

Belle Isle Multimodal Mobility Study 2024

Acknowledgements

Agency Partners

- The Michigan Department of Natural Resources (DNR)
- Belle Isle Conservancy
- Michigan Department of Transportation
- The Michigan Department of Technology, Management & Budget (DTMB)

Consulting Partners

- Wade Trim
- LivingLab
- Quality Counts
- E Austell Associates
- The Greenway Collaborative Inc.

Stakeholders

- Belle Isle Conservancy Board of Directors Belle Isle Golf
- Belle Isle Nature Center Detroit Mayor's Office Detroit City Council
- Detroit Department of Transportation Detroit Departments:
(General Services Department, Division Department of Public Works, Department of Neighborhoods, Mobility, Detroit Police)
- Detroit Disability Power Detroit Greenways Coalition Detroit Parks Coalition
- Detroit Riverfront Conservancy
- Detroit Wayne County Port Authority Detroit Yacht Club
- Dossin Great Lakes Maritime Museum
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1.0. Introduction

The Michigan Department of Natural Resources (DNR) has partnered with The Michigan Department of Transportation (MDOT) and the Belle Isle Conservancy (BIC) to develop a comprehensive multimodal mobility study to improve transportation for all modes and abilities to and around the park. The following plan was developed to improve the efficiency and safety of the transportation network at Belle Isle to serve diverse visitor and parking demands. The primary objectives of the study including obtaining the data needed to conduct the analyses, engaging stakeholders and the public for input, developing the recommended strategies and prioritizing alternatives for immediate, near-term and long-term improvements, and coordinating with agencies. Encouraging a mode shift to provide more emphasis on non-automobile modes and expanded opportunities for mobility choices to non-drivers is included in the multimodal feasibility transportation plan.

The following project goals were set at the start of the project and checked against throughout the project to ensure proposed strategies meet them.

- Provide convenient access to Belle Isle, reducing visitor dependence on personal vehicles.
- Improve public accessibility to the park to optimize visitor capacity and ideal parking capacity.
- Improve the visitor experience.
- Reduce need for traffic management by law enforcement and park staff.
- Improve access and safety for visitors using all modes of transportation.
- Implement improvements in a sustainable manner.

This will become a guiding document to ensure individual projects, investments and partnerships are coordinated and focused on community priorities.

1.1 Belle Isle Transportation Background

Belle Isle is a 982-acre urban island park located in the middle of the Detroit River. The island and adjacent waters were ancestral fishing grounds for local native tribes prior to European Settlement. This park has served as an important urban respite since before being purchased by the City of Detroit from the Campau family in 1879. In 1870, Detroit, like many other American cities, was looking for a location to place a large urban park in the midst of their growing city. After nearly a decade of sometimes fierce public debate, Belle Isle was purchased as the site for Detroit's large urban park. Ferry service provided sole public access to the island until the first bridge was placed into service in 1889.

Known as Wah-na-be-zee (Swan Island) to the Chippewa and Ottawa Native American tribes, French colonists kept livestock on the island in the 18th Century, where the Island got the name *île aux Cochons* (Hog Island). Some historical accounts have the island being purchased from Ojibwa, Chippewa, and Ottawa tribe leaders by Lt. George McDougall in 1769. Several of Detroit's elites owned the island including the Dequindres, McDougalls, Alexander, Macomb, and the Campau family. The island was reportedly named Belle Isle in 1845 in honor of Governor Lewis Cass's daughter Isabelle Cass.

Shortly after its purchase, Frederick Law Olmsted was hired to design an urban destination park, but few of Olmsted's design concepts were ever realized. Notable architects with works on the

island include Cass Gilbert, William Kapp, Albert Kahn, and Eero Saarinen. Saarinen's protégé, J. Robert F. Swanson, designed the Flynn Pavilion built in the 1950's. In 1974, the park was listed in the National Register of Historic Places and listed in the Michigan State Register of Historic Sites in 1979.

Access to the park was originally by ferry (1840-1957) with the first Belle Isle bridge entering service in 1889. This bridge partially burned in 1915 and was replaced by a hastily built bridge that served from 1916 to 1923 when the current MacArthur Bridge was built.

Since the 1920s, vehicular access has been the predominate form of access to the island. In 2016, the Detroit Department of Transportation (DDOT) partnered with the Michigan Department of Natural Resources (DNR) to revive bus service into the park via the No. 12 Conant route. In 2019, DDOT reported an average of 1,981,934 riders throughout its network between April and August. While the route-specific information is not available, the high ridership numbers show how important bus access is to the city residents and a valuable asset to the park.

As Detroit grew in size and wealth so did Belle Isle Park as a favorite recreational destination in metro Detroit. Due to its location in the middle of the Detroit River, proximity to downtown, and its size, the park has served as the city's premier passive and active park since inception. The facilities and size have grown from approximately 600 acres when it was originally purchased to its over 980-acre size today.

Belle Isle Park has welcomed family gatherings since the beginning. As the city grew, like other rapidly urbanizing American cities, Detroit added a variety of amenities to the island for both passive and active recreation users. These facilities have included an aquarium and conservatory in 1904, band shell, casino, canoe and skating pavilion, ball fields, zoo, maritime museum, fishing piers, nature walks, golf course, fountain, playscapes, giant slide, and numerous picnic shelters.

A variety of courts and games are played on the island including tennis, handball, cricket, basketball, soccer, badminton, and ice hockey. During the summer, the park hosts countless graduations and family reunions.

The park also played host to the Detroit Belle Isle Grand Prix when the CART-sponsored Detroit Grand Prix moved from the original Downtown Detroit Street course to a Belle Isle Road course in 1992. The park has hosted the Detroit Grand Prix off and on since 1992 with breaks in 2002-2006, 2009-2011, and 2020. Since 2023, the Detroit Grand Prix has been relocated back to

Downtown Detroit. However, the race has left a lasting impact on the island. The Grand Prix racecourse was historically located on the western portion of the Island, going up Central Avenue to Picnic Way and the Strand wrapping around prominent Island features like the James Scott Memorial Fountain, Lagoon, Casino and Lake Tacoma. In addition, for some peak days during the Grand Prix from 2012-2015, a ferry service was available hourly from the Port Authority to Harbormaster Station.

The Belle Isle course had been criticized by a number of groups for a variety of reasons. Race attendees have complained about the difficulty to access the racecourse on race days and limited sight lines. Racers complained about the narrowness of the course, lack of passing areas, poor track conditions, and lack of permanent paddock facilities. Non-race fans have complained about the significant disruptions caused by the annual construction of the temporary race facilities on the island including barricades, fencing, hospitality structures, bleachers, and more. These interruptions would last for multiple months during the park's summer peak visitor season. In addition to the disruptions, numerous permanent concrete facilities have been inserted into the park just to host a single weekend event including widened intersections, extra roads, and the insertion of a massive concrete Paddock area (constructed in 2007), located to the northeast of the Scott Fountain. In 2023, the Detroit Grand Prix race left Belle Isle and returned to its Downtown Detroit location, which hosted the Formula 1 races from 1982 to 1988 and the CART Indy open-wheel cars from 1989 to 1991.

Detroit's growing dependence upon traveling by personal vehicle has impacted the island since the turn of the 20th Century. On hot summer nights, the island served as a respite for Detroiters prior to the advent of widespread air conditioning. The island has served as a cruising destination since the 1960s. In the 1990s on nice weekend nights, E. Jefferson Avenue would be blocked from downtown Detroit to the island with cruisers completing continuous loops from Greektown out around the exterior of the park and back.

Along with standing attractions, Belle Isle is known for hosting popular events: 5k races, triathlons, the Belle Isle Art Festival, the Detroit hydroplane races, and the summer Kite Festival to name a few large events that draw crowds to the park.

The DNR with the Michigan Natural Resources Trust Fund, the Land and Water Conservation Fund and the Ralph C. Wilson, Jr. Foundation introduced the first phase of the Ralph Wilson Gateway and Trail to Belle Isle in spring of 2022. Michigan's Iron Belle Trail covers greater than 2,000 miles across Michigan, which is composed of routes for hiking and biking, and connects Belle Isle to the Upper Peninsula. This 6-mile section of the Ralph Wilson Trail includes the first segment of the larger Iron Belle Trail with a separated multi-use path routing around the perimeter of the island for bicycles and pedestrians. The completed section of the trail currently

connects from the park entrance, along the north beach to the Ralph C. Wilson, Jr. Gateway at Driker Trail, and the next phase is planned to be completed in 2025.

To survive economic hardship, the City of Detroit signed a 30-year lease to the State of Michigan in 2013 to turn over the day-to-day operations to the Department of Natural Resources (DNR) as one of Michigan's State Parks. By 2017, \$32 million had been invested in renovations and improvements to the park. Around the same time, the DNR reported almost 4 million people visited Belle Isle in 2016.

Like most every other park and park system in the country, Americans visited their public parks in record numbers during the COVID-19 pandemic for recreational activity and socially distant outdoor gathering. Belle Isle has faced this same situation with high numbers of visitors wanting to come to the park as it was a fun and safe place to visit with friends and/or commune with nature during various phases of the pandemic. In 2021, five and one half million users visited the park, an increase from four million visitors in 2016. This increase in attendees exacerbated the ongoing congestion in several locations on the Island that were already facing overcrowding issues.

In May of 2022, the Michigan Department of Natural Resources in partnership with the Michigan Department of Transportation and the Belle Isle Conservancy authorized a study for a comprehensive transportation analysis of Belle Isle Park. This broad-based investigation includes multimodal transportation, circulation, and traffic management analyses. The results inform the development of a multi-phased strategy for the implementation of sustainable improvements to manage traffic, circulation, and multimodal services within the park's capacity to provide these services to its visitors.

As part of the study, innovative transportation improvements address vehicular congestion, improve visitor safety, enhance park transportation access, and improved wayfinding. Due to the congestion issues at various locations on the island including the pay booths and at popular areas where parking is limited such as Sunset Drive, conservatory/aquarium, and the Belle Isle Beach, this project determines an estimated maximum carrying capacity for the park and its various attractions. The DNR has requested a robust data collection program over peak summer weekends and days including aerial traffic photography, traffic turning movement count videos, island-wide parking area utilization, attendance at key destinations, picnic shelter capacities, inventory of existing signing and pavement markings, and others. All of this information is to inform the development of a comprehensive multidisciplinary and multimodal plan for traffic management on the island.

1.1. Scope and Objectives

Currently, Belle Isle Park faces traffic and parking-related issues at several locations and at periods throughout peak days, which significantly impacts the operation of the park's transportation network. With most of the park's visitors arriving by car, this negatively impacts the visitor experience. In addition, there are periods when congestion at certain points on the island forces the Michigan Department of Natural Resources to close the island to new visitors. Many visitors will just then wait in their cars near the entrance to Belle Isle at East Grand Boulevard and Jefferson Avenue at the foot of the MacArthur Bridge waiting for the DNR to reopen the island to additional vehicular traffic. Visitors who left the island for whatever reason (picking up forgotten supplies, picking up another picnic guest) or visitors trying to reach an event are unable to gain access, causing frustration and missed experiences. In addition, these closings also require a significant amount of staffing to operate while staff would be better utilized providing services to the existing visitors.

Another concern is that emergency vehicle access may be significantly restricted to the park from the mainland in general and parts of the park specifically during the periods of congestion. With the large numbers of visitors at peak periods, this causes public safety concerns regarding crowd control or ability to provide rapid response to an emergency situation.

The scope of this effort is to conduct an intensive analysis of the operation of the Belle Isle motorized and nonmotorized networks to create a baseline assessment of the system's current operations and to understand its challenges. With the results from the analysis portion of the attendance data collection phase, the plan recommends immediate, short-term, and long-term solutions that once implemented will complement each other and improve the operation of the island's road network during peak and off-peak hours.

Park Multimodal Transportation Study

An overarching goal of the study is to enhance the visitor experience by reducing transportation delays independent of what mode of travel is used to get to the park while allowing for opportunities such as visitor growth. The park-wide comprehensive multimodal transportation study recommends improvements for a convenient multimodal system with opportunities for connectivity to local transportation multimodal networks including transit. The study is supported by use of sustainable best practices for multimodal transportation to encourage a mode shift from personal vehicles by providing convenient and easy-to-use alternative travel options. Understanding that there will always be a desire for some personal vehicles at the park, recommendations for optimized visitor and parking capacity plans are provided to improve traffic operations, safety and accessibility.

Park Capacity Plan

Implementation of management strategies, transportation services and park circulation improvements for a phased approach of immediate (0-1 year), short-term (2-5 years), and long-term future conditions (5-10 years) are identified as part of this study. Road treatments and

improvements are identified and illustrated in a conceptual plan for the internal multimodal transportation network. The plan takes into consideration comments and input received and developed via collaboration with the client, public, user groups and stakeholders, and client input obtained during the project process.

Park Circulation and Traffic Management Plan

A park circulation and traffic management plan includes recommendations to improve traffic operations and safety for optimized visitor capacity for the phased term needs.

Recommendations are made to not only improve vehicular traffic circulation patterns but also to provide a plan that encourages a mode shift from personal vehicle to other modes by enhancing multimodal travel opportunities, and also reduce conflicts between vehicles, pedestrians, bicycles, transit and other modes.

Park Signage, Wayfinding and Communications Plan

A comprehensive facility and wayfinding system for Belle Isle is necessary to improve visitor ability to navigate effectively and safely throughout the park to reach destinations and in turn improve traffic flow. A comprehensive wayfinding design package is included as part of this plan to provide clear direction and concise information to visitors, which is expected to significantly improve safety and operations for all modes of travel.

Parking Plan

Conceptual comprehensive parking arrangements are identified to meet individual facility needs within the park, while optimizing the use of existing paved areas including off-street lots and opportunities for on-street parking. Recommendations are provided for areas where there clearly is a need and opportunity for redistributing parking to improve traffic delays and congestion. Phased implementation of the parking plan supports the public transportation service and site traffic flow and circulation recommendations.

2.0. Existing Conditions

2.1. Existing Transportation Network

Currently, Belle Isle Park faces traffic and parking-related issues at several locations and at periods throughout peak days, which significantly impacts the operation of the park's transportation network. With most of the park's visitors arriving by car, this negatively impacts the visitor experience. Found in Section 6 of this study, recommendations are made to enhance the visitor experience by reducing transportation delays and improving circulation throughout the park. The park-wide comprehensive multimodal transportation study recommends improvements for a convenient multimodal system with opportunities for connectivity to local transportation multimodal networks including transit.

Field reviews, combined with existing base plan files and aerial photos were utilized to inventory and assess existing road and traffic conditions. The following section summarizes existing

roadway cross sections, traffic control, and parking throughout the island park. The continuous perimeter roadway comprised of Sunset Drive, The Strand, Lakeside Drive, and Riverbank Drive encompasses the outer edge of the park and consists of a varying cross section with two to four travel lanes. The roadway operates with one-way vehicular traffic traversing the outer edge of the island in a counterclockwise direction and traditionally has provided a popular activity for visitors who “cruise” the island. However, its significant length combined with the one-way operation of the minor roadways within the park have contributed to frustration and confusion for visitors.

2.2. Sidewalk Network

The Belle Isle sidewalk network is comprised of nearly 11.5 miles as shown in the Sidewalk network Figure 2.2. The sidewalk infrastructure identified in the map mainly consists of concrete pavement in varying degrees of condition. As shown in the figure, numerous gaps are present in the existing sidewalk network, particularly along Central Avenue, Loiter Way, and The Strand. A sidewalk repair and gap connection program was started by MDOT to make improvements to the sidewalk network in 2023.

2.3. Trail and Biking Network

The Belle Isle multiuse trail network is comprised of the initial segment of the Ralph C. Wilson Trail that has been built to date, and bike lanes around the perimeter roadway, as shown in the Trail Network map (Figure 2.6). The paved trail infrastructure identified in the map mainly consists of asphalt pavement, and plans have been developed to complete construction of the multiuse trail. Many primitive trails and accessible trails can be found throughout the park in areas such as in the Wet Mesic Flatwoods, along the south side of the Nashua Canal, near the Nature Center, as well as the Driker Trail and other trails around the Blue Heron Lagoon and Livingston Memorial Lighthouse.

2.4. Road Network

The Belle Isle road network is comprised of approximately 13 miles as shown in the Road Network figure. The majority of the road network is paved with asphalt, while some of the road infrastructure installed for Grand Prix use consists of concrete pavement.

East Jefferson Avenue & East Grand Boulevard

The intersection of East Jefferson Avenue and East Grand Boulevard is a complex signalized intersection with a boulevard-to-boulevard operation.

- Vehicle travel – A complex boulevard to boulevard intersection with unconventional operations including a combination of indirect and direct left-turns.
- Pedestrian and bike travel – Buffered bike lanes are present on East Jefferson Avenue and a combination of marked bike lanes and shared markings exist on East Grand Boulevard.

The intersection has been studied over the years by various entities to evaluate potential operational and safety improvements. However, the project was reduced from a full reconstruction project to an enhanced phased resurfacing streetscape approach and is currently on hold. The streetscape will mainly include curb and gutter work, milling and resurfacing and

configuration of lanes to accommodate pedestrian and bicycle traffic along with a streetscape to enhance the viability of the corridor.

MacArthur Bridge

The MacArthur Bridge is 2,193 feet in length and connects the East Grand Boulevard and Jefferson Avenue intersection to the entrance of Belle Isle. Incoming traffic enters the park via Sunset Drive, towards the pay booths, while outgoing traffic exits the park via Picnic Way.

- Vehicle travel – The bridge cross section consists of five lanes (two inbound and three outbound lanes).
- Pedestrian and bike travel – A bike lane is marked on the shoulder in both directions and sidewalks for pedestrian use separated by concrete barriers
- Lighting – The bridge is illuminated by pedestrian-scale lighting spaced 60 feet apart.

Belle Isle Pay Booths

Upon entering the park just beyond the MacArthur Bridge, the travel lanes split into Sunset Drive and Casino Way, with each leading to a separate pay booth.

- Sunset Drive Pay Booth
 - Located approximately 1,170 feet from the park entrance
 - Consists of three vehicle lanes with the pay booth located between the right lane and center lane
- The two right lanes are intended for visitors requiring Recreation Passport purchase, indicated with the pavement markings “BUY PASS”
- The far-right lane is often closed to traffic
- The left lane is intended for visitors already having purchased a Recreation Passport prior to entering the park
 - The bike lane from the MacArthur Bridge prior to the Sunset Drive pay booth crosses from the right to the left side of the road with an abrupt transition of 90 feet across three travel lanes.
- Casino Way Pay Booth
 - Located approximately 1,100 feet from the park entrance.
 - Similar to the Sunset Drive Pay Booth, the two right lanes are intended for visitors which need to purchase a Recreation Passport as indicated by the “BUY PASS” markings, while the left lane is for those who already are in possession of a pass. However, the pay booth is frequently unstaffed, and the lanes are used indiscriminately.
 - Separate pedestrian or bike facilities are not present at the Casino Way pay booth

Sunset Drive, The Strand, Lakeside Drive, and riverbank Drive (Perimeter Roadway)

The 5.5-mile combination of Sunset Drive, The Strand, Lakeside Drive, and Riverbank Drive comprise the perimeter roadway encompassing the park and consists of a varying cross section with two to four travel lanes. The roadway operates with one-way vehicular traffic traversing the outer edge of the island in a counter- clockwise direction. The following sections describe the transportation network in this direction.

