

DL+W

MULTIMODAL ACCESS ENHANCEMENT STUDY



FINAL
SEPTEMBER 2022

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PROJECT FUNDING

This project was funded by a Community Foundation for Greater Buffalo's Ralph C. Wilson Jr. Foundation Design and Access grant.

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INTRODUCTION



PROJECT PURPOSE

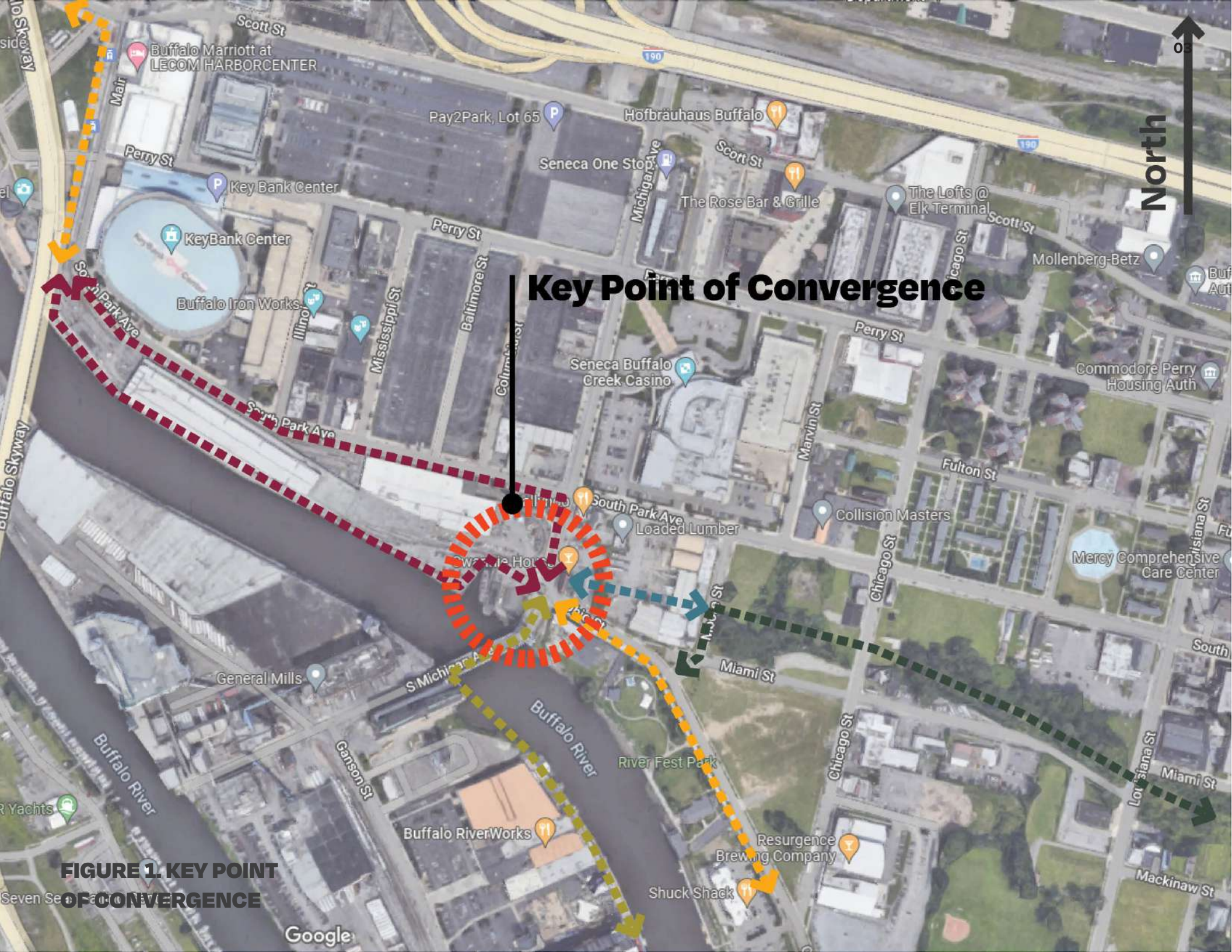
Located at the intersection of the Shoreline Trail, Niagara River Greenway, and Empire State Trail, the DL+W Terminal and its surrounding public spaces serve as a primary source of access for bicyclists and pedestrians seeking to travel between the Canalside and Cobblestone Districts and areas to the north and south. This area also has the potential to be a gateway to downtown for people coming from the south and southeast.

Under existing conditions, the public right-of-way surrounding the DL+W Terminal is narrow and uninviting for pedestrians and bicyclists due to confusing intersections, sharp turns, a driveway, chain link fencing around the NFTA-Metro rail yard and parking lot, and several staircases. These accessibility issues serve to create a gap in the nearby multi-use trail network and limit public interaction with Buffalo's waterfront and other downtown attractions.

As NFTA moves toward completion of the DL+W Metro Rail Station and redevelopment of the adjacent space in the DL+W Terminal, the agency seeks to plan and implement access and trail improvements to support both the adaptive reuse of a Buffalo landmark and walking and bicycling connections along Buffalo's waterfront; creating multimodal transportation options.

As shown in Figure 1 on the following page, the study area acts as a key point of convergence for several existing and proposed trails. This nexus, alongside connection to the NFTA Metro service, creates a central destination point that can be enhanced through improvements to the public realm and placemaking adjacent to the DL+W terminal.





Key Point of Convergence

FIGURE 1. KEY POINT OF CONVERGENCE

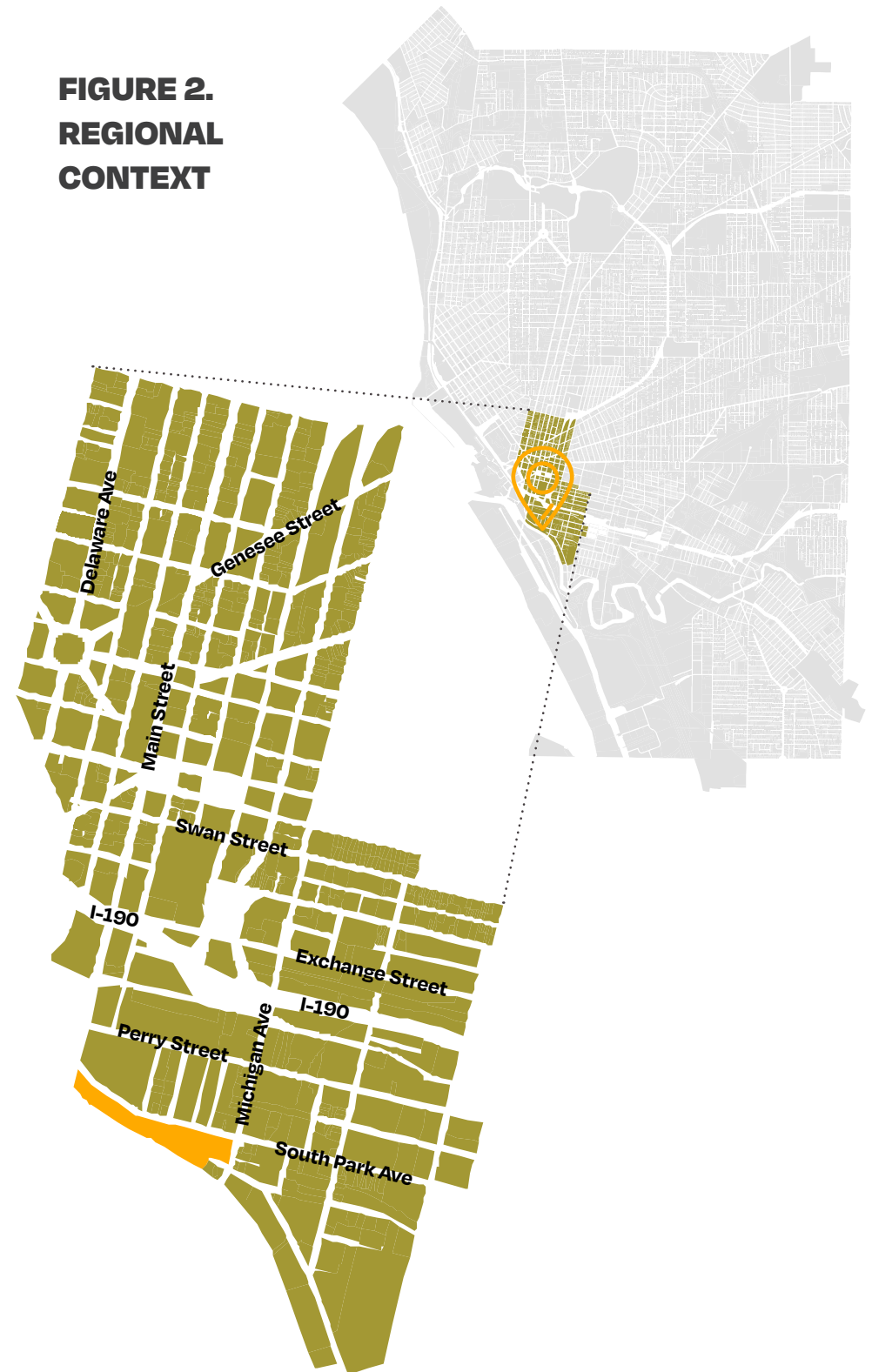
STUDY AREA

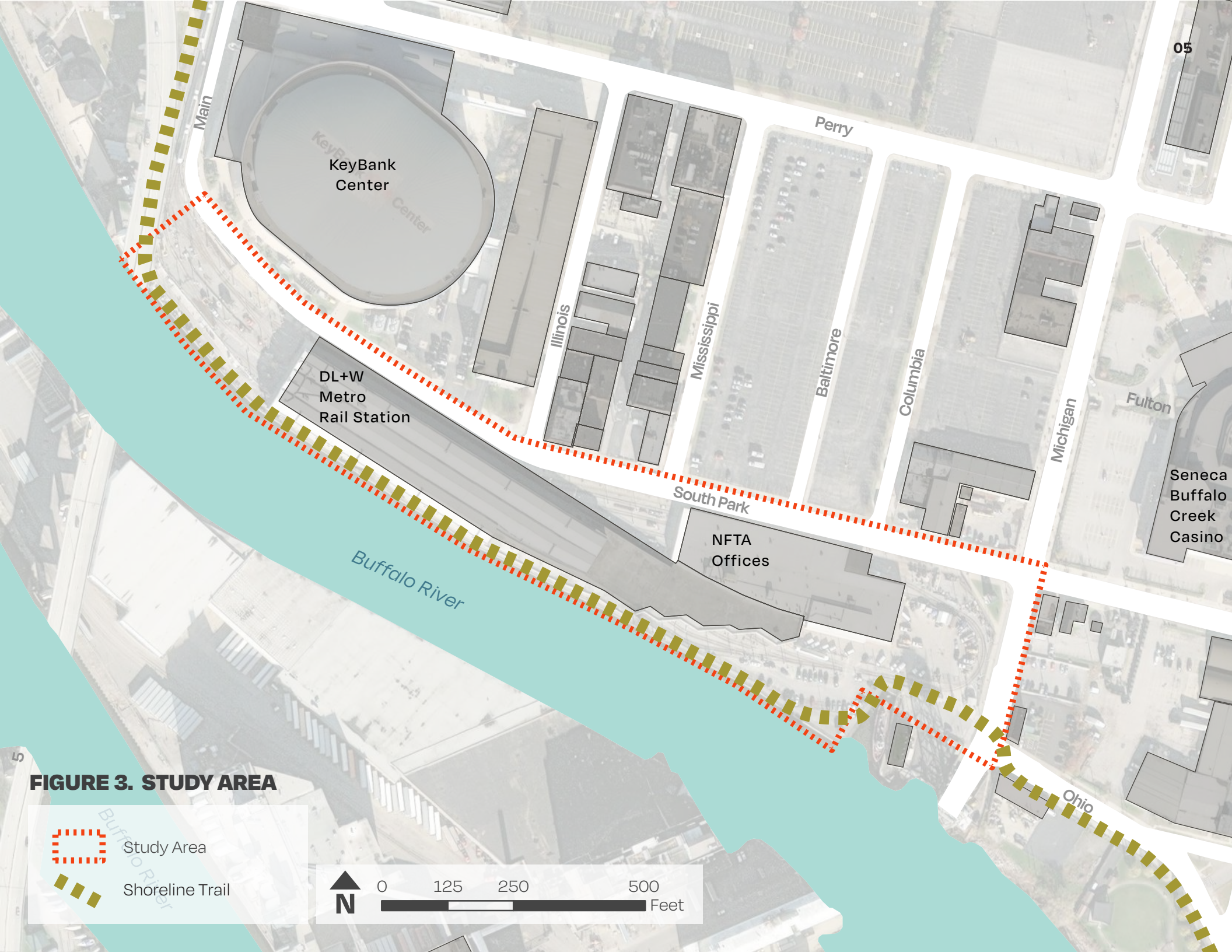
The study area includes the DL+W terminal and surrounding area; including portions of South Park Avenue, Michigan Avenue, Ohio Street, and the Shoreline Trail.

The DL+W terminal is located along the Buffalo River, on South Park Avenue across the street from the KeyBank Center. It is located in the heart of Buffalo's downtown waterfront district in close proximity to several major attractions, including Canalside and the Outer Harbor.

Figure 2 on the following page depicts the study area in yellow, and the surrounding neighborhood. Figure 3 on the following page depicts the study area in closer detail, including the alignment of the Shoreline Trail and nearby amenities.

**FIGURE 2.
REGIONAL
CONTEXT**





05

Main

KeyBank Center

Center

Illinois

Mississippi

Perry

Baltimore

Columbia

Michigan

Fulton

Seneca Buffalo Creek Casino

DL+W Metro Rail Station


South Park


NFTA Offices

Buffalo River

Ohio

FIGURE 3. STUDY AREA

 Study Area

 Shoreline Trail



VISION AND GOALS

A vision statement and supportive goals were developed early in the design process to help focus the initial analysis of the study area and to guide the development of concept design alternatives.

VISION

To establish a safe, inviting multimodal network adjacent to the DL+W Terminal that facilitates activity to and from the station, connects people to the Buffalo River and creates a unique commuter and recreational user experience along the waterfront.

STUDY AREA GOALS

1. Establish a **seamless, connected transportation network** in proximity to the DL+W Terminal that supports a wide variety of users, including those walking and bicycling, as well as those using scooters, skateboards, strollers, and mobility devices.
2. Enhance **visibility, accessibility and safety** on Buffalo's waterfront and celebrate the historical context of the area.
3. Become a **gateway** to Canalside / Cobblestone District / Downtown.
4. Enhance **sense of place** near the DL+W Terminal through improvements, such as wayfinding, landscaping, and public art interventions.
5. Support the **adaptive reuse** of the DL+W Terminal to enhance public transportation options, and development and tourism opportunities in the City.

FOCUS AREA



Four key focus areas for improvements were identified through the planning process, including the following:

▶ **MICHIGAN AVENUE TRAIL ENTRANCE**

This area was identified as a conflict point between vehicular traffic and trail activity, and also lacks design elements and amenities to clearly identify the location of the trail entrance once users have crossed Michigan Avenue.

▶ **BRIDGE VIEW PLAZA**

The paved area with a small pavilion was identified as an area of significant opportunity to implement placemaking and create a gathering space along the Shoreline Trail.

▶ **SHORELINE TRAIL**







The Shoreline Trail is the most significant existing pedestrian and bicyclist facility within the study area, and presents many opportunities for user experience and placemaking enhancements.

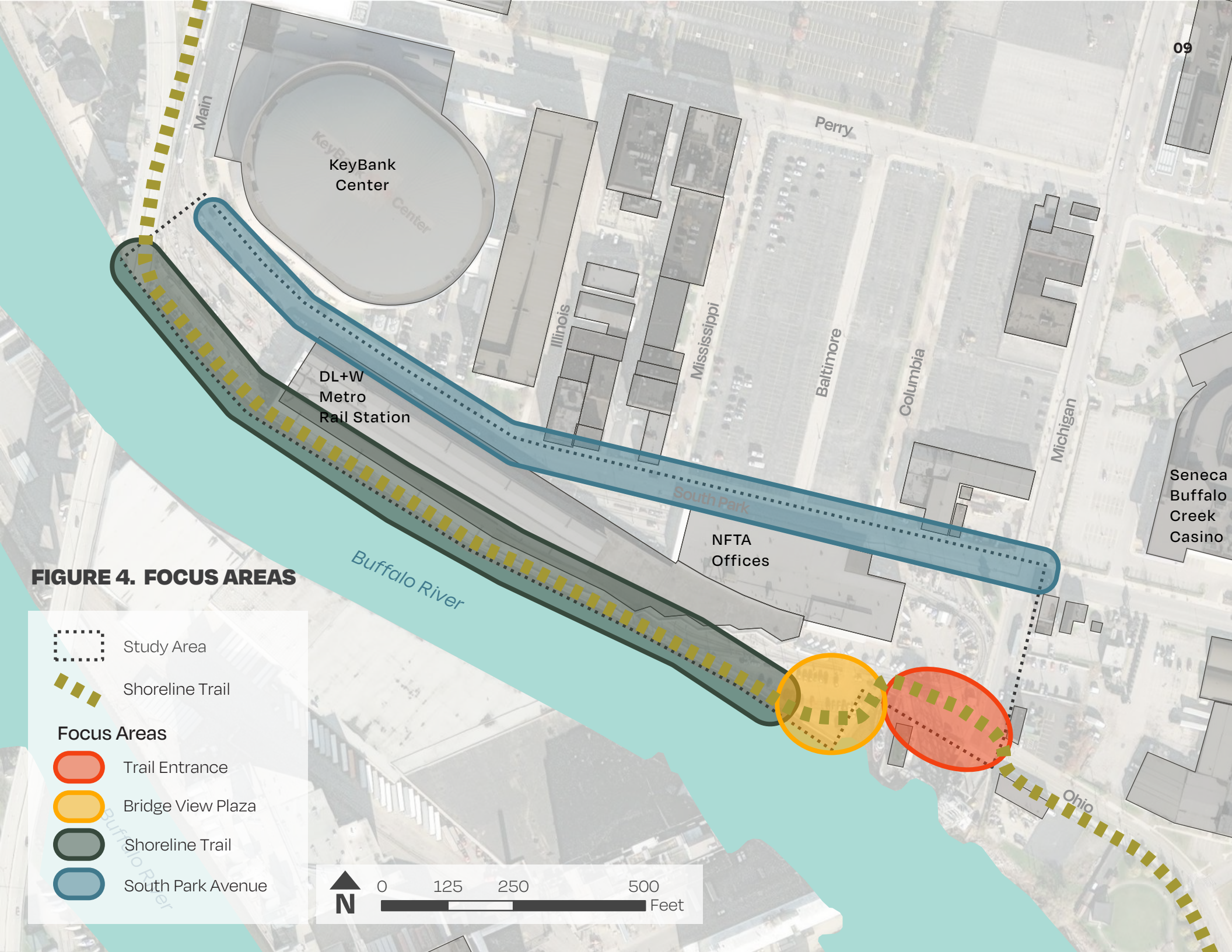
▶ **SOUTH PARK AVENUE**

South Park Avenue (owned by the City of Buffalo) is currently used by many bicyclists as a connector to the larger trail system along the waterfront, and hosts a significant amount of travel activity during major events at the KeyBank Center.

The extents of each focus area are presented in Figure 4 on the following page.

FIGURE 4. FOCUS AREAS

 Study Area
 Shoreline Trail
Focus Areas
 Trail Entrance
 Bridge View Plaza
 Shoreline Trail
 South Park Avenue



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EXISTING CONDITIONS ANALYSIS

See the yellow boxes throughout the document for key takeaways of each component of the study area!

A review of the study area's existing conditions is intended to inform recommendations related to future multimodal accommodations and public realm enhancements. This Chapter analyzes existing conditions within the study area including roadway characteristics, traffic operations, transit service, pedestrian and bicyclist facilities, and nearby key destinations. This Chapter is broken up into two key sections:

- **Vehicular Network:** This section looks at on-road activity regarding motorist patterns and behaviors. This includes the physical roadway characteristics; operational data including traffic volumes, travel speeds, and crash patterns; and public transit routes and ridership.
- **Pedestrian & Bicyclist Network:** This section focuses on the study area's characteristics from a non-motorist perspective, including existing on-road facilities, the Shoreline Trail, and nearby attractions and destinations accessible by foot or bike.





