

Fort Lauderdale Beach Mobility