Sunset Drive

The following transportation network exists on the perimeter roadway section along Sunset Drive, which follows the inside of Sunset Point between the north and south Fountain Drive approaches.

- Vehicle travel – Three vehicle lanes merge to two lanes west of the pay booth in the counterclockwise direction.
- Pedestrian and bike travel – A separated multiuse path is located on the right side of the roadway up to the pay booth, and a bike lane is marked on the left shoulder. Several marked midblock crosswalks are located along Sunset Drive. The bike lane abruptly transitions from the right side of the road to the left side of the road just past the pay booth as shown in Figure 2.20.
- Parking – Angled on-street parking exists along the outer perimeter of Sunset Drive travel lanes

The Strand

The Strand continues along the south side of the island between Fountain Drive and Lakeside Drive, where the following transportation network exists.

- Vehicle travel – The number of vehicle lanes on The Strand varies from two to three lanes in the counterclockwise direction.
- Pedestrian and bike travel – A continuous bike lane is marked on the left shoulder of the roadway. No sidewalks exist along this section of The Strand, with the exception of a short section of sidewalk at the Dossin Great Lakes Museum.
- Parking – Intermittent various areas of angled and parallel on-street parking exist along both the inner and outer perimeter of The Strand travel lanes.

Lakeside Drive

The Strand transitions into Lakeside Drive at the roadway curve just east of the Coast Guard Station and continues along the east side of the island to the north side of Lake Muskoday, where the following transportation network exists.

- Vehicle travel – Three vehicle lanes merge into two vehicle lanes near the Ralph C. Wilson Gate-way in the counterclockwise direction.
- Pedestrian and bike travel – A multiuse trail exists along the Lakeside Drive perimeter which ends near the Yacht Club, and a bike lane is marked on the left shoulder. No sidewalks exist along this section of Lakeside Drive.
- Parking – On-street parking is not permitted on the majority of this section.

Riverside Drive

The perimeter roadway is named Riverbank Drive along the north side of the island, where the following transportation network exists.

- Vehicle travel – Two vehicle lanes expand to three lanes at Oakway Trail, and to four lanes just past Oakway Trail near the beach in the counterclockwise direction.
- Pedestrian and bike travel – A multiuse trail starts at the beach and travels along the Riverbank Drive perimeter, terminating near Picnic Way. A bike lane is marked on the left

shoulder. Some short sections of sidewalk exist along the north side of Riverbank Drive near Inselruhe Avenue, and along the north side of the roadway leading to the MacArthur Bridge. Sidewalks do not exist on the south side.

- Parking – Parallel on-street parking exists on this section between Inselruhe Avenue and Vista Avenue

Central Avenue

Central Avenue is a one-way east-west roadway located in the center of island, where the following transportation network exists.

- Vehicle travel – Two very wide vehicle lanes are marked for eastbound travel only from Casino Way to Portage Way, where Central Avenue reduces to one lane eastbound through the wooded area.
- Pedestrian and bike travel – West of Portage Way, no bike lanes exist and a few sections of intermittent sidewalk exist along Central Avenue. East of Portage Way, a two-way buffered multiuse trail is marked on the roadway shoulder.
- Parking – Various combinations of parallel and angled on-street parking exist intermittently on the section west of Portage Way

Casino Way and Fountain Drive

Casino Way is a two-way roadway located between the paddock and the Casino. Fountain Drive connects Sunset Drive to the center of the roadway at James Scott Memorial Fountain. The following transportation network exists on these roadways.

- Vehicle travel – One vehicle lane in each direction exists.
- Pedestrian and bike travel – Sidewalks exist in this area, but no biking infrastructure is present.
- Parking – Parallel parking exists throughout the majority of this area.

Vista Avenue / Vista Drive

A small section of Vista Drive exists between Riverbank Drive and Central Avenue, and a larger section of Vista Avenue exists to the south between Loiter Way and The Strand. Both sections of Vista Avenue / Vista Drive are two-way roadways, where the following transportation network exists.

- Vehicle travel – One vehicle lane in each direction exists.
- Pedestrian and bike travel – A short section of sidewalk is present on the west side of the north on-street parking zone serving the athletic complex. No other sidewalks or bike infrastructure exist in this area.
- Parking – Primarily 90-degree parking exists on this section, but parallel parking is permitted on the bypass segment near The Strand.

Inselruhe Avenue

Inselruhe Avenue is a two-way two-lane roadway between Riverbank Drive and The Strand, where the following transportation network exists.

- Vehicle travel – One vehicle lane in each direction exists.

- Pedestrian and bike travel – Sidewalks exist intermittently on the west side of Inselruhe Avenue (near the Conservatory and Aquarium) and along the entire east side of Inselruhe Avenue. No bike infrastructure exists in this area.
- Parking – On-street parking does not exist on this section

Muse Road and Loiter Way

Muse Road transitions into Loiter Way near the Flynn Pavilion and continues east to the athletic fields. These are two-way roadways, where the following transportation network exists.

- Vehicle travel – One vehicle lane in each direction exists.
- Pedestrian and bike travel – Intermittent sidewalks exist in this area.
- Parking – Parallel parking exists on varying areas of this section.

2.5. Destinations

Popular destinations and attractions on Belle Isle as indicated on the Belle Isle Conservancy map of destinations, in Figure 2.63 on the previous page, are all accessible by various facilities within the existing transportation network. Attractions are listed generally in a counterclockwise direction, starting from the entrance of the island.

1. MacArthur Bridge to the Island (1923)
2. Floral Clock (1990)
3. James Scott Memorial Fountain and Lagoon (1925)
4. Sunset Point (2006)
5. Casino (1908)
6. Flynn Memorial Pavilion (1949)
7. Nancy Brown Peace Carillon Tower (1940)
8. Dossin Great Lakes Maritime Museum (1960)
9. Levi Barbour Memorial Fountain (1936)
10. Anna Scripps Whitcomb Conservatory (1904)
11. Aquarium (1904)
12. Greenhouses
13. The White House (1864)
14. Old Horse Stables/Maintenance Building (1894)
15. Athletic Field and Field House (1898)
16. U.S. Coast Guard Sector Detroit Station Belle Isle (1942)
17. Livingstone Memorial Lighthouse (1930)
18. Blue Heron Lagoon (1930)
19. Belle Isle Golf Course Practice (1922)
20. Belle Isle Nature Zoo (1977)
21. Belle Isle Golf Course/Disc Golf Course
22. Detroit Yacht Club (1922)
23. Beach
24. Kids Kingdom Playscape (2003)
25. Giant Slide (2004)

26. Police Station
27. North Fishing Pier
28. Detroit Boat Clubhouse (1902)

2.6. Destinations

Parking Space Inventory and Occupancy

Belle Isle has an astounding number of parking spaces, with an estimated total of approximately 6,157 total spaces. There are an estimated 5,567 spaces available to the public, employees and volunteers, while 429 private spaces are located at the Detroit Yacht Club (DYC) and 161 private spaces are located at the Boat Club. The parking spaces are spread across the island with 148 distinct parking facilities concentrated within 41 parking areas. The total number of parking spaces is estimated as there are designated parking areas with unmarked spaces located throughout the park located both on-street and within parking lots. There are approximately 3,000 marked public spaces, with the remainder being unmarked. A standard parking space of 9 feet by 18 feet was used to estimate unmarked locations.

The Island-Scale Parking Zones Figure shows nine parking zones delineated during the parking study phase of the project. The island is broken down into zones in order to visualize trends in broader areas throughout the park. Zones A, C and F, which are the south side of the island, account for 63% of the total public parking spaces on the island. Occupancy maps were created for each zone on an island-wide scale. An island-scale illustration of parking occupancy on week-end afternoons is shown in Figure 2.65 on the following page. Island-wide occupancy maps for the other time periods are included in Appendix A-2.1.

Each individual parking lot/on-street parking area has also been delineated for more detailed analysis, as discussed and shown in the figures associated with each zone. Figures for each zone are included in Appendix A-2.2.

Parking Space Occupancy and Demand

The location of existing spaces is not distributed proportionally to best serve visitors with relatively convenient parking for their final destinations. The parking study evaluated average parking occupancy rates for high level larger zones, as well as for each individual parking area over several summer days during July 2022 and broke those findings into the following blocks:

- Weekday Afternoon (3:00 – 6:00 PM)
- Weekday Evening (6:00 – 10:00 PM)
- Weekend Morning (8:00 – 11:00 AM)
- Weekend Midday (11:00 AM- 3:00 PM)
- Weekend Afternoon (3:00 – 6:00 PM)
- Weekend Evening (6:00 – 10:00 PM)

Even at peak times throughout the higher-level zones, there is not an overall shortage of parking on the island. This analysis, however, also looks at specific parking areas and spaces and it is in this analysis, where parking efficiencies and hurdles are more clearly identified.

Parking Analysis by Zone

This section will examine and analyze usage patterns for each lot or parking area within each parking zone.

Zone A

Existing Conditions

Zone A includes the James Scott Memorial Fountain parking lot (185 spaces), the old Grand Prix Paddock parking lot (450 spaces), the Casino parking lot (125 spaces), two small lots at either end of Fountain Drive (15 and 13 respectively), angled on-street parking along Sunset Drive and The Strand (218 total spaces), and on-street parallel parking along Sunset Drive, Fountain Drive, and Casino Way.

Demand Analysis

The on-street angled parking along Sunset Drive are the most heavily used parking spaces in Zone A. Within this area, peak occupancy times are weekend afternoons, with over 90% of the spaces nearest Sunset Point occupied, but ample parking is available within other areas of the zone. The three large, paved parking areas – the James Scott Memorial Fountain, the Paddock, and the Casino Way parking lots are underutilized by visitors but are largely considered inconvenient. Of these three lots, only the Casino lot is more than 30% occupied during peak hours. Granted, the James Scott Memorial Fountain was not operational during the summer of 2022 and the Casino was closed for renovation. Nevertheless, these large, paved areas are not typically heavily used and have the potential to be redesigned and/or repurposed to provide more event space and overflow parking while reducing the amount of impervious surface. This creates more flexibility for operations to develop more appropriate context sensitive solutions for special events.

Input gathered from stakeholders and the public supports the idea of redesigning and/or repurposing the Paddock area as there is an overwhelming desire for more parking closer to the most popular areas in the park. Visitors want to park close to Sunset Point, the beach, shelters and other open lawn spaces as visitors have a lot of items such as tents, grills, food and other items used for parties, picnics, swimming, etc. In addition, the pilot shuttle program found only light usage during the summer, which started at the Paddock/Casino parking area with the idea that these large parking areas could be used by visitors to park and then take the shuttle. Unfortunately, the vision of the pilot shuttle program was not realized as it was found later via conversations with stakeholders and survey comments that visitors expressed a desire for the shuttle to begin outside of the island so they can avoid having to try to find a parking space and navigate traffic within the island.

Zone B

Existing Conditions

Zone B includes dedicated parking for the DNR staff, the Detroit Police Harbormaster Station, Great Lakes Water Authority (GLWA) facilities and the Detroit Boat Club, as well as on-street parking along Riverbank Drive and a 50 space paved off-street lot west of Picnic Way, an unmarked grass area on Riverbank Drive used for parking across from the Detroit Boat Club, and a dedicated off-street lot with 8 spaces for Picnic Shelter #5 (accessed from Riverbank Drive).

Demand Analysis

This parking zone does not experience heavy parking demand with the exception of Picnic Shelter #5 during peak weekend summer days as illustrated in Figure 2.71. The parking area directly serving Picnic Shelter #5 experiences over 238% parking utilization which occurred as visitors parked in unmarked locations adjacent to the shelter on the lawn. No other parking area in the zone exceeds 29% utilization during any of the survey. Parking information, wayfinding signage and on-street pavement markings are lacking, creating confusion for visitors. It was observed that the lack of information and wayfinding in combination with the one-way roads created motorist confusion and additional traffic volumes throughout the park inter-sections with motorists going the wrong way or people retracing their steps, making unnecessary additional trips. Improving these design elements will improve parking function and mobility in Zone B.

Zone C

Existing Conditions

Parking Zone C contains the areas from The Strand on the south, Central Avenue to the north, Inselruhe Avenue to the east, and just west of Muse Road to the western boundary. There are four dedicated off-street lots, the largest of which provides 151 spaces and direct access to the two pavilions on the north side of Lake Tacoma and Picnic Shelter #2. There is a 109-space paved lot on the east edge of the zone, providing access to the Aquarium, Conservatory, Giant Slide, and White House. There is a 102-space paved lot adjacent to the Bandshell, and a 64-space paved lot adjacent to the Dossin Museum. The rest of the parking in Zone C is on-street, or in small lots along streets. There are 803 on-street, or street adjacent spaces compared with 439 spaces in paved lots, and 20 spaces for accessible parking and staff parking at the Conservatory.

Demand Analysis

Based on the counts, Zone C peak parking demand are weekend afternoons, when the parking lot at the Dossin Museum was 83% occupied, and the parking lot for the Conservatory, Aquarium, and Giant Slide was 69% occupied. During this period is also when the on-street parking demand is highest with 72% of the on-street parking occupied along Muse Road. It is worth noting that the easternmost street parking in this zone at The Strand and Casino Way hit 85% occupancy during weekend evening hours, but otherwise was at 34% occupancy or less during all other times.

Even at peak event times and hours, there is not a significant parking shortage in Zone C other than the area directly adjacent to the Aquarium and Conservatory. Also, fairly

significant parking demand is present for the 64-space lot adjacent to the Dossin Great Lakes Maritime Museum. While some of the on-street spaces experience higher demand, there is visitor hesitancy to park outside of the Aquarium and Conservatory due to lack of wayfinding and understanding of vicinity of other parking areas in relation to the Aquarium and Conservatory, and lack of pedestrian connectivity between all parking areas within the zone.

Zone D

Existing Conditions

Parking Zone D is located on the north side of the island, which includes a very popular area in and around the beach which spans approximately 2,000 feet and was found to hold over 400 people during peak times in the summer. There are 256 parking spaces in three off-street lots, 131 on-street along Riverbank Drive, and 143 on-street spaces along Central Avenue

Demand Analysis

Based simply on the parking counts, there is ample available parking in Zone D during off peak times on weekdays and weekend mornings. No parking areas – either lot or on-street – was observed with more than one-half of the spaces occupied during these times. Weekend middays also do not experience a significant volume of parking, with just 58% of the spaces in the beach parking lot occupied and less than a quarter of the on-street parking spaces occupied. However, during peak times on weekend afternoons (3:00 PM – 6:00 PM) and evenings (6:00 PM – 10:00 PM) are highly popular times for visitors, and a much higher demand for spaces is needed close to the beach. The beach parking lot was observed to have 95% to more than 116% occupancy during this period. Some areas reached over capacity when motorists created their own parking spaces by parking in illegal or unmarked areas. Our team has observed these lots over capacity during summer weekend afternoons and evenings, as shown in the beach example in Figure 2.81.

The parking lot at the Kayak Launch and Fishing Pier typically sees minimal usage during the week; however, during weekend afternoons and evenings usage increases dramatically, spiking to 89% occupancy on weekend evenings. It should be noted that the parking lot at Oakway Trail and Portage Way was closed during the data collection, likely discouraging illegal parking at the former Zoo entrance.

Due to a lack of wayfinding signage in the area surrounding the beach combined with a lack of pavement markings to delineate parking lanes along Riverbank Drive, confusion was observed with motorists slowing and looking for parking spaces when the beach and Kayak Launch lots are at or near capacity. Because Riverbank Drive is a one-way street with counterclockwise traffic only, users opting to pass the Kayak Launch parking lot and then find the beach parking lot at or near capacity have limited options for parking without having to completely loop the island again. In order to prevent vehicles from illegally parking in the bike lanes, temporary measures have been taken by park staff including placing cones and temporary parking signs in the bike lane along Riverbank Drive near the beach.

It is clear that additional parking is needed near the beach and the immediate beach parking area would benefit from expansion. A substantial increase in the number of spaces is being incorporated in the conceptual plan as part of this study. In addition to an increase in parking spaces near the beach, a designated drop off area is something that has been identified as a desire for visitors based on stakeholder and public survey findings and is also included in the conceptual plan. Additionally, improved wayfinding signage to complement this expansion of designated, paved and marked lots at the Beach will significantly improve parking conditions and circulation, traffic flow, and pedestrian safety at peak visitor times. Improved wayfinding signage and pavement markings are needed to direct motorists to intended parking areas. Conversion of Riverbank Drive to two-way traffic will allow visitors to double back and find parking in the two beach lots. Absent of a roadway conversion to two-way traffic, improved signage and real-time digital parking availability signs are a minimum requirement to alleviate peak demand and direct visitors to designated parking areas.

Zone E

Existing Conditions

Parking Zone E extends from Inselruhe Avenue on the west to Vista Avenue on the east. On the north side, the zone extends to Central Avenue and the southern boundary follows the Nashua Canal. It includes approximately 340 on-street spaces along Central Avenue (angled parking) and Loiter Way (parallel parking), and unmarked parking for approximately 50 vehicles adjacent to the Sawmill Complex and another 10 unpaved spaces adjacent to the Golightly Career and Technical Center's Greenhouse Annex. There is a small, paved area to the east of the Sawmill Complex that has room for approximately 6 spaces.

Demand Analysis

This zone includes the Giant Slide and Kids Row playground, the Golightly Career and Technical Center's Greenhouse Annex, and the Sawmill. Zone E is also adjacent to the Belle Isle Aquarium and Anna Scripps Whitcomb Conservatory. The primary visitor parking for the Aquarium and Conservatory is to the west of Inselruhe Ave, with overflow spaces along Loiter Way.

The two larger parking areas – the space at the Sawmill and to the east of the greenhouse annex– are not visitor parking. These are unmarked, unsigned spaces used for service vehicles and construction and debris staging. The 10 spaces adjacent to the greenhouse annex are almost always fully occupied, indicating a need to designate enough parking within this area for service vehicle parking.

Parking at the Sawmill did not exceed 17% occupancy during the duration of the study and is restricted to service vehicles.

The parallel on-street parking spaces on Loiter Way never exceeded 35% occupancy, even during peak weekend afternoon and evening periods. The angled parking along Central Avenue, however, experiences heavier demand during these peak weekend hours (3:00 – 10:00 PM). The spaces on the south side of Central Avenue are more

heavily used due to the location adjacent to the entrance to the playground and Giant Slide, with up to 72% occupancy during weekend afternoon hours (3:00 – 6:00 PM). Despite being immediately adjacent to Picnic Shelters #10 and #11, the parking on the north side of Central Avenue, while heavily used, does not experience the demand experienced on the other side of the road.

Zone F

Existing Conditions

Zone F includes the athletic fields and facilities north of The Strand, east of Inselruhe Avenue, and south of the Nashua Canal. The zone extends eastward to just past the intersection of Woodside Drive and The Strand.

During the period of the study, the paved lot adjacent to the tennis courts and Athletic Shelter was fenced off and closed to visitor access and was being used for construction vehicle parking and staging. There are approximately 99 head-in parking spaces along Vista Avenue, which are used by visitors utilizing the athletic fields, hiking trails, tennis courts and basketball courts.

Additionally, there are approximately 205 on-street spaces along The Strand that are adjacent to fields used for youth and adult soccer which can be used by visitors to the athletic complex. There is unmarked on-street parking available for approximately 80 passenger vehicles along Nashua Drive.

Existing Conditions

Notably, there is a considerable amount of unauthorized parking that occurs in this parking zone. One area with multiple unauthorized parking is adjacent to the athletic fields on Vista Avenue, where visitors were observed parking on the grass on the west side of Vista Avenue and on the grass around the Athletic Shelter. One potential reason for the unauthorized parking is the closure of the Athletic Shelter parking lot, while another may simply be proximity to the athletic fields for youth sporting activities. There is space to expand parking on both sides of Vista Avenue to create more convenient parking for visitors. Users are parking in unauthorized locations because they are more conveniently located and there are no barriers (trees, bollards, signage, fencing, etc.) that physically prevent unauthorized parking.

The second area where unauthorized parking is happening in Zone F is on the grass adjacent to Picnic Shelters #14 and #15. Based on observations and photos, much of the unauthorized parking in this area during the study period was related to construction and construction staging. During evening peak weekend hours, there was no shortage of authorized parking spaces; however, it was found during weekday observations that there is a lack of parking available in the area during baseball games, and overflow parking occurred in unauthorized areas and on The Strand. This unauthorized parking is likely directly related to temporary construction and is not representative of significant unauthorized parking by park guests.

It was observed on days when baseball games were in session, overflow parking for the athletic fields also took place on the Strand as shown in Figure 2.93. Most of the visitors that parked in this area as shown were observed walking over to the fields.

Zone G

Existing Conditions

This parking zone is the private lot for the Detroit Yacht Club (DYC). The zone does not include any parking areas accessible to park visitors who are not members or guests at the DYC and was not analyzed by the team; however, parking space count data is available for this location in Appendix A-2.2.

Zone H

Existing Conditions

Zone H is the northeastern-most section of Belle Isle and includes parking for the Kayak launch, Picnic Shelters #19 and #20, the Nature Center, Oakway Drive, the North Shoreline fishing area, the ADA playground, and the Golf Center.

In this area, there are four dedicated, paved parking lots – one lot with approximately 70 spaces adjacent to the kayak launch, approximately 55 unmarked spaces adjacent to the restroom building, 75 spaces at the golf driving range, approximately 57 spaces in the Nature Center parking lot, and approximately 18 spaces adjacent to the Oakway Drive ADA playground. There are also approximately 78 unmarked on-street spaces along Lakeside Drive and Riverbank Drive.

Existing Conditions

This zone contains several very popular park attractions and the observed parking utilization rates reflect the importance of these amenities. While there was heavy use observed, there is adequate space to meet demand during all but the highest peak period on a weekend evening (6:00 – 10:00 PM). During this period, all parking lots and on-street parking zones, with the exception of the golf center parking lot, are at least 72% occupied. Parking for shelter use is split between the two paved lots and parking along Lakeside Drive – these two lots are nearly at capacity during peak hours, with the on-street parking all at least 72% full. Nevertheless, there was significant unauthorized parking at the northwestern point, where the two picnic shelters are located. This is an open field and cars can easily access these locations by driving on the multi-use path, or simply over the open field.

The Oakway ADA playground is a very popular destination for visitors, and this is reflected in the parking demand during weekend evenings (6:00 – 10:00 PM). The 18 car lot immediately adjacent to the playground was observed over capacity (there is a gravel area along the closed portion of Oakway Drive that can be accessed by driving past the road closed signs, which was observed to be used by visitors for parking) and the Nature Center parking lot, located across Oakway Drive, was at 72% capacity, indicating visitors use this lot despite the closure of the Nature Center for the entirety of the summer for renovations.

There is space for additional parking adjacent to the Kayak launch that could be expanded to allow closer proximity to the picnic shelters and fencing that would prevent unauthorized car access, which would help address peak demand.

Zone I

Existing Conditions

Zone I is the southeastern-most area of Belle Isle and provides parking for the Blue Heron Lagoon Trail, various hidden beaches (Hipster Beach, Cocker Beach, Redemption Beach), beaches along the Livingstone Lighthouse, three picnic shelters (#16/ Woodside, #17 and #18), the south fishing pier, the US Coast Guard Belle Isle station, and the Ralph C. Wilson Gateway and Iron Belle Trail Southern trailhead.

There is a 32-space paved lot, and a temporary gravel area for future paved expansion with approximately 35 unmarked spaces at the Ralph C. Wilson Gateway and Iron Belle Trailhead. There is a gravel on-street parking area at the eastern terminus of Woodside Drive, adjacent to Shelter 18 with room for approximately 34 cars. Unmarked on-street parking is also available for approximately 243 cars on The Strand and Lakeside Drive, and parking for another 153 vehicles in unmarked gravel spaces is located on the eastern portion of Woodside Drive. There is also a 34-space paved lot that is restricted for use by the U.S. Coast Guard and is not accessible to the public (this lot has been excluded from Zone I analysis).

Demand Analysis

On weekdays and weekends before 3:00 PM, there is no notable parking demand in Zone I. Weekend afternoons and evenings (3:00 – 10:00 PM) experience higher levels of use, particularly in the lots adjacent to the Iron Belle's Ralph C. Wilson trailhead. There is also considerable "unauthorized" parking along The Strand as it curves and becomes Lakeside Drive. The parking is classified as unauthorized, but vehicles utilize the extensive paved shoulders on both sides of the road. These spaces are unmarked and not configured for optimal use or pedestrian and bicycle safety. Peak demand can better be addressed through proper delineation of parking areas and improved signage. Based on the analysis, no additional parking is necessary in this zone.

Conclusions and Action Items

In analyzing all of the parking occupancy counts for peak periods during the month of July in 2022, there are areas of Belle Isle that experience parking demand deficiencies and overcapacity issues at peak times, primarily on weekend afternoons and evenings between 3:00 and 10:00 PM. In particular, three zones - Zones D, H and I - were identified with peak demands that created short-term parking concerns, traffic flow and safety issues. Improved wayfinding signage, pavement markings, parking identification, and expanded parking designs to deter unauthorized parking should all be deployed to alleviate peak demand concerns.

In Zone D, where the main beach is located, significant parking issues were recorded and observed during peak weekend afternoons and evenings. This is exacerbated by a strong visitor demand at the Kayak Beach parking lot and the main beach parking lot, which

results in many visitors parking in unauthorized locations rather than looping the island again to access those lots after they have passed them. In addition to expanded parking demand and other infrastructure-related improvements, real-time parking availability signage would improve circulation in the area and prevent issues in the area such as slowing down, multiple trips and looping around while searching for a parking spot. Converting Riverbank Drive to two-way traffic will certainly help with the parking issues; however, this conversion in isolation will not solve peak demand issues. In addition to expansion recommendations to create additional parking spaces, all parking improvements within Zone D will benefit from real-time parking availability signs, improved directional signage, improved and extensive pavement markings, and design interventions such as fencing, landscaping, and bollards to prevent unauthorized parking in sensitive or dangerous areas.

2.7. Traffic Operations Analysis

Roadway Capacity Analysis Procedures

Intersection capacity analyses were conducted to determine the existing level of service of the study area inter-sections. Synchro 11 was used to conduct the analyses which is a software package used for modeling intersection roadway capacity, among other features. The program utilizes the methods of the 2000 Highway Capacity Manual (HCM), 2010 Highway Capacity Manual, and 6th Edition Highway Capacity Manual to calculate capacity. The HCM 6e outputs were utilized where the intersection configurations are supported for LOS, whereas HCM 2000 or HCM 2010 LOS outputs were utilized for intersection configurations not supported by HCM 6e LOS outputs. The capacity worksheets for existing year conditions are provided in Appendices A-3.2 through A-3.4.

Capacity analyses were conducted to measure the performance of the intersections in terms of level of service. Level of service (LOS) ranges from LOS A, which represents the best traffic conditions, to LOS F, which is the worst condition. Operations at LOS A through E are generally considered acceptable for side-street movements at unsignalized intersections.

The level of service measurement for both signalized and stop-controlled intersections is average control delay, which is also quantified in terms of seconds of delay per vehicle. Control delay includes the initial deceleration delay, queue move-up time, stopped delay, and acceleration delay. The level of service criteria for unsignalized intersections, taken from the HCM 6e, is shown in Table 2-2, and for signalized intersections the level of service is shown in Table 2-3.

Roadway Capacity Analysis Results & Summary

The analysis of existing traffic operations was initiated with the preparation of existing condition models using Synchro 11 and the aerial and field obtained geometric data. Highway capacity analyses were conducted for existing geometric conditions and traffic control. One important factor used in calculating capacity at intersections is the peak-hour factor. The peak-hour factor is found by dividing the total hourly volume observed on an approach leg by four times the highest 15-minute volume. As manual traffic counts based on 15-minute data were obtained for the intersections, the peak-hour factors used in the analyses are based on actual count data. The capacity analysis included an examination of the Friday, Saturday, and Sunday peak traffic conditions.

The results of the capacity analyses for existing conditions for each peak period are depicted in Figures 2.103 through 2.105, which provide the LOS values at each intersection throughout the study area. The capacity analyses for existing conditions revealed that most study area intersections and movements operate at an acceptable LOS D or better during the Friday, Saturday, and Sunday peak traffic volumes under existing conditions, with the few exceptions noted below during the weekend. The vast majority of the approaches and intersections on the island operate at LOS B or better during a typical weekend, and LOS A or better on a typical weekday.

- Saturday Peak traffic Operational Deficiencies
 - The intersection of East Jefferson Avenue at East Grand Boulevard operates at LOS E with 63.3 seconds of average vehicle control delay for the overall intersection. The westbound approach operates at LOS E with 70.5 seconds of average vehicle control delay.
 - The Sunset Drive pay booth approach operates at LOS E with average vehicle delays of approximately 36 seconds observed during a non-event weekend on July 16-17, 2022. A maximum wait time of 5 minutes and 54 seconds was recorded during the observation.
- Sunday Peak Traffic Operational Deficiencies
 - The Sunset Drive approach to the pay booth and the intersection of Sunset Drive at Pleasure Drive operate at LOS F with average vehicle delays of approximately 25 minutes on the Sunset Drive approach observed prior to the bridge closure on July 10, 2022. Queues were observed spilling back to the intersection of E Jefferson Avenue and E Grand Boulevard prior to the bridge closures. All vehicles in the southbound lanes on the MacArthur Bridge approaching Belle Isle experienced significantly failing level of service.

Although the majority of intersections operate at acceptable levels of service during peak times, there are operational issues along roadway segments with motorists slowing down to figure out where they are going, drivers slowing down in and around parking areas to look for open spaces, and unnecessary additional trips made due to the operations of the one-way road that are not directly reflected in the existing levels of service. However, these issues are reflected and evaluated in the parking analysis study included in previous sections of this report.

SimTraffic Model Calibration and Validation

After completing the Synchro analysis for existing conditions, the SimTraffic models were calibrated and validated to ensure that they reflected actual field operations. This is an essential step in Synchro modeling and was conducted prior to the analysis and simulation of any future conditions.

The SimTraffic results for existing conditions were calibrated and validated for peak hour conditions. The process involved comparing the actual traffic volumes collected at each intersection with the SimTraffic Volume Exited report. The models were considered validated when the field counts and model results were within the greater of ± 10 percent or ± 20 vehicles. The SimTraffic validation summary reports are included in Appendix A-3.2 through A-3.4.

Bicyclist Level of Traffic Stress

Given the recreational nature of Belle Isle, the roadway capacity analysis discussed in the previous section may not adequately describe the level of comfort or stress a bicyclist may experience while riding on the island. A planning tool, known as the Bicyclist Level of Traffic Stress (LTS) is a more fitting tool used to analyze how cyclists experience the island on a bike. Based on research published in “Network Connectivity for Low Stress Bicycling, Transportation Research Record 2587, 2016”, the Bicyclist LTS analysis relates cyclist stress with the geometric and operational characteristics of the roadway, primarily in relation to number of lanes, presence and characteristics of bike infrastructure such as a bike lane, presence and characteristics of adjacent on-street parking, prevailing motor vehicle speed, and effective average daily traffic (ADT). Based on these factors, the Bicyclist LTS is scored from LTS 1 indicating “Low Stress” to LTS 4 indicating “High Stress”, as depicted in the chart in Appendix A-3.6.

The Bicyclist Level of Traffic Stress (LTS) for each of the roadway segments on Belle Isle under existing conditions is depicted in Figure 2.106 on the previous page.

- As shown, most of the interior roadways currently provide a Bicyclist LTS of LTS 2 (moderately low stress) or LTS 1 (low stress), mostly as a result of relatively lower traffic volumes and prevailing speeds on these roadways, despite the lack of dedicated bike infrastructure.
- Central Avenue experiences Bicyclist LTS 3 (moderately high stress) due to the increased number of lanes and higher vehicle volumes.
- Bicyclist LTS 3 and LTS 4 (high stress) are present along segments of the perimeter roadways such as Sunset Drive, The Strand, Lakeside Drive, and Riverbank Drive. While a bike lane is present along the perimeter roadway, most of these segments have two or more lanes, high traffic volumes, and high vehicle speeds, all factors which increase cyclists’ levels of stress. LTS 4 is present on roadway segments with three or more lanes.

The proposed multimodal infrastructure plan will implement treatments intended to improve LTS with enhanced infrastructure for multimodal travel throughout the park. The LTS depends on the speed of traffic and the number of traffic lanes, and generally the wider the separation between bike lanes and traffic, the more reduction on the LTS to bicyclists. Therefore, a bike lane that is buffered from traffic by a row of parked cars or a wide landscaped buffer zone generates a lower level of stress to bicyclists as opposed to those only separated by pavement markings, flexible delineator posts or bollards. Concepts for buffered bike lanes, improved on-street parking, and other multimodal enhancements are included in the proposed infrastructure as part of the study. In addition, the Ralph C. Wilson Trail has been partially constructed, with the next phase to be completed by 2025, to provide a separated two-way multimodal facility around the perimeter of the park.

Walking and Biking Distances

A number of the most popular destinations on Belle Isle are in relatively close proximity to one another. Bike lanes, trails, paths and sidewalks are planned in order to improve mobility and safety and encourage more walking and biking. In addition, mobility hubs as seen in Figure 2.107, are proposed at several locations to include maps, bus stops, bike share stations, bike and

car parking and informational kiosks. Figures 2.107-2.110 show more detailed information regarding estimated travel times for walking and biking around the island.

2.8. Traffic Safety Analysis

One goal of the mobility study is to reduce or eliminate traffic crashes on Belle Isle. The traffic safety analysis uses the observed crash history to determine any patterns of hazardous actions or infrastructure deficiencies which may be correctable with traffic safety countermeasures.

To examine the crash history on Belle Isle, police crash data were obtained from Traffic Improvement Association's (TIA) Traffic Crash Analysis Tool (TCAT) website files. The ten-year period of January 1, 2012, through December 31, 2021, was used to conduct the analysis. Crashes which occurred within a 250-foot radius of each intersection was reviewed to determine if any crash patterns were present. The crash results were also used as one indicator to determine if additional design measures were needed to improve safety. Below is a summary of the analysis findings.

Crash Analysis Findings- Belle Isle Island

As shown in Figure 2.107, crash frequency was highest in 2013 and 2020, with 27 crashes reported during each of those years. A total of 166 crashes occurred during the ten-year analysis period, resulting in a crash frequency average of 16.6 crashes per year. As shown in Table 2-4, one crash resulted in a fatality during the analysis period. The crash occurred in 2021 when an eastbound vehicle struck the statue in the center of the intersection of Central Avenue and Inselruhe Avenue. As shown in Table 2-4, 36 crashes resulted in either a Type A (incapacitating), Type B (non-incapacitating), or Type C (possible) injury, representing 21.6% of total crashes between 2012 to 2021. Figure 2.112 depicts the number of crashes by severity for each of the analysis years.

Figure 2.113 depicts the total number of crashes by type during the analysis period. Most crashes were either single motor vehicle (30.1% of all crashes), sideswipe— same direction (25.3% of all crashes), or rear end collisions (18.7% of all crashes). As depicted in Figure 2.110, the predominate hazardous action cited in the UD-10 crash reports filed by police was improper lane use, merging or passing which resulted in 60 crashes during the analysis period, or 36.1% of the total. The second most cited hazardous action was failure to stop or yield, which resulted in 30 crashes, or 18.1% of the total. Other hazardous actions resulted in 37 crashes (22.3% of the total), which included but were not limited to loss of vehicle control, driver distraction, sleeping or otherwise impaired motorist, and obstructions in the roadway.

The majority of reported crashes occurred on a clear, dry day under daylight conditions. As depicted in Figure 2.116, most crashes occurred between 2:00 PM to 8:00 PM. Figure 2.112 shows the number of crashes by day of the week. 54.2% of crashes occurred during the weekend, while the weekday with the highest percentage of crashes was Wednesday which represented 32.9% of the total crashes which occurred on Monday through Friday.

A map indicating the locations of all crashes by type on Belle Isle between 2012 to 2021 is depicted in Figure 2.117. A table indicating the number of crashes at 10 specific intersections with the highest crash totals is shown in Table 2-5. At these locations, crashes may have occurred

nearer to the intersection center than shown in Figure 2.118 however the crash symbols were dispersed slightly for visual fidelity.

A heat map for crashes which occurred between 2017 and 2021 is displayed in Figure 2.118. As indicated by the heat map, more crashes occurred along or near Riverbank Avenue relative to the rest of the island, particularly at the intersection with Inselruhe Avenue. Another area that experienced a relatively higher crash density was at the intersection of Fountain Drive and Sunset Drive.

A map indicating the locations of all crashes by severity on Belle Isle between 2012 to 2021 is depicted in Figure 2.119. Over the ten-year analysis period, there were six crashes resulting in Type A (incapacitating) injuries and one crash resulting in a fatality. A brief description of each of these crashes is included in the figure. Five of the seven severe crashes involved a single motor vehicle (including the single fatal crash), one crash involved a rear-end vehicle collision, and one crash involved a left-turning vehicle striking a moped attempting to overtake in the left lane.

Although 2022 data is not included in the analysis, it should be noted that a fatal crash occurred at the beach that was unrelated to roadway conditions. Unfortunately, a girl on the beach was fatally injured during a crash that occurred on May 30, 2022 when a motorist drove onto the beach with the intent to harm someone. The motorist has been charged with murder in this incident.

A map indicating the locations of all recorded crashes involving a pedestrian or cyclist on Belle Isle between 2012 to 2021 is depicted in Figure 2.120. Over the ten-year analysis period, there were eight crashes involving a cyclist and two crashes involving a pedestrian. A brief description of each of these crashes is included below:

1. On March 14, 2012, a hit and run collision involving a bicyclist occurred when a vehicle struck a cyclist in the bike lane on westbound Lakeside Drive north- west of Oakway Trail. The crash resulted in a Type C (possible) injury to the cyclist.
2. On July 14, 2012, a motorcycle traveling the wrong way on Riverbank struck a cyclist. The crash resulted in a Type C (possible) injury to the cyclist.
3. On July 25, 2015, a vehicle traveling at a high rate of speed on The Strand struck a cyclist in the bike lane while turning left to Vista Drive. The crash resulted in a Type B (non-incapacitating) injury to the cyclist.
4. On August 6, 2015, a vehicle traveling eastbound on The Strand west of Vista Drive struck a cyclist in the bike lane. The crash resulted in a Type A (incapacitating) injury to the cyclist.
5. On August 16, 2015, a cyclist was struck by a left-turning vehicle while traveling in the left lane due to vehicles parked in the bike lane on Riverbank Drive east of Inselruhe Avenue. The crash resulted in Type B (non-incapacitating) injuries to the cyclist.
6. On August 14, 2016, a cyclist was struck by a vehicle while riding in the bike lane crossing Sunset Drive at Casino Way. The crash resulted in property damage only (PDO).

7. On July 1, 2017, a driver whose vision was obstructed by trees struck a cyclist in a sideswipe collision at the intersection of Riverbank Drive and Oakway Trail, resulting in a Type B (non-incapacitating) injury.
8. On July 29, 2017, a driver parked on Sunset Drive exited and walked around to the rear of the vehicle. A driver in another vehicle swerved to avoid a collision and struck the exited driver, resulting in a Type C (possible) injury.
9. On June 20, 2020, a cyclist traveling eastbound on The Strand near Vista Drive was struck by a vehicle. The crash resulted in PDO.
10. On September 20, 2020, a vehicle ran off the road on Vista Drive and struck a pedestrian outside a parked vehicle. The crash resulted in Type B (non-incapacitating) injuries to the pedestrian.

Based on historical crash data, no discernible crash pattern can be attributed to crashes involving bicycle and pedestrians, as they all occurred in various locations and for a variety of unrelated reasons. However, bicycle and pedestrian safety is an important factor that will be enhanced as part of the multimodal mobility plan, as there are near-miss incidents that were observed during the field reviews conducted for this study, and likely unreported crashes as well involving pedestrians and bicyclists. In addition, survey and stakeholder engagement findings, and LTS analysis indicate that comfort levels need to be improved to encourage a mode shift to get people out of their cars and walking and biking around the island to get to destinations.

Crash Analysis Findings – MacArthur Bridge

Between 2012 to 2021, there were five reported crashes on the MacArthur Bridge. A brief description of these crashes is listed below:

1. On March 17, 2012, a crash occurred reported as type “Other” which resulted in Type C (possible) injuries.
2. On June 25, 2013, a rear-end crash occurred which resulted in Type C (possible) injuries.
3. On April 6, 2014, a motorcycle lost control at the curve at the foot of the bridge on Belle Isle with Type A (incapacitating) injuries sustained by the passenger and Type B (non-incapacitating) injuries by the operator.
4. On August 26, 2018, a cyclist was fatally struck while traveling northbound in the southbound lanes on the bridge.
5. On June 30, 2020, a sideswipe collision occurred which resulted in property damage only (PDO).

Crash Analysis Findings – E Jefferson Avenue at E Grand Boulevard

- Between 2012 to 2021, 148 crashes were reported at the intersection of E Jefferson Avenue at E Grand Boulevard, including the crossovers serving the intersection. The results in a crash rate of 14.8 crashes per year.
- Of the 148 crashes, there were no fatalities reported, three crashes resulted in Type A (incapacitating) injuries, 6 crashes resulted in Type B (non-incapacitating) injuries, 24

crashes resulted in Type C (possible) injuries, and the remainder resulted in property damage only (PDO).

- Two crashes involved a pedestrian (one Type C injury and one PDO), while three crashes involved a cyclist. One of the cyclist crashes resulted in a Type A injury to the cyclist, while the other two cyclist crashes resulted in a Type C injury or PDO.
- The most common crash types at the intersection of E Jefferson Avenue at E Grand Boulevard involved a rear-end collision (44 crashes representing 29.7% of the total) or a sideswipe – same direction collision (35 crashes representing 23.6% of the total).

Crash Analysis Conclusion

Studying the descriptions in individual UD-10 police reports revealed that driver confusion, motorists trying to find ways to various destinations, motorists locating parking spaces and performing parking maneuvers, and speeding contributed to most of the crash issues that Belle Isle currently faces within the limits of the island. Proper wayfinding is expected to mitigate a large percentage of these crashes, which will help visitors get to their destinations more efficiently. Major changes such as improved traffic circulation which includes removal

of most of the interior one-way roads, improved signing, pavement markings and traffic control, better parking facilities, and traffic calming treatments will be included in the plan. These safety countermeasures are also expected to mitigate crashes and improve overall safety. In addition, multimodal comfort levels will be improved to encourage a mode shift to get people out of their cars and instead walking and biking around the island to reach destinations.

2.9. Existing Traffic Sign Inventory

While developing the existing conditions and inventory of park transportation infrastructure, it was realized that traffic and wayfinding signage is a critical component of the project. The vast number of popular destinations on the island combined with one-way roads was found to make it challenging for some visitors to get to places. Belle Isle signing designs vary widely and there are a lot of signs in many areas that can be overwhelming to try to understand. Other challenges to the existing signing include misplacement of signs and legends having too much information or providing information that is out of date. In addition, study evaluations identified inadequate wayfinding and traffic signing impacts congestion on Belle Isle, as well as directly contributing to some of the crashes that occur at the park, particularly during peak times.

As part of the inventory, we reviewed the project in the field, took photographs of selected signing anomalies and noted issues we observed throughout the park. The inventory found several issues that will be corrected as part of the proposed plan:

- Sign message and/or sign placement contradictions that can lead to potential safety and operational problems.
- Resolving conflicting messaging between various users of the park including motorists, transit, pedestrians, bicyclists, scooter users, etc.
- Consistency with messaging of parking and standing restrictions.
- Identifying other planned projects or changes in infrastructure that may conflict with the existing signs.

Based on field review of traffic signing on the island, it was found that most of the existing signs have reached an age where the sign face and legends are faded, and some are difficult to read. While there are a few newer signs at some locations that have been replaced due to damage to the older sign, or by MDOT work order, some of the signs and supports are well worn and at the end of their service life. Some are not designed with legends large enough or placed too far from the travel lanes for motorists to see. The Wade Trim team took photographs to document the current condition and a sample of signs from each route is provided in this summary. Many guide, regulatory, warning, and directional traffic signs will require upgrading to meet current standards and motorist needs (font, color, size, material, supports and offset).

Overly wide and unmarked lanes, redundant connections, along with worn/missing pavement markings and signing are factors that require improvement. Additional roadways were constructed specifically for Grand Prix use and were designed to allow high speed racing. These areas have been largely unimproved since the removal of the Grand Prix, and were left lacking clearly defined pavement markings, signing and traffic controls.

Many parking and standing signs have been placed in locations as parking or standing vehicles pose an issue, and additional signs were likely added with closer spacing as an increasing number of vehicles park on the road. Many street name and one-way signs have faded since they were installed to the point where determining the direction is not possible. Lack of directional signing in some areas makes it difficult to determine which streets are one-way streets and which are two-way. Some stop signs are placed too far off the roadway, are too small, and some are posted back-to-back with "Do Not Enter" signs, obstructing the shape and recognition of the stop sign from other directions. With these typical sign conditions found throughout the island, signing contributes to the safety, operational and circulation issues that visitors face while driving, walking and biking throughout the park.

The following photographs illustrate typical existing sign types found on Belle Isle, as well as identify specific signing issues at various locations throughout the park.

Traffic Signing and Pavement Marking Recommendations

The traffic signing and pavement marking plans presented in the inventory conducted by Wade Trim include regulatory, guidance, and warning signage types as found in Michigan Manual on Uniform Traffic Control Devices (MMUTCD) and MDOT standards. Ensuring that signs meet current guidelines with respect to message, color, size and location will make the signs easier for motorists to read, understand, and be prepared to make a decision. This process provides the driver with a better opportunity to process the information and continue to their destination without interruption. In addition to the development of a signing plan that adheres to MMUTCD and MDOT signing standards, wayfinding signage plans are also being developed for Belle Isle Park.

As part of the gap analysis, Wade Trim requested copies of all existing Traffic Control Orders (TCOs) to ensure all signs are placed correctly in accordance with the TCO stipulated speed limits and parking restrictions within the project limits. At this time, there is no evidence of any existing speed limit and parking TCOs in MDOT's Traffic Control System database or in City of Detroit traffic records; however, the speed limit signs around Belle Isle Park are consistently

posted for 25 mph. In addition, no parking regulation TCOs could be found, and a wide variety of parking, standing and fire lane signs are placed throughout the park without consistency or defined pattern.

At this time, changes in speed limits are not anticipated; however, consistency in the parking/standing signs is recommended. As no existing TCOs could be located, it is recommended that a TCO be made for speed limit 25 mph throughout the park, and for new parking TCOs to reflect field conditions and MDOT practices. Since there is currently a mix of No Stopping and No Standing signs throughout the park, it is recommend using the No Stop- ping Standing Parking Sign R7-14 for parking restriction and prohibitions on this project to provide a consistent approach using current standard sign designs wherever possible, as this sign covers all types of parking and standing activity.

The advantage of using a standard sign is related to cost and the time required to acquire and install the sign. Standard signs are stored in the shop and can be installed immediately after a crash or other damage to the sign. Consistent and clear messaging with respect to parking restrictions and prohibitions, while avoiding sign clutter, will reduce the frequency and duration of violations. Another way to reduce the need for extra no parking signs is to ensure that the TCOs are up-to-date, making them enforceable by law.

Parking Signing and Pavement Marking Next Steps

Implementation of management strategies, transportation services and park circulation improvements for a phased approach of immediate (0-1 year), short-term (2-5 years), and long term future conditions (5-10 years) are identified as part of the Belle Isle Multimodal Mobility Study. The plan takes into consideration comments and input received and developed via collaboration with the DNR, MDOT, Belle Isle Conservancy, public, user group and stakeholder input obtained during the project process. The traffic signing and pavement marking inventory as provided in this document will be used to inform the phased implementation approach:

- Immediate/short-term plans – A separate wayfinding plan is being prepared in collaboration with the Belle Isle Multimodal Mobility Study team, which will address the urgent need for visitor guidance throughout the park to improve circulation and safety and produce a wayfinding design plan ready for construction.
- Short/long term future plans – Upon completion of the final conceptual multimodal transportation network, Wade Trim will build upon the signing and pavement marking inventory findings to produce high level traffic signing and pavement marking recommendations for the proposed cycle track around the loop road. As sections of the network are designed and constructed, various sections of this plan can be used for implementation in a phased and as-needed basis approach.

2.10. Parking Area Pavement Conditions

The pavement and surface conditions were evaluated by the project team for all existing parking facilities on Belle Isle. Parking lots and on-street parking lanes were evaluated in terms of pavement conditions, drainage management, and potential for green infrastructure. Pavement conditions were rated as Good, Fair, or Poor based on the presence/frequency of cracks and surface raveling, as shown in Figure 2. 162.. Pavement material and any signs of ponding or

standing water were noted, along with locations where existing topography could support green infrastructure with minimal adjustment. All other areas that were rated are included in Appendix D-1. Parking facilities not open to the public were excluded from analysis.

Overall, Belle Isle's parking facilities include asphalt, concrete, gravel, and locations with a mix of these pavement types. A summary of the findings is shown in Table 2-6 below. Asphalt pavement was most common and had the highest number of locations rated as Fair or worse. With a few exceptions, the concrete parking facilities were in good condition, and the gravel lots were well maintained. While there were few locations with two or more types of pavement, these locations were rated Fair or worse with the highest percentage. The main instances of mixed pavement are along the north side of Central Ave, where a strip of gravel was added to extend the asphalt shoulder into perpendicular parking lanes.

Standing water and evidence of ponding were found in several parking areas across the island. One of the more commonly found issues was at angled parking areas adjacent to travel lanes. In these areas, the angled parking frequently slopes towards the travel lane, creating low points for water to gather. One case of this layout from Central Avenue is shown below. In parking lots, the most common drainage issue was improper grading preventing water from reaching the catch basins.

Several locations across Belle Isle were identified where the topography could potentially support rain gardens or bioswales. These were primarily parking areas where the surrounding grass is lower than the pavement or areas where water currently gathers naturally.

2.11. Roadway Pavement Conditions

SEMCOG partners with MDOT and local agencies to collect pavement condition data every year in order to quantify network-level pavement condition. Considerations such as surface distress, ride quality, structural capacity and friction are factors of the rating system. This pavement condition data is important in planning and decision-making to successfully manage highway pavements. As shown in the pavement condition figure, Belle Isle's roadway ratings vary from good to poor, as of 2022. Since the ratings were taken, resurfacing along Central Ave and most of the loop road has taken place.

3.0. Attendance and Parking Capacity

3.1. Attendance

This section summarizes a comprehensive inventory of park attendance and provides park capacity recommendations. The attendance is related to congestion and the ability to move around the park, and the existing park attendance informs the determination of proposed capacity ranges and related recommendations. The study provides operational recommendations that align with proposed multi-modal transportation and park circulation and traffic management plans.

- The yearly visitor attendance for Belle Isle State Park between 2014 and 2022, and the monthly attendance between 2020 and 2022 are depicted in Figures 3-1 and 3-2, respectively.
- Attendance doubled in three years from 2.1 million visitors in 2014 to 4.2 million visitors in 2017.
- Attendance remained at approximately 4 million up until the COVID pandemic hit in 2020, and as people began to get outside, visitor attendance grew to 4.7 million in 2020 and peaked in 2023 at 5.6 million.
- As shown, a reduction in yearly attendance was experienced in 2022 compared to 2021. This may be explained by the easing of COVID-19 restrictions in 2022 that were still present in 2021. However, there were still over five million visitors to the park in 2022 with a general trend of growth.
- The busiest months of the year are May through August, with a peak in July of approximately 800,000 visitors.
- The park sees a significant number of visitors throughout the rest of the year, with almost 200,000 visitors per month in the months of January and February.

3.2. Multimodal Park Attendance Inventory

3.2.1. Data Collection Background

The existing park attendance data provides insight into the current demand, distribution, and utilization of existing features of Belle Isle Park by visitors. The project team collected an extensive amount of data for use in this study, with the majority of data collected in July 2022. Park visitor attendance and parking utilization data was collected via various methods including, but not limited to, stationary traffic camera recordings, aerial imagery via airplane, and personnel observations.

Extensive equipment was placed throughout the island to collect traffic and attendance data, as described below:

- 206 cameras were placed on the island
- 360 12V 15Ah SLA batteries were used to power the cameras for the five days of collection
- 618 32GB SD cards were used to store footage
- That footage was compressed, concatenated, and uploaded to equal a total of 491GB of video, inclusive of:
 - 3,136 hours of TMC footage
 - 931 hours of Conflicts/Interactions footage
 - 980 hours of Park Attendance Sampling footage
 - 196 hours of Bus Utilization footage

In total, 5,243 video or still-shot hours of data were collected between the five daily periods listed below:

- Typical non-holiday peak summer and event week- end (Belle Isle Kite Festival) data collection
 - Friday, July 8 from 3 PM to 8 PM
 - Saturday, July 9 from 8 AM to 10 PM
 - Sunday, July 10 from 10 AM to 10 PM (Belle Isle Kite Festival)
- Typical non-holiday peak summer weekday data collection
 - Thursday, July 14 from 3 PM to 10 PM

The specific types of attendance and other traffic data collected in July 2022 included:

- Multimodal Traffic Turning Movement Counts
 - Classified into personal vehicles, heavy vehicles, public transit vehicles, scooters, and pedestrians counted directionally per approach
 - Entering and exiting Belle Isle Park via MacArthur Bridge
 - 60+ intersections and driveways within the park
 - Sunset Drive and Casino Way pay booths
 - Primary intersection of East Jefferson Avenue and East Grand Boulevard across the MacArthur Bridge.
- Attendance Data and Pedestrian Counts at Popular Destinations
 - Sunset Point at the west end of the park
 - James Scott Memorial Fountain
 - Kids Row including Central Avenue near the playground and concessions
 - 19 park shelters
 - Temporary structures and tents installed by visitors for their own use near or at prominent park facilities.
- Pay Booth Operation Data
 - Count, dwell time, and queue length data was collected per lane at each of the pay booths on Saturday, July 16 and Sunday, July 17.
- Public Transit
 - Inter-park bus utilization data was obtained by timestamping and tabulating the ingress and egress of passengers utilizing the City of Detroit Department of Transportation (DDOT) at each of the two bus stop locations.
- Pilot Shuttle Service
 - Utilization of the shuttle service provided by the Detroit Bus Company (DBC) at the shuttle stops near the gate on the southeast corner of the Paddock and in front of the Beach House.
- Interactions (Conflict Observation Data)
 - Between vehicles and pedestrians or bicycles as well as parking related interactions for the areas near Sunset Point, James Scott Memorial Fountain, Kids Row, park entrance/exit, and the beach.
 - Interaction or conflict events were captured that occurred between vehicles, pedestrians, and cyclists for the following:
 - Four zones along Kids Row
 - Ten zones along Sunset Point

- Four zones along the James Scott Memorial Fountain

In addition to the range of attendance and other traffic data collected in July 2022, historical multimodal traffic volume data was reviewed and evaluated on roadways within the park as well as at the intersection of East Jefferson Avenue and East Grand Boulevard.

Aerial photos were created for 38 hours during July 8-10 and July 14, 2022, to quantify island-wide parking utilization trends and congested areas on an hourly basis. The entirety of Belle Isle Park was surveyed via flight missions with the use of a Cessna 172 aircraft equipped with a high-resolution digital camera, which was positioned directly below the plane and aimed perpendicular to the ground below. The aircraft's flights were taken in a predetermined grid pattern as indicated in Figure 3-3 flying at 90 knots (about 100 mph ground speed) at 1,500 ft and taking an image every 2 seconds, totaling:

- 13 hours of flight time
- 240 images per mission
- 9,120 individual geotagged images to produce the resulting 38 orthomosaic maps

The digital camera was equipped with a GPS receiver, which reported the precise location coordinates tagged to each image recorded. Hundreds of high-resolution images were created and later stitched together to create a singular orthomosaic image map of the entire island. The flight missions were flown for each hour during the specified flight times, creating a sequence of image maps allowing team to measure changes in island capacities and other items of interest. Examples of the image resolution obtained via this procedure are displayed in Figures 3-4 and 3-5, with the overall aerial maps available in Appendix B-1.

Events & Rentals During Data Collection

Several events took place during the data collection dates in July, as well as structure rentals and field reservations. This data was used to correlate with data in subsequent sections of the Data Inventory Report.

- July 8, 2022
 - Swim Across America
 - Beach Cleanup
- July 9, 2022
 - No events
- July 10, 2022
 - Kite Festival located near Paddock
 - Two softball field rentals
- July 14, 2022
 - One softball field rental
- July 16, 2022
 - Escape to Belle Isle 5k Run

- July 17, 2022
 - Paddlefest Classic at the beach
 - Structure #2 rental
 - Two softball field rentals

Weather During Data Collection

The weather on the data collection dates is an important factor in the visitor attendance data. During data collection in July, the weather was warm, sunny and generally perfect conditions for participating in popular activities and visiting attractions throughout the park, with the exception of Friday, July 8, 2022 which experienced light rain that cleared up in the early evening that day. Weather conditions are considered in the analysis of the data and in order to quantify visitor and parking demand, the peak data collection days of Saturday and Sunday are the primary focus in this study.

3.2.2. Inventory of Multimodal Traffic Counts

Multimodal traffic turning movement data was collected for each of the time periods listed in Section 3.1.1 at each of the locations depicted in Figure 3-7. Data was collected along the following roadways:

- MacArthur Bridge
- Sunset Drive
- Riverbank Drive
- Picnic Way
- Fountain Drive
- Casino Way
- Central Avenue
- The Strand
- Muse Road
- Loiter Way
- Fleming Strait
- INselruhe Avenue
- Kids Row
- Vista Drive
- Portage Way
- Woodside Drive
- Lakeside Drive
- Oakway Trail
- E Jefferson Avenue
- E Grand Boulevard

Passenger vehicles, heavy vehicles, pedestrians, and bicycles were counted, and all possible vehicle turning movements at these intersection approaches were recorded in 15-minute intervals. Central Avenue was closed east of Portage Way due to bridge work during the July 9-10 weekend; however, it was opened to traffic the following week and data was recollected at that time and data along Central Avenue has been adjusted

accordingly. All existing turning movement data that were collected are summarized in Appendix C-1 through C-5.

Once the data was collected, an initial round of data processing at priority intersections was conducted to determine the peak traffic conditions for a typical weekday and weekend day. The selected priority intersections are depicted in green in Figure 3-7. From inspection of the data at these locations, it was determined that the turning movement data at all study intersections would be processed for the following peak time ranges:

- Friday, July 8th – 3:00 PM – 4:00 PM
- Saturday, July 9th – 4:00 PM – 8:00 PM
- Sunday, July 10th – 11:30 AM – 5:00 PM
- Thursday, July 14th – 5:30 PM – 9:30 PM

The intersection peak hour traffic volume data used in the study for a typical weekend are shown for motor vehicles, pedestrians, and cyclists in Figure 3-8 through Figure 3-10. These figures depict the peak hour traffic volume data at the intersections near the entrance to the park including the James Scott Memorial Fountain and Sunset Point. Figure 3-11 shows pedestrian and bicycle counts at the Aquarium/Conservatory walkway, which experienced nearly 1,000 people walking and biking in the small area during the peak hour on Sunday, July 10th. For the days which counts were conducted, it was determined vehicle volumes were highest on Saturday, July 9th while pedestrian and bicyclist counts were highest on Sunday, July 10th. The figures showing peak hour traffic volume data for the remainder of the park are included in Appendix B-2 through B-4.

A figure depicting July 2022 peak hour through vehicle traffic volumes and historical average daily traffic (ADT) volumes is depicted in Figure 3-12.

- In general, Saturday vehicle traffic volumes tend to be the highest in comparison to Friday and Sunday.
 - On Saturday, 1,329 vehicles entered and 1,541 vehicles exited the park during the peak hour.
 - On Sunday, 1,124 vehicles entered and 1,050 vehicles exited the park during the peak hour.
 - Traffic volumes tended to be higher around the perimeter road around the island relative to the interior roadway network.
 - On Saturday, peak hour vehicle counts on the perimeter roadway:
 - Riverbank Drive east of the bridge – 1,347 vehicles
 - Lakeside Drive – 839 vehicles
 - The Strand east of Inselruhe Avenue – 923 vehicles
 - On Saturday, peak hour vehicle counts within the interior roadways:

- Central Avenue west/east of Inselruhe – 445/177 vehicles
- Picnic Way – 210 vehicles
- Loiter Way - 175 vehicles
- Vista Drive – 119 vehicles

The total number of visitors entering and exiting the site during each processed hour of data collection is summarized in Table 3-1. The table also includes the number of Recreation Passports sold each day. The Recreation Passport is a pass that must be purchased in order to access state parks and recreation areas including Belle Isle.

- Entering vehicles on Sunday, July 10th dropped off significantly which was the result of an inbound traffic closure on the MacArthur Bridge during the Belle Isle Kite Festival. The closure message was sent at 4:02 PM and the reopen message was sent at 6:56 PM.
- An analysis of traffic volumes and park attendance during the bridge closure is summarized in Section 3.1.4 of this report.

3.2.3. Inventory of Park Facility Attendance

As vehicles enter the island, there is a lack of signage informing visitors which lane(s) to use in order to pass through either of the pay booths on Sunset Drive or Casino Way. Some common observations during data collection included:

- Vehicles sometimes stop in the outside lane and the attendant has to cross inside lane (with moving vehicles at times).
- Vehicles avoided the additional queue and wait time associated with the Sunset Drive pay booth by using the Casino Way pay booth and were observed looping around the fountain to Sunset Point.
- Vehicles did not have to wait at the Casino Way pay booth on observation days, as indicated by the absence of queues at the Casino Way pay booth in aerial images taken during data collection.

Based on a queuing analysis performed at the Sunset Drive pay booth during a non-event weekend in July

16-17, 2022, the average wait time at the pay booth was observed to be 36 seconds and a maximum wait time

of 5 minutes and 54 seconds. These values are likely reasonable measures for typical wait times during non- peak demand periods on the weekend, similar to the conditions depicted in Figure 3.13.

Just prior to the bridge closure during the Kite Festival on July 10, 2022, a queue developed which extended from the Sunset Drive pay booth along the entire length of the MacArthur Bridge and through the eastbound right-turn slip-lane on E Jefferson Avenue. Still-shot images at various locations along the queue at 2:45 PM are included in

Figures 3.14 through 3.16. The approximate wait time for a vehicle to travel the approximate 4,500 feet distance during this peak demand period just prior to the bridge closure was 25 minutes.

Visitors attempting to access the island by vehicle after the bridge closure experienced wait times in excess of three hours due to the two hour bridge closure time.

Figures 3.17, 3.22, 3.23, and 3.29 depict the peak pedestrian attendance at the beach, James Scott Memorial Fountain, Sunset Point, and Kids Row on either Saturday, July 9th or the Belle Isle Kite Festival on Sunday, July 10th. Pedestrian activity was highest at Sunset Point, Kids Row, and the beach on Saturday, and at the Fountain on Sunday. Pedestrian activity was light to moderate on Thursday and Friday. Additional figures for these other days of data collection, and graphs which chart the total pedestrian counts as collected in 15-minute intervals for each location and section are included in Appendix B-5 through B-7.

Beach Attendance

Attendance at the main beach was measured for peak times on each of days that data was collected and a pedestrian dot map was developed for the peak hour. The dots are shown in the diagram to visually represent the number of pedestrians in attendance during peak times. As shown in Figure 3.17, the dots are randomly placed in the large area of the beach and also in the water where people were counted. People on the beach could be individual, in groups, on blankets, near tents, walking, etc. People in the water limits could be on rafts, swimming or wading, or near boats.

The day of the Belle Isle Kite Festival held on Sunday, July 10, 2022 experienced the highest day of beach attendance, with the beach having approximately 440 visitors throughout the area. Saturday, July 9, 2022 came close with 415 people; while Thursday counted 240 people on the beach, and Friday only counted 115 people which is likely attributed to the unfavorable weather that day.

Additional attendance maps for the beach are available in Appendix B-5.

Sunset Point Attendance

Attendance at Sunset Point was measured for peak times on each of the days that data was collected. A pedestrian dot map was developed for the peak 15-minute time periods. As shown in Figure 3.22, the dots are randomly placed in designated zones to visually represent the number of pedestrians in attendance during peak times.

For example, on Thursday, July 14, 2022, Zone 10 in the southeast section of the Sunset Point area had 25 visitors. The Belle Isle Kite Festival which took place on Sunday, July 10, 2022 (figure included in Appendix B-6) experienced the greatest number of visitors in the area with a total of 168 people during the peak times of all ten zones around Sunset Point. Additional attendance maps for the Sunset Point area are available in Appendix B-6.

Additional attendance maps for the beach are available in Appendix B-5.

James Scott Memorial Fountain Attendance

Attendance at the James Scott Memorial Fountain was measured for peak times on each of the days that data was collected. A pedestrian dot map was developed for the peak 15-minute time periods. As shown in Figure 3.23, the dots are randomly placed in designated zones to visually represent the number of pedestrians in attendance during peak times.

On Thursday, July 14, 2022, Zone 1 in the northwest section of the fountain area had 26 visitors within the area from 7:30 to 7:45 PM. In Zone 5 directly adjacent to the fountain, 6 people were counted in the area during the peak period. The Belle Isle Kite Festival which took place on Sunday, July 10, 2022 (figure included in Appendix B-6) experienced the greatest number of visitors at the fountain with a total of 232 people during the peak times of all five zones.

It should be noted that the fountain was not operational during the data collection period nor for the duration of the summer in 2022. Additional attendance maps for the James Scott Memorial Fountain are available in Appendix B-6.

Kids Row Attendance

Attendance near Kids Row was measured for peak times on each of the days that data was collected. A pedestrian dot map was developed for the peak 15-minute time periods. As shown in Figure 3.29, the dots are randomly placed in designated zones to visually represent the number of pedestrians in attendance during peak times.

On Thursday, July 14, 2022, Zone 2 in the section near the playground had 30 visitors within the area from 7:15 to 7:30 PM. Saturday, July 10, 2022 experienced the most number of visitors in the area with 86 people counted. Additional attendance maps for Kids Row are available in Appendix B-7.

Conservancy and Aquarium Attendance

Pedestrian and cyclist attendance at the sidewalk crossing adjacent to the Belle Isle Conservancy and Aquarium was collected on July 8-10 & 14, 2022. Pedestrian volumes were among the highest observed at any location on the island during the peak periods. As indicated in Figure 3.30, pedestrian attendance to the Conservancy and Aquarium were at peak demand on Saturday, July 9, 2022, with 994 pedestrians and 21 cyclists crossing at the walkway during the peak demand hour. Figures and data for hourly attendance at the crossing are included in Appendix B-4.

Given the high volume of pedestrian and cyclist traffic in this area, the study evaluates consideration of prohibiting vehicle traffic on the stretch of Inselruhe Avenue between Loiter Way and The Strand.

Conflicts (Interactions) between Pedestrians, Bicyclists, and Vehicles

The number of interactions was recorded between pedestrians, cyclists, and vehicles in zones at four locations which include the James Scott Memorial Fountain, Sunset Point, Kids Row, and near the park entrance.

For the purposes of this study, these interactions are referred to as conflicts and do not reflect near-miss crash situations, but instead represent instances where the modes interacted with each other in some way. Figure 3.31, depicts the frequency of each type of conflict that was observed at the Fountain on Saturday, July 9, 2022. As indicated, the majority of conflicts involved interactions between vehicles and pedestrians with 41 such occurrences. Conflict diagrams for the remaining areas and dates are included in Appendix B-8.

Permanent and Temporary Shelter Attendance

The Michigan DNR provides numerous shelters on the island for public use. These shelters can be reserved on a daily basis for a fixed fee ranging between \$50 and \$210. Grills are present at every shelter location, while bathrooms are provided at or near some of the shelters. Figure 3.32 depicts a map of each of the shelter locations on Belle Isle, while Figure 3.39 depicts more detailed information for each shelter including maximum capacity, reservation fee, presence of a restroom or grills, and any additional information.

Hourly attendance data at each permanent shelter was collected on Thursday through Sunday. This data was also supplemented with reservation data which included headcount information, as provided by MDNR. Table 3-2 records the percentage of peak hour occupancy versus maximum capacity at each of the shelters, while Figure 3.33 depicts the peak occupancy rate versus the maximum capacity values for each of the shelters on Saturday, July 9th. Shelter peak occupancy rate maps for the other data collection days are included in Appendix B-9.

Additionally, any temporary structures, such as canopies or tents, were quantified on an hourly basis throughout the park. As depicted in Figures 3.34 through 3.38, some key areas where park visitors tended to install temporary shelters included near the north shoreline fishing area, between the fountain and the casino, at Sunset Point, around the perimeter of permanent shelters, and near Muse Avenue / Loiter Way. An hourly inventory of the temporary shelters for each of the zones discussed in the parking analysis in Section 2-5 is included in Appendix C-12.

As shown in Table 3-2, the highest island-wide occupancy of permanent shelters occurred on Saturday, July 9th with a 69% total occupancy rate between all shelters. The most popular shelters during the data collection period were Shelters #3, #5, and #10 with multiple days at full capacity. Other popular shelters which reached full capacity on at least one day were Shelters #2, #4, #7, #8W, #9, #11, Woodside/#16, and #19. The shelters with lowest utilization were Shelters #14, #15, #17, and #18. The study evaluates right-sizing shelter capacity with consideration of expanding shelter capacity, parking provisions, and other amenities at the highly demanded shelters.

Public Transit

Figure 3.40 depicts the utilization at each of the bus and trolley stops on Belle Isle. There are currently two City of Detroit Department of Transportation (DDOT) bus stops on the island, as indicated by the green icons. These stops are at the southern end of DDOT's #12 Conant public bus route.

In July 2022, it was found that generally each of these transit service stops are under-utilized:

- Inselruhe Avenue & Loiter Way Stop - Peak ridership of 18 passengers for a total day count, which occurred on Saturday, July 9th.
 - Bus operation is from 8:00 AM to 8:15 PM daily
 - Bus schedule indicates a bus arrival every 60 minutes
- Inselruhe Avenue & Riverbank Stop – No buses were recorded stopping at this location.

Figures indicating bus stop utilization for the remaining days are included in Appendix B-10.

Shuttle Pilot Project

Additionally, the DNR launched a pilot project to provide a shuttle on the island. The Detroit Bus Company was chartered to operate a free shuttle service on the island, starting near the old Grand Prix Paddock and routing around to popular destinations such as the aquarium and the beach, as indicated by the blue icons in Figure 3.40.

Although no official records were taken on ridership throughout the pilot, the shuttle use was recorded as part of this study at the Paddock:

- 13/14 passengers were recorded getting on/off the shuttle on Sunday, July 10, 2022, during the Kite Festival.
- Upon conversations with the Detroit Bus Company staff, it was estimated that a peak of 15 visitors/day utilized the shuttle on a weekend day during the summer, which aligns with the numbers taken during the Kite Festival.

The shuttle staff modified the shuttle operations to better fit the needs of visitors and stopped traveling the predetermined route in lieu of taking them directly where they wanted to go. However, the takeaways heard in the stakeholder meetings which are further summarized in the analysis part of this study is:

- Visitors generally want to be as close to the beach and other destinations as possible to carry the variety of items they need.
- Visitors and stakeholders mentioned that a shuttle service located outside of the park vs inside the park would be a better option.

Micromobility and Shared Mobility

Micromobility is the use of light weight, low-powered or human powered personal transportation and provides alternatives to automobile-oriented transportation option, with the most common forms of micromobility including

e-scooters and e-bikes. Shared mobility is a similar transportation option that enables users to reserve vehicles on a short-term and as-needed basis. This can be done at onsite stations or via smartphone apps. Shared mobility includes micromobility (shared scooters, shared bikes and e-bikes), and also include ride hailing and carsharing (Uber, Lyft, and ZipCar).

On Belle Isle, shared biking is an available form of micromobility, where MoGo Detroit has three stations totaling 35 docks that service the island located at the Casino, the aquarium/conservatory, and the main beach. Off-island, nearby MoGo stations are located at the Rivertown Warehouse District, Mt. Elliott Park, and the West Village.

E-scooters were not permitted on Belle Isle at the time the data was collected; however, during the July 2022 data collection days, 6 (on Saturday), 12 (on Sunday) and 22 (on Thursday) e-scooters were counted entering or exiting the island. Shared rides were observed in various locations throughout the island including bus drop offs near Kids Row, the main beach, the James Scott Memorial Fountain, and Belle Isle Nature Center. This shows that there is a demand for using scooters on the island.

3.2.4. Inventory of Park Facility Attendance During MacArthur Bridge Closures

Throughout the year, certain conditions will trigger a temporary prohibition of access to Belle Isle State Park. DNR Law Enforcement Division and DNR Parks and Recreation staff will block access to the MacArthur Bridge at the intersection of East Jefferson Avenue and East Grand Boulevard. The conditions that may trigger a bridge closure include special events, parking issues around the island, traffic crash or other safety related incidents, or excessive wait times at the pay booth resulting in lengthy vehicle queues on the MacArthur Bridge.

In 2021, there were 30 total closures on 21 different days between May through August. 22 of the closures occurred on either a Friday, Saturday, or Sunday, and two closures each occurred during the Independence Day holiday and Labor Day. In 2022, the island shut-down log was maintained between April to mid-June, with 10 closures occurring during that time.

A bridge closure occurred during the Kite Festival on Sunday, July 10th, with the shutdown notice beginning at 4:02 PM and reopen message sent at 6:56 PM. As shown in the aerial taken at this time in Figure 3.48, the traffic backed up along the bridge in both travel lanes up to the Sunset Drive pay booth. Although bridge closure data was not available for the years 2023 and 2024, it was noted by the DNR that fewer closures took place due to factors including increased staffing at pay booths.

As shown in Figure 3.50, the traffic volumes at the intersection of Sunset Drive at Casino Way started to drop on Sunday, July 10 at 1:30 PM with a sharp decline beginning at 2:45 PM. The bridge closure message was sent out at 4:02 PM, and traffic volumes entering the island did not reach normal values until approximately 6:30 PM.

Figure 3.51 also compares the traffic entering the island on Sunday during a bridge closure versus the preceding day on Saturday, where no bridge closure occurred. As shown, in the absence of a bridge closure, traffic entering the island would be expected to continue growing steadily throughout the day, until a slight drop occurs between 4:00 PM - 5:00 PM, with traffic increasing again until reaching peak traffic demand of 1,350 vehicles at 6:00 PM.

Figures 3.52 and 3.53 indicate a similar pattern near the center of the island and at the beach during the bridge closure on Sunday, July 10. As shown, traffic at these locations increased steadily until approximately 3:00 PM near the beach and 2:15 PM near the island center at the intersection of Inselruhe Avenue and Central Avenue. At both locations, traffic volumes receded substantially until approximately 5:30 PM. Traffic volumes began to increase until reaching a peak of 904 vehicles near the beach at 8:15 PM. Near the island center, traffic volumes only reached a value of 403 vehicles at 6:30 PM after the bridge closure, compared to a peak value of 748 vehicles which occurred just prior to the bridge closure at 2:15 PM.

3.2.5. Data Summary

Based on data and inventory findings, some key takeaways of contributors to the driving and access challenges include the following:

- Bridge access and closures
- Pay booth backups and confusion on how passes work
- Mix of one-way & two-way roads
- People get lost
- Drivers miss their destination and are stuck circling around the perimeter one-way loop
- Missed events due to backups
- Emergency access concerns
- Enforcement and staffing

As shown, accessing the island can be challenging in the summer months. On the busiest days, the DNR closes off the bridge access to the park during peak times. Compounding the backups on the Bridge, there is also confusion at the pay booths on how the park passes work. The passes, called Recreation Passports, can only be purchased two ways: either prior to entry by checking “YES” when renewing your license plates, or at the Belle Isle pay booth.

The existing road network is confusing, and it was discovered through the data collection, public engagement and research that this is largely due to the mix of one-way and two-way roads and lack of signing. With the large 7-mile perimeter loop road operating one way, if you miss your destination, you can get stuck circling around again for a lengthy loop.

All of these factors – traffic congestion, bridge closures, and confusion about wayfinding combine to force bridge shutdowns which have resulted in people missing events, challenges for emergency access, enforcement and park staffing. Improving these areas will greatly improve the visitor experience

Based on data and inventory findings, the study identified some key driving and access challenges and suggests the key traffic circulation issues can be attributed to three main factors:

1. Visitor confusion about pay booth and pass purchases. There is confusion at the pay booths on how the Recreation Passports work, which can only be purchased two ways: either prior to entry by checking “YES” when renewing your license plates, or at the Belle Isle pay booth. The confusion is exacerbated by uncertainty on which lanes are dedicated for pass holders, and whether pass holders are required to stop. The data showed that vehicles stopping in the pass holder lane significantly contributed to backups. Accessing the island can be challenging in summer months as there is only one access to the island for motorists, walkers and bikers via the MacArthur Bridge. On the busiest days, the DNR closes off the bridge access to the park during peak times. The congestion and bridge closures create issues with people missing events, as well as challenges for emergency access, enforcement and park staffing.
2. Vehicle queuing and circling, and driver confusion. Cars queue while looking for parking spaces at popular locations including the beach, Sunset Point, and Aquarium/Conservatory. The existing road network is confusing, and as documented in crash data, public engagement and research, this can be largely contributed to the mix of one-way and two-way roads and lack of signing. Drivers often miss their destination and are stuck circling around the perimeter one-way loop or other internal one-way roads or make risky maneuvers such as driving the wrong-way down one-way roads and driving in bike lanes.
3. Parking needs. Traffic modeling for peak conditions show that most intersections operate at acceptable levels of traffic service and delay; however, much of the congestion is associated with slowed vehicles looking for parking in parking lots.

All of these factors – traffic congestion, bridge closures, and confusion about wayfinding – combine to force bridge shutdowns which have resulted in people missing events, challenges for emergency access, enforcement and park staffing. Improving these areas will greatly improve the visitor experience.

4.0. Public and Stakeholder Engagement

The Belle Isle Multimodal Mobility Study addresses the perpetual challenge of preserving the essential nature of the park while identifying and implementing sustainable improvements to manage traffic, circulation, and multi-modal transportation services. All are aimed at making it simple, safe, and fun for visitors to access, traverse, and enjoy the park.

The goal of this communications plan was to employ strategies that engage stakeholders and community members across the city and region in finding a future vision and sustainable, multimodal solutions for this essential asset. The project team in partnership with Core Team members including the Michigan Department of Natural Resources (MDNR), the Belle Isle Conservancy (BIC), the Michigan Department of Transportation (MDOT), the city of Detroit and other partners to achieve this end.

4.1. Engagement Management

This engagement plan with the Strategic Management Plan developed by MDNR in partnership with the BIC. That document outlines strategies for the ongoing management and sustainability of the park. It also guided and supported the project team’s effort to gather data based on the

observations and aspirations of park vendors, visitors, and other stakeholders with knowledge of the park. The plan is directed toward:

- Creating visually appealing, thematically appropriate project branding to capture stakeholder attention and make the study easily identifiable
- Employing engagement strategies that will contribute to a holistic vision for sustainable movement onto and around the park
- Recommending tools and tactics aimed at engaging and energizing each stakeholder group to maximize their interest and participation
- Coordinating communications assets, messaging, and outreach with the MDNR, BIC and other potential partners

4.2. Objectives

The engagement team pursued the following objectives:

- Maintaining open, transparent two-way communication and engagement with all stakeholders
- Engaging stakeholders to exchange information, gather feedback and foster partnerships
- Focusing on strategies that resonate with stakeholders and generate high-quality input to help shape project outcomes
- Emphasizing the MDNR's role in maintaining Belle Isle Park as a vibrant and sustainable destination for the enjoyment of all

4.3. Stakeholders

Several categories of stakeholders were identified that align with the project's proposed public engagement strategies and schedule. Each group was included in each of the three rounds of engagement.

- Tenants and Vendors: Entities with direct connections to the island including organizations and businesses operating on the island
- Key Agencies: City of Detroit departments, State agencies and non-profit and neighborhood organizations that have close relationships with the park
- Partner Groups: Entities with strong community connections that can assist with outreach and engagement
- Community/General Stakeholders: The public at-large, both individuals and organizations with an interest in helping to shape the Island's future

4.4. Stakeholders

The Team coordinated with MDNR, MDOT and BIC communications to develop and deploy engagement assets such as:

- Project branding
- Content for dedicated webpage on the MDNR site (including online survey(s))
- PowerPoint presentations to support community and stakeholder meetings
- In-person and/or virtual community meetings and a public meeting collect input and evaluate proposed solutions

- Virtual stakeholder focus groups and one-on-one stakeholder meetings
- Onsite engagement at the park including Intercept surveys for gathering initial input and pop ups for gathering feedback on proposed solutions
- Onsite campaign signs with QR codes connecting to the online survey or announcing engagement events
- Online surveys
- Social media
- Media relations
- Virtual community and business group presentations
- Partnerships with the City of Detroit, the Detroit Riverfront Conservancy, the Detroit Department of Neighborhoods, and other community allies
- Video and photos to document the project
- Translation services (Arabic, Spanish)
- Online technology, priority/preference games, polling and/or other technology for community meetings and webpage

4.5. Engagement Structure and Results

Engagement was structured into three distinct rounds as described on the pages that follow.

4.5.1. Round One: Sharing Project Information and Gathering Input

This round of engagement took place in fall 2022 and winter 2023. It began with conducting intercept surveys to capture visitor input from August to September of 2022. In addition, this included the development of cohesive project branding materials, webpage content, an online survey, presentations, media relations, and social media postings. It also included community and stakeholder meetings and developing community partnerships. During this time, the project evaluated the data and beginning to prepare it for community and stakeholder review.

Media relations and social media announcements about the project and engagement opportunities were made. Community and stakeholder meetings and other out- reach were held. The data from this round was incorporated into the development of draft mitigation strategies.

Over the duration of the survey, a total of 3,097 responses were collected. Responses show that nearly half of respondents have visited the island within the last 6 months to a year. Another large portion of respondents had been to the island more recently with 24.36% visiting within the last month and 16.88% in the last week (Figure 4.5).

Some of the key findings surrounding transportation on the island include the fact that most people arrive by car at 83%, while 12% bike and 2% walk or run onto the island as seen in Figure 4.9. The most popular areas include the conservatory, aquarium, gardens and Sunset Point, but also people said they enjoy the use of trails and open lawn areas.

Once individuals get onto the island, most do stay for a while, with nearly half staying 1-2 hours and 38% staying 3-4 hours (Figure 4.12). One-half of respondents were

interested in a shuttle or trolley to and from island, and others are really interested in bike rentals, ferry rides, and more bus service (Figure 4.15).

It was also heard that the biggest frustration was getting to or around the island with one-third of respondents noting the condition and design of the existing roads and bike lanes (Figure 4.14). However, approximately one quarter said they don't have any frustrations (26%). Others noted multiple frustrations including condition or design of trails and sidewalks, traffic queues, and bridge closures.

A total of 3,097 surveys responses were collected with 42% being Detroit residents. Zip codes with the highest number of respondents, 48207 and 48214, are adjacent to Belle Isle seen in Figure 5.20. Outside of Detroit, Royal Oak, Grosse Pointe, Ferndale and Oak Park had the highest numbers of respondents. Notably, 31 surveys were taken from individuals that lived out of state and 15 from individuals living in Canada.

4.5.2. Round Two: Sharing Draft Mitigation Strategies and Gathering Input

This round began in Spring 2022 as the project team developed a set of draft recommendations for the community and stakeholders to review. At this time there were opportunities to comment on the proposed mitigation strategies with a focus on possible early interventions. New materials – meeting invitations, project presentations, updated web content, etc. were developed as needed.

In these materials the team showed how they used community and stakeholder input and study generated data to develop their ideas. Community partners were enlisted to assist with outreach and a public meeting was held at the Dossin Great Lakes Museum on Belle Isle in July 2023. Feedback from this round was then used by the project team to make adjustments to the draft plan, moving toward the final iteration and recommendations. Images of the public engagement event are seen on this page and presentation engagement boards on the following pages.

At the public engagement event, the public was asked to comment on a draft plan. Feedback was gathered through comment cards for each area of concern as seen in Figure 4.28. The first area of concern addressed in the draft plan was the desire for a more welcoming bridge and entry experience. Adjusting the location of pay booths, improving signage and adding protected pedestrian pathways and bike lanes were proposed.

Participants were asked if they felt these ideas were helping move us toward a welcoming bridge and entry experience. As shown in the graph in Figure 4.29, respondents largely felt positive about the proposed solutions with nearly half agreeing and 41% believing it partially addressed the issues.

Through survey collection public input verified study findings that individuals felt the one-way roads can be confusing, create safety concerns, lead to fast vehicle speeds and require excessively lengthy travel distances to get to destinations. The proposed solution to these problems shown in Figure 4.35, was to convert all road- ways including the outer loop to handle two-way traffic. Participants were asked if they felt the proposed

ideas created easier and safer access for all users. Over half of respondents (55%) responded with push back against the outer loop road being converted to a two-way road. Many cited concerns of increased confusion, safety and increased traffic while others simply enjoy the scenic one-way route and would like to see it remain.

Central Avenue is the historic spine of the island which survey respondents report having confusing lane configurations, poor traffic control and facilities for pedestrians and cyclists. In the proposed solutions, participants were presented with the idea of creating a more people-centric design along central avenue. This would include slowing traffic, providing on street parking and accommodating multi-modal activities. Participants were shown and draft design (Figure 4.39) of what the improved Central Avenue would look like.

Participants were then asked if they felt that these ideas were helping moving toward creating a Central Avenue that accommodates all modes. 48% of respondents believed that the proposed solutions did create a more equitable Central Avenue. A quarter of respondents believe that this did not help create a Central Avenue for all with 29% believing it partially addresses the issues. Respondents commented that they liked the idea of it being a no car zone while others wanted pedestrians to remain in the outside of the roadway with it remaining one-way.

Through previous surveys, comments indicated that some of the more popular areas where parking demand still needs to be met is within the Casino, Museum/ Aquarium/Conservatory area, Athletic Fields and Beach. Some commented that the lack of parking in areas required more than an 18-minute walk to reach core areas. In order to reduce the dependence on passenger cars and reduce the need for parking around the Island, the proposed solution was to establish mobility “hubs” in each core area. These hubs would include improved parking, maps, bike share, bus stops, scooters, passport kiosks, etc. These hubs would be intended to improve multi mobility and provide visitors with a comprehensive area to obtain park information.

Participants were asked if the proposed ideas helped move us toward placing parking where they need it. A large majority agreed that the proposed solutions either met their need or partially met their need. Many respondents commented a desire for more parking in core areas such as the beach and to see the large paddock reduced or removed. Some respondents also had concerns regarding the potential loss of green space and hoped to see a shuttle system that provides trips to and from a location outside of the Island such as Riverside Park. The desire for a shuttle that makes trips within the park was noted as not desirable as the pilot shuttle program in 2022 remained under-used.

Currently, signage on the island is considered to be confusing, out of date, and does not meet regulatory requirements. Creating a coordinated wayfinding system throughout the island that meets regulatory standards is proposed as a solution. The public was presented with several signage concepts that have themes unique to Belle Isle (Figure 4.45). Only 4% of individuals felt that this solution did not help move us toward a clear wayfinding and signage system on the island.

Historic data shows that Belle Isle had many transportation options in the past and over time the car began to take precedent. In previous surveys, it has been found that visitors would like to see other modes like ferries, bike rentals, bus services and shuttles. It was also determined that there are many frustrations on the condition of the existing pedestrian and cyclist network. In the proposed solution presented to participants, partnerships with DDOT, ferry services, expansion of the bike share (MOGO Detroit) and electric scooters were proposed. Additionally, mobility “hubs” and increased signage was also suggested. A majority of respondents (47%) believed that this solution would only partially help move the island toward supporting alternative transportation modes. Many respondents emphasized the desire to see bus and shuttle services, improved accessible pathways and an implemented ferry or more boat docks.

Historic data shows that Belle Isle had many transportation options in the past and over time the car began to take precedent. In previous surveys, it has been found that visitors would like to see other modes like ferries, bike rentals, bus services and shuttles. It was also determined that there are many frustrations on the condition of the existing pedestrian and cyclist network. In the proposed solution presented to participants, partnerships with DDOT, ferry services, expansion of the bike share (MOGO Detroit) and electric scooters were proposed. Additionally, mobility “hubs” and increased signage was also suggested. A majority of respondents (47%) believed that this solution would only partially help move the island toward supporting alternative transportation modes. Many respondents emphasized the desire to see bus and shuttle services, improved accessible pathways and an implemented ferry or more boat docks.

4.5.3. Round Three: Presenting Final Mitigation Strategies, Gathering Input, and Sharing Next Steps

At this point the final plan was presented to the media, stakeholders, and the community along with a proposed implementation schedule and other next steps. This information was also posted on the project webpage and the Michigan DNR social media. The community was thanked for their participation. Final release to take place at the end of 2024.

4.6. Incorporating Stakeholder and Public Feedback Into the Final Plan

In summary, the input received was thoughtful and varied with support for most of the proposed changes, but a strong desire to keep the loop road one-way was expressed by a variety of users.

- There was public support for:
- Improving the bridge and entry experience for all visitors
- Adding new wayfinding signs to help visitors better understand how to move around the island
- Turning Central Avenue into a people-focused promenade while still allowing for slow-moving vehicular traffic
- Working with a variety of providers to continue to improve other modes of arrival including bike share, improved bus routes/stops and determining feasibility of a ferry stop at Belle Isle

- Improving promotion and awareness of Recreation Passport
- Increasing parking at the most popular areas but decreasing parking and pavement where it's not needed
- Improving designs and facilities for walking and biking such as measures to slow speed of vehicles, improve crosswalks, add more sidewalks, and include designs that reflect the varied types of bicyclists and size of bicycling groups

Loop Road Feedback

We also heard public input on the loop road:

- The majority of the community would like the outer loop road to remain one-way
- The project team evaluated how to keep one-way traffic around the outer loop for vehicles while still being able to address the overall goals of improving safety and enjoyment for all park users. This includes various traffic calming treatments as discussed in further detail the strategies section of this report, which includes traffic circles, narrowed lanes, wayfinding, and raised crosswalks.

Proposed Loop Road

Considering the public's input, the study team developed a plan for determining priorities for adjustments of the loop road:

- One-way loop remains counterclockwise for vehicles
- 2 lanes on majority of loop / 1 lane on the east end of the island
- Two-way buffered bike lanes on the interior side of the loop road
- Road cyclists have right to a lane
- Pedestrians use the Iron Belle Trail and connecting sidewalks and trails
- Enhanced crosswalks at several key locations around the loop
- Parking retained on exterior side of road
- Emergency vehicle access maintained

5.0. Attendance and Parking Capacity

5.1. Data Analysis Overlays

Figures 5.1 through 5.4 show the results of analyses from overlaying maps with related but varying information. Vehicle circulation, walking, biking and parking evaluations are noted directly on the maps.

6.0. Recommendations

The public input received during the extensive engagement process was diverse and thoughtful. Although there was overall support for most of the proposed changes, a significant portion of the public expressed a strong preference for maintaining the loop road as one-way. The project team carefully considered this feedback and subsequently made adjustments to the proposed plans. The final recommendations for enhancing multimodal mobility on Belle Isle are outlined in the following sections.

6.1. A Welcoming Bridge & Entry Experience

The enhancement of the visitor entry experience begins with improvements at the intersection of Jefferson and Grand Boulevard. Recognizing its pivotal role in facilitating access to and from the island, this will require collaboration between agencies include the DNR (Department of Natural Resources), MDOT (Michigan Department of Transportation) and the City of Detroit to expedite the design and implementation of these improvements. The proposed intersection enhancements are illustrated in Figure 6.1.

In addition to the intersection upgrades, further enhancements to the visitor entry experience involve modifications to the MacArthur Bridge. These changes are aimed at improving safety for both motorized and non-motorized users. Illustrated in Figures 6.2, 6.4 and 6.5 the bridge improvements feature a 10' sidewalk on each side, separated from the traffic lanes by a 4' buffer zone. The bridge accommodates two lanes of traffic in each direction for motorized vehicles.

On the eastern side of the bridge, a dedicated two-way bike lane is proposed, with buffer zones on either side to ensure safe passage for multiple modes of transportation. As visitors enter the island, it is advised to relocate the pay booths and adjust driving lanes to accommodate the new traffic pattern. As depicted in Figure 6.6, the rightmost pay booth will be staffed by an attendant to assist with inquiries and cash transactions for day passes. The middle lane will function as a cashless booth for purchasing passports. Additionally, an annual Recreation Passport scanner is proposed for individuals to pre-purchase passes. Passholders will utilize the left lane for automatic scanning of their pass upon entry to the island.

To facilitate these changes effectively, it is crucial to install ample overhead and ground-mounted signage. In addition to signage, it is recommended to utilize advanced markings and pavement indicators to guide traffic flow efficiently (Figure 6.3).

6.2. Clarifying Wayfinding & Signage

The existing signage on the island presents several challenges, including confusing and outdated information, inconsistency, clutter, and non-compliance with regulatory standards, as evident in Figures 6.7-6.10. To address these issues, it is essential to implement key improvements centered around creating a cohesive visual identity and providing clear, up-to-date maps. Information should be easily accessible to all modes of transportation and available in multiple languages.

Drawing inspiration from various elements such as historic park structures, bridges, natural surroundings, and Detroit's rich history, the design of new signage aims to enhance way finding and create a sense of arrival at key locations. These signs will feature a unified appearance and include simple, current maps, available in both printed and digital formats. Initial design concepts, depicted in Figure 6.11, indicate that Concept One, 'Bridges,' is the preferred option.

6.3. Central Avenue for All

Central Avenue holds significant historical importance as a major thoroughfare running through the heart of the island (Figure 6.12 and 6.13). Historical imagery showcases this noteworthy roadway, flanked by tree-lined promenades, stretching from the James Scott Memorial Fountain

to the opposite end of the island. Recommendations for Central Avenue include the transformation into a more people-centric environment, fostering a pedestrian-friendly experience along its length.

The design of the proposed Central Avenue promenade was inspired by the historic Central Avenue as people-centric and pedestrian-friendly, as well as from La Rambla, a well-known pedestrian-oriented street Barcelona, Spain (Figure 6.14 and 6.15). Cars are pushed to the outside while people are concentrated in the center. This configuration serves to calm traffic, improve pedestrian and bike safety and clarify the mobility hierarchy.

Throughout the island, the uses of Central Avenue changes from being non-motorized to motorized; however, for a large portion of the island Central Avenue is recommended to function as shown in Figure 6.16. Slow traffic, on-street parking, and space for cyclists are encouraged. The space is designed for the safety and comfort of pedestrians while accommodating motorized vehicles where necessary.

From the James Scott Memorial Fountain to the beginning of the existing Central Avenue, the recommended promenade is designated as nonmotorized. This twenty-foot-wide promenade is flanked by five-foot amenity zones on each side, providing ample space for individuals to gather, walk, and cycle.

Central Avenue South, situated south of this area, comprises a narrow-motorized section featuring the same twenty-foot-wide promenade with driving lanes on either side (Figure 6.19). To enhance accessibility around the island, traffic flow is converted to accommodate two-way movement.

The main segment of Central Avenue (Figure 6.20) extends from Picnic Way to Kids Row. In this section, the promenade remains consistent, while the roadway widens to incorporate street parking.

The northern section of Central Avenue spans from Kids Row to Portage Way and the Flatwoods, representing the final stretch of the promenade. In this segment (Figure 6.21), the amenity zones on either side of the promenade are slightly narrower. Two-way driving lanes are proposed on both sides of the roadway, with angled parking designated solely on the southern side.

Continuing through the Flatwoods, the last portion of Central Avenue (Figure 6.22) features westbound one-way traffic and a two-way protected bike lane. This segment will significantly benefit from a change in the direction of vehicle traffic flow from eastbound to westbound, which will improve traffic circulation by providing an additional “exit” route to the MacArthur Bridge and will remove some traffic off the loop road north of Central Ave. In particular, this is expected to relieve congestion on Riverbank in the vicinity of the beach.

6.4. Mobility Zones at Popular Areas

Mobility hubs serve as pivotal points to facilitate visitor way finding, disseminate park information, and offer access to various modes of transportation across the island. The proposed enhancements include improved parking facilities, informational maps, bike-sharing stations, bus stops, walking distance indicators, electric car charging stations, and Recreation Passport kiosks, among others.

Figure 6.25 illustrates the circulation routes for bikes, pedestrians, and vehicles, as well as identifies ‘hot spots’—popular areas frequented by a high volume of visitors. Taking into account these factors, the proposed locations for mobility hubs are highlighted in green on Figure 6.25.

Increasing the island’s mobility options entails the integration of watercraft access, thereby enhancing the island’s multi mobility network. This strategic expansion serves multiple purposes, including the mitigation of traffic congestion, the promotion of tourism, and the diversification of transportation modes.

Illustrated in Figure 6.27 is a potential route accessing the area of the North Fishing Pier, which has been identified by the DNR as a viable candidate for space necessary for ferry dock infrastructure.

Inclusion of a water taxi service represents a significant step towards facilitating efficient multi-modal transportation between downtown and the island. A comprehensive feasibility study for water transportation was conducted as part of the Transit Feasibility Study & Implementation Plan prepared for the Detroit River- front Conservancy in 2015 and suggests potential ferry routes to the Boathouse or Dossin Museum. However, the exact route and/or stops should be reevaluated in further detail from recreation, tourism, infrastructure and economic perspectives.

To further strengthen the partnership with the Detroit Department of Transportation (DDOT), it is recommended to expand the bus route on the island to reach key attractions and effectively cater to visitors’ needs. Expanding the route may require an additional bus operator. While specific locations for added stops along the extended route have not been finalized, ensuring safety and accessibility are important considerations in determining the design and placement of new stops.

6.5. Promote Recreation Passport Campaign

To enhance the visitor entry experience, a campaign to improve understanding of how the Recreation Passport works is recommended. The Recreation Passport, an existing option for state park visitors, allows entry into Michigan state parks, recreation areas, state managed boating access sites, state forest campgrounds, thousands of miles of trails and other outdoor areas run by the Michigan DNR. Michigan’s state-managed parks and recreation system is largely self-supporting. Funds derived from the Recreation Passport go right back into maintaining and improving outdoor spaces loved by many and protecting natural resources for the next generation. As part of this initiative, entry signage (Figure 6.33) indicating Recreation Passport holders by- pass lane or similar is proposed to streamline the entry process for visitors who are pass holders. Recreation Passports are proposed to be conveniently available for purchase online and at mobility zones within the park.

In order to promote the purchase and broader use of the Recreation Passport, various marketing tools such as information kiosks, message board signage, and banners will be strategically placed throughout the island. Additionally, it is encouraged to the DNR that they undertake statewide promotion of the Recreation Passport. This could involve the implementation of an Outward Facing Recreational Passport Promotional Program, collaboration with the Secretary of State to include promotional material in auto registration renewal mailings, targeted media advertising,

and Pro Bono Advertising Placements (e.g., WDET, local newspapers) provided by media partners.

Furthermore, an Ad Series, characterized by bold and inspiring content via print and broadcasting mediums, will be employed.

By deploying these comprehensive media strategies, it is anticipated that the Recreation Passport will gain widespread recognition and increase purchases for visitors prior to coming to Belle Isle. The more people that have the pass prior to entering the island, the less purchases will be required to be made at the pay booth, and subsequently will result in a significant reduction in wait times. Additionally, increased understanding of how it works will expedite entering traffic, as visitors understand they don't have to stop at the pay booth if they already have a pass.

6.6. Parking Analysis & Migration, Reducing Impervious Areas

Right-sized parking is a critical component of providing an organized and safe transportation network for all types of users. As shown in the existing conditions section of this report, the high demand coupled with the insufficient number of parking spaces at the most popular destinations on Belle Isle are a significant contributor to congestion throughout the park and on the bridge.

Traffic and nonmotorized counts, site area attendance, and parking data collected as part of the inventory plan on peak summer days, as well as available historical data, were evaluated and analyzed.

As part of the park capacity evaluation and attendance data assessment, visitor and employee parking were considered, as well as the number of spaces recommended per facility. These took into consideration adjacent roadway capacity, traffic patterns, areas available for additional pavement, emergency access, and on-street parking.

Currently there is a City of Detroit goal to reduce infrastructure and permeable surfaces in the park which were evaluated with potential mode shift options, which encourage access to and within the park via options other than personal vehicles, such as multimodal transportation and transit opportunities. Natural resources, historical and cultural facilities, park activities and access to multimodal transportation were also considered in the parking plan development.

Parking analysis reviewed the value of retaining the existing designated visitor parking spaces in relation to demand posed by various facilities. A parking space gap analysis evaluated the number of parking spaces appropriate for each facility and quantify their expected parking space needs, as well as developed from the gaps and shortages identified during the inventory and counting process. Parking occupancies analyzed from summer data, city parking ordinances, in combination with best practices in Institute of Transportation Engineers (ITE) publication Parking Generation were used to inform the area of potential rightsizing of the number of spaces in lots. In addition, analysis of data during the peak summer times assisted in estimating the number of desired spaces in different areas of the park. For example, the beach area has limited parking, but high demand and people are parking in other various locations and then traveling mostly by foot to get to the beach.

The rightsizing of parking determined the number of desired parking spaces vs. the number of available spaces, and alternatives will be developed in order to meet that demand. As previously discussed, there are approximately 3,000 marked public spaces with additional space available in unmarked areas for parking, totaling over 5,000 spaces. Based on the parking utilization analysis, it was found that the issue that needs to be addressed is there are spaces not being used when the spaces fill up on peak days; therefore, the number of spaces doesn't correlate with being fully occupied. There are approximately 2,500 to 3,000 spaces where people want to park on peak days and when those spaces become occupied, the bridge typically requires a temporary closure to additional traffic. These popular areas encompass the parking areas that are recommend- ed for migration and/or expansion.

It is recommended to migrate parking spaces from underutilized parking areas and areas with less visitors to the more popular and heavily used areas of the park. Recognizing the benefits of reducing impervious areas, the migration of the spaces is desired as opposed to only adding spaces. The areas with underutilized parking were identified where a majority of spaces were unused during the data collection period. The old Grand Prix paddock is a prominent area with a significant amount of concrete space and underutilized parking. As the pilot shuttle project did not generate more parked vehicles in the paddock and public comment supported the desire to park nearby destinations, it is recommended to migrate parking from the paddock to the most popular areas where the spaces will be more utilized.

The areas with significantly increased proposed parking include the aquarium, athletic fields, and beach, as shown in Figure 6.35 and 6.36. Additional parking in the area north of the Casino is included to accommodate future events. Parking spaces were generated for these destinations as described below. The existing number of parking spaces are shown, as well as the spaces required per standards plus 20% for growth and/or events.

- Aquarium and Conservatory - Museum land use from parking generation data was used to estimate that at least 260 parking spaces are required (or 312 spaces for growth).
 - Conceptual plans have 361 spaces, which includes new parking lot/spaces to the north and west of Inselruhe.
- Athletic Fields – Athletic fields land use from parking generation data was used to estimate that at least 250 parking spaces are required (or 300 spaces for growth).
 - Conceptual plans have 329 spaces, which includes a new parking lot in the northwest area of the fields and additional on-street parking on Vista.
- Beach – Parking generation data is not available for the beach land use; however, visitor attendance was used to estimate parking demand. During the peak moment on the July 2022 summer day, 440 people were counted in the vicinity of the beach. With an occupancy of 1.25 persons per vehicle, 350 spaces are needed (or 420 spaces for growth).
 - Conceptual plans have 563 spaces in the vicinity of the beach, with the most popular beach lot expanded parking expanded for twice as much parking and new parking lot/spaces at the old zoo site.
- Casino - Convention center land use from parking generation data was used to estimate 124 parking spaces are required (or 149 spaces for growth).

- Conceptual plans include additional room for growth at 413 spaces, which include a new parking lot north of the Casino. These lots will be utilized for events at the Casino and for other events taking place in the flexible event space in the old paddock area.

Proposed changes to the remaining parking areas in the park include recommendations for organizing and improving circulation and flow, but do not significantly impact the number of spaces in each area. Changes include:

- Sunset Point - Maintain angled parking in this highly utilized and highly popular area with addition of traffic circles at both termination points with Fountain Drive. Parking directly in the circle around the fountain is migrated to on-street locations along Fountain Drive (Figure 6.40).
- Pavilion & Oudolf/Tower - Maintain parking lots which are currently underutilized but may see more utilization with potential future programming.
- Ralph C. Wilson Gateway - Maintain parking lots and number of spaces.
- Nature Center & Golf Center - Maintain parking lots and number of spaces.
- Shelter #19 and Daffodil Hill - Expand west parking lot to double spaces to accommodate growth and future shelters (Figure 6.42).
- Kids Row - Expanded parking with shared future lots in the area of the old zoo and along Central Ave (Figure 6.43).
- Boathouse - Maintain parking lot which is currently underutilized but may see more utilization with potential future programming.
- Shelters - Maintain adjacent parking spaces and on-street parking in vicinity of shelters. Most shelters were highly utilized and experienced 70 percent or more occupancy at some point and/or consistently between Thursday and Sunday, with Shelters #14 #15 being the only less-utilized exceptions at or below 50 percent.

All other proposed parking locations are shown in the conceptual plan resulting from the park capacity evaluation and attendance data assessment. It should be noted that while individual on-street spaces are marked, individual spaces within new parking lots are not as plans will be refined with future projects.

Accessible Parking

With any change or improvement made to parking areas, accessible parking spaces must be provided as required by the U.S. Department of Justice Americans with Disabilities Act (ADA) Standards for Accessible Design. Considerations that were taken into consideration for the planning of ADA spaces were evaluated per the ADA design guidelines:

- Locating spaces near the shortest accessible route of travel to an accessible facility entrance.
- Providing an accessible route from the accessible parking to the accessible entrance.
- Locating spaces at the most level ground close to the accessible entrance.
- Making sure an accessible route is free of curbs or stairs, is at least 3- feet wide, and have firm, stable, and slip resistant surfaces.

- Clustering of accessible parking spaces in one or more lots if equivalent or greater accessibility is provided in terms of distance from the accessible entrance, parking fees, and convenience.

The conceptual plan shows the minimum number and location of proposed ADA spaces and were calculated based on zoned areas of parking. The existing number of ADA spaces currently signed is approximately 25, but there are additional spaces marked in blue. Although the intent may be for these spaces to be ADA compliant, each space must have an accessible sign to make it enforce- able. It is recommended to be increased to 170 spaces. This will allow a greater number of accessible parking spaces to those individuals with physical limitations and will give visitors with limited mobility and health issues greater confidence prior to traveling to the park that they can freely enjoy Belle Isle without fear of overcoming obstacles and barriers associated with having to use non-accessible parking spaces.

Estimating spaces using zoned areas as opposed to considering all the island is more appropriate as it considers walking distances, and results in more ADA spaces per zone. The number of ADA spaces may be increased, and the locations may be revised as future plans develop and as stakeholders provide additional input. If any locations are adjusted based on need, they should follow ADA guidelines as listed above.

Reducing Impervious Areas

Large expanses of impervious surface pose significant risks to both human and environmental well-being. To mitigate these risks, it is advised to re-purpose underutilized impervious surfaces and parking lots while augmenting them where demand makes it necessary.

To further mitigate the impact of excess impervious surfaces, it is recommended to adjust turning radii and road widths in areas where pavement is in excess. This strategic adjustment serves multiple purposes, including the reduction of vehicular speeds, enhancement of pedestrian safety, minimization of impervious surface coverage, and mitigation of storm water runoff. Immediate attention should be directed towards areas across the island where the widening of roadways and installation of large turning radii occurred due to the Grand Prix. An example where this reduction in impervious surface is seen in Figure 6.44 near the Oudolf Garden. Curbs are extended at Picnic Way and Loiter Way to reduce turning radii. Bike Lanes are added, and roadway lines are painted to depict separate driving lanes.

One effective approach involves the implementation of painted surfaces to create the optical illusion of an extended curb as seen in Figure 6.45. This visual narrowing of roadways not only fosters a perception of reduced space for vehicles but also encourages drivers to moderate their speeds, thereby improving safety conditions for pedestrians and cyclists alike. A second option is through the integration of green storm water infrastructure (Figure 6.46), such as engineered rain gardens. This presents an opportunity to manage storm water runoff efficiently while also meeting safety concerns.

Future Park Capacity

Belle Isle is home to natural and cultural resources of great importance to the state of Michigan and its visitors each year. Given the significance of this resource, public demand is very high to experience and enjoy the park, particularly on during the summer. As discussed in detail in Section 3 of this report, the visitor attendance has grown significantly over the past decade. The increasing popularity has been challenging to fulfill the goals of historic and natural preservation while accommodating the increasing number of visitors and the quality of their experience.

One main objective of this multimodal mobility study is to develop a plan to enhance the transportation network which will in turn improve the visitor experience. Although there are many standards, studies and philosophies on the ideal numbers of people that can utilize areas and spaces in a park and at various attractions, this study specifically focuses on capacity related to various modes of transportation. This includes getting people to and from the park, to and from destinations within the park, and providing a network that allows for recreation within the transportation network.

Section 2.7 of this report summarizes the traffic modeling and subsequent level of service analysis that was conducted as part of the study. Traffic models were also developed for proposed conditions at full build out. Assuming all of the recommendations are completed, the traffic capacity and levels of service are expected to significantly improve at the most congested areas, when comparing LOS (Figure 6.47) to proposed conditions LOS (Figure 6.48). As shown, the efficiency and flow of traffic is expected to improve throughout the park and notably at the intersection of E Grand Blvd. and Jefferson Ave, at the tool booths, and along the loop road.

Increased popularity of Belle Isle is evident in the annual attendance rates, as shown in Figure 6.48. Between 2014 and 2016, attendance doubled from approximately 2 to 4 million annual visitors and is continuing to increase with 5.6 million visitors in 2023. At this rate, the linear trend shows an estimated increase in visitors, to a point reaching nearly 9 million visitors in 2033. Although this value is a rough estimate and many different factors can impact the number of visitors per year, it demonstrates the critical need for a mode shift from personal vehicles to non-motorized travel to an within the park. This plan provides a path forward to encourage other modes such as walking and biking as a mode of transportation and increase comfort levels so users of all ages and abilities are able to use them. These reduce unnecessary trips.

Future Park Bicyclist Level of Traffic Stress

As discussed in the existing conditions section of this report, the level of comfort or stress a bicyclist may be a challenging experience to the average bicyclists while riding on the island. The Bicyclist Level of Traffic Stress (LTS) is a tool used to analyze how cyclists experience the island on a bike, ranging from low stress to high stress.

With the proposed concept implementing bikeways, paths and promenades, bicyclists will be completely separated from vehicular traffic traveling on roadway. This is expected to dramatically improve the comfort levels for bicyclists, as shown in comparison to the existing LTS (Figure 6.450) to the proposed LTS (Figure 6.51), where high stress roadways that currently are reduced to low stress. On Central Avenue the proposed promenade will not only separate the vehicles from bikes, but will slow down traffic with narrower lanes and traffic circles.

Additionally, the high stress along the loop road and perimeter roadways such as Sunset Drive, The Strand, Lakeside Drive, and Riverbank Drive, will be more comfortable with the addition of the protected two-way cycle track, separated multiuse path, narrowed and reduced number of lanes, improved nonmotorized crossings, and improved parking.

Creating a less stressful bicycle network though minimizing or eliminating some of these factors will make bicycling more appealing to a broader segment of the population.

As these stress factors are reduced, the number and diversity of types of users willing to use a bicycle facility are increased. The benefits of the LTS often translate to improved conditions for pedestrians and people using motor vehicles. This is seen at crossings and crosswalks, as improvements are measured in terms of reduced exposure to motor vehicle travel speed and the number of travel lanes crossed.

6.7. Simplify the Street Network

One Way Outer Loop

Through stakeholder engagement, it was determined that the majority of the community would like to maintain the one-way outer loop going counter-clockwise for vehicles. Figure 6.52 shows the one way loop in pink, and blue roadways to be two-way. Improvements including two-way buffered bike lanes, enhanced crosswalks, narrowed roadways, retained parking and maintained emergency access help provide accessibility and safety along the beloved loop road. Changes to the outer loop are seen in Figures 6.53 - 6.56 that show street sections in varying locations throughout the island.

Along the Strand, a two-way bike lane with a 4-foot buffer to protect bicyclists from the two driving lanes. Angled parking is also maintained.

On Lakeside, a slightly narrower two-way bike lane is proposed with a buffer between a single driving lane.

Along the Riverbank, an expanded 20-foot shared use path showing the proposed Iron Belle Trail expansion. Angled parking, two driving lanes and a two-way bike lane are also provided.

Near Sunset Point, the one-way bike lane is maintained with two driving lanes and angled parking.

Establish Full Network for Cyclists

The need for a full, comprehensive bike network on island is evident. Providing two-way bike lanes where possible using the interior side of the outer loop road is proposed (Figure 6.59). In most instances, separation of transportation modes is provided by use of buffer zones, curbing, bollards and green paint in areas of highest need (Figures 6.61, 6.62). Paint, bollards, and barriers are along only portions bike lanes to allow for bicyclists to move into other lanes if traveling at fast speeds or in large groups. Figure 6.63 further details the proposed changes to the bike and pedestrian network.

Enhance Pedestrian Connectivity and Safety

Safety, connectivity and mobility analyses were conducted to provide an enhanced network for improving, comfort, safety and walkability to and from popular destinations. Providing connectivity along with clear wayfinding is a key strategy for reducing unnecessary inter-park trips and improving traffic congestion. As identified in the existing conditions review, people often do not realize how close destinations are to each other and instead of walking to places that are within close proximity, get in their personal vehicles to head to the next location. Due to the combination of one-way roads and lack of guide signs, they also get confused and lost while driving, circle around popular areas looking for parking, and waste time and travel time in the process. Safety is an issue as well, where officers have indicated motorists speeding and clocking in up to 50 miles per hour or more on the loop and Central Ave, drive the wrong way down one-way roads, and disregard traffic control including stop signs.

To mitigate identified crash patterns and safety issues, slowing traffic is critical for improving roadway safety for all users of the roadway. Vehicle speed plays a central role in the safety of pedestrian and bicyclists, as studies show that even a modest reduction in average vehicle speed can result in significantly fewer and less severe bicyclist and pedestrian crashes. Speed reduction also has important additional benefits that increase the quality of life for neighborhoods including facilitating bicycling and walking that have wider health benefits for society, a reduction in traffic noise, pollution, greenhouse gases, average fuel consumption and barrier effects.

The proposed crossings include evaluation of the overall sidewalk connectivity within the park and the needs for marked crosswalks. The sidewalk network as shown in Figure 6.63 shows the proposed sidewalk network in yellow, and is based on the following considerations:

- Evaluation of the active transportation safety data to identify conflict points and locations of crashes between motorized and non-motorized users.
- Documentation of the existing gaps within the pedestrian network.
- Review of sight distances and obstructions at intersections to determine if countermeasures are necessary.
- Analysis of the existing and projected active transportation user data to determine where mid-block crossings are required and the type of traffic control.
- Traffic control evaluations at mid-block crossings, where recommendations include pedestrian warning signs at moderately traveled locations, and Rectangular Rapid Flashing Beacons (RRFBs) at the most heavily used crossings near the park entry, beach and Dossin Museum.

Additional Roadway Improvements

Various measures were considered to improve traffic flow and achieve a reduction in traffic speeds using a variety of traffic calming techniques.

- Raised Crosswalk - A raised crosswalk is a speed table that meets the adjacent curbs, and has a marked crosswalk within the flat portion of the table. Vehicles driving over it must reduce speeds for comfort.

- Road Diet - Reducing the number of lanes around the loop road has already been implemented in the Riverbank area and has observationally been found to lower traffic speeds.
- Two-way Streets - Implementation of two-way streets of all streets interior to the loop road will slow vehicles by encouraging motorists to be more cautious and wary of oncoming traffic. This is critical on Central Ave which currently has the most speeding problems that encourage speeds with two wide, undefined lanes in one direction of travel.
- Lane Narrowing - Narrow lanes encourage driver alertness, and cause motorists to slow down in order to increase driving comfort.
- Curb Extensions - These visually and physically narrow the roadway, creating safer and shorter crossings for pedestrians while increasing the available space for street furniture, benches, plantings, and street trees (as shown in Figures 6.44 & 6.45). These are recommended at the wide intersections along Casino Way, Loiter Way & Picnic Way.
- Roundabouts - Roundabouts and traffic circles reduce traffic speeds at intersections by requiring motorists to move with caution through conflict points. Traffic circles are recommended at each end of Fountain Drive and at key locations along Central Ave.
- On-Street Parking - Parking narrows the street and slows traffic by creating friction for moving vehicles. Both parallel and angled parking can create this effect and are recommended at many roadways throughout the park.
- Street Trees - Trees narrow a driver's visual field and create rhythm along the street and currently exist along several roadways.

6.8. Proposed Layout

Based on the combined efforts of the data collection, traffic and mobility analyses, public and stakeholder input, and conceptual cross section plans, a plan view preliminary design of the proposed transportation network was developed. The development of the plan was an iterative process that began with a layouts of the roadways, nonmotorized infrastructure and parking needs, with changes to the plans being made based on DNR, MDOT and BIC feedback. The general philosophy of the roadway improvements attempted to utilize the existing roadways where possible and try to avoid an extensive amount of new roadways and excessive widening. With this, construction costs and addition of impervious areas and pavement are minimized as much as possible throughout the park.

The plans also consider future developments and construction projects occurring within the next two years, including:

- Construction of the final 3.2 miles of the Ralph Wilson Trail around exterior of the island to complete the network
- Starting Phase One of the wayfinding signage package
- Flatwoods trail opening
- Additional projects as budget is allocated

The following Figures 6.72 through 6.76 show the detailed conceptual plan from west to east that can be utilized for refinement in future construction projects as of September 2024. Refinements will be continued as the roadway design, nonmotorized network, ADA accessible design, parking lots and on-street parking areas are subject to modifications upon survey collection, impacts from other planned projects, grant and funding availability, state design standards and recommendations made by the 2025 Belle Isle Strategic Plan.

The concept plan and this report lay out a many-layered approach to improving Belle Isle's transportation network. These improvements will include:

1. Development of an integrated multimodal system to drastically improve the accessibility to the island;
2. Improve intra-island transportation and transport connections onto the mainland; and,
3. Balance parking facilities to accommodate peak demand at high-traffic destinations.

These phased improvements will significantly improve visitor experience by improving the park's main congestion points including entering and exiting the Island and around the Belle Isle Beach. These congestion mitigation efforts will greatly lessen the demands on park staff and law enforcement to address the periodic peak period shutdowns and specific area congestion.

Numerous improvements to the transportation network develop the park-wide multimodal transportation system that can be implemented through immediate, short, and mid-term investments. These steps will lead to the development of an interlinked transportation system that interconnects with the mainland for both regional residents/visitors and riverfront tourists alike. These improvements will occur across the Island's motorized and nonmotorized systems, building a seamless network that serves and is easily accessible for all park visitors.

7.0. Phased Improvements

Phased improvements are based off of the recommendations previously made in the report. Improvements are categorized by implementation priority and level of urgency. Projects to be implemented immediately within 0-2 years are deemed high priority, near term projects are to begin within 2-5 years, and long-term projects within 5-10 years are deemed low priority. Potential phasing breakdown and estimated costs based on 2024 construction costs are outlined.

Improvement 1: Implement Enhanced Way-finding Signage for All Modes

Wayfinding improvements are needed throughout the island to provide a coordinated look and meet regulatory standards. Proposed sign concepts are seen in figure 7.1 to address needs for all modes of transportation and create a cohesive look.

*Phasing & Costs***

- Phase 1 (0-1 Years): Implement new way finding signage for all transportation modes.
 - Estimated Cost (Initial Priority Signage Only): \$1.5 Million

Improvement 2: Jefferson Avenue and East Grand Boulevard Intersection Improvements

In order to make significant changes to circulation on MacArthur Bridge, improvements to the Jefferson Avenue and East Grand Boulevard intersection are needed. Improvements to the intersection include adjustment to signal timing, exploration of circulation concepts and construction of newly designed boulevard, crossovers, signals and nonmotorized facilities. Work on these improvements will be completed through continued collaboration of MDOT and the DNR.

*Phasing & Costs***

- Phase 1 (0-1 Years): Signal timing adjustments.
 - Estimated Cost: Low Cost
- Phase 4 (5-10+ Years): Refine studies, concepts and develop plans.
 - Estimated Cost: \$1 Million
- Phase 4 (5-10+ Years): Construction of new boulevard, crossovers, signals and non-motorized facilities.
 - Estimated Cost: \$5 Million

Improvement 3: Pay Booth and Recreation Passport Improvements

Relocating the existing pay booth location and the implementation of a Recreation Passport system is intended to alleviate congestion and create a more welcoming entry experience onto the island. Figure 7.4 illustrates the proposed circulation through the proposed pay booth changes.

Implementation of this recommendation is expected to happen in the immediate (0-2 years) and near term (2-5 years).

*Phasing & Costs***

- Phase 1 (0-1 Years): Way finding at park entry and pay booth lanes. Begin passport campaign through banners and message boards.
 - Estimated Cost: \$250,000+
- Phase 3 (3 Years): Make passport purchases available at all mobility stations. Promote statewide use of the Recreation Passport.
 - Estimated Cost: \$500,000+
- Phase 3 (4-5 Years): Install overhead signs and shift main booth to the west.
 - Estimated Cost: \$1 Million

Improvement 4: Additional Parking for Most Popular Areas & Right-Size Parking and Improve

Vehicular and Pedestrian Connections between the Beach and Athletic Complex via Vista Road
As previously outlined, parking reconfiguration throughout the island is needed to effectively support vehicular traffic needs. It is proposed to remove parking in areas where it exceeds demand and increase parking availability in areas where demand is not currently met. In addition to parking adjustments are improvements to pedestrian circulation in high activity areas such and the Beach and Athletic fields.

*Phasing & Costs***

- Phase 2 (1-2 Years): Additional parking for highest priority areas near Central Park Area.
 - Estimated Cost: \$1 Million

- Phase 2 (1-2 Years): Connect Vista Road and associated pedestrian travel ways between beach and athletic complex.
 - Estimated Cost: \$250,000
- Phase 2 (1-2 Years): Implement additional ADA spaces per conceptual plan
 - Estimated Cost: \$10,000
- Phase 2 (1-2 Years): Reduce Paddock and implement even space changes.
 - Estimated Cost: \$2 Million
- Phase 3 (2-5 Years): Right-size parking for remaining areas per conceptual plan including the athletic fields.
 - Estimated Cost: \$4 Million
- Phase 3 (2-5 Years): Removal of excess impervious surfaces.
 - Estimated Cost: \$1 Million
- Phase 3 (2-5 Years): Additional parking for highest priority areas near Beach and Aquarium.
 - Estimated Cost: \$2.6 Million

Improvement 5: Adjust MacArthur Bridge Cross Section for Separated Bike Lanes with Buffers
 Prior to the implementation of the proposed changes to MacArthur Bridge, Improvements 1- 4 must be completed. Changes to the bridge include the addition of protected bike lanes and a total of four driving lanes, two in each direction.

*Phasing & Costs***

- Phase 4 (5-10+ Years): Adjust cross section for separated bike lanes with buffers.
 - Estimated Cost: \$300,000+ depending on selected buffer style

Improvement 6: Central Avenue Promenade, Two-Way Conversion and Traffic Flow Changes in the Flatwoods

Prior to the interim Central Avenue improvements, new Vista Road connections must be in place. In this improvement the transition from a one way to two way traffic direction will be changed along Central Avenue. This will also include the reconstruction of the promenade with street parking and traffic circles where applicable.

*Phasing & Costs***

- Phase 2 (0-2 Years): Interim Central Avenue two- way conversion utilizing signing, markings and delineators. Reverse Central Avenue through the Flatwoods.
 - Estimated Cost: \$65,000
- Phase 4 (5-10+ Years): Final Central Avenue reconstruction to promenade with angled parking and traffic circles.
 - Estimated Cost: \$6-8 Million depending on design and included amenities

Improvement 7: Various Small Interventions at Wide Intersections for Improved Safety

Due to the previous uses of the island, some roadways have unusually wide widths and turning radius. Scaling the roadways widths and turning radii to typical sizes is expected to help reduce vehicular speeds

and improve pedestrian and bicyclist safety. These improvements can be completed at any time but must be staged in tandem with other improvements accordingly.

*Phasing & Costs***

- Phase 2 (1-2 Years): Small interventions at wide intersections for improved safety utilizing quick build measures such as bollards, temporary curbing, signing and markings.
 - Estimated Cost: \$10,000-25,000 per intersection*
 - High Priority Intersections: Casino way & the Strand, Casino Way to Fountain, and Loiter Way & Picnic Way.

Improvement 8: Complete Connected Walking and Biking Networks

In the concept plan, there are proposed improvements for the pedestrian and bicyclist network throughout the island. Improvements include adding new buffered cycle tracks, signage, bollards and re-marking traffic lanes through several phases outlined below.

*Phasing & Costs***

- Phase 1 (0-1 Year): Complete Ralph C. Wilson Trail around the exterior of the island
 - Under Construction (2024)
- Phase 1 (0-1 Year): Implement buffered cycle track around the loop road utilizing pavement marking, signage & bollards.
 - Estimated Cost: \$200,000
- Phase 2 (1-2 Years): Interim Implement Inselruhe promenade from the aquarium parking to Dossin utilizing existing pavement.
 - Estimated Cost: \$250,000
- Phase 2 & 3 (1-4 Years): Implement connected and complete sidewalk network.
 - Estimated Cost: \$1 Million
- Phase 3 (2-5 Years): Final reconstruct Inselruhe promenade from the aquarium parking to Dossin utilizing existing pavement.
 - Estimated Cost: \$1 Million
- Phase 3 (2-5 Years): Establish the remainder of the full bike network including interior roadways.
 - Estimated Cost: \$250,000
- Phase 3 (3-5 Years): Re-mark lanes around the outer loop road for lane reductions with on-street parking for traffic calming and access.
 - Estimated Cost: \$100,000

Improvement 9: Complete Reconfiguration Surrounding Fountain Access and Casino Access Improvements

Changes around the Casino and Fountain area are proposed with the reduction of the paddock and addition of the Central Avenue Promenade. Improvements to circulation in this area are outlined and are expected to aid in traffic and safety problems throughout the island.

*Phasing & Costs***

- Phase 4 (5-10+ Years): Realign Picnic Way from Central Avenue to Riverbank.
 - Estimated Cost: \$500,000

- Phase 4 (5-10+ Years): Complete Casino access and parking improvements (1 new parking lot and drop off loop at Casino).
 - Estimated Cost: \$2.3 Million
- Phase 4 (5-10+ Years): Complete parking lot and area improvements (One new parking lot north of the Casino).
 - Estimated Cost: \$750,000
- Phase 4 (5-10+ Years): Complete reconfiguration surrounding Fountain Access (Fountain Drives and roundabouts)
 - Estimated Cost: \$2.5 Million

Improvement 10: Implement Pilot Project for Two Raised Crosswalks Near the Beach and Dossin

Prior to implementation of crosswalk changes throughout the island, a pilot project is proposed to understand the most effective approach. Two raised crosswalks are proposed near the beach and Dossin for pedestrians. Raised crosswalks must be constructed after beach access and Dossin promenade improvements are completed.

*Phasing & Costs***

- Phase 2 (1-2 Years): Implement pilot project for two raised crosswalks & rectangular rapid flashing beacons (RRFBs) near the beach and Dossin.
 - Estimated Cost: \$100,000
- Phase 2 (2 Years): Monitor impacts from the pilot project raised crosswalks
 - Estimated Cost: \$5,000
- Phase 3 (3 Years): Implement additional raised crosswalks
 - Estimated Cost: \$25,000 per raised crossing including ADA ramp upgrades; \$25,000 per RRFB system

Improvement 11: Beyond the Car: Other Improvements for Alternative Modes

To provide multi-mobility throughout the island, various recommendations have been made. Expanding MoGo bike station access, plan and create mobility hubs, provide electric charging, addition of Recreation Passport kiosks, extend the DDOT bus route with new stops and the implementation of ferry access are all proposed as part of the new multi-mobility network.

*Phasing & Costs***

- Phase 1 (0-2 Years): Expand MoGo Bike Stations
 - Estimated Cost: Low Cost
- Phase 3a (2-5 Years): Plan and create multi-modal hubs, electric vehicle charging, and additional Recreation Passport kiosks
 - Estimated Cost: \$10,000 - \$200,000 per hub
- Phase 3b (2-5 Years): Extend DDOT bus route to loop road and establish additional stops at hubs.
 - Estimated Cost: \$N/A
- Phase 4 (5-10+ Years): Implement ferry access to the island through partnerships/shared costs.
 - Estimated Capital Cost: \$3.36 Million (\$250,000 - \$750,000 per vessel).
 - Estimated Operating Cost: \$27,000 per month.

- Costs obtained from The Detroit River Front Conservancy by Freshwater Transit Feasibility Study and Implementation Plan for water service system. Capital and operating costs have been increased by 40% to account for inflation).

1.1. Phased Improvements Summary

Figure 7.26 shows a summary of improvements by phasing, which are described in the previous section. It also includes a summary of associated costs per phase:

- Phase 1 (0 -1 year) is \$2,070,000
- Phase 2 (1 - 2 years) is \$3,680,000
- Phase 3 (2 - 5 years) is \$13,750,000
- Phase 4 (5 - 10 years) is \$28,850,000
- Total cost of Phases 1 through 4 is \$47,850,000

1.2. Phased Improvements – Critical Paths

Some of the improvements can be done independent of each other; however, there are some with critical paths:

- Ralph C. Wilson Trail and Buffered cycle track around the loop to be completed in 2025
- Implement Immediate Recommendations #1 through 4 prior to Fountain Drive Improvements (#9) and Bridge Cross Sections (Bike Lanes) Modifications (#5)
- Implement Immediate Recommendations #8 Interim Inselruhe Conversion and Restriping prior to Inselruhe Promenade Reconstruction
- Casino Improvements are to be completed in conjunction with each other
- Implement Immediate Recommendation #4 Central Park Area Parking, Connect Vista Road, ADA Spaces, and Paddock Reduction prior to (#10) Raised Crosswalks (pilot) and RRFBs
- Implement Immediate Recommendation #6 Interim Central Ave Conversion prior to #6 Full Central Ave Promenade Construction
- Implement Immediate Recommendation #4 at the Beach, Aquarium and Vista Rd prior to (#10) Raised Crosswalks (pilot) and RRFBs
- Implement Jefferson Ave and Grand Blvd Reconfiguration prior to Bridge Cross Section Changes