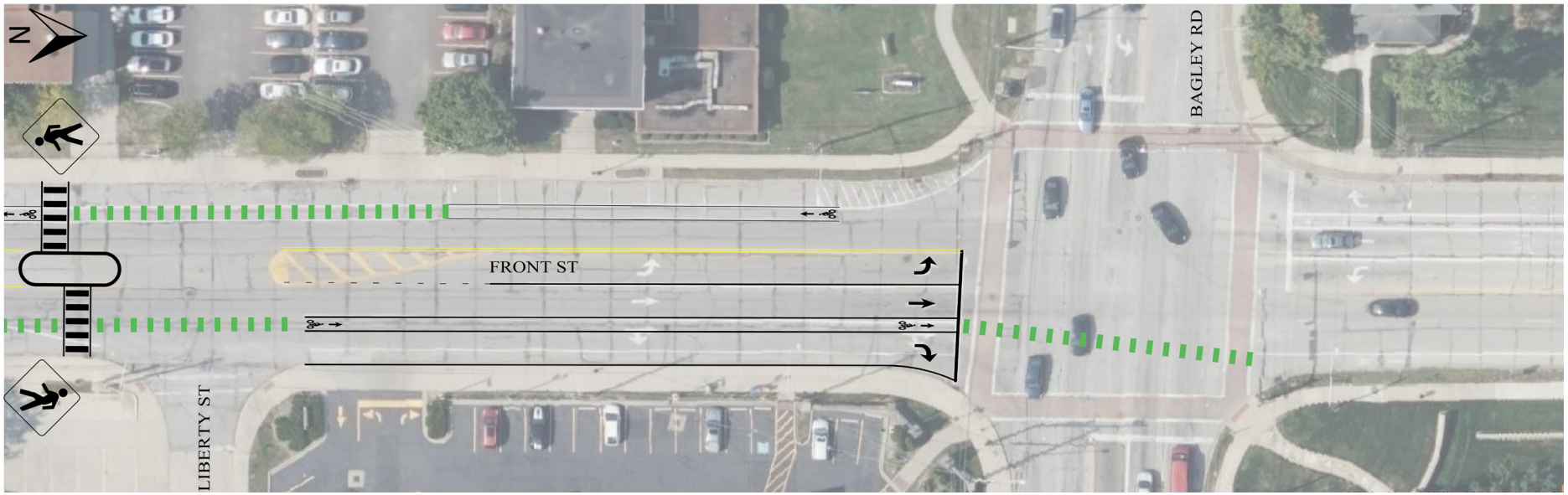


Figure 52 - Front Street Improvements 2

Seminary Street

Seminary Street has continuous sidewalks on both sides of the street within our project area. There are also two existing midblock crossings near the southern side of Seminary Street near Baldwin Wallace University buildings. The pedestrians using these midblock crossings from the east must step out into the roadway between parked cars at times which impacts drivers' ability to see the pedestrian and for pedestrians to see oncoming traffic. It is recommended that these midblock crossings be upgraded with curb bump-outs within the parking lane to shorten the pedestrian crossing distance and increase visibility for both drivers and pedestrians. Curb bump-outs also narrow the roadway which will help with encouraging slower speeds along this residential street. Figure 53 shows the proposed curb bump-out midblock crossing locations and the proposed signs that should be added to these crossings.

Speeds along Seminary Street were brought up as a concern during the community engagement process. As discussed earlier, the city's installation of a radar speed feedback sign found that drivers largely observed the posted speed limit – at least when being provided feedback on their speed by the device. However, additional traffic calming measures could be considered such as speed humps in advance of pedestrian crossings. Figure 53 shows where these speed humps can potentially be installed. NOACA offers temporary speed humps to localities for evaluation prior to a permanent installation. Installing temporary speed humps will allow for the city to "test" out the benefits and evaluate potential maintenance concerns while also giving the public a chance to give their feedback on their experience with the speed humps.

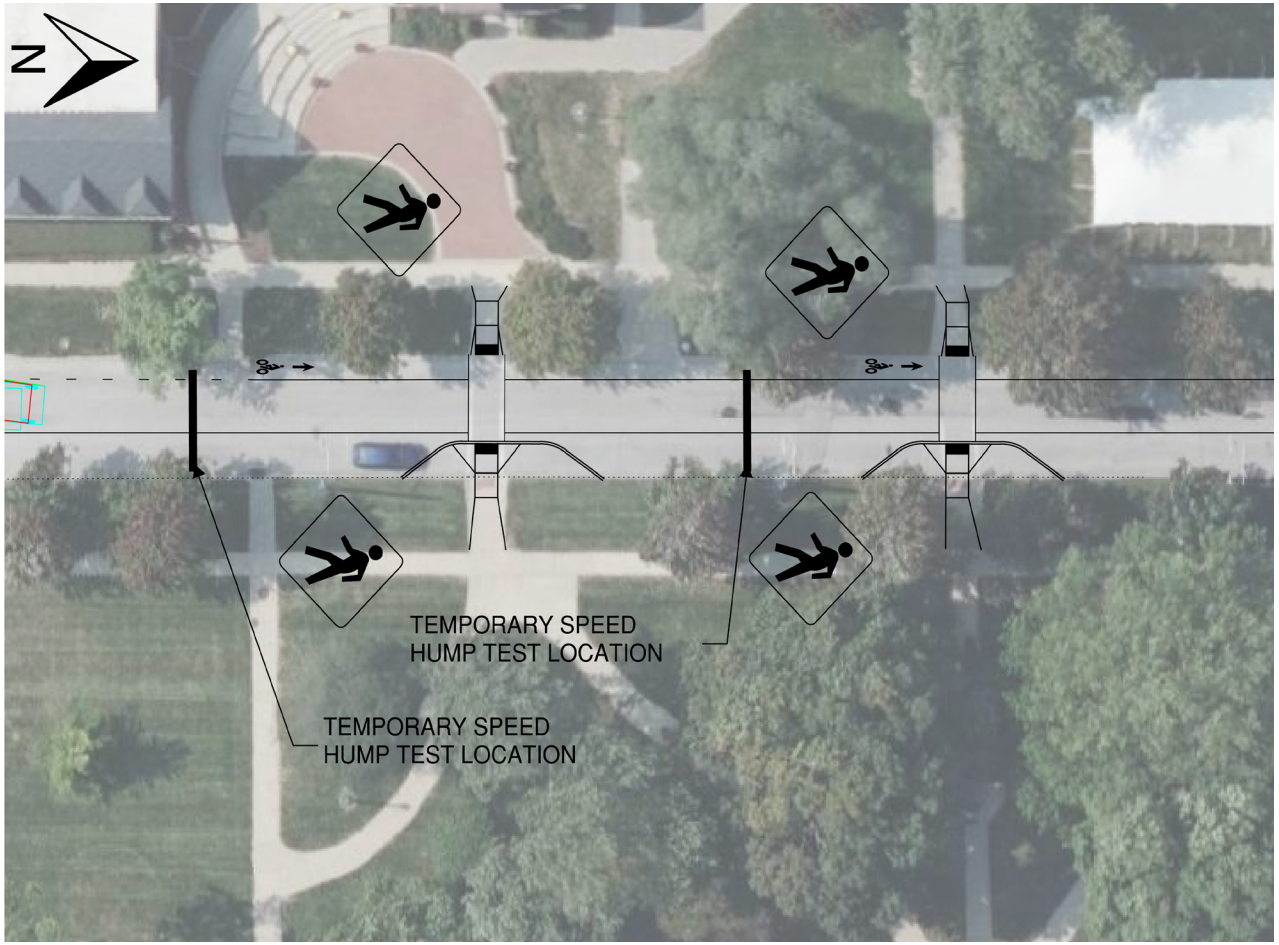


Figure 53 - Proposed Curb Bump-Outs on Seminary Street

Figure 54 - Proposed Curb Bump-Outs on Beech Street

Beech Street

Beech Street has continuous sidewalks on both sides of the street within our project area. Beech Street also has several Baldwin Wallace University buildings and midblock pedestrian crossings that experience high pedestrian volumes at times. Two crossing locations were identified for recommended improvements including curb bump-outs within the parking lane, curb ramps, and additional signing and pavement markings. One location is near the Baldwin Wallace University Student Center where a marked crossing does not exist currently but where many students cross Beech Street near a parking lot driveway. The existing angled pedestrian crossing at Beech Street and East Center Street should also be upgraded with a curb bump-out to help shorten the existing pedestrian crossing length. The crossing could be adjusted to be perpendicular to Beech Street or could be maintained to accommodate the predominant walking path as it does today. Figure 54 illustrates these recommendations on Beech Street.

Liberty Street and Spring Street

Sidewalks exist on both sides of Liberty Street and Spring Street which run east-west in the northern portion of the study area. Students use these streets to walk east and west between campus and locations on Front Street. The existing sidewalks lack buffers with the street and curb ramps are missing where the sidewalk crosses alleys. Opportunities to widen or provide buffers for these walkways appears limited given right of way constraints, however, providing curb ramps where sidewalks cross alleyways should be considered as improvements are made to the alleyways or roadways in those areas.

It is recommended that marked pedestrian crossings of Beech Street and Seminary Streets be provided at their intersections with Liberty and Spring Streets to provide continuous east-west pedestrian infrastructure in this area.

South Rocky River Drive

South Rocky River Drive has continuous sidewalks on the east side of the street within our project area. There are also two existing midblock crossings; one near South Rocky River Drive and Berea Commons and the other south of South Rocky River Drive and North Quarry Lane. Both of these midblock crossings are recommended to be improved with curb bump-outs on the east side of the roadway. The bump-outs will help to calm traffic, delineate existing on-street parking, improve visibility for both pedestrians and drivers of the crossing and shorten the distance for pedestrians crossing the roadway. Figure 55 shows the proposed midblock crossing changes and the signage that should be installed with the crossings.

Figure 55 - South Rocky River Drive Improvements

Overall Curb Ramp Improvements

Figure 8 illustrates the existing curb ramp inventory within the project area. The missing curb ramps shown in red on Figure 8 should be designed and constructed within the study area according to ADA requirements. The curb ramps shown in blue on Figure 8 should be investigated as the aerial image shows missing detectable warnings at the existing ramps. It is recommended that curb ramps that do not currently have detectable warning surfaces be upgraded along with adjacent sidewalk or roadway improvement projects as they occur. Figure 51 to Figure 55 also show some additional curb ramp improvement locations on the streets where new or upgraded pedestrian crossings are recommended.

Vehicular Recommendations

Seminary Street

The existing northeast corner of Seminary Street and East Bridge Street currently has a large curb radius which results in long pedestrian crossings at this corner and may encourage faster turning speeds and lower adherence to the stop sign control on the east approach to the intersection. A smaller curb radius could help to slow traffic making the right turn on to Seminary Street as well as shorten the pedestrian crossing. It is noted that one of the severe pedestrian injury crashes involved a pedestrian at this crosswalk. The new curb radius will be determined by the truck turning templates that need to be run in order to set the new curb location. With the revision of this curb radius, the southbound lanes of Seminary Street could also be reduced to one shared through/left turn lane to further shorten the pedestrian crossing of the north leg of the intersection. This would also allow more space for parking maneuvers where angled parking exists in front of the Post Office to the north. Curb ramps at the intersection will also need to be constructed since the revised curb line cannot accommodate the existing ramps. Figure 56 shows the proposed layout of the new curb along with the proposed curb ramp configuration. Since the lane configuration is also proposed to be updated, one 20-foot lane in each direction should be striped to allow for enough pavement width for the turning trucks onto Seminary Street. This proposed 40-foot width is a reduction from the existing 53-foot width of Seminary Street in this area. Figure 57 shows the truck turning templates with the proposed layout to show that the trucks can make their movements within the new curb lines.

The existing intersection of Seminary Street and Church Street is also an area that was identified as a location for improvements. The current layout allows for northbound vehicles on Seminary Street to either continue on Seminary Street or turn left onto Church Street without any restrictions. Backing out of angled parking spaces where free flowing traffic exists, cut-through traffic on Seminary Street and the lack of a pedestrian crossing of Seminary Street near the Post Office were all concerns identified through the community engagement process. Figure 57 shows proposed improvements in this area that include stop control on the south leg of Seminary Street along with a pedestrian crossing and a realignment of the access to the residential portion of Seminary and Church Streets to encourage northbound through traffic to continue to Front Street. With the revised curb lines on Church Street, the parking configuration is recommended to be modified with parallel parking on the north side of Church Street and angled parking on the south side of Church Street. Flipping the parking configuration from its current orientation will help with the existing in-and-out angled parking issues from vehicles turning onto Church Street. Figure 57 shows the proposed curb layout, parking, curb ramps, and pedestrian crossings on Seminary Street and Church Street.

The proposed modifications to lane configuration and traffic control discussed above were tested using Synchro traffic capacity analysis software. The analysis found that the proposed configuration is expected to operate well during peak commuting hours. In the proposed configuration, the southbound approach of Seminary Street at Bridge Street would be modified from a separate through lane and left turn lane to a shared through/left turn lane. With this change, the intersection is still expected to operate at an excellent level of service (LOS) of A.

A stop sign is also proposed on the northbound approach of Seminary Street at Church Street. This proposed change in traffic control was also tested with Synchro and was found to operate well at LOS B and a maximum (95th percentile) queue of 2 vehicles during peak hours.

Synchro capacity analysis reports for these proposed improvements are included in the appendix.

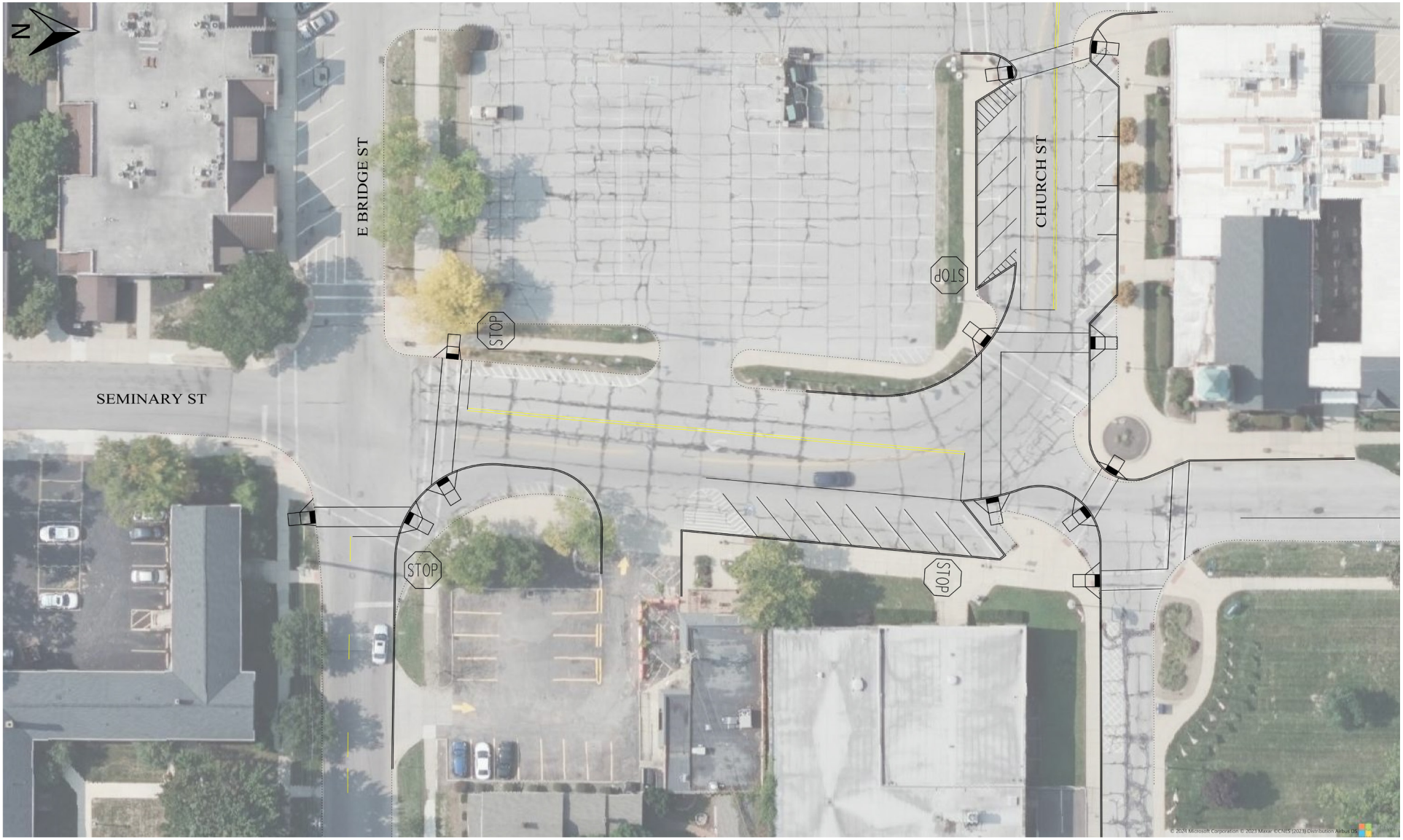


Figure 56 - Seminary Street Improvements

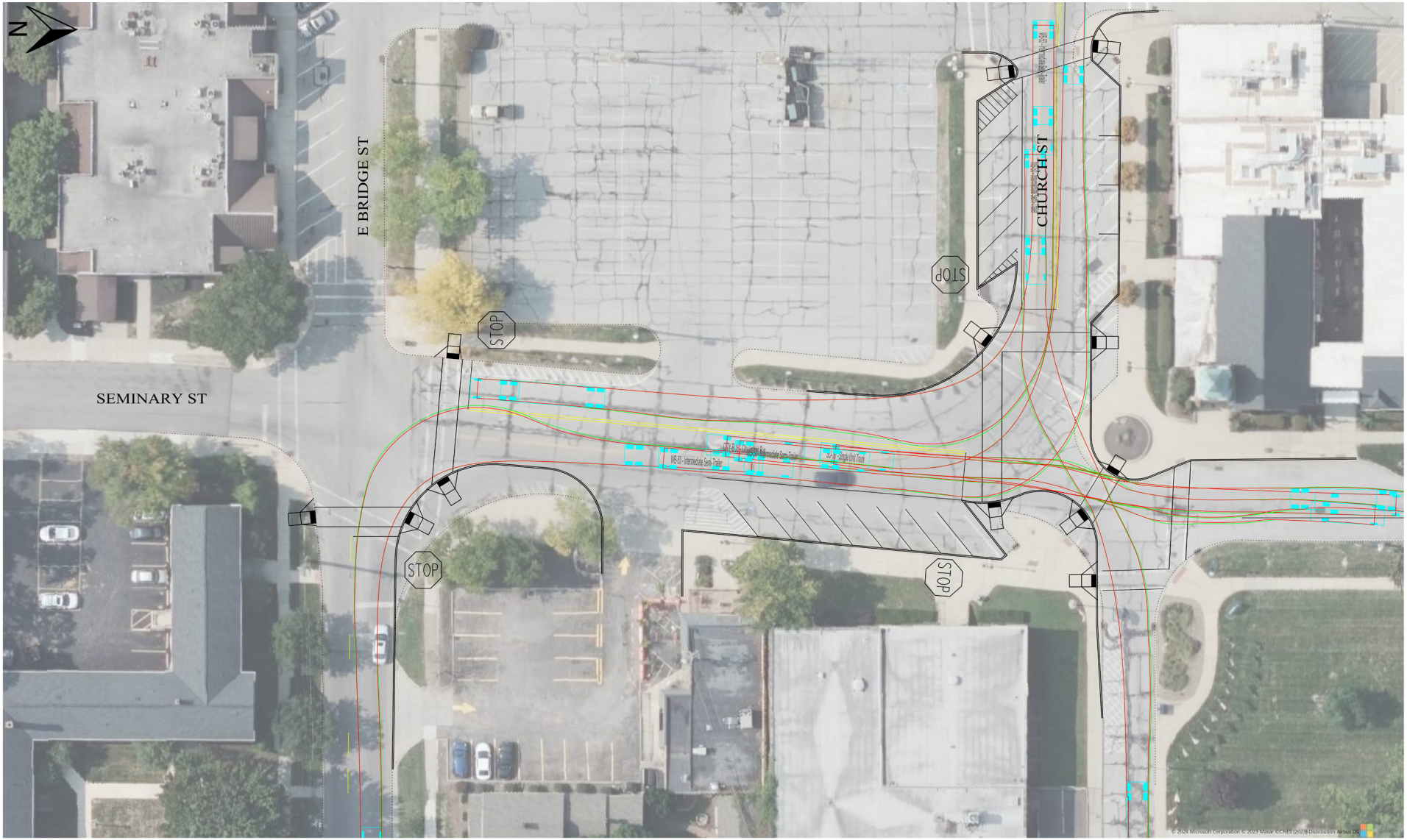


Figure 57 - Seminary Street Truck Turning

Signage Recommendations

Wayfinding Signage

Existing wayfinding signage within the study area can be found on Figure 24. Directional signage is generally lacking within the study area. The current wayfinding signage available appears to be directed at drivers entering the area, however, the signs have smaller font and more lines of text than can be discerned by the average driver. New and additional wayfinding signage for both motorized and non-motorized modes of transportation are recommended to be implemented throughout the study area. A comprehensive wayfinding signage system was also a key recommendation of the 2010 Berea Master Plan. The goal of a comprehensive wayfinding signage system is to improve motorized and non-motorized circulation throughout the downtown area and nearby destinations.

It is recommended that the city engage a sign designer to develop and implement a signing package to include elements such as a brand or theme consistent with the city's current branding and materials selected for sign posts and structures that will be both appealing and durable. The size and messages for directional signing should be developed to target different modes: drivers, bicyclists, and pedestrians. Kiosks and smaller pedestrian level signing within the downtown area as well as the Metropark entrances was identified as a need to help cyclists and pedestrians "map" their way to key destinations. Driver-oriented signage with larger font and simple messages was identified as a need to help drivers find parking near key destinations. Through coordination with the city and stakeholder committee, a map of key destinations recommended to be included in the wayfinding package was developed and is shown in Figure 42.

School Street

School Street is an east-west street that's only about 22-feet wide in between Seminary Street and Front Street that accesses some residential drives as well as parking lots for the university market area. Feedback received from the public meetings indicated that two-way traffic could get tight through this street when there are cars parked on the street. It can be especially difficult to make turning movements from the parking lots, the alley, or from Seminary Street when cars are parked in those areas. A review of crash data did not find that this situation results in crashes. In fact, the narrow nature of the short street segment may help in calming traffic and encourage drivers to be more cautious. However, some targeted parking restrictions could help address some of the concerns expressed by the public.

Enhanced One-Way Signs

Additional one-way signage is also recommended for consideration at both Seminary Street and Beech Street. Wrong-way driving was cited as a concern, especially during special events when there are more drivers unfamiliar with the area present. A crash pattern involving wrong-way drivers was not identified, but traffic observations did capture the phenomenon of drivers traveling the wrong way on these one-way streets. The operations of these streets are clearly marked currently with one-way signs present at all cross streets. However, given the data and concerns expressed about wrong way drivers it is recommended that the City continue to monitor the situation and enhance regulatory signing as needed to add visibility and further encourage adherence to the proper traffic pattern. The adjacent image shows an example of signage added to an existing stop sign.

Recommendations Summary

The project team, city officials, NOACA staff, and community stakeholders embarked on a comprehensive effort to understand the existing mobility and safety features of the study area for all modes of travel including pedestrians, bicyclists and personal vehicles. The effort resulted in a number of recommended improvements that should be considered to enhance the already robust multi-modal transportation infrastructure in downtown Berea. The following is a summary of the key recommendations detailed in this section.

Bicycle Improvements

- Add sharrow pavement markings on Seminary Street and Bridge Street between Bagley Road and Church Street and Bridge Street, respectively. Include appropriate signing to reinforce that drivers and bicyclists share the roadway. Continue to evaluate bicycle traffic along these streets and consider establishing painted, left-side bicycle lanes on both streets as part of future pavement rehabilitation projects.
- Change the lane configuration of Front Street on its northbound approach to Bagley Road to address the conflict between right turning vehicles and through bicyclists.
- Update pavement markings for the dedicated bike lanes on Front Street to include dashed, colored pavement within the bike lane at conflict areas such as driveways and intersections.
- Add sharrow pavement markings on West Center Street between Front Street and the access to the Valley Parkway All Purpose Trail.
- Develop a City-Wide Bike Plan to create a comprehensive bicycle network that ties into the Cuyahoga Greenways plan and identify opportunities for additional bicycle infrastructure improvements within the study area.

Pedestrian Improvements

- Complete the sidewalk on the west side of Front Street south of Center Street. Along with this improvement, it is recommended that an ADA compliant ramp be constructed to connect this sidewalk with the wooden walkway and bridge behind the Riverside Townhomes.
- Add pedestrian crossings of Front Street between Bagley Road and Grand Street with features such as pedestrian refuge islands and curb bump-outs in the parking lanes.
- Construct curb bump-outs at key pedestrian crossings of Seminary Street and Beach Street.
- Construct curb bump-outs at pedestrian crossings of South Rocky River Drive.
- Construct curb ramps at pedestrian crosswalks that lack curb ramps currently:
  - East end of crosswalk on north leg of intersection at Front Street and North Rocky River Drive
  - West end of crosswalk on north leg of intersection at Front Street and Center Street
  - Construct curb ramps and pedestrian crossings of Beech Street and Seminary Street at their intersections with Liberty Street and Spring Street.

Vehicular Improvements

- Reconstruct the northeast corner of the intersection of Seminary Street and Bridge Street to reduce the curb radius and pedestrian crossing distances. Reduce the number of southbound lanes approaching this intersection from two to one.
- Reconstruct portions of the intersection of Seminary Street and Church Street to add stop control to the northbound approach, add a pedestrian crossing on the south leg of the intersection, narrow access to the residential portion of Seminary Street and relocate angled parking from the north side of Church Street to the south side.
- Test temporary speed humps at key locations along the residential portion of Seminary Street for evaluation as a traffic calming measure and for potential permanent speed hump installation.

Signing Improvements

- Develop and implement a comprehensive wayfinding signage system to improve motorized and non-motorized circulation throughout the downtown area and nearby destinations.
- Enhance existing one-way signage for one-way streets with the aim of reducing incidents of wrong-way driving.
- Implement parking restrictions along School Street between Front Street and Seminary Street to address maneuverability concerns for vehicles turning to and from School Street.

Prioritization and suggested time frame for implementing these recommendations is discussed in the Implementation section of this report.

06

Implementation Plan

The Implementation section outlines the prioritized multimodal transportation improvement projects identified throughout this plan. Prioritization considers several factors including project type, potential impact, community feedback, and most importantly, funding availability.

While a comprehensive wish list exists, it is expected that the city will ultimately determine priority of improvements to be implemented and its approach to funding. A realistic approach must be taken to maximize the impact of available resources.

This section suggests prioritization of improvements, identifies the most likely funding sources for the improvements and an expectation for whether projects can be completed in the near term, medium term or are projects that would need to be implemented on a longer-term timeline.

Project Cost Estimates

Opinions of probable costs to complete the projects that were identified through the course of this study were developed. For projects that appear to have a relatively clear and defined scope of improvements, rough estimates of material quantities were developed to construct the project. Prevailing unit costs for these quantities based on DLZ's database of recent bids on transportation projects were then applied to develop a construction cost estimate. A 30% contingency was then added to account for unknowns and design fees.

Where the scope and extents of a project are less defined, DLZ's knowledge from similar recent projects along with corroborating research was used to develop high and low estimates for the project.

Project Timelines

Near term projects are those that can be implemented with little upfront design or coordination needed. Once a funding source is identified, these improvements could be either designed in house or in the field during construction. Construction of the improvement could be done by City staff or an outside contractor. It's expected that these projects could be completed in one (1) or two (2) years.

Medium term projects are those that require some level of design prior to construction and may require coordination with utilities, local residents/businesses or others. Construction of the project would likely need to be completed by a contractor through a letting or task order process. These projects could likely be completed in less than five (5) years.

Long term projects are those that are expected to require a longer design and/or implementation process. The expected timeline for these projects is between five (5) and ten (10) years.

Community Project Prioritization

At the third and final community meeting, the recommended improvements were presented to those in attendance. They were then asked to provide a priority number for each improvement based on a scale of 1 thru 5, with 1 being the highest priority and 5 being the lowest priority. Table 10 shows the responses received from the 17 individuals at the meeting (a few participants did not indicate a ranking on every project so some improvements have less than 17 total rankings).

Table 10 - Community Project Prioritization Results

	Project Name	1. Most Important	2.	3.	4.	5. Least Important
Bike	Seminary Street Painted Bike Lane	7	4	2	1	2
	Beech Street Painted Bike Lane	4	6	3	2	1
	Front Street Bike Lane Striping Improvement	3	6	3	3	1
	Front Street and Bagley Road Bike Lane Reconfiguration	3	4	3	3	3
	West Center Street Sharrow Markings	1	7	2	1	5
	City-Wide Bike Plan	8	3	4	0	1
Ped	Front Street Missing Sidewalk	10	4	2	0	1
	Front Street Pedestrian Refuge Islands	12	1	4	0	0
	Seminary Street and Beech Street Curb Bump-Outs	9	4	1	0	1
	South Rocky River Road Curb Bump-Outs	5	4	6	1	1
	Overall Curb Ramp Improvements	5	6	2	3	1
Vehicular	Seminary Street Speed Humps	5	3	3	2	4
	Bridge Street Center Line	5	2	2	4	4
	Seminary Street and Bridge Street Intersection	7	3	5	1	1
	Seminary Street & Church Street	6	5	2	0	3
Signage	Wayfinding Signage Improvements	9	5	1	1	1
	Enhanced One-Way Signage	8	4	4	0	1
	School Street Parking Restrictions	2	4	6	1	4

Composite scores for each of the recommended improvements are included in the Implementation Matrix. Higher priority recommendations have a LOWER composite score with 1 being the highest priority and 5 being the lowest priority.

While the city is expected to prioritize improvements based on other factors including cost and funding availability, the community feedback is presented for the city's information and use as it considers implementation.

Potential Funding Sources

The following are descriptions of the potential funding sources that were identified for the proposed improvements.

Transportation for Livable Communities Initiative (TLCI)

The TLCI program consists of two components: the planning grant and the implementation grant. The planning grant component helps local partners fund planning studies that can lead to improvements to transportation systems and the neighborhoods they support. Implementation awards help communities move forward with the development and installation of infrastructure from past completed livability studies.

Transportation Alternatives

These funds are used for pedestrian and bicycle facilities, safe routes for non-drivers, recreational trails, community improvement activities, environmental mitigation, and more.

Surface Transportation Block Grant Program (STBG)

These funds are the most flexible and may be applied to road and bridge projects, transit projects, bikeways, pedestrian, safety, planning, and TLCI projects.

PeopleForBikes Community Grant Program

This program supports bicycle infrastructure projects and targeted initiatives that make it easier and safer for people of all ages and abilities to bike.

Carbon Reduction Program

This funding program was authorized by the 2021 Bipartisan Infrastructure Law to be used towards projects focused on reducing transportation emissions. The program prioritizes projects that reduce emissions by increasing safety, equity, and sustainability among others.

Implementation Matrix

The implementation matrix detailed on the following tables is meant to aid the City of Berea and NOACA in prioritizing recommendations from this Transportation for Livable Communities Plan. The matrix includes information on ranked priority by the community, preliminary estimated project costs, potential funding sources, and expected timeline to implement. It is anticipated that the City would be the lead on any of these identified projects. Potential partners in the projects have been noted in the matrix.

Table 11 - Implementation Matrix

Implementation awards help communities move forward with the development and installation of infrastructure from past completed livability studies.

Recommendation	Community Priority Score	Estimated Project Cost	Potential Funding Sources	Potential Partners	Timeline
Bicycle Improvements	Lower Score = Higher Priority				
Seminary and Beech Street Sharrows and "Share the Road" Signing	2.29*	~$15k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program PeopleForBikes Community Grant Program	Baldwin Wallace University	Near Term (1-2 years)
Seminary Street Painted Bicycle Lane	2.19	~$40k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program PeopleForBikes Community Grant Program NOACA Street Supplies Program		Long Term (5-10 Years)
Beech Street Painted Bicycle Lane	2.38	~$40k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program PeopleForBikes Community Grant Program NOACA Street Supplies Program		Long Term (5-10 Years)
Front Street Bicycle Lane Striping Improvement	2.56	~$100k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program PeopleForBikes Community Grant Program NOACA Street Supplies Program		Medium Term (<5 Years)
Front Street and Bagley Road Bike Lane Reconfiguration	2.94	~$40k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program PeopleForBikes Community Grant Program NOACA Street Supplies Program	ODOT	Near Term (1-2 Years)

*- This specific improvement was not scored at the final community meeting. The score is assumed to be an average of the scores for painted bike lanes on Seminary Street and Beech Street.

Recommendation	Community Priority Score	Estimated Project Cost	Potential Funding Sources	Potential Partners	Timeline
West Center Street Sharrow Markings	3.13	~$25k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program PeopleForBikes Community Grant Program NOACA Street Supplies Program		Near Term (1-2 Years)
City-Wide Bicycle Plan	1.94	~60k	NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program PeopleForBikes Community Grant Program	Residents, Businesses, Community Groups, Baldwin Wallace University, MetroParks	Medium Term (<5 Years)
Pedestrian Improvements	Lower Score = Higher Priority				
Front Street Missing Sidewalk	1.71	~$125k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program	Property Owners	Medium Term (<5 Years)
Front Street Pedestrian Refuge Islands	1.53	~$125k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program	Property Owners	Medium Term (<5 Years)
Seminary Street and Beech Street Curb Bump-Outs	1.53	~$225k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program	Property Owners, Baldwin Wallace University	Medium Term (<5 Years)
South Rocky River Road Curb Bump-Outs	2.35	~$175k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program	MetroParks	Medium Term (<5 Years)
Overall Curb Ramp Improvements	2.35	~$150k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program		Medium Term (<5 Years)

Recommendation	Community Priority Score	Estimated Project Cost	Potential Funding Sources	Potential Partners	Timeline
Vehicular Improvements	Lower Score = Higher Priority				
Seminary Street Speed Humps Trial	2.82	~$75k	NOACA Street Supplies Program	Residents	Near Term (1-2 Years)
Seminary Street and Bridge Street	2.18	~125k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program	Property Owners	Long Term (5-10 Years)
Seminary Street and Church Street	2.13	~225k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program		Long Term (5-10 Years)
Signing Improvements	Lower Score = Higher Priority				
Wayfinding Signage Improvements	1.82	~$70k to $150k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program	Residents, Businesses, Community Groups, Baldwin Wallace University	Medium Term (<5 Years)
Enhanced One-Way Signage	1.94	~$15k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program NOACA Street Supplies Program		Near Term (1-2 Years)
School Street Parking Restrictions	3.06	~$5k	NOACA TLCI Implementation Funds NOACA Transportation Alternative Funds NOACA Surface Transportation Block Grant Program NOACA Street Supplies Program	Property Owners	Near Term (1-2 Years)

Implementation Plan Summary

The information provided in the Implementation Matrix will assist the City in prioritizing and planning for projects that will improve mobility and safety for non-motorized users in Downtown Berea. The matrix includes indications of community desire for specific improvements, expected costs and funding sources for these projects and the expected timeframe to complete each.

In viewing the matrix, it can be noted that pedestrian-specific improvements were generally ranked as higher priority by community members but are expected to be some of the more costly projects to complete and take up to 5 years to implement. Pedestrian and bicycle improvements on Front Street between Grand Street and Bagley Road could be coordinated with an upcoming resurfacing project which can help in reducing cost and expediting implementation.

Near term improvements for bicycles along Seminary and Beech Streets can be implemented relatively quickly and at low cost. The more substantial improvement of painted bike lanes on these streets should be confirmed by observations of the impact of the near term improvement and coordinated with other improvements such as pavement maintenance and rehabilitation. Therefore, painted bike lanes are expected to be on a longer timeline since the timeline for pavement work on these streets is not known at this time.

Improvements to wayfinding signing was also ranked as one of the most desirable projects by the community members at the final public meeting. This type of project can vary in cost depending on extent, complexity and other factors discussed previously in this study. The development of a plan, working with a designer, and fabrication and installation is expected to take up to five (5) years.