SHORELINE TRAIL

GREENWAY HEADWATERS

- ↑ Empire State Trail
- Industrial Heritage Trail
- River Fest Park
- Fr. Conway Park
- DEC Boat Launch
- Outer Harbor
- ← Freedom Trail

OHIO STREET & MICHIGAN AVENUE

TO BE HAD
DRINK
OLD
KENTUCKY
WHI
JAMES

VEHICULAR NETWORK

This section includes an inventory and analysis of the existing transportation network and traffic patterns within the study area. Topic areas within this section include:

- ▶ Roadway Conditions
- ▶ Intersection Conditions
- ▶ Traffic Volumes & Speeds
- ▶ Crash Analysis
- ▶ Public Transit

ROADWAY CONDITIONS

AT A GLANCE...



0.8 Lane Miles



6 Intersections



30 MPH Speed Limit



Deteriorated Pavement Conditions

Roadway Conditions Takeaways: South Park Avenue and Michigan Avenue are the study area's primary roadways, which both have deteriorated pavement conditions, especially on South Park Avenue. The pavement markings on South Park Avenue are severely worn, and in some instances not visible.

OVERVIEW

The study area encompasses two major roadways: South Park Avenue and Michigan Avenue. South Park Avenue is a two-way minor arterial roadway, with one lane in each direction. There is also a center turning lane between Illinois & Columbia Street. East of Columbia, South Park Avenue has a left turn lane that approaches the Michigan Avenue intersection.

Michigan Avenue, located on the east side of the study area, is a two-lane minor arterial roadway with a left hand turn lane at the intersection of South Park Avenue.

Both of these roadways are owned and maintained by the City of Buffalo.



SOUTH PARK AVENUE

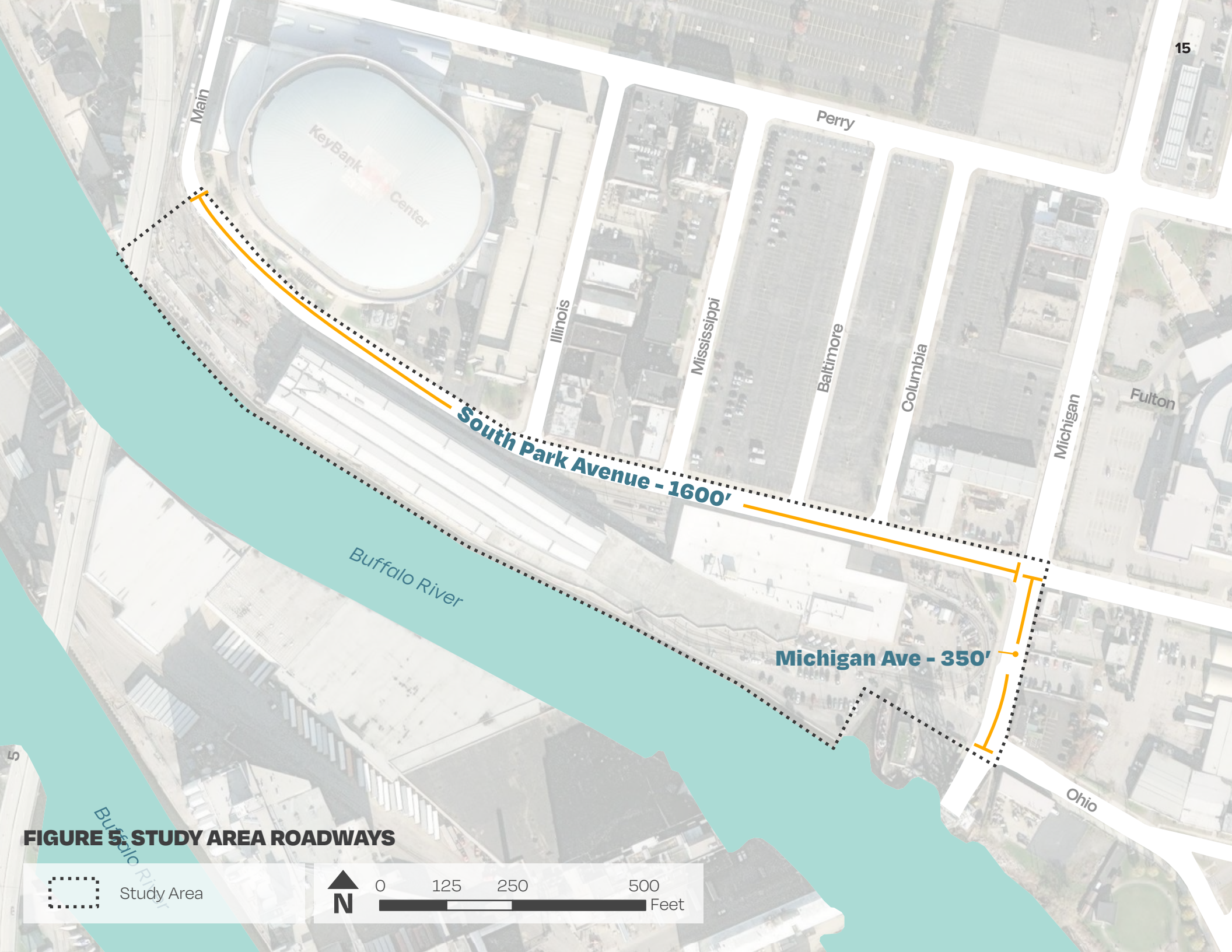



FIGURE 5 STUDY AREA ROADWAYS

 Study Area



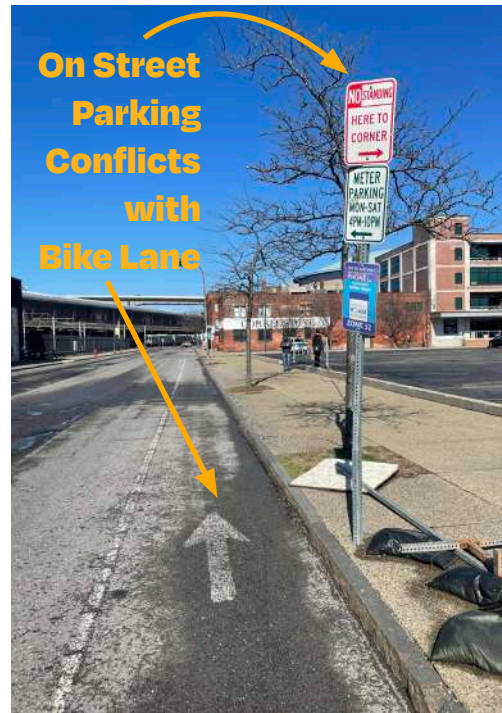
SOUTH PARK AVENUE

ON-STREET PARKING

On-street parking is prohibited on the south side of South Park Avenue. As of April 2022, parking is available on the north side of the street, and is metered between Monday and Saturday from 4 PM to 10 PM through a mobile app. There is currently a five foot bike lane directly adjacent to the sidewalk on the north side of South Park Avenue, presenting conflict between bicycle travel and parked vehicles. There is also a large amount of off-street parking available along the north side of South Park Avenue.

PAVEMENT CONDITION

A visual assessment of pavement conditions along South Park Avenue and Michigan Avenue was conducted during a site visit in April 2022. Based on the Pavement Condition Assessment Manual from NYSDOT, it was determined that South Park Avenue has a poor pavement condition, due to frequent and severe cracking and significant patching. Several potholes were present within the roadway as well. The pavement markings along South Park Avenue were barely visible, which made it difficult to discern lane alignments for the majority of the roadway segment.



Patching

Cracking



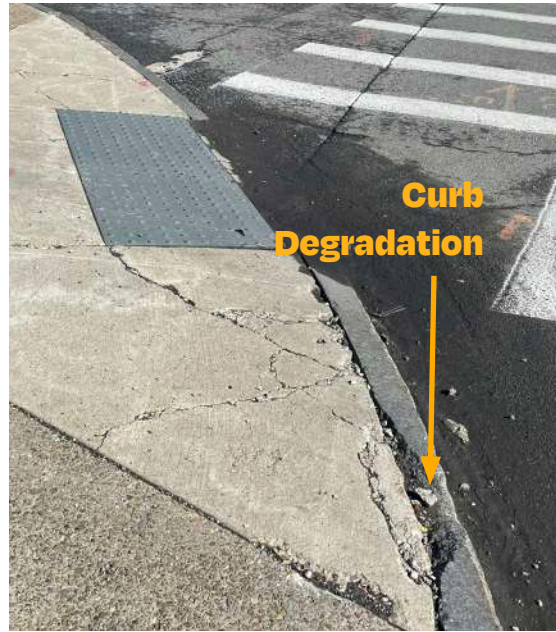
MICHIGAN AVENUE

ON-STREET PARKING

There is no on-street parking available on Michigan Avenue.

PAVEMENT CONDITION

Michigan Avenue had a slightly better pavement condition than South Park Avenue, but exhibits cracking and patching. The existing lane striping was visible but slightly worn. Additionally, there are storm drains within the bike lane on Michigan Avenue where the surrounding pavement has degraded significantly, creating a potential hazard for bicyclists.



INTERSECTIONS

There are six intersections within the study area; four of which are three way intersections on the north side of South Park Avenue. There are two four-way intersections — one at South Park Avenue and Michigan Avenue, and one at Michigan Avenue and Ohio Street.



FIGURE 6. STUDY AREA INTERSECTIONS



1 Illinois & South Park

- ▶ Three way intersection
- ▶ All-way stop-controlled
- ▶ Curb ramps lacking detectable warning strips and deteriorated on west side



2 Mississippi & South Park

- ▶ Three way intersection
- ▶ Stop controlled at Mississippi approach
- ▶ Curb ramps lacking detectable warning strips but in good condition



3 Baltimore & South Park

- ▶ Three way intersection
- ▶ Stop controlled at Baltimore approach
- ▶ Gate-controlled access on Baltimore
- ▶ Curb ramps lacking detectable warning strips but in good condition



4 Columbia & South Park

- ▶ Three way intersection
- ▶ Stop controlled at Columbia approach
- ▶ Curb ramps lacking detectable warning strips and are somewhat deteriorated



5 Michigan & South Park

- ▶ Four way signalized intersection
- ▶ Left turning lanes at all approaches
- ▶ Crosswalks at all four approaches
- ▶ Detectable warning strips at all four curb ramps



6 Michigan & Ohio

- ▶ Four way intersection
- ▶ Two-way stop (Ohio Street approaches)
- ▶ Crosswalks at all four approaches
- ▶ Curb ramp on west side have detectable warning strips



TRAFFIC VOLUMES & SPEED

Traffic Volume & Speed Takeaways: As shown on the next page, Michigan Avenue has the highest traffic volume and travel speeds. Immediately adjacent to the study area, Ohio Street has a significant amount of traffic relative to other roadways near the study area. Travel speeds are generally within or close to the posted speed limit of 30 MPH.

TRAFFIC VOLUMES

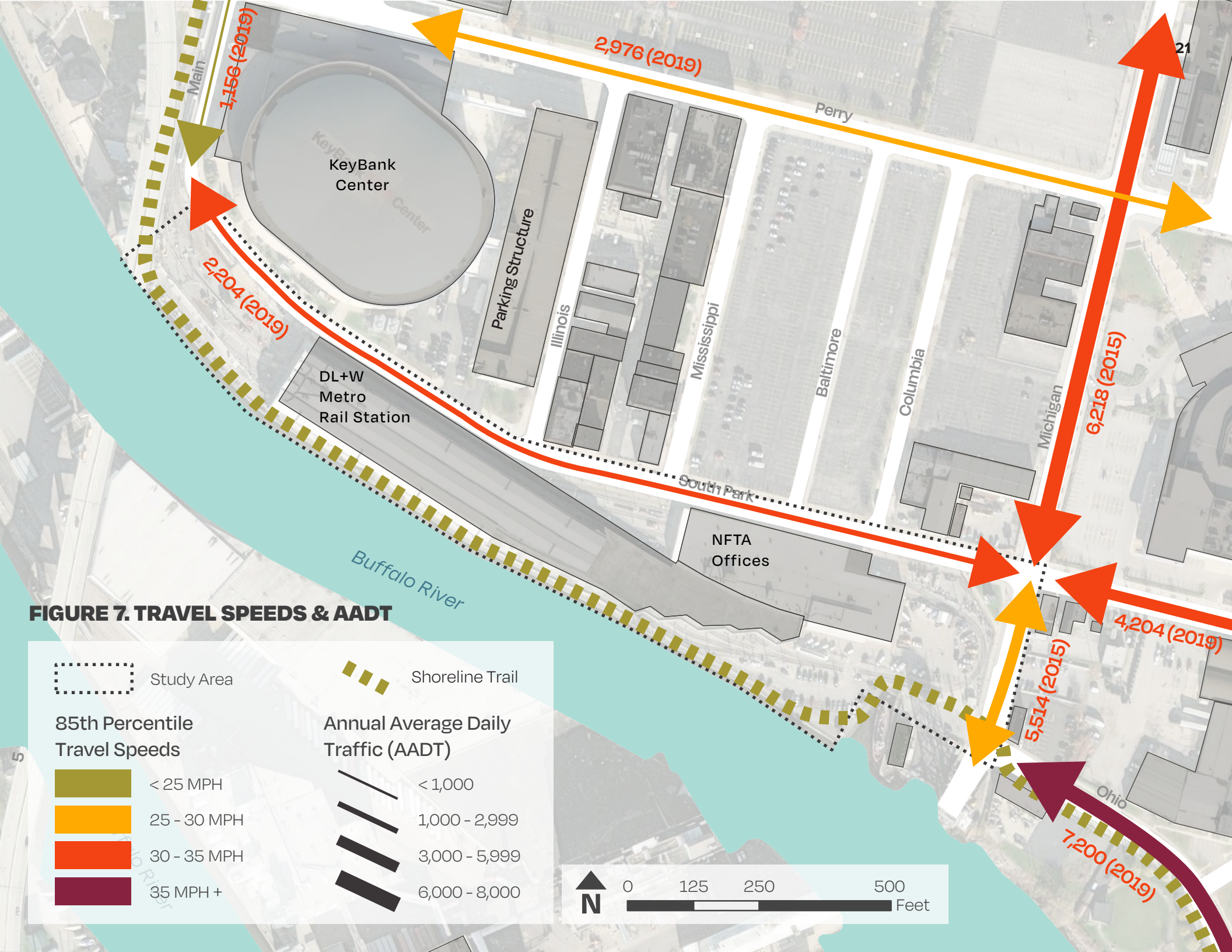
Annual Average Daily Traffic (AADT) was used to determine traffic volumes in and around the study area. AADT collected before 2019 were used to reflect conditions prior to the Michigan Avenue Bridge and Ohio Street Bridge closures and COVID-19. AADT was highest along Michigan Avenue (6,218) and Ohio Street (7,200), where there is a significant amount of commuting active due to General Mills and other nearby businesses. Main Street and South Park Avenue receive the lowest average traffic (1,156 and 2,204 respectively); followed by Perry Street (2,976). While average daily traffic volumes are generally low in the study area, there are periods of very high traffic volumes for small periods of times during events at KeyBank Center and the surrounding area.

TRAVEL SPEEDS

All of the roadways within and adjacent to the study area have a 30 MPH speed limit, per City code. The lowest 85th percentile speed recorded was for the segment of Main Street directly next to KeyBank Center at 22 MPH. On the opposite side of the study area, vehicles were traveling eight miles per hour over the speed limit on Ohio Street, with a 38 MPH 85th percentile speed. The 85th percentile travel speed on South Park Avenue was 31 MPH, and 28 MPH on Michigan Avenue.

Annual Average Daily Traffic, or AADT, is the average number of total of vehicles that travel on a roadway segment on a daily basis. It is used as a metric for traffic volumes, and is typically calculated by extrapolating short term vehicle counts.

85th percentile speed is the speed that 85% of drivers will drive at or below. Engineers typically use this as their "design speed" for determining geometric features of the roadway such as lane and shoulder widths and curb radii.



CRASH DATA ANALYSIS



24 injuries



56% during
clear weather



35% at night



70% collisions
with another
vehicle

Crash Analysis Takeaways: Within the study area, the majority of crashes occurred at the intersection of South Park Avenue and Michigan Avenue. All but one of the crashes that involved a non-motorist resulted in injury.

OVERVIEW

The Greater Buffalo Niagara Regional Transportation Council (GBNRTC) provided 15-year crash data (2007-2021) from the Accident Location Information System (ALIS). During this time period, 195 crashes occurred within the area bounded by Main Street, Perry Street, Michigan Avenue, and the Buffalo River. A total of 118, or 61% of crashes occurred along Michigan Avenue. The intersection with the highest crash density is located at Michigan Avenue and Perry Street, with 58 crashes; followed by the Michigan Avenue and South Park Avenue intersection, with 35 crashes. 78, or 40% of the crashes identified were directly within the study area. 45% of crashes within the study area occurred at the Michigan Avenue and South Park Avenue intersection.

PEDESTRIAN INVOLVED CRASHES

Of the nine pedestrian crashes, four (or 44%) involved a pedestrian crossing with a signal at an intersection. Only three of these crashes were within the study area. All but one (or 89%) of the pedestrian-involved crashes involved an injury, one of which was deemed serious.

BICYCLIST INVOLVED CRASHES

All four of the bicyclist involved crashes involved injuries, one of which was deemed serious. All four occurred directly at intersections. One of the bicyclists was not in the roadway, one was crossing against the traffic signal, and one was traveling along South Park Avenue next to traffic. Two were within the study area at the intersection of Michigan Avenue and South Park Avenue.

During the writing of this report, an incident occurred within the study area along South Park Avenue in which two bicyclists were injured, and one was killed after being struck by a vehicle. This tragic event has amplified safety concerns and need for improved bicyclist accommodations in the study area.

FIGURE 8. CRASH DATA (2007-2021)

Shoreline Trail

Study Area

Bike & Ped Crashes

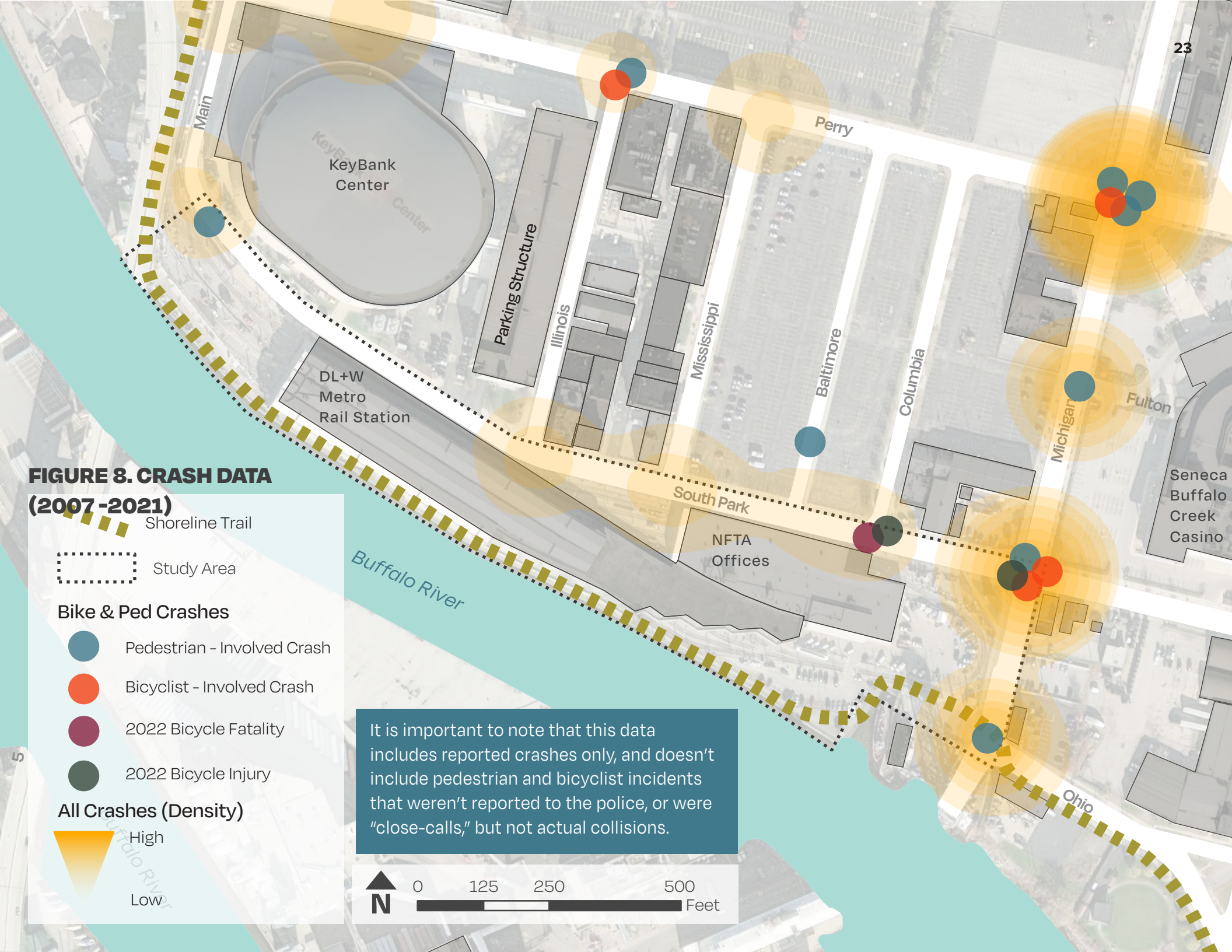
- Pedestrian - Involved Crash
- Bicyclist - Involved Crash
- 2022 Bicycle Fatality
- 2022 Bicycle Injury

All Crashes (Density)

High

Low

It is important to note that this data includes reported crashes only, and doesn't include pedestrian and bicyclist incidents that weren't reported to the police, or were "close-calls," but not actual collisions.





PUBLIC TRANSIT

The extension of Metro Rail service to the reactivated DL+W terminal will transform the study area into a transit hub; providing connectivity to and between the City's key waterfront destinations such as Canalside and the Cobblestone District.

Public Transit Takeaways: Bus ridership is low within and adjacent to the study area, however the expansion of the Metro Rail to the DL+W terminal is anticipated to increase transit activity in the area.

BUS SERVICE

Currently, four bus routes serve the area adjacent to the DL+W terminal:

- ▶ **Route 14 (Abbott)** Route 14 operates between downtown Buffalo and the McKinley Mall; with stops at SUNY Erie South, The Shops, Mercy Hospital, and the Buffalo Niagara Medical Campus. The route primarily uses Abbott Avenue and South Park Avenue.
- ▶ **Route 42 (Lackawanna)** Route 42 provides service between Mohawk Place in the City of Buffalo to Southgate Plaza in Lackawanna, using Route 5 and Ridge Road.
- ▶ **Route 16 (South Park)** Similar to Route 14, Route 16 provides service between the Town of Hamburg and the Buffalo Niagara Medical Campus; but utilizes South Park Avenue instead of Abbott Avenue south of the City.
- ▶ **Route 101 (North-South)** Route 101 provides service on school days throughout the City of Buffalo, terminating at South Park High School to the south, and Utica Station to the north.

BUS STOPS

The closest bus stops to the study area are on Michigan Avenue at the intersection of South Park Avenue, at the Seneca Buffalo Creek Casino, and at the intersection of Perry Street. All of these stops are indicated by a pole sign, with no additional amenities, aside from bicycle parking provided at the stop along Michigan Avenue within the study area.

RIDERSHIP DATA

According to 2021 data, bus ridership in the study area ranges from 0-17 daily riders on average. The stop on the west side of Michigan Avenue across from the Buffalo Creek Casino had the highest ridership at 17 average daily riders. The second highest average ridership was just west of the South Park Avenue and Michigan Avenue intersection with 16 riders. Erie Canal Harbor Station, the current terminus of the Metro Rail, has an average of 334 riders on weekdays, 454 on Saturdays, and 194 on Sundays.

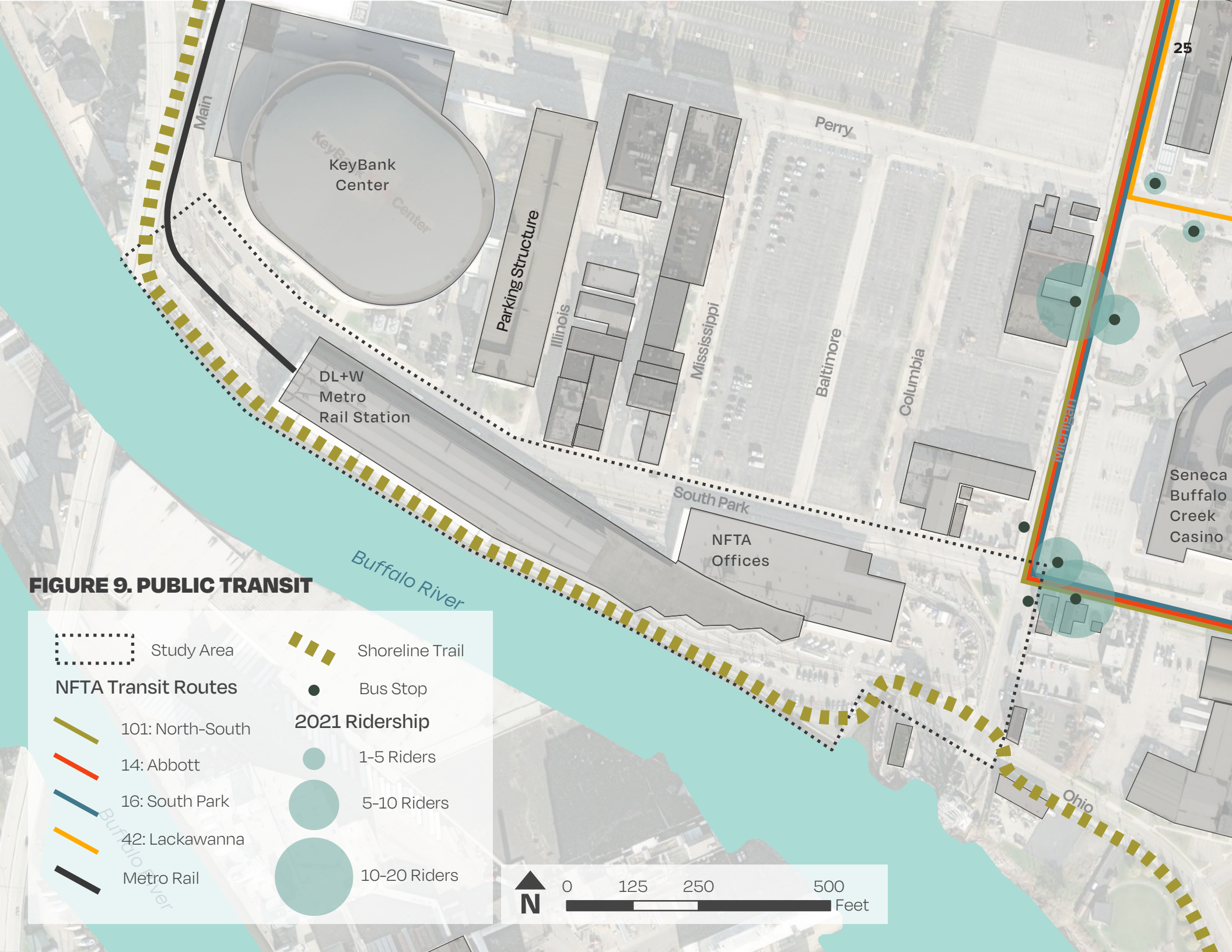













FIGURE 9. PUBLIC TRANSIT

	Study Area		Shoreline Trail
NFTA Transit Routes			Bus Stop
	101: North-South	2021 Ridership	
	14: Abbott		1-5 Riders
	16: South Park		5-10 Riders
	42: Lackawanna		10-20 Riders
	Metro Rail		





PEDESTRIAN & BICYCLIST NETWORK

This section provides an overview of the existing active transportation facilities surrounding the DL+W terminal. This analysis provides an understanding of how people currently move through and within the study area, any potential safety hazards or physical barriers to access, and how the current environment either supports or detracts from a bike- and walk-friendly environment. Topic areas include:

- ▶ Multimodal Facilities
- ▶ Bike & Pedestrian Amenities
- ▶ Shoreline Trail
- ▶ Key Destinations



MULTIMODAL FACILITIES

The roadways within the study area are equipped with urban-scale amenities such as a complete sidewalk network, crosswalks, and dedicated bicycle lanes.

Multimodal Facilities Takeaways: South Park Avenue and Michigan Avenue have on-road bike and pedestrian facilities, providing connectivity across the study area. Some of the conditions of the facilities could be improved upon, including condition of pavement and more visible markings.

SIDEWALKS

All of the roadways within the study area (South Park Avenue, Michigan Avenue, and Ohio Street) have sidewalks on both sides of the roadways. The table below shows the sidewalk widths and conditions:

Road	Side	Width	Condition
South Park Avenue	North	12' - 20'	Fair
	South	10' -12'	Fair
Michigan Avenue	East	9'-16'	Good
	West	7' - 8'	Fair
Ohio Street	North	9'-11'	Excellent
	South	5'	Excellent

ON-ROAD BIKE LANES

South Park Avenue currently has on-road dedicated five foot bike lanes. However, they are unprotected and the markings are in poor condition. Michigan Avenue also has dedicated five foot bike lanes on both side of the roadway.

OFF-ROAD MULTIMODAL FACILITIES

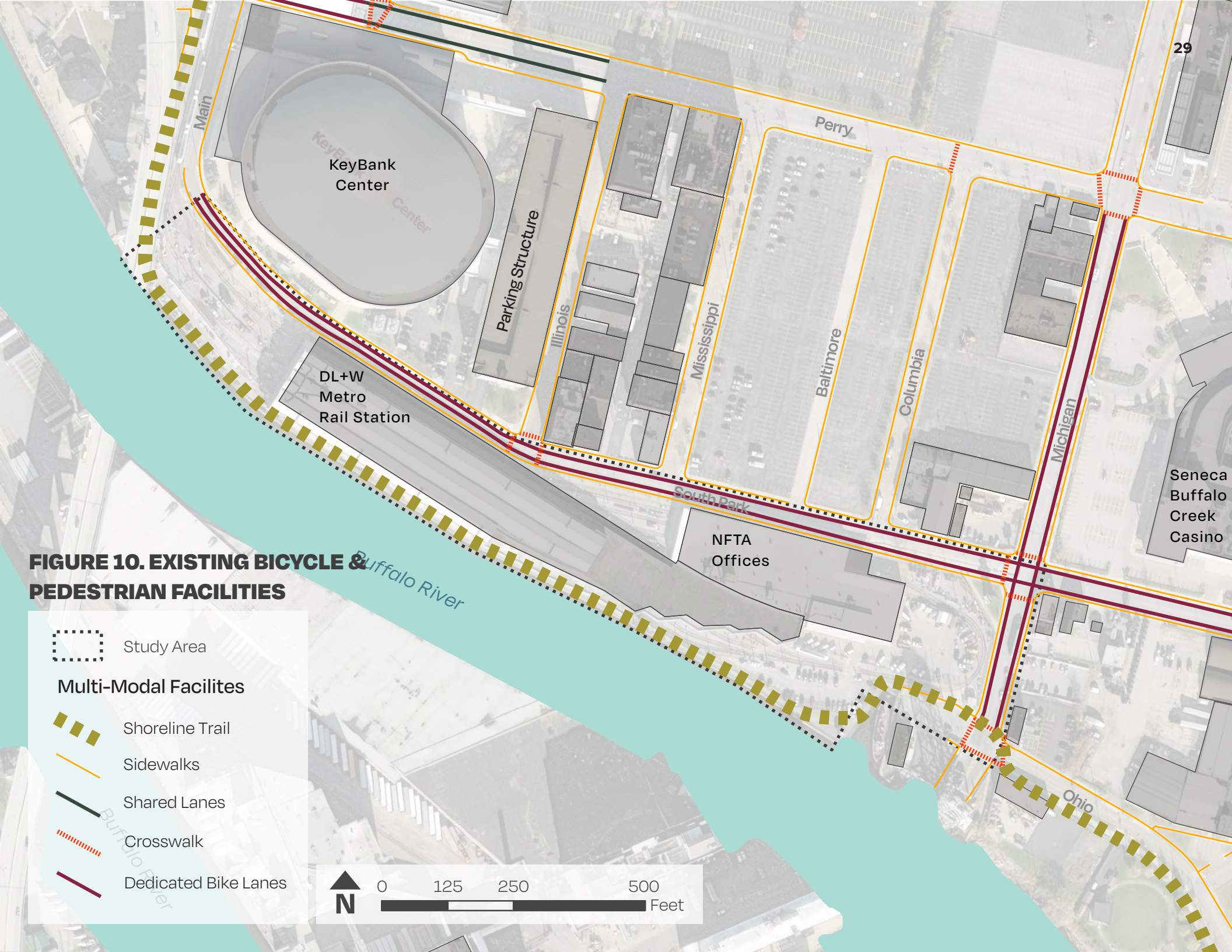
The Shoreline Trail passes through the study area from east to west; following the riverfront alongside the DL+W terminal. The trail runs the entire width of the study area, accounting for approximately 0.4 miles. Additional details regarding the characteristics of the trail are provided on the following pages. Pages 34-41 also provide background information and context related to the Shoreline Trail.

FIGURE 10. EXISTING BICYCLE & PEDESTRIAN FACILITIES

Study Area

Multi-Modal Facilities

- Shoreline Trail
- Sidewalks
- Shared Lanes
- Crosswalk
- Dedicated Bike Lanes



ON-ROAD BIKE & PED FACILITIES

The project team performed a site analysis of the study area roadways on April 12, 2022. The photos on the following page (keyed to the map below), present some of the findings regarding on-road bike & pedestrian accommodations.

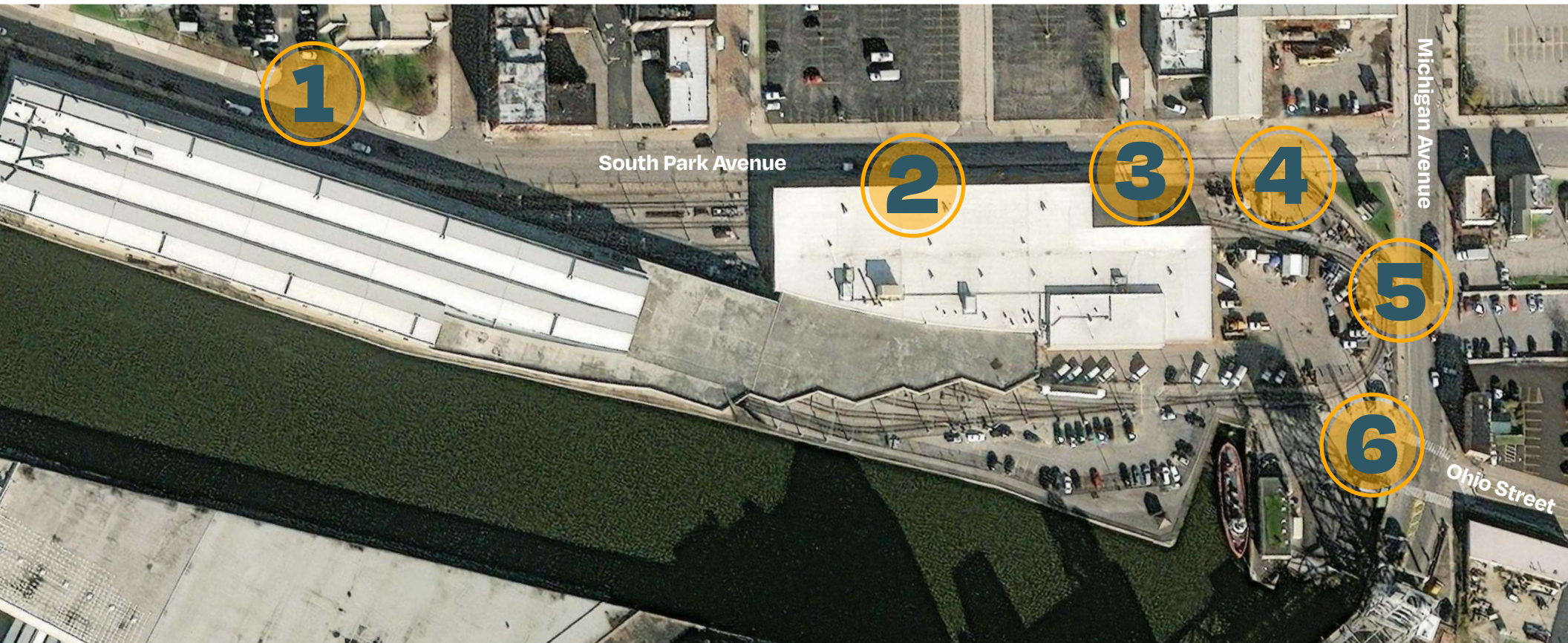


FIGURE 11. ON-ROAD BIKE & PED FACILITIES



1 The KeyBank Center and parking garage driveway presents a 100' gap in the pedestrian right-of-way.



2 Many of the tree pits are empty; particularly on the south side of South Park Avenue.



3 Sidewalk heaving due to street tree roots, presenting potential accessibility issues.



4 Pavement markings for the designated bicycle lanes (as well as lane striping) on South Park Avenue are very faint and hard to discern.



5 The sidewalk is cracked and significant deteriorated in some spots along Michigan Avenue, creating potential hazards for pedestrians.



6 Crosswalk striping is almost completely faded out across the NFTA facilities driveway.



PUBLIC AMENITIES

Site amenities, such as street trees, benches, lighting, and public art can have a significant impact on the bike- or walk-friendly character of an area by creating a sense of place and visual appeal.

Public Amenities Takeaways: The study area has limited amenities that contribute to the public realm and enhance the sense of place. One example is the public art installation on the DL+W terminal facade. Amenities such as pedestrian scale lighting, benches, and landscaping are lacking.

STREET TREES & VEGETATION

There are tree pits present on both sides of South Park Avenue for the entirety of the study area, as well as along the west side of Michigan Avenue. However, several of the tree pits are currently empty, particularly along the south side of South Park Avenue. Street trees have several benefits, including shading during warmer months, CO₂ capture, improvement of air quality, and stormwater management. There is a lack of additional landscaping in the area, such as tree lawns or planter boxes.

BICYCLE RACKS

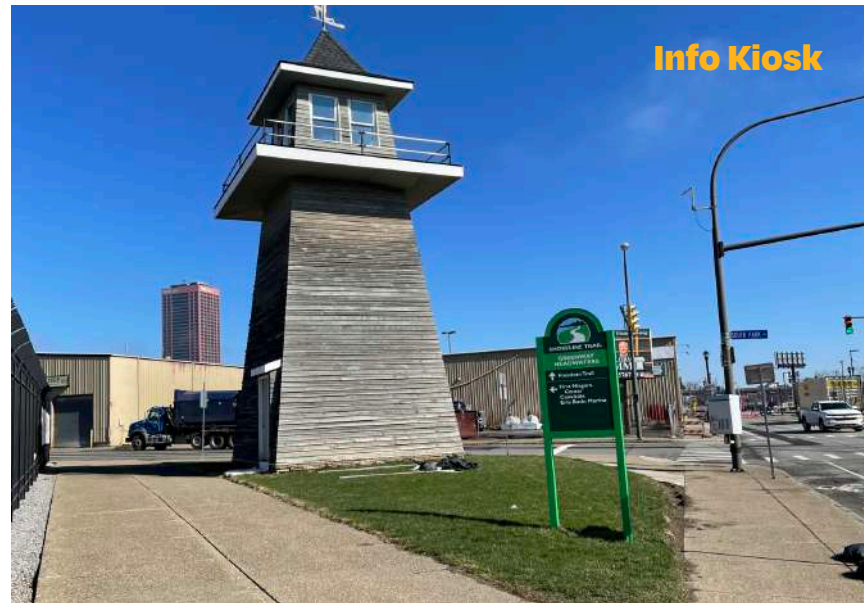
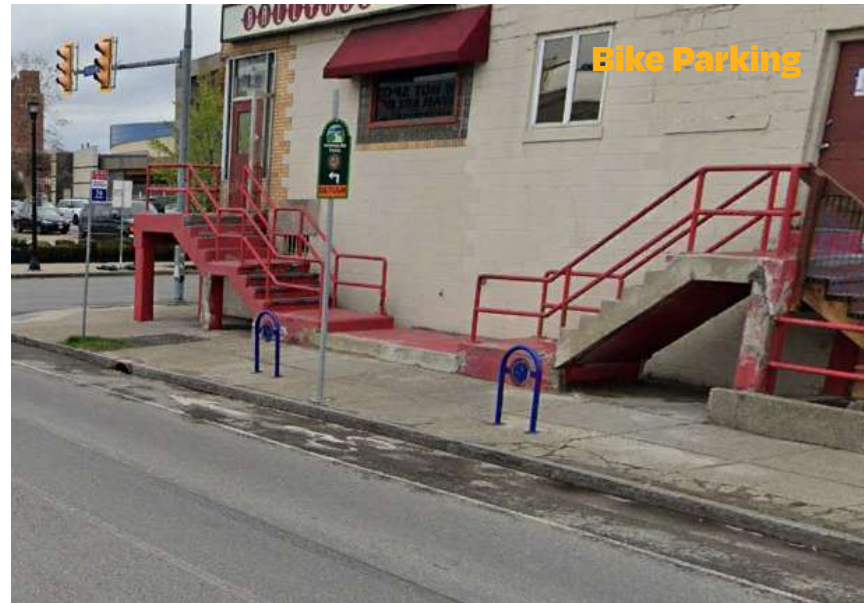
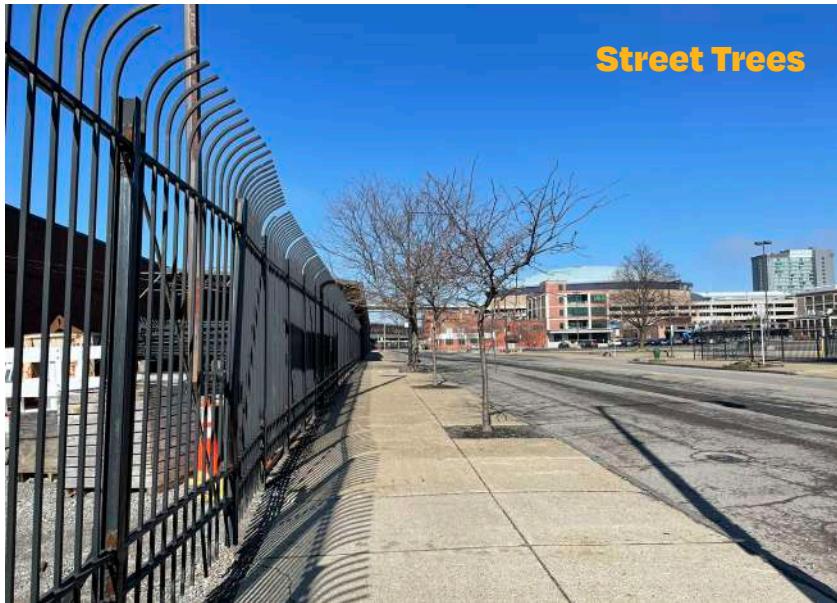
The only bike parking available in the study area are two decorative loop bike racks adjacent to the bus stop at the southwest corner of South Park Avenue and Michigan Avenue.

PUBLIC ART

There are several murals present along the facade of the DL+W Terminal on the south side of South Park Avenue, creating visual interest and adding character to the otherwise monotonous brick facade of the building.

INFORMATION KIOSK

A decorative lighthouse structure is located within a lawn area at the southeast corner of South Park Avenue and Michigan Avenue, which was built to act as an informational kiosk.





SHORELINE TRAIL

The main artery of bicycle and pedestrian travel in the Study Area is the Shoreline Trail, which follows the Buffalo River on the south side of the DL+W Terminal.

Shoreline Trail Takeaways: The Shoreline Trail is a significant multimodal asset within the study area which presents several opportunities for increased visibility and access to the trail and the waterfront.

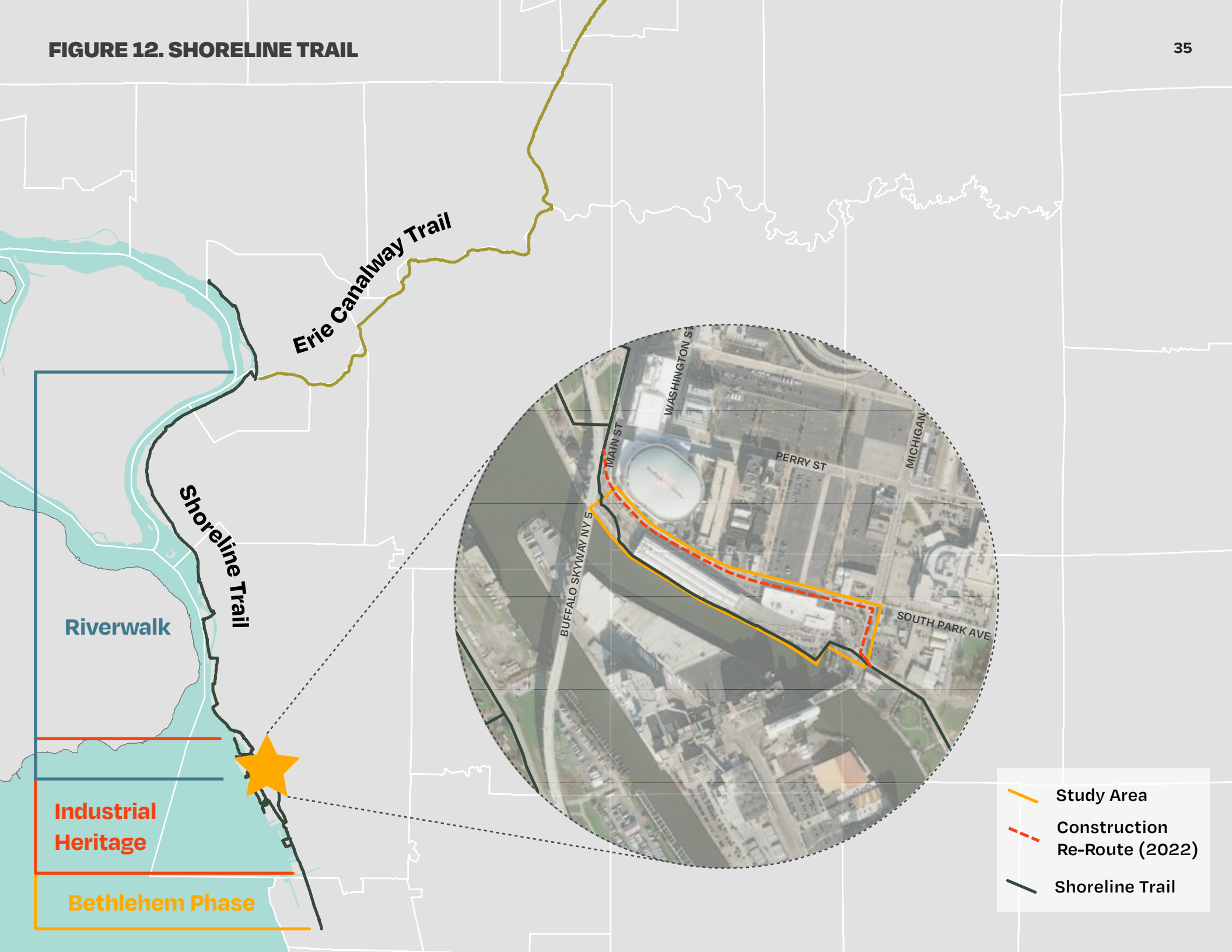
The Shoreline Trail within the study area is part of both the Riverwalk and Industrial Heritage trails and a piece of the Niagara River Greenway. At the time of the writing of this Plan, the portion of the Shoreline Trail within the study area follows a detour onto South Park Avenue within due to construction of the new Metro Rail station. Typically, the trail follows the south side of the rail terminal, providing direct access to the Buffalo Riverfront. The trail crosses Michigan Avenue at the eastern edge of the NFTA property, and continues south along Ohio Street. The following pages describe some of the key characteristics and amenities of the trail in the study area.



Within the City of Buffalo, the Shoreline Trail is an eight mile paved, primarily off-road shared use trail that follows Lake Erie, the Niagara River, and a portion of the Buffalo River. The trail begins in Niagara County, and follows the shoreline south, where it currently terminates in Lackawanna. The trail is planned to extend further along Lake Ontario to the southern edge of Erie County. The trail is also the western-most portion of the Empire State Trail, and links to the Erie Canalway Trail in Tonawanda, which carries the statewide trail east.

Given all of these local, regional, and statewide connections; the Shoreline Trail plays a significant role in the study area by connecting transit riders to world-class recreational amenities; and conversely connecting trail users to the City of Buffalo via the Metro Rail.

FIGURE 12. SHORELINE TRAIL



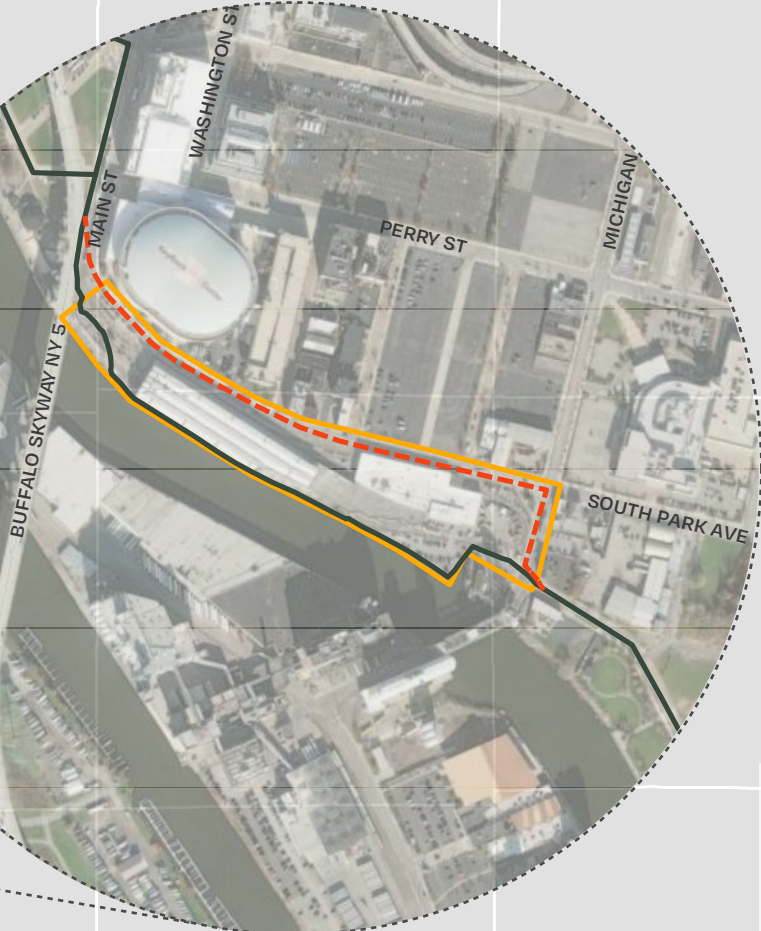
Erie Canalway Trail

Shoreline Trail

Riverwalk

Industrial Heritage

Bethlehem Phase



- Study Area
- Construction Re-Route (2022)
- Shoreline Trail

SURFACE

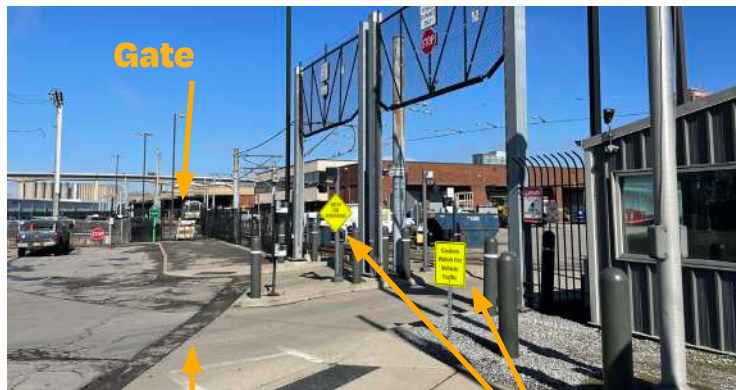
Beginning east of the NFTA facilities gateway, the trail surface is asphalt with notable cracking within the pavilion area, and vegetation growing up along the edges of the trail. The surface transitions to concrete where the trail is aligned directly between the terminal structure and the riverfront, which exhibits some cracking, and water pooling (as shown in the photo at right). These conditions may be hazardous or unfriendly to pedestrians and bicyclists.

TRAIL ACCESS

Currently, this portion of the Shoreline Trail is closed due to the ongoing construction of the DL&W Metro Rail Station. Before construction began, the gate was open during NFTA transit operation hours, and closed overnight. The entrance to the trail from the Michigan Avenue and Ohio Street currently does not have a walk- or bike-friendly character, and may confuse users as to whether they can access the trail from this location. Similarly, before this was a construction zone, there was a gate on the east end of the DL+W terminal that is locked and closed during non-operational hours. The photo below depicts the western gate to the trail within the study area, as well as the crossing at the NFTA facilities entrance.



Shoreline Trail adjacent to NFTA parking lot



Gate

Faded Crosswalk Striping

Warning Signage



Gate looking west towards Ohio Street



Cracking

Pooling

TRAIL AMENITIES

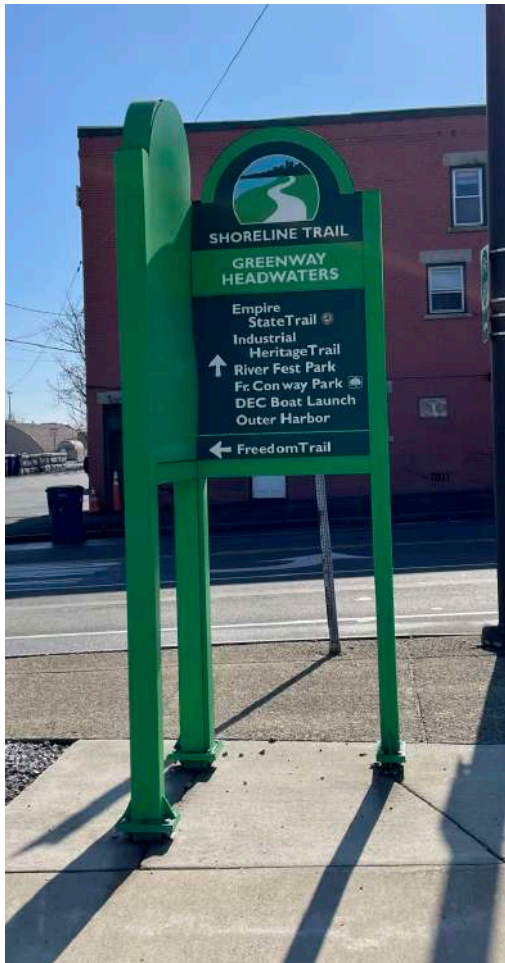
The segment of the Shoreline Trail within the study area provides direct access to the Buffalo Riverfront and views of the surrounding grain elevators and other nearby attractions. One of the most significant attributes of the trail is an area of pavement that is approximately 5,000 square feet near the NFTA facilities entrance*. This area contains some amenities, including a metal pavilion with a picnic table, two benches, and a trash receptacle. However, the area is largely unprogrammed, and the wide swath of asphalt can make the environment uncomfortable during the warmer months and generally is lacking in character, as shown in the photos on this page. Adjacent to the pavilion area is the Edward M. Cotter, an active Buffalo Fire Department fireboat.

*A portion of the seawall collapsed in August 2022 as this study was wrapping up. See page 44 for details.



SIGNAGE & WAYFINDING

There are several wayfinding signs along the trail indicating direction of the trail, as well as nearby destinations. Some of the signage has been vandalized over the years. The signage has clear branding, providing users clear visual cues. These cues are particularly important in transition areas where the trail alignment may not be particularly clear, such as the Michigan Avenue and Ohio Street intersection.



TRAIL WIDTH

The trail width varies throughout the study area. Prior to entering the gate the asphalt trail is over sixteen feet in width. Within the gate prior to the concrete surfacing, the trail is generally 10 feet in width — easily allowing for two-way travel. However, the trail width decreases to less than seven feet due to the presence of the rail stanchions within the trail (as shown at right.). This may cause conflict between opposing directions of travel. Just east of the stanchions, a stairway to the second floor of the terminal poses an additional barrier within the trail, reducing the width to less than eight feet. Further east, the trail widens to over 12 feet, presenting opportunities for other programming elements. Overall, the trail provides ample room for bi-directional travel, however the barriers such as the stanchions and stairwells must be considered in the recommendations and design concepts as potential barriers to safe and accessible non-motorist travel.







Former Trail Alignment northwest of the study area Prior to Metro Station Construction

Existing Signage



The trail alignment along the DL+W terminal provides direct access to the Buffalo River and varies between 6' - 12' in width.

There are several sets of stairs along the DL+W terminal that could provide access to future development on the second story of the building. The stairs also are an obstacle for trail users.

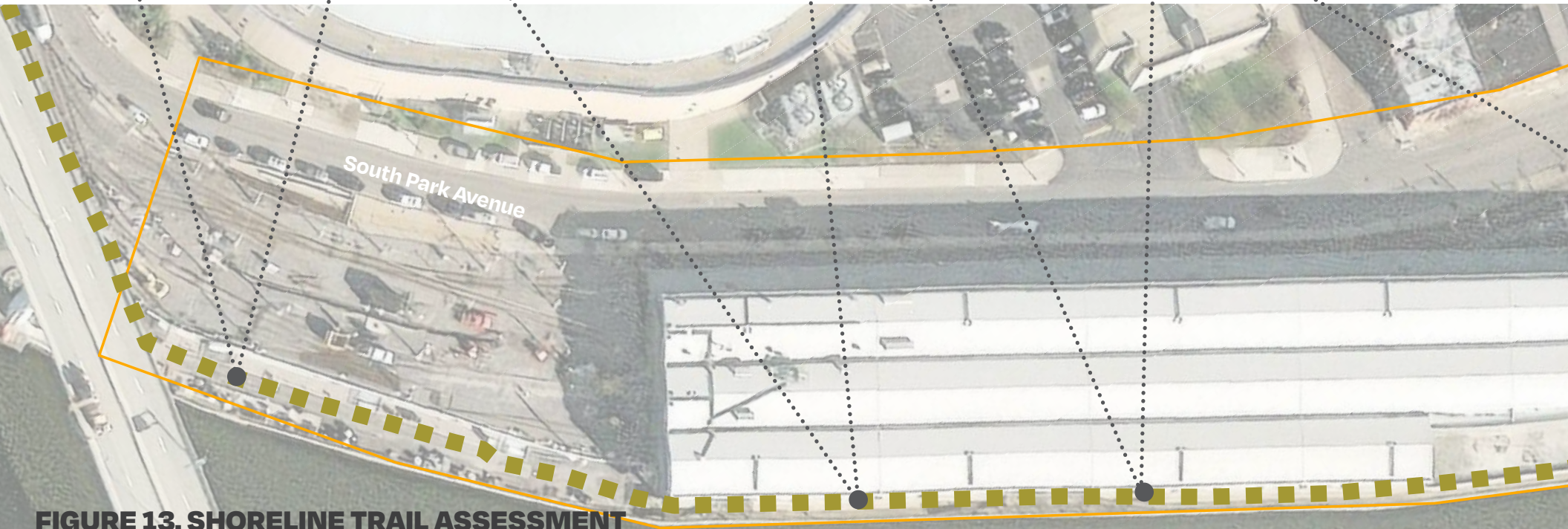


FIGURE 13. SHORELINE TRAIL ASSESSMENT



Stanchions for rail operations are located within the trail alignment, presenting obstacles for trail users.

Approximately 5,000 sf of an asphalt area with a pavilion is located near the eastern edge of the study area along the trail.



A gate is located at the eastern edge of the NFTA facilities, and was historically locked overnight.

The current trail alignment crosses the NFTA driveway before crossing the Michigan Avenue and Ohio Street Intersection.





KEY DESTINATIONS

Planned improvements at the DL+W Terminal will enhance visitor access to Buffalo's waterfront destinations with a short walking and biking distance; increasing the viability and support for effortless non-motorized travel within the heart of downtown.

Key Destinations Takeaways: The DL+W terminal is easily accessible to many downtown destinations and a significant portion of Buffalo's publicly accessible waterfront.

KEY DESTINATIONS

As shown in Figure 14, there are numerous parks, amenities, and key destinations within a relatively short walking and/or biking distance from the new Metro station. Within a 15 minute walk, riders are able to access some of Buffalo's greatest waterfront assets; such as Canalside, the Outer Harbor, and Riverworks. Directly across from the Station, KeyBank Center is a significant hub of activity in the City that drives Metro Rail ridership and brings visitors to the area. Many other key waterfront destinations are easily accessible via the Shoreline Trail further north and south along the lakeshore. The development of a new Metro Rail station directly along the Empire State Trail will also help to foster improved connectivity from the trail into other areas of Buffalo; allowing visitors to explore more of the City. Below are some of the key destinations within close proximity to the station.

Location	Walk Time	Bike Time
KeyBank Center	3 min	1 min
Canalside	6 min	2 min
Sahlen Field	12 min	3 min
Riverworks	13 min	3 min
Future Ralph C. Wilson Jr. Centennial Park	28 min	7 min
Red Jacket River Front Park	30 min	9 min
Larkin Square	37 min	11 min
Buffalo Medical Campus	39 min	12 min
Tifft Nature Preserve	45 min	12 min
Outer Harbor	55 min	15 min
MLK Jr. Park	60 min	20 min

It should be noted that on Figure 14 walk and bike times are estimated as 3 MPH and 15 MPH respectively. The radii presented are intended to be representative, and do not reflect actual walk/bike times based on the roadway network.

FIGURE 14. KEY DESTINATIONS



Source: Buffalo News



Source: Visit Buffalo Niagara



Source: Visit Buffalo Niagara





CHANGING CONDITIONS

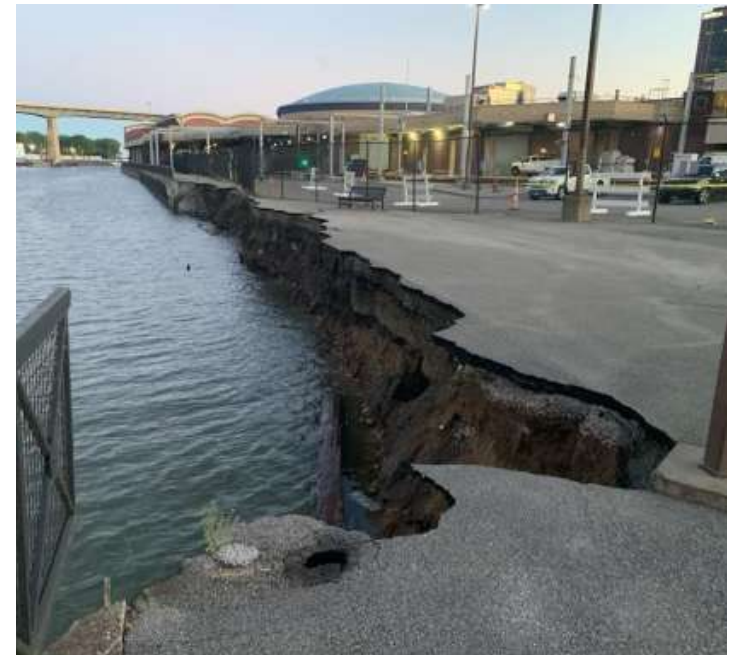
During the development of this study, a section of the Shoreline Trail collapsed into the Buffalo River, creating an urgent need for repairs and improvements within the study area.

SHORELINE COLLAPSE

Around 1:00 am on Saturday, July 30, 2022, a 12 ft by 200 ft section of the Riverwalk, on the southern end near the NFTA parking lot and Cotter fireboat, collapsed into the Buffalo River. NFTA took immediate action to ensure that the area was appropriately closed off to the public, and to reduce any further erosion.

As this study concludes, the cause of the collapse remains unknown. NFTA is continuing an underwater investigation of the site and coordinating efforts with the United States Coast Guard, the Buffalo District of the United States Army Corps of Engineers and the City of Buffalo.

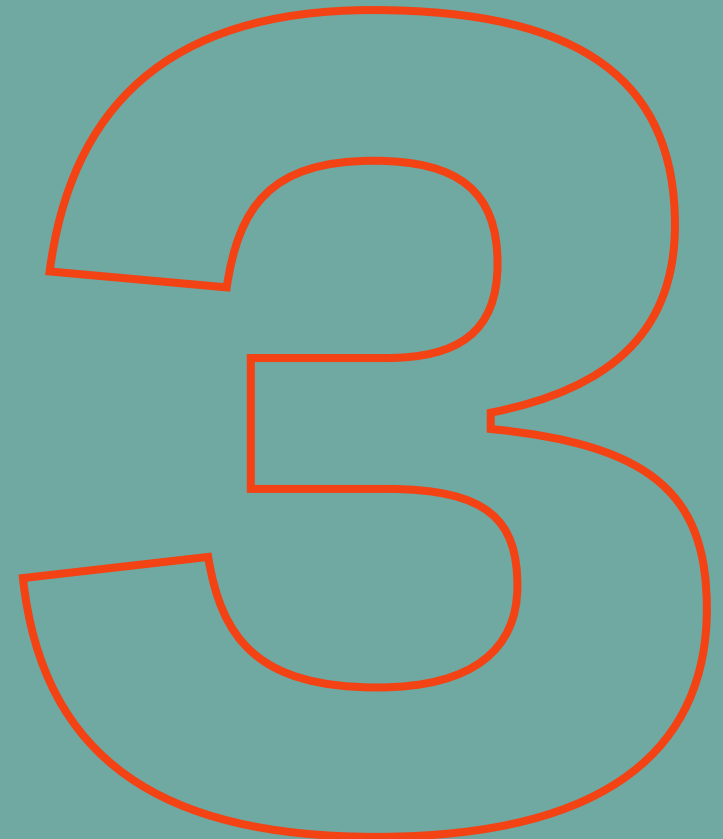
NFTA remains committed to the vision for bicycle and pedestrian access identified through this study process, and plans to incorporate study recommendations into the rebuilding and rehabilitation of the collapsed portion of the Riverwalk, as feasible.



NEEDS & OPPORTUNITIES ASSESSMENT

An assessment of needs and opportunities within the study area was informed by site visits, discussions with the internal steering committee and external stakeholder committee, and key findings in the preceding existing conditions analysis. This assessment identifies the primary concerns and potential opportunities related to expanding pedestrian and bicycle access and connectivity adjacent to the new Metro Rail station, enhancing safety for all types of users, and strengthening placemaking efforts. Findings related to needs and opportunities for each character area are described in this section and are organized by the following topics:

- Bicycle and Pedestrian Travel
- Vehicle Transportation
- Public Realm



BICYCLE & PEDESTRIAN TRAVEL

- ▶ **INCREASE BICYCLIST ACCOMMODATIONS.** South Park Avenue and Michigan Avenue both have bi-directional dedicated bike lanes. Bicyclist visibility and safety could be enhanced through improvements to the bike lanes, ranging from improving lane striping, or implementation of protective features such as bollards, curbing, or planters. Additionally, the existing street parking signage along South Park Avenue should be removed to eliminate the conflict between the bike lanes and parking, which existed at the time of this study.
- ▶ **MORE BICYCLE STORAGE AND AMENITIES.** As activity in the study area continues to grow with the revitalization of the DL+W terminal, there is an opportunity to support more bicyclist travel by providing additional bike racks, particularly within or nearby the primary DL+W station entrance. Additionally, bike share stations could be installed in the vicinity of the terminal to increase multimodal options.
- ▶ **IMPROVE SIDEWALK CONDITION.** As identified in the Existing Conditions analysis, many of the sidewalks have cracking and heaving, reducing accessibility particularly for pedestrians with reduced mobility. Repairing sidewalks along South Park Avenue and Michigan Avenue will help foster a cohesive multimodal experience throughout the study area.
- ▶ **CURB RAMP IMPROVEMENTS.** As mentioned in Chapter 2, many of the curb ramps within the study area are lacking detectable warning strips, are degraded, and in some instances are not ADA accessible. Each of the curb ramps should be improved to accommodate users of all abilities.
- ▶ **ADDRESS CROSSING LENGTH AT THE KEYBANK DRIVEWAY.** Pedestrians traveling along the north side of South Park Avenue near the eastern edge of the study area must cross the driveway to the service entrance to the KeyBank Center that is over 100 feet in width. Pedestrian comfort and safety could be enhanced by reducing the curb radii, creating a median between the KeyBank surface parking lot, or creating high visibility crosswalks.



DETERIORATED BICYCLE LANES



SIDEWALK CRACKING



CROSSING @ KEYBANK DRIVEWAY



CURB RAMP PAVEMENT FAILURE

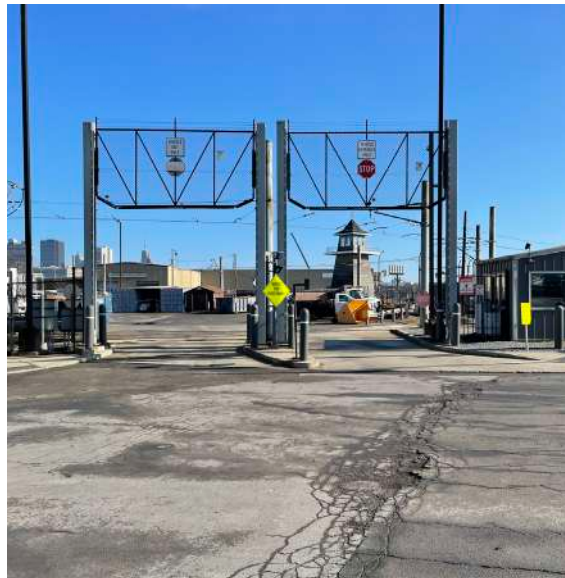
- ▶ **IMPROVE TRAIL SURFACING.** The concrete trail surfacing alongside the DL+W terminal shows signs of degradation, including cracking and pooling water. To improve trail conditions, resurfacing the trail should be considered. Additionally, landscaping elements along the edge of the trail may help with capturing stormwater and enhance sense of place.
- ▶ **POTENTIAL TRAIL REALIGNMENT.** The redevelopment of the DL+W terminal poses an opportunity to capitalize on the assets of the structure to enhance the Shoreline Trail and support additional activity surrounding both trail and Metro Rail use. This may include re-aligning the trail.
- ▶ **ENHANCE TRAIL CROSSING AND AT NFTA FACILITY ENTRANCE.** The Shoreline Trail connection across the NFTA facility vehicular entrance and the Michigan Avenue and Ohio Street intersection could benefit from wayfinding and design treatments to create visual cues between the trail segment along the DL+W terminal and Ohio Street.
- ▶ **ENHANCE CROSSWALKS.** Many of the crosswalks in the study area are faded, or non-existent. The implementation of high-visibility crosswalks throughout the study area would improve pedestrian safety and comfort.



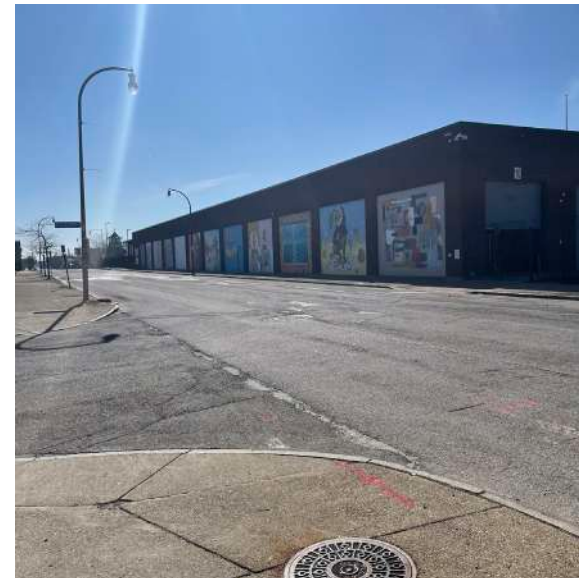
CONCRETE TRAIL SURFACE CONDITION



DL+W TERMINAL ROOFTOP AREA



NFTA FACILITY ENTRANCE TRAIL CROSSING



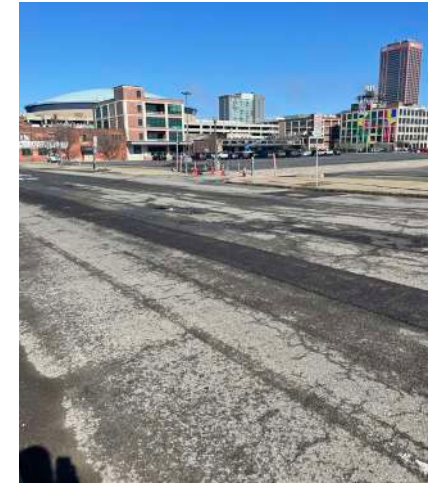
INTERSECTION @ MISSISSIPPI & SOUTH PARK

VEHICLE TRANSPORTATION

- ▶ **RESURFACE ROADWAYS.** The pavement on South Park Avenue, Michigan Avenue and Ohio Street is in poor condition and in need of upgrade to improve user safety and comfort.
- ▶ **RESTRIPE LANE MARKINGS.** The lane markings along South Park Avenue are very worn, and in some instances are not visible. The entire segment of South Park Avenue should be restriped to improve visibility, and regulate vehicular patterns and enhance safety.
- ▶ **RESTRICT ON-STREET PARKING.** The on-street parking on South Park Avenue currently conflicts with the bicycle lane present along the shoulder of the roadway. The current parking signage is in the process of being removed, but reconfiguration of on-street parking within the study area should be further explored to mitigate conflicts between pedestrians, bicyclists and vehicles.
- ▶ **MICHIGAN AVENUE & OHIO STREET INTERSECTION IMPROVEMENTS.** This intersection is a crucial connection for the Shoreline Trail. Therefore, it should be designed such that vehicles are keenly aware of the potential pedestrians and bicyclists moving through the intersection. The reduction of curb radii, the installation of curb bump-outs, and reconfiguration to be a four-way stop controlled intersection should be explored.
- ▶ **MICHIGAN AVENUE & SOUTH PARK AVENUE INTERSECTION IMPROVEMENTS.** This intersection had the highest concentration of crashes within the study area, including two bicyclist and pedestrian crashes. Reduced curb radii, installation of bicycle boxes, or improved signal timing should be explored to reduce future crash incidents.



PAVEMENT CONDITION @ GATEWAY



SOUTH PARK PAVEMENT CONDITION



OHIO & MICHIGAN INTERSECTION



MICHIGAN & SOUTH PARK INTERSECTION

PUBLIC REALM

- ▶ **BRIDGE VIEW PLAZA ENHANCEMENT.** The pavilion area along the Shoreline Trail provides space for waterfront access and a resting area for trail users. There is an opportunity to enhance this space and create a greater sense of place through user amenities, landscaping, public art, and other design elements.
- ▶ **INCREASE WAYFINDING.** The existing wayfinding signage is beneficial for trail users, especially at crossings such as at Michigan Avenue. Wayfinding could be expanded to include elements such as trail maps, mile markers, travel distances to nearby destinations, and pavement markings to enhance user navigation.
- ▶ **IMPROVE BUS STOP AMENITIES.** To support increased ridership and improve comfort and safety for current riders, enhancing the bus stops in the area with seating or shelters should be explored.
- ▶ **INCREASE GREEN INFRASTRUCTURE & LANDSCAPE.** The study area could benefit from additional vegetation which can assist with mitigating urban heat island effect, managing stormwater runoff, and creating a more inviting atmosphere. Such enhancements may include planter boxes, street trees, or vegetative curb areas.
- ▶ **PEDESTRIAN-SCALE LIGHTING.** There are street lights present on both South Park Avenue and Michigan Avenue, but could benefit from pedestrian-scale lighting fixtures which are positioned closer to the ground. The Shoreline Trail could also benefit from improved lighting.



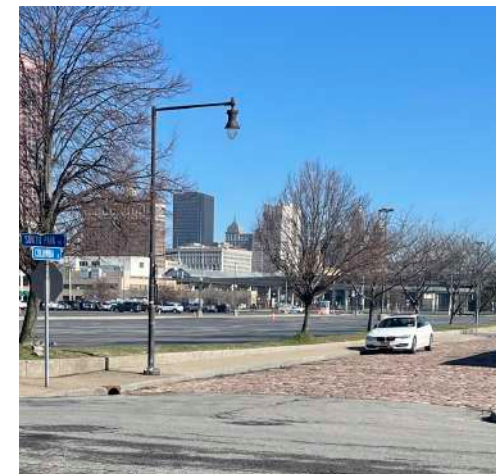
EXISTING PAVILION AREA



EXISTING WAYFINDING



LACK OF LANDSCAPING IN PEDESTRIAN REALM



EXISTING STREET LIGHTING

- ▶ **ADDITIONAL WATERFRONT GATHERING SPACES.** The area near the trail entrance gate is characterized by a significant amount of pavement that is currently underutilized. There is an opportunity to enhance the trail entrance with the development of passive areas to rest, gather and experience the Buffalo Riverfront.
- ▶ **ENHANCE TRAIL ENTRANCE.** The current gate and fencing surrounding the NFTA facilities adjacent to the trail do not contribute to a walk- or bike-friendly environment. The removal and/or replacement of the current gates should be considered to enhance trail connectivity both north and south of the study area.
- ▶ **ENHANCE BICYCLE & PEDESTRIAN AMENITIES.** To further support the study areas transformation into a more walkable and bikeable environment, the implementation of additional seating areas, trash receptacles, public art, and other amenities should be considered. These elements could display branding or design elements that tie the study area to the waterfront and the legacy of the DL+W terminal.
- ▶ **REALLOCATE SURFACE PARKING FOR PUBLIC SPACE.** As mentioned previously, the area is predominately comprised of paved surfaces, many of which are underutilized based on their advantageous location along the waterfront. These areas could be repurposed for public gathering spaces, green space, or other public amenities to help foster a sense of place and increased activity surrounding the terminal.



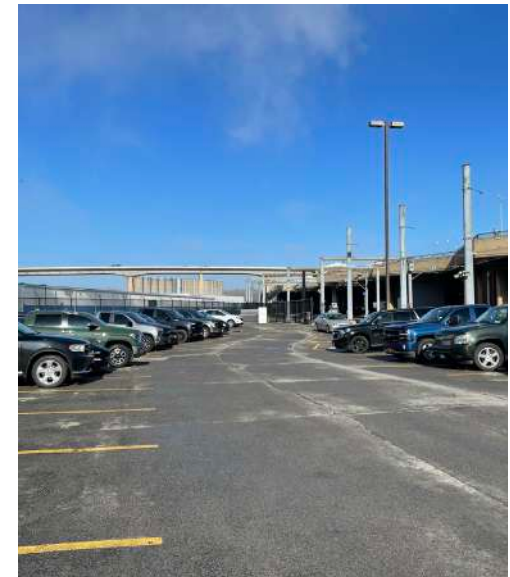
EXISTING SURFACE PARKING AREA



EXISTING TRAIL ENTRANCE



LIMITED PEDESTRIAN AMENITIES



EXISTING NFTA PARKING LOT

DESIGN ALTERNATIVES & RECOMMENDATIONS

Recommended design alternatives were informed by the existing conditions inventory, needs and opportunities assessment, and discussions with key stakeholders. This section describes the alternatives considered as well as the preferred alternative(s) for each of the key focus areas within the study area including:

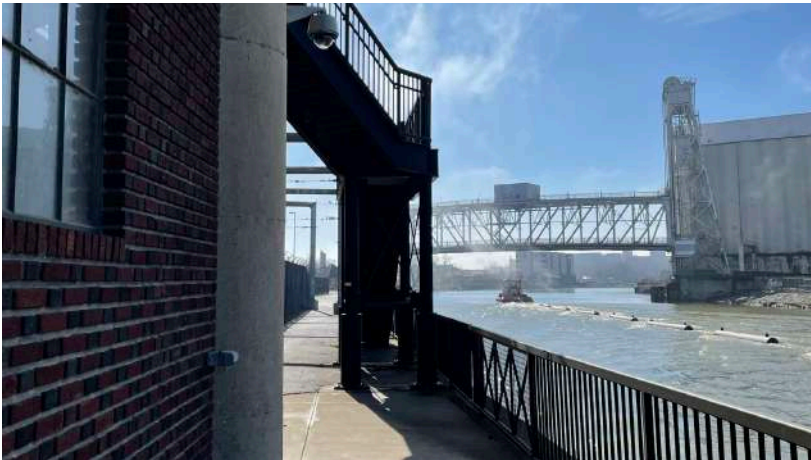
- Michigan Avenue Trail Entrance
- Bridge View Plaza
- Shoreline Trail
- South Park Avenue



OVERVIEW

A series of alternatives were developed for four key focus areas within the study area. These alternatives encompass varying levels of public realm enhancements and pedestrian and bicyclist facilities, ranging from short-term low-cost improvements to large-scale projects. All alternatives presented are intended to enhance multimodal accessibility and connectivity surrounding the DL+W terminal for users of all types, ages, and abilities.

The design alternatives are geared towards improving mobility and safety for pedestrians and bicyclists, creating inclusive gathering spaces, and fostering a unique sense of place surrounding the new Metro Rail station. These improvements will build upon and contribute to the current and previous successes of the City's waterfront revitalization.



ELEMENTS TO GUIDE DESIGN ALTERNATIVES



Safety +
Accessibility



Connectivity



Placemaking



Viewsheds

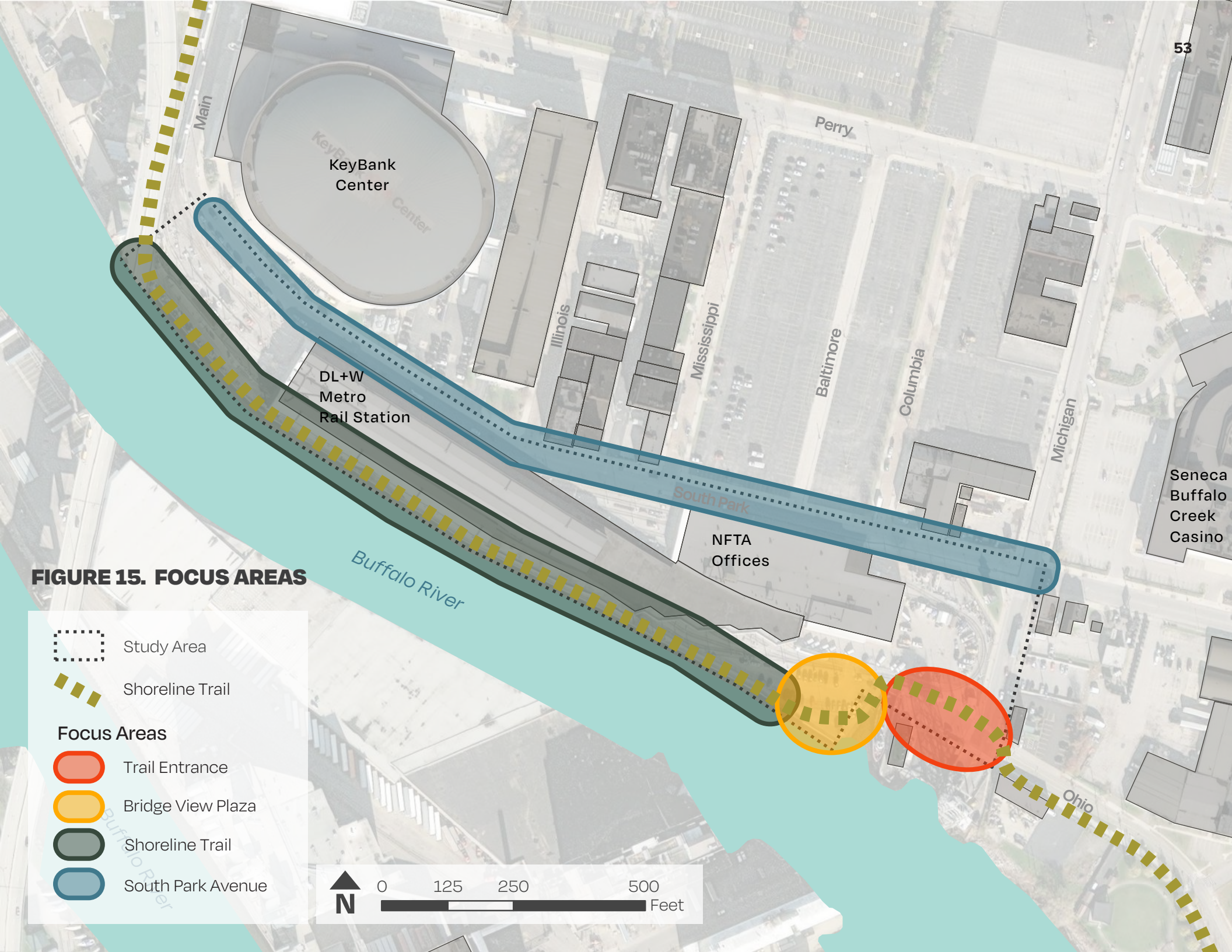








FIGURE 15. FOCUS AREAS

-  Study Area
-  Shoreline Trail
- Focus Areas**
-  Trail Entrance
-  Bridge View Plaza
-  Shoreline Trail
-  South Park Avenue



TRAIL ENTRANCE

The Michigan Avenue Trail Entrance is a key connection point along the Shoreline Trail. Based on the existing conditions analysis and input from key stakeholders, recommendations were made to improve the trail entrance to align with the vision and goals of the study. Four alternatives are presented for this focus area with increasing degrees of intensity in terms of design interventions.

ALTERNATIVE 1

Alternative 1 presents the most minimal design options, with the intent of raising awareness of the trail alignment and creating a clear path of connection for trail users. The trail alignment generally remains in its present-day location but is enhanced with decorative pavement markings and an enhanced crosswalk treatment at the NFTA facility entrance, increasing visibility and creating a clear trail connection. The trail alignment is straightened and widened to bring more awareness to the trail and also provide the opportunity for vegetated screening between the trail and the NFTA facility. Additional signage is included in Alternative 1, as well as a gateway feature at the trail entrance.





ALTERNATIVE 2

In Alternative 2, the trail alignment is moved to the south side of Ohio Street, removing the conflict point at the NFTA facility entrance between vehicles and trail users. At the entrance to the Edward M. Cotter firehouse surface parking area, a painted trail crossing is recommended to increase visibility and awareness of trail users for vehicles. Gateway features will create a defined entranceway to the trail segment along the DL+W terminal, and enhance wayfinding for trail users crossing the Ohio Street and Michigan Avenue intersection.

The implementation of a small green space at the trail entrance will create a park-like setting for both trail and Metro Rail users to rest in and enjoy. Additional proposed amenities include bicycle parking, bike repair stations, benches, and pedestrian-scale lighting. The proposed vegetation will be hardy and resistant to extreme weather coming off of the Buffalo River and Lake Erie and require a minimal amount of maintenance.





Shoreline Trail

Public Facility

ALTERNATIVE 3

Alternative 3 presents the most intensive design solution by both realigning the trail to the south side of Ohio Street as well as creating additional programmatic spaces adjacent to the trail entrance. Similar treatments to Alternative 2 are proposed, such as green spaces, bike parking, pedestrian-scale lighting, and decorative gateway treatments. However, more significant amenities such as a bike rental and repair space and a formalized seating area are also included in Alternative 3. In order to achieve this, a cantilevered deck extends into the boat slip where the Cotter is currently located. This cantilever allows the trail alignment to have a more curved profile, rather than the several sharp turns it currently requires at the trail entrance.

Decorative fencing treatments would allow for screening of the NFTA parking lot and improve the visual character of the gateway area. In the formalized seating area located along the edge of the parking lot, surface mounted benches and picnic tables would create additional spaces for trail and terminal users to enjoy the waterfront.



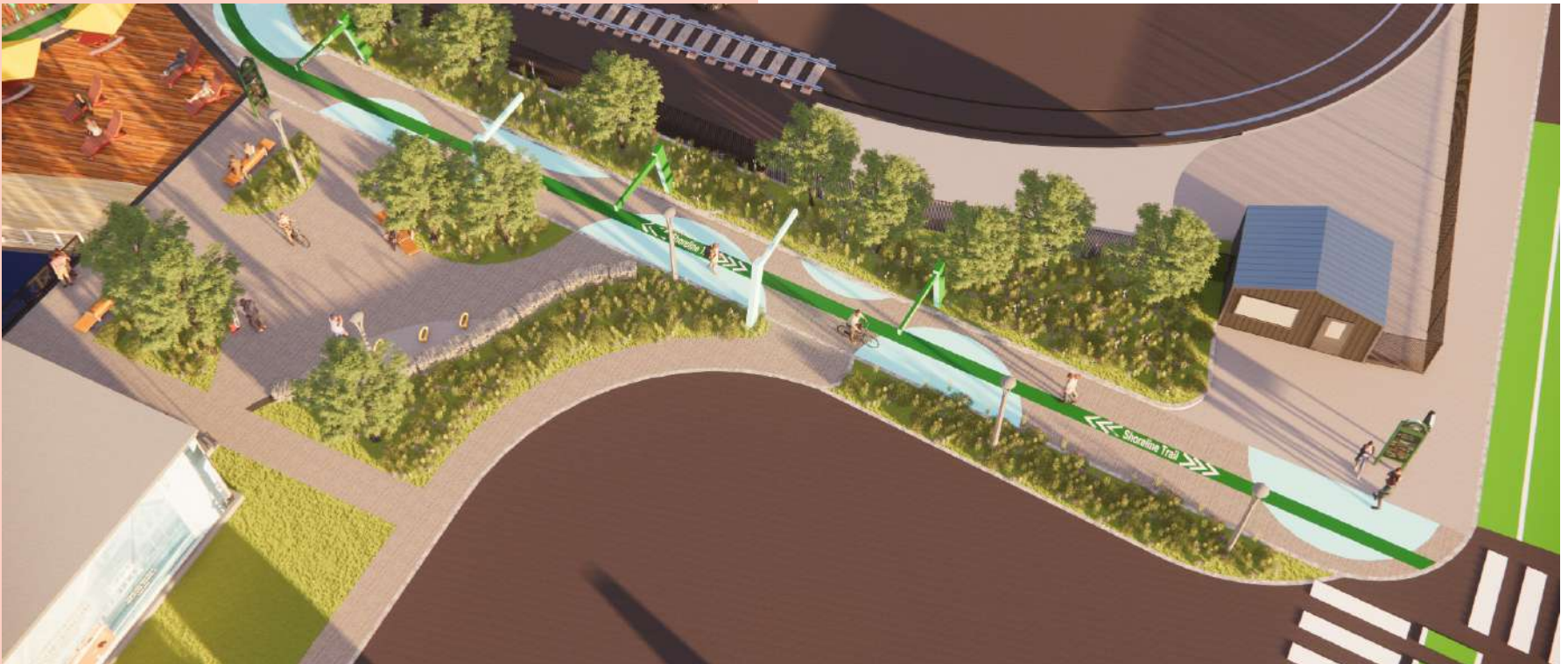
Shoreline Trail



TRAIL ENTRANCE PREFERRED ALTERNATIVE

After considering the different elements in Alternatives 1, 2, and 3, a single alternative was developed, with options for a phased implementation.

The Preferred Alternative is based on Alternative 1, but includes enhanced site design elements such as gateway features and a plaza by the trail entrance. Additionally, the preferred alternative includes the future removal of the NFTA facility entrance, increasing green space along the trail and eliminating conflicts with NFTA vehicles.



KEY FEATURES

- ▶ GATEWAY STRUCTURES
- ▶ WAYFINDING SIGNAGE
- ▶ LIGHTING
- ▶ PLANTERS
- ▶ BIKE RACKS
- ▶ BOARDWALK STRUCTURE
- ▶ SHADE TREES
- ▶ BENCHES
- ▶ DECORATIVE FENCING
- ▶ SIDEWALK REPLACEMENT
- ▶ NATIVE PLANTINGS

The Trail Entrance Preferred Alternative can be implemented in two phases:

PHASE

1

includes installation new pavement markings, a landscaping buffer between the path and the NFTA facility, a gateway structure, pedestrian-scale lighting, and wayfinding signage.

PHASE

2

includes the NFTA driveway relocation*, a small plaza, benches, bike racks, trash receptacles, a bike repair station, and additional decking.



The Preferred Alternative has the ability to connect to future trail, pedestrian and bicycle facility improvements at the Ohio Street / Michigan Avenue intersection.



The Preferred Alternative can be implemented prior to the NFTA facility entrance removal and can incorporate decorative pavement treatments, enhanced crosswalk markings and gateway features.

* The cost of the relocation of the NFTA driveway is not included in this study.

BRIDGE VIEW PLAZA

Bridge View Plaza is a large area within the current Shoreline Trail right-of-way that presents an opportunity to create a significant gathering space along the Buffalo River for trail and Metro Rail users alike. The alternatives presented for this area envision a dynamic space where trail users can safely travel through the area and visitors can stop and enjoy the waterfront in a more passive manner. Through design treatments, this space has the potential to transform from a harsh environment to a welcoming and comfortable space for users of all kinds to enjoy. Alternatives 1 through 3 present varying degrees of design interventions to achieve this goal.

ALTERNATIVE 1

Alternative 1 includes modest improvements within the existing limits of the plaza. A central planting area and buffer treatment along the NFTA facility fence help to define the trail and the path of travel through the space. These areas are intended to be planted with native trees and wildflower type plantings. The central planting area is defined by a concrete seat wall and provides separation between the active recreational trail activity and the passive activity along the river's edge. A shade structure is also incorporated to provide cover from the elements throughout the year. This alternative also includes site amenities such as benches, bike racks and pedestrian level lighting.





ALTERNATIVE 2

Alternative 2 expands upon the features of Alternative 1. The planted buffer between the trail and the NFTA facility is increased in size. This will allow for additional vegetation and the incorporation of decorative gabion walls to provide visual interest and incorporate existing design language currently used elsewhere along the Buffalo waterfront. Alternative 2 also proposes a more formal pavilion structure with flexible panels that can be located to protect users from the elements throughout the year.





ALTERNATIVE 3

Alternative 3 incorporates the elements of Alternatives 1 and 2. The pavilion structure is moved to the rear of the plaza to open up the space along the waterfront for pedestrians and other amenities including additional plantings and permanently installed lounge chairs. The buffer area between the trail and the NFTA facility incorporates a turf area for flexible programming and activity, permanently installed picnic tables, and bench swings. Alternative 3 also incorporates a decorative/artistic fence treatment that can provide visual interest within the plaza space and enhanced security for the NFTA facility.





BRIDGE VIEW PLAZA PREFERRED ALTERNATIVE

Alternative 3 was selected as the preferred alternative for Bridge View Plaza. The alternative maximizes interactive spaces within the area, and creates a true gathering space for both trail users and visitors to the terminal.



KEY FEATURES

- ▶ RAISED GARDEN BEDS WITH SEAT WALLS
- ▶ LOUNGE SEATING AREA
- ▶ CAFE DINING AREA
- ▶ FLEXIBLE LAWN SPACE
- ▶ SHELTERED PAVILION WITH FLEXIBLE WALLS
- ▶ PEDESTRIAN-SCALE LIGHTING
- ▶ DECORATIVE FENCE SCREENING
- ▶ BIKE RACKS
- ▶ BENCH SWINGS
- ▶ NATIVE PLANTING AREAS
- ▶ TREES
- ▶ DECORATIVE WALLS
- ▶ IMPROVED ASPHALT SURFACING

The proposed enhancements to Bridge View Plaza will primarily serve trail users, and complement any future redevelopment efforts within the DL+W terminal.



LOW-GROW

NO-MOW GRASS

In order to reduce maintenance requirements, low-grow no-mow grass should be considered for the lawn area depicted in the preferred alternative. The seed mix may include fine fescue grasses which form a dense sod. This creates a surface that withstands foot traffic and restricts weed growth. The mix is also drought-resistant, requires little to no fertilizer, and does well on dry, sandy or rocky soils.

Utilizing low-grow no-mow grass is a sustainable solution for the small lawn area in Bridge View Plaza that will allow visitors to utilize the space for a variety of programming such as picnics or yoga.

Source: Prairie Nursery, Westfield, WI

SHORELINE TRAIL

As one of the central features of the study area, as well as an essential asset to all of Buffalo's waterfront, it is important that the Shoreline Trail is a comfortable, safe environment for trail users to enjoy. There is a great opportunity to enhance the attractiveness of the trail by creating additional amenities such as seating areas, bicycle storage, and landscaping to draw visitors to spend more time enjoying the Buffalo River.

The successes of the Shoreline Trail will help to activate the DL+W terminal, and in turn, the new Metro Rail station will draw more visitors to this section of Buffalo's waterfront. Furthermore, the enhanced trail will create more multimodal transportation options for both recreational and commuting purposes. The alternatives presented for the Shoreline Trail seek to contribute to the sense of place in the study area and enhance opportunities for both active and passive enjoyment of the waterfront.

ALTERNATIVE 1

Alternative 1 enhances the Shoreline Trail within its existing footprint. New pavement along with decorative pavement markings will help to define areas for pedestrian and bicycle use. The addition of amenities such as planters, benches and bike racks will help to activate the trail and create a unique sense of place. This can be further enhanced with the incorporation of public art or unique paint treatments highlighting the building architecture. It is anticipated that bicyclists will have to move slowly throughout this area, or dismount their bikes depending on the level of activity on the trail.





&W
AION

ALTERNATIVE 2A

Alternative 2A expands upon Alternative 1 and creates greater separation between pedestrian and bicycle uses and provides more programmable space with the incorporation of an approximate 1,000 linear foot cantilevered deck. The additional space can incorporate outdoor dining and seating opportunities, as well as step down areas to bring users closer to the water and providing a unique experience along the Buffalo river.

Moving users who are not actively moving along the trail to the waters edge allows the space closer to the DL&W terminal to be prioritized for more active pedestrian and bicycle activity.



ALTERNATIVE 2B

Similar to Alternative 2A, Alternative 2B considers the installation of a 1,000 linear foot cantilevered deck, but places the more active pedestrian and bicycle activity along the waters edge, and the more passive recreation activity along the building edge.



SHORELINE TRAIL PREFERRED ALTERNATIVE

Alternative 1 was selected as the preferred alternative for the Shoreline Trail.

Given the high costs associated with installing a 1,000 linear foot cantilever along the full length of the DL&W terminal, Alternatives 2A and 2B were removed from consideration in their original form. Small cantilevers are still being considered as future project phases to expand usable space along the building, help separate trail users and also navigate around obstacles including the existing staircases to the upper level of the terminal.



KEY FEATURES

- ▶ IMPROVED ASPHALT SURFACING
- ▶ CATENARY POLE REMOVAL
- ▶ TWO-WAY TRAFFIC STRIPING
- ▶ PAINTED COLUMNS
- ▶ PLANTER BOXES
- ▶ PUBLIC ART
- ▶ BIKE RACKS
- ▶ BENCHES
- ▶ TRASH RECEPTACLES
- ▶ PEDESTRIAN-SCALE LIGHTING
- ▶ SMALL CANTILEVERED LOUNGE / CAFE AREAS

The Shoreline Trail Preferred Alternative can be implemented in two Phases:

PHASE

1 includes painting, benches, trash receptacles, lighting, and other lower-cost projects.

PHASE

2 includes the installation of the cantilevered areas. Potential locations are depicted on the following pages.



WATER ACCESS

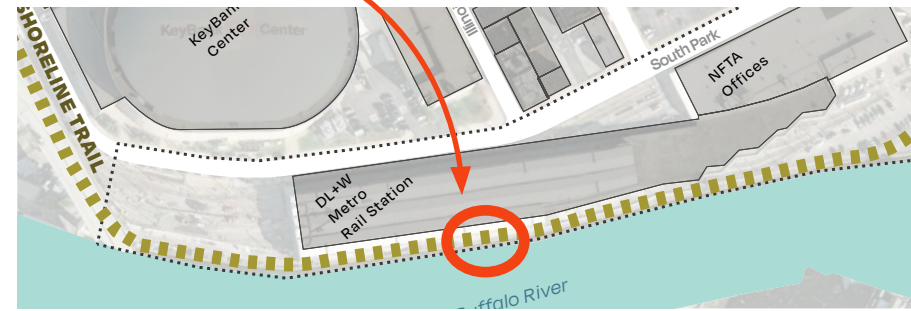
An additional element considered during the design process was the creation of direct water access from the Shoreline Trail and station area. This water access could be used for water taxi service to and from other areas of Buffalo's waterfront, or potentially serve as a passive boat launch for non-motorized vessels. The map below depicts the potential location and length of the ramp required for accessible access to the river.



Approximate Location of Pedestrian Overlook

PEDESTRIAN OVERLOOK

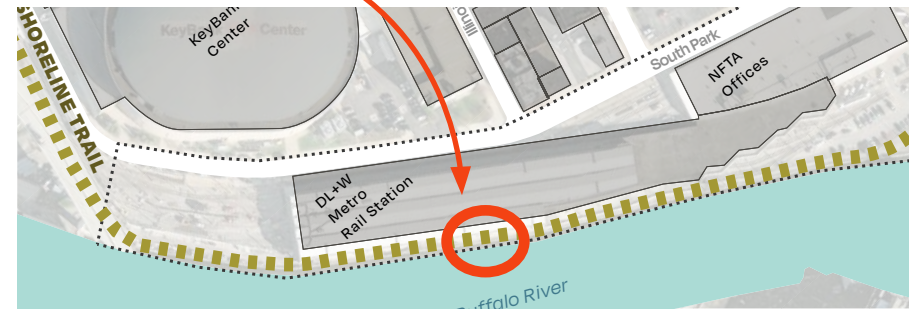
The pedestrian overlook would involve locating cantilevers at strategic locations along the building to align with potential future retail/restaurant uses in the building or to take advantage of existing views. The cantilever has the potential to incorporate permanent lounge chairs, high top cocktail tables, or similar features.



Approximate Location of Step Down Area

STEP-DOWN AREA

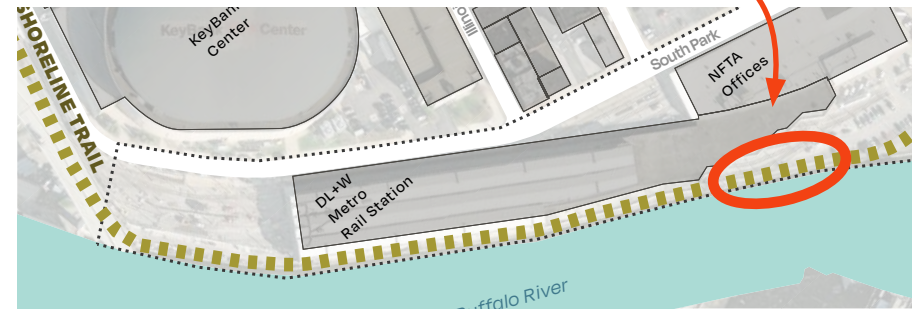
The step-down area concept illustrates an alternative treatment to the cantilever by providing a step down area bringing users closer to the water. A series of ramps and walls can provide ADA access to the lower level and accommodate informal seating opportunities to take advantage of views to the water and surrounding area.



STAIR BY-PASS

The stair by-pass looks at locating a cantilever at existing obstacles including the staircases which were identified as a mobility restriction along this segment of the trail. Providing a cantilever will help to expand the trail width and mitigate the conflict.

Approximate Location of Stair Bypass



RAISED TRAIL ALTERNATIVE

Early in the study, the concept of raising the trail to the second level of the DL+W terminal was explored. This included the creation of ADA accessible ramps on both sides of the building, and the inclusion of an accessible lift. The map below depicts the initial concept development, taking into account the amount of space required to create an accessible ramp. In order to accommodate a 5% slope (the maximum slope a ramp can be before requiring a 5' landing for every 30" in rise), the ramp would encompass a significant portion of the existing trail footprint - approximately 460 feet. The ramp could be reduced to approximately 325 feet if the slope increased to 8.33%; and would require landings. Given the space required for this alternative, as well as the associated engineering constraints and high costs, this alternative was removed from consideration early in the study.



SOUTH PARK AVENUE

South Park Avenue presents an opportunity to increase multimodal safety and connectivity adjacent to the DL+W terminal. Given the recent bicyclist fatality at the time of the writing of this report, it is especially prudent that non-motorists are considered and accommodated along this corridor. As one of the major roadways that services the KeyBank Center and its visitors, as well as connecting the study area to many destinations to the south, it is important to consider both hyper-local traffic patterns as well as through-traffic for this segment of South Park Avenue.

The alternatives presented include varying bicycle facility treatments for South Park Avenue. Each alternative also entails maintaining and improving the conditions of the robust sidewalk network along the corridor for pedestrians, and enhancing crossing where appropriate.

ALTERNATIVE 1

Alternative 1 includes bike lanes on each side of South Park Avenue protected by a buffer strip and flexible delineators. Crossings will include high visibility pedestrian and bicycle striping to increase visibility for both motorists and non-motorists. All roadway lanes will be restriped to enforce dedicated travel lanes for all users.



5 ft wide one-way
bike lanes

5 ft buffer with
flexible delineators

(2) 10 ft travel lanes



ALTERNATIVE 2

Alternative 2 is similar to Alternative 1, but includes a raised median to provide a more substantial buffer between bicycle and vehicular travel lanes. Street trees are envisioned to be located along the median to increase comfort and safety, and act as traffic calming by narrowing drivers' field of vision.



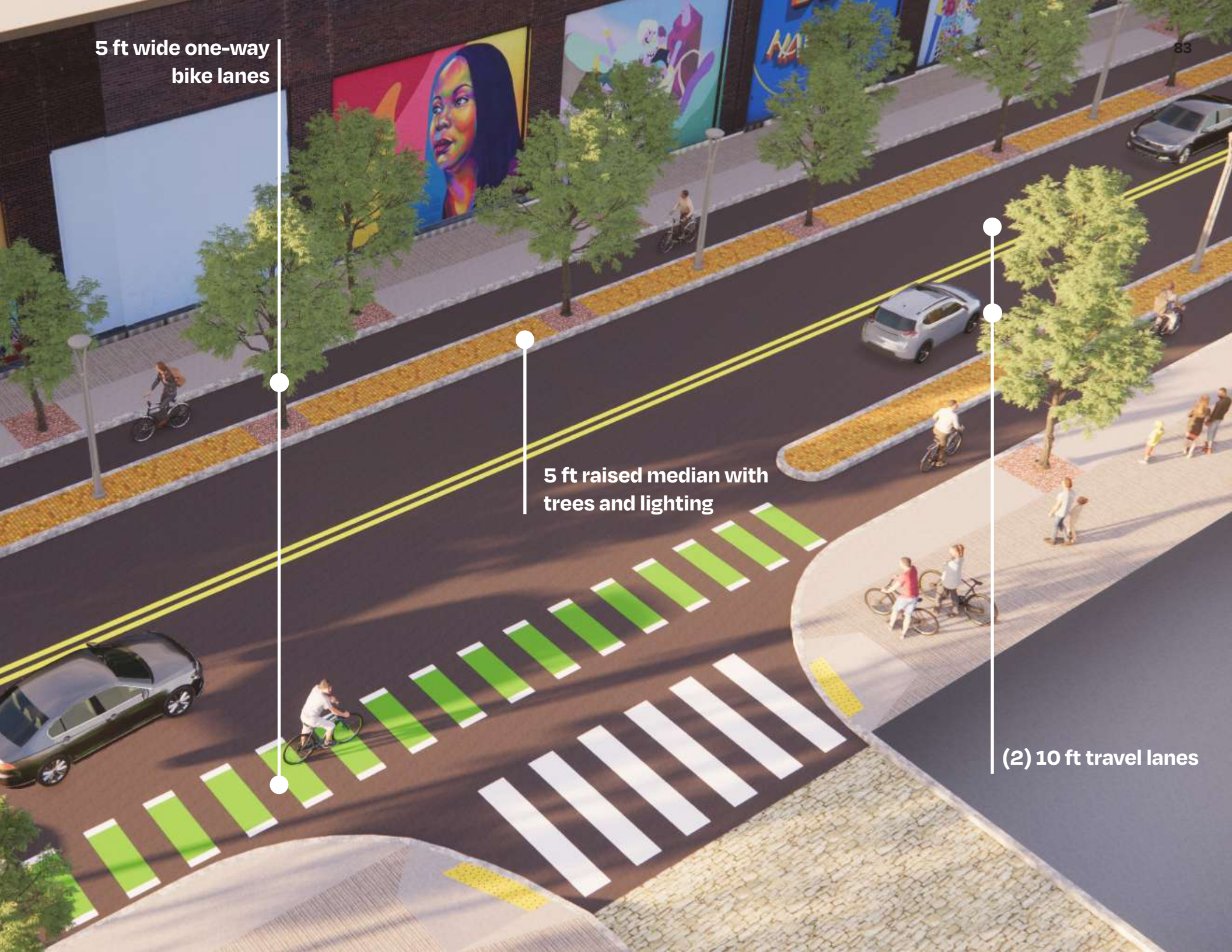
South Park Avenue is an integral piece of the multimodal connectivity within the vicinity of the DL+W terminal. It is envisioned to act as travel option for bicyclists and pedestrians who are moving through the study area for commuting or long-distance travel. This provides a more efficient option for some users, while allowing the Shoreline Trail to act more as a destination and accommodate slower and more leisurely travel.



5 ft wide one-way bike lanes

5 ft raised median with trees and lighting

(2) 10 ft travel lanes



ALTERNATIVE 3A

Alternative 3A includes a two-way cycle track protected by a buffer strip and flexible delineators. Crossings will include colored high visibility striping to increase visibility for both motorists and non-motorists. Directional signage will also be included to inform users of connections to the Shoreline Trail.



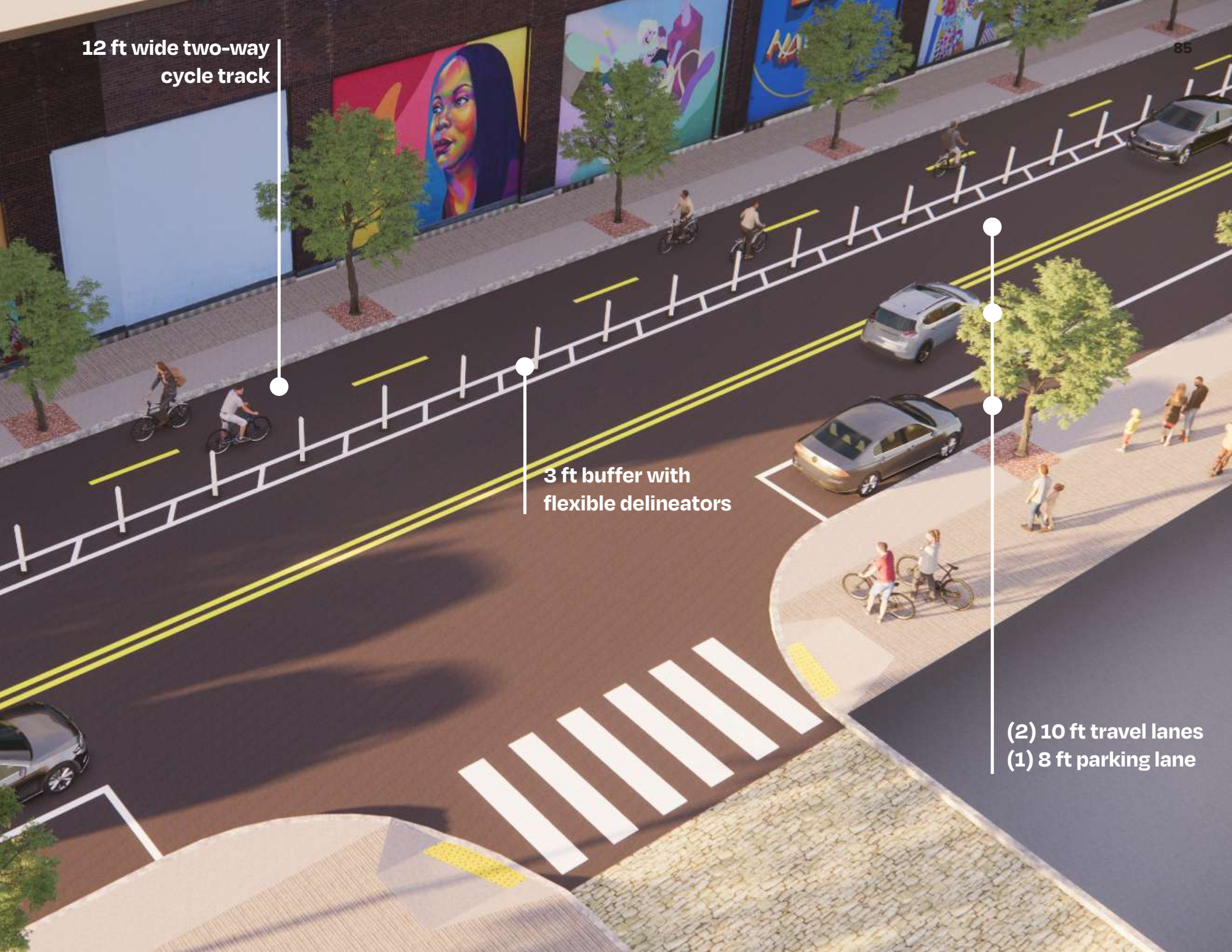
Final design must take into consideration high-volume traffic periods that generally occur during major events at the KeyBank center, and ensure safe efficient travel for all modes.



**12 ft wide two-way
cycle track**

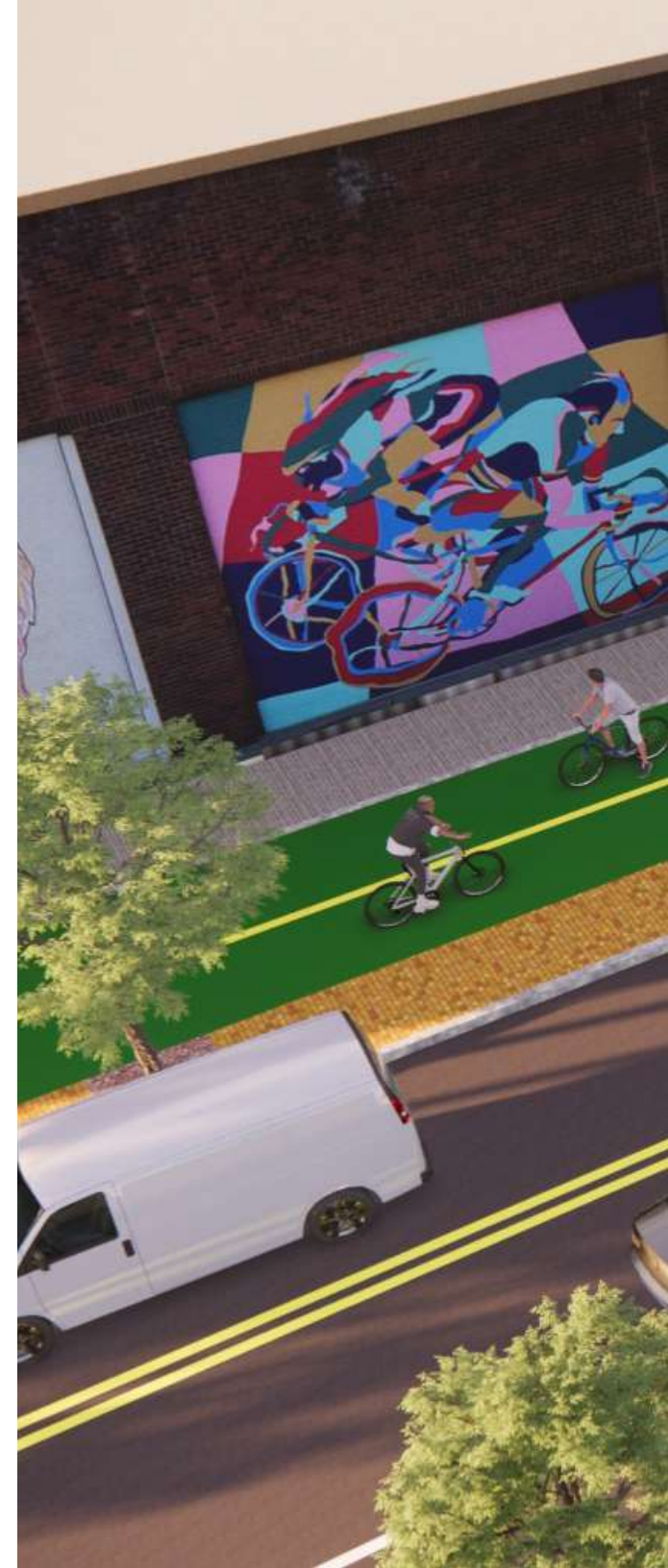
**3 ft buffer with
flexible delineators**

**(2) 10 ft travel lanes
(1) 8 ft parking lane**



ALTERNATIVE 3B

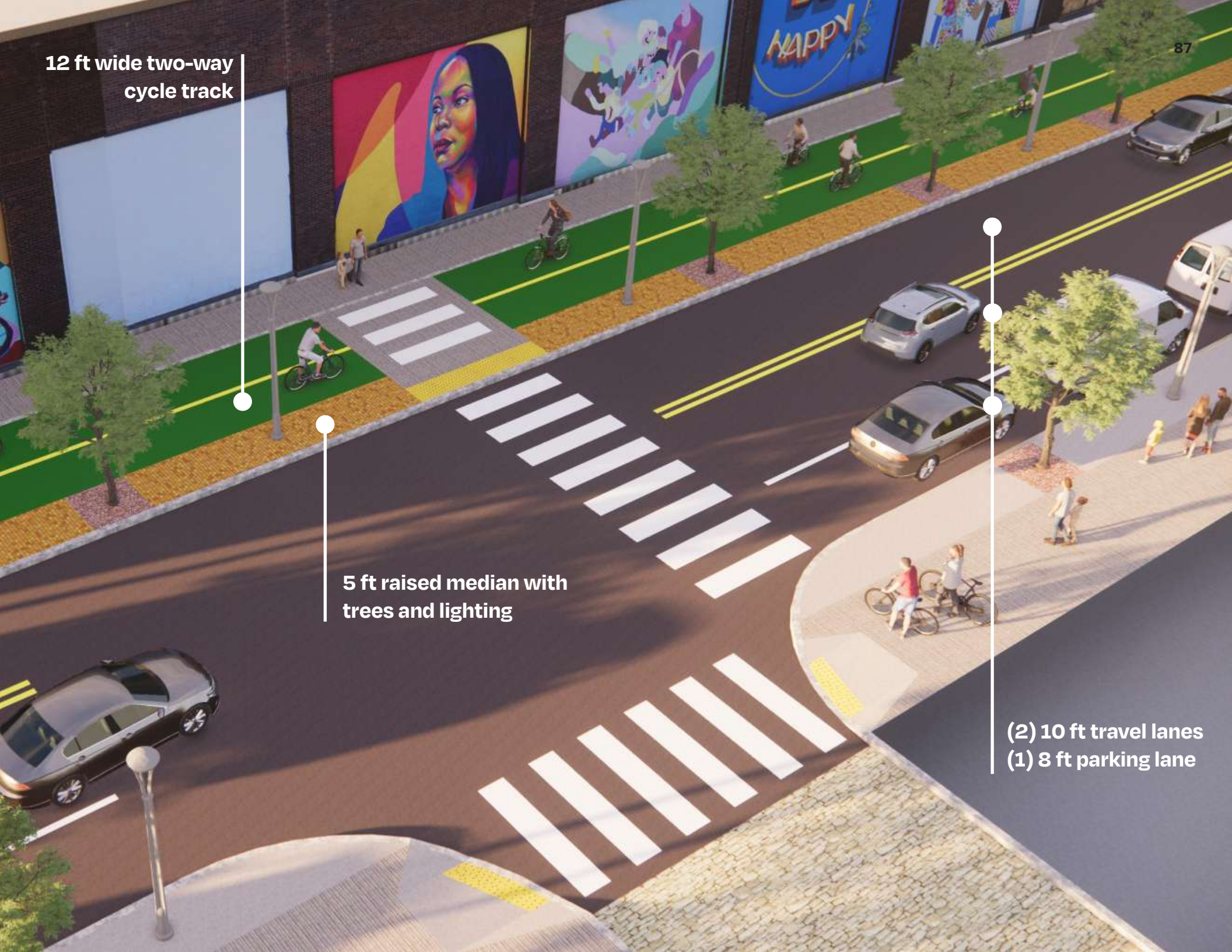
Alternative 3B also includes a cycle track, but protected by a five foot raised median that includes street trees and pedestrian scale lighting. Pedestrian crossings, where appropriate, will be clearly marked through pavement treatments and high visibility crosswalks. The cycle track will be paved with colored flexipave to improve surface conditions and increase visibility. Accessible curb ramps will be implemented at pedestrian crossings to ensure universal access. Additional seating will be implemented along the corridor to maximize comfort and provide resting areas for individuals with restricted mobility. Artistic elements will also be incorporated to enhance the sense of place along the corridor and create a more inviting and friendly streetscape.



12 ft wide two-way
cycle track

5 ft raised median with
trees and lighting

(2) 10 ft travel lanes
(1) 8 ft parking lane



SOUTH PARK AVENUE PREFERRED ALTERNATIVE

Alternative 3A & 3B were selected as two phases of the preferred alternative for the Shoreline Trail.

Given the bicyclist fatality that occurred in the study area along South Park Avenue during the design process, it was deemed a priority to create the most robust and safest facilities for bicyclists along this corridor.

Similar to other focus areas, in order to expedite implementation, the preferred alternative has been broken into two phases.



KEY FEATURES

- ▶ TWO-WAY FLEXIPAVE CYCLE TRACK
- ▶ RAISED MEDIAN
- ▶ CURB RAMPS
- ▶ PAVEMENT RESTRIPING
- ▶ STREET TREES
- ▶ BENCHES
- ▶ TRASH RECEPTACLES
- ▶ BIKE RACKS
- ▶ PLANTERS
- ▶ PEDESTRIAN-SCALE LIGHTING
- ▶ ARTISTIC ELEMENTS

The South Park Avenue Preferred Alternative can be broken into two Phases:

PHASE

1 includes pavement striping, flexible delineators, and wayfinding signage.

PHASE

2 includes a flexipave two-way cycle track, sidewalk reconstruction, a median, street trees, pedestrian lighting, benches, bike racks, planters, and artistic elements.



OHIO STREET AND MICHIGAN AVENUE

During the design process, the Ohio Street and Michigan Avenue intersection was identified as an important gateway and decision-making point for bicyclists and pedestrians in the area. Several design treatments were considered for this intersection to increase its functionality and create a gateway for the DL+W terminal and surrounding area. The treatments included were the continuation of the cycle track along Michigan Avenue and a plaza area with a bike share station, cafe seating, pedestrian-scale lighting, benches, public art, and bike racks. Screening along the NFTA facility fence would also provide a more comfortable and welcoming environment.



COSTS & IMPLEMENTATION

This section provides detail regarding the estimated costs of the preferred design alternatives for each of the focus areas within the vicinity of the DL+W terminal.

The cost estimates are broken down by follow-on studies / observations and phases of implementation. A financing and funding plan is also presented, which identifies potential funding options to achieve the recommended improvements in the study area.



COST ESTIMATES

In order to move forward with implementation of the preferred alternatives for the study area, a cost estimate was created for each focus area.

The cost estimates are broken down into three components to facilitate manageable implementation as funding becomes available:

- ▶ Follow-on studies / observations
- ▶ Phase I (short-term)
- ▶ Phase II (long-term)

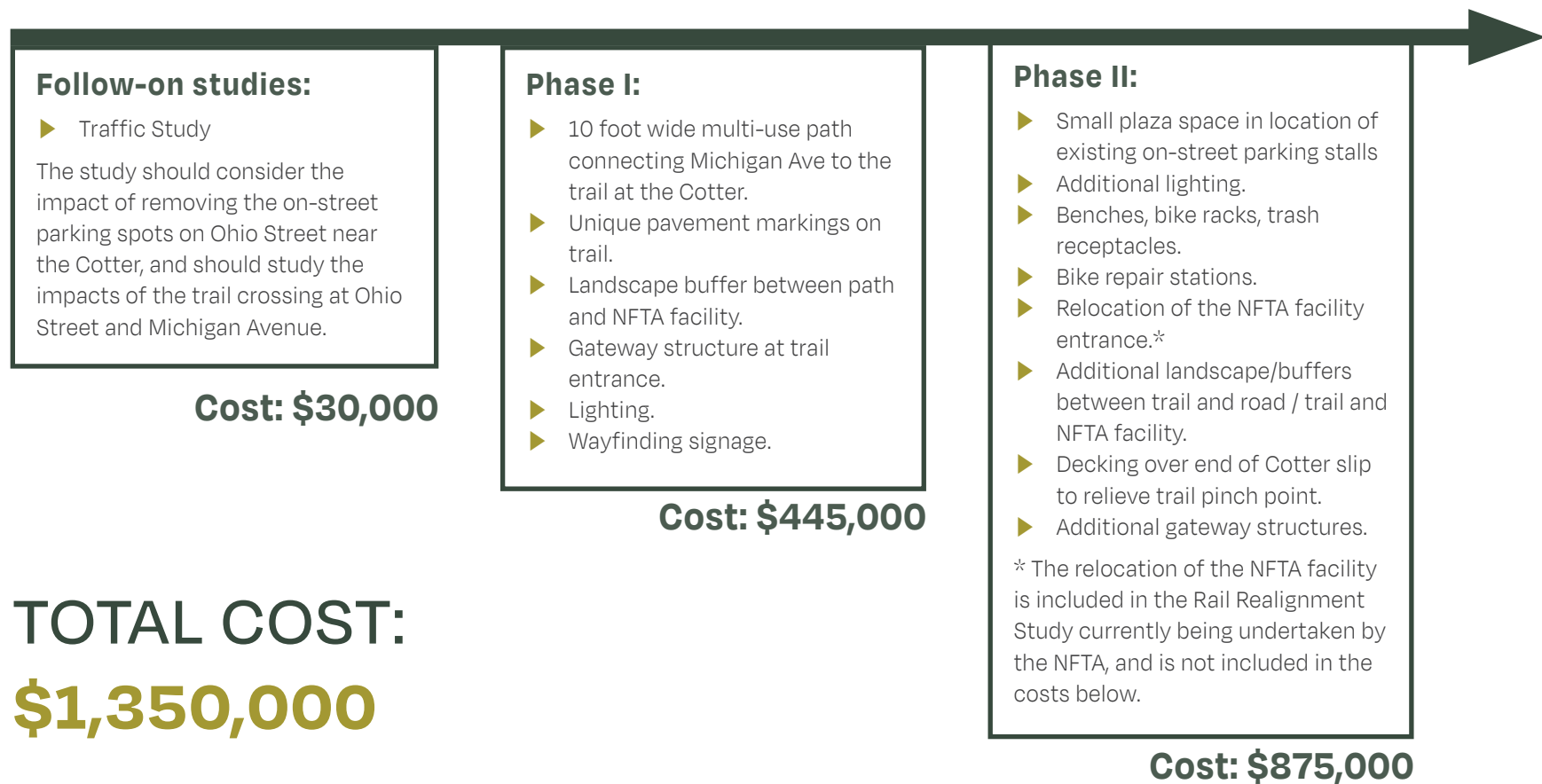
The following total cost estimates are presented for planning purposes, to allow the NFTA to gauge the approximate costs for implementing the preferred alternatives within the study area. Refer to Appendix A for detailed cost estimates.

Specific design elements may change once the project reaches the final design stage. Dollar figures included are from 2022. Each cost estimate includes design and construction, as well as a 25% contingency for project unknowns. Escalation due to inflation or other factors has not been included in the following analysis.

It is important to note that all cost estimates are contingent on the results of the follow-on studies recommended within this section.

FOCUS AREA	TOTAL COST
Michigan Ave Trail Entrance	\$1,350,000
Bridge View Plaza	\$1,850,000
Shoreline Trail	\$7,550,000
South Park Avenue	\$4,525,000
Total	\$15,275,000

TRAIL ENTRANCE COST ESTIMATES



BRIDGE VIEW PLAZA

COST ESTIMATES



TOTAL COST:
\$1,850,000

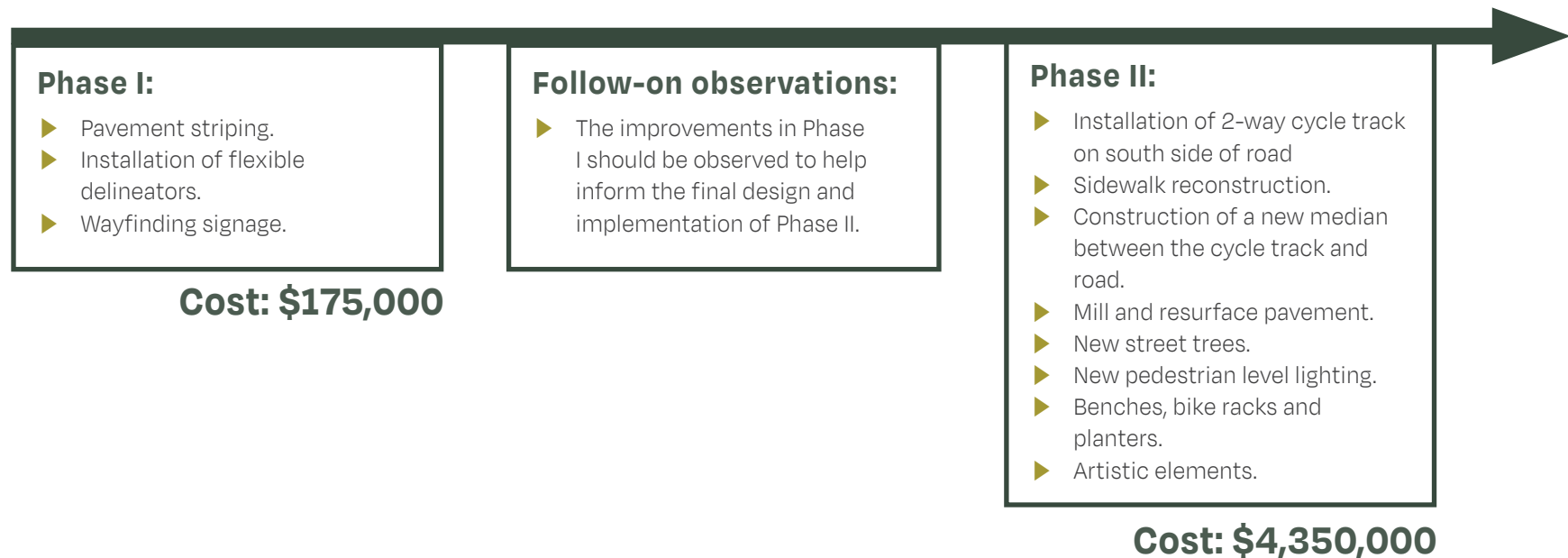
Due to the recent wall collapse, structural assessments of the wall are in progress. Results of the structural assessments will need to be taken into account in future detailed design phases of Bridge View Plaza.

SHORELINE TRAIL COST ESTIMATES



TOTAL COST:
\$7,550,000

SOUTH PARK AVENUE COST ESTIMATES



TOTAL COST:
\$4,525,000

FUNDING & FINANCING OPPORTUNITIES

To facilitate implementation of the preferred alternatives presented, potential funding sources and financing options have been identified. The following pages present several state and federal funding and financing programs that can be utilized to implement the recommended enhancements within the study area. Implementing these improvements will require coordination between multiple agencies and organizations.

	PROGRAM	DESCRIPTION	APPLICANT	USES	TERMS/CONDITIONS
NYS DOT	Consolidated Local Street and Highway Improvement Program (CHIPS)	Funds support the construction and repair of highways, bridges and highway railroad crossings, and other facilities not in the State highway system.	Municipal governments	Funds can be used for resurfacing, shoulder improvements, new drainage systems, sidewalk improvements, traffic calming installations, and bus shelters.	To be eligible for CHIPS reimbursement, the project must have a service life of 10 years or more.
EMPIRE STATE DEVELOPMENT (ESD)	Transit Oriented Development (TOD)	Grant and revolving loan fund for gap financing administered under the Better Buffalo Fund for adaptive reuse or infill capital projects.	While a single primary applicant is required, stakeholder organization partnerships are strongly encouraged and receive priority. Eligible applicants include: <ul style="list-style-type: none"> • City of Buffalo • Development Corporations • Community and Neighborhood Services Not-for-Profits • Businesses and for-profit establishments 	Funds are allocated to projects that: <ul style="list-style-type: none"> • Promote dense development (housing, employment, retail) in proximity to transit. • Encourage the use of multimodal transportation. • Stimulate pedestrian activity through retail and neighborhood-oriented businesses and services, quality public spaces, and accessible walkways. 	TOD funds are eligible for use in the study area, given it is within a half-mile radius of Main Street.

ESD

FEDERAL HIGHWAY ADMINISTRATION (FHWA)

PROGRAM	DESCRIPTION	APPLICANT	USES	TERMS/CONDITIONS
<p>WNY Regional Economic Development Council</p>	<p>The creation of the Regional Economic Development Councils brings together state grants into a Consolidated Funding Application (CFA) that allows applicants to be considered for multiple sources of funding for a project by filling out a single application.</p>	<p>Eligible applicants include:</p> <ul style="list-style-type: none"> • City of Buffalo • NFTA • Community and Neighborhood Services Not-for-Profits • Businesses and for-profit establishments 	<p>Intended for construction-ready transportation projects but can also fund planning activities.</p>	<p>Various guidelines depending on the type of grant funds sought.</p>
<p>Rebuilding American Infrastructure with Sustainability and Equity (RAISE)</p>	<p>The RAISE Transportation Discretionary Grant program provides a unique opportunity for the DOT to invest in road, rail, transit and port projects that promise to achieve national objectives.</p>	<p>Eligible Applicants for RAISE Transportation grants are State, local and tribal governments, including U.S. territories, transit agencies, port authorities, metropolitan planning organizations (MPOs), and other political subdivisions of State or local governments.</p>	<p>Intended for construction-ready transportation projects but can also fund planning activities.</p>	<p>For capital projects located in urban areas, the minimum award is \$5 million.</p> <p>Not more than 50 percent of the funds provided for RAISE Transportation grants (or \$114M) shall be awarded to projects located in rural areas (as defined in section C.4.(a)) and directs that not more than 50 percent of the funds provided for BUILD Transportation grants (or \$114M) shall be awarded to projects located in urbanized areas (as defined in section C.4.(a)).</p> <p>Further, DOT must take measures to ensure an equitable geographic distribution of grant funds, an appropriate balance in addressing the needs of urban and rural areas, and investment in a variety of transportation modes.</p>

FHWA

PROGRAM	DESCRIPTION	APPLICANT	USES	TERMS/CONDITIONS
Transportation Infrastructure Finance and Innovation Act (TIFIA) Program	The Transportation Infrastructure Finance and Innovation Act (TIFIA) program provides Federal credit assistance in the form of direct loans, loan guarantees, and standby lines of credit to finance surface transportation projects of national and regional significance.	State, local and tribal governments, including U.S. territories, transit agencies, port authorities, metropolitan planning organizations (MPOs), and other political subdivisions of State or local governments.	Many surface transportation projects - highway, transit, railroad, intermodal freight, and port access - are eligible for assistance.	An eligible project must be included in the applicable State Transportation Improvement Program. Major requirements include a capital cost of at least \$50 million (or 33.3 percent of a state's annual apportionment of Federal-aid funds, whichever is less) or \$15 million in the case of ITS. TIFIA credit assistance is limited to a maximum of 33 percent of the total eligible project costs.
Surface Transportation Block Grant (STBG)	The FAST Act eliminates the MAP-21 Transportation Alternatives Program (TAP) and replaces it with a set-aside of Surface Transportation Block Grant (STBG) program funding for transportation alternatives (TA). These set-aside funds include all projects and activities that were previously eligible under Transportation Alternatives Program (TAP), encompassing a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity.	Eligible applicants include all entities that were eligible to apply for TAP funds. FAST Act also allows nonprofit entities responsible for the administration of local transportation safety programs to apply.	<p>STBG activities must relate to surface transportation, and must fall within one of ten statutorily defined categories, including the following:</p> <ul style="list-style-type: none"> • Construction, planning, and design of on-road and off-road trails for pedestrians and bicycles • Construction, planning, and design of infrastructure-related projects and systems providing safe routes for non-drivers <p>Additionally, funds under this program can be used to plan, design, or construct comprehensive streetscapes that incorporate trees, plants, and cool pavements to create more pedestrian-friendly (and cooler) streets if they result in safer streets for non-drivers, and of recreational trails.</p>	For most projects, STBG requires a 20 percent funding match from non-federal sources.

PROGRAM	DESCRIPTION	APPLICANT	USES	TERMS/CONDITIONS
Transportation Alternatives Program (TAP)	<p>Funds from this source are used to support bicycle, pedestrian, multi-use path and non-motorized transportation-related projects. Projects must be related to surface transportation.</p> <p>*Federally-funded, state administered.</p>	<p>Applications may be developed by any municipality or non-profit incorporated group, but must be sponsored by a municipality, state agency or public authority eligible to administer federal TAP transportation funds.</p>	<p>Construction of pedestrian and bicycle facilities, recreational trails, and safe routes to schools, to community improvements such as historic preservation and projects that reduce congestion and gas emissions.</p>	<p>For most projects, TAP requires a 20 percent funding match from non-federal sources.</p>
Highway Safety Improvement Program (HSIP)	<p>The Highway Safety Improvement Program (HSIP) to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned public roads and roads on tribal lands. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance.</p>	<p>Municipal governments</p>	<p>HSIP funds may be used for safety projects that are consistent with the State's strategic highway safety plan (SHSP) and that correct or improve a hazardous road location or feature or address a highway safety problem. Funds can be used for the installation of vehicle-to-infrastructure communication equipment, pedestrian hybrid beacons, roadway improvements that provide separation between pedestrians and motor vehicles, including medians and pedestrian crossing islands, and other physical infrastructure projects not specifically enumerated in the list of eligible projects.</p>	<p>States are now required to spend at least 15% of HSIP funds on biking and walking safety when bicyclist and pedestrian fatalities are 15% or more of traffic fatalities. 28% of all traffic fatalities involve a pedestrian in New York State, which qualifies them for this requirement.</p>

NEW YORK STATE

PROGRAM	DESCRIPTION	APPLICANT	USES	TERMS/CONDITIONS
Green Innovation Grant Program (GIGP)	The Green Innovation Grant Program (GIGP) provides grants on a competitive basis to projects that improve water quality and implement green infrastructure in New York State. GIGP provides up to \$15 million to cover a minimum of 40% up to a maximum 90% of the total eligible project costs. A match from state or local funds is required.	Eligible applicants include municipalities, private entities, state agencies, and soil and water conservation districts.	GIGP funds a range of green infrastructure-focused installation projects, including the installation of permeable pavements and stormwater street trees.	The maximum percentage grant is up to 90% of eligible project costs for a green stormwater infrastructure project in a municipality that meets the Median Household Income criteria, or that serves, protects, or benefits an environmental justice area. All other green infrastructure projects are eligible to receive up to a maximum of 75% of total eligible project costs.
New York Main Street Program (NYMS)	This program is administered through the Office of Community Renewal. New York Main Street provides funds to stimulate reinvestment in properties located within mixed-use commercial districts located in urban, small town and rural areas of NYS. NYMS is a comprehensive grant program that provides funding for local revitalization efforts and technical assistance to help communities build the capacity required to grow the downtown or neighborhood retail district.	Applicants must be either a unit of local government or an organization incorporated under the NYS Not-for-Profit Corporation Law.	Funds can be used to implement streetscape enhancements, such as planting trees; installing street furniture and trash receptacles; providing appropriate signs in accordance with a local signage plan.	Applicants may request up to \$15,000 in grant funds for streetscape enhancement activities, such as: planting trees, installing street furniture or public art or other activities to enhance the NYMS target area.

NEW YORK STATE

PROGRAM	DESCRIPTION	APPLICANT	USES	TERMS/CONDITIONS
Local Waterfront Revitalization Program (LWRP)	The NYSDOS administers LWRP funding, which can be utilized for improvement projects located within the LWRP boundary in conjunction with an approved LWRP document.	Municipal governments with an approved LWRP document.	Applicants with approved or substantially complete LWRPS may apply for implementation funding for activities include but not limited to: <ul style="list-style-type: none"> • Project-specific planning feasibility, design, marketing, or education needed to implement an approved or substantially complete LWRP component • Constructing projects necessary to implement an approved LWRP • Site-specific community and waterfront redevelopment projects including design, construction, and/or implementation activities 	The City of Buffalo has an approved LWRP from 2021 that includes the study area within the Waterfront Revitalization Area (WRA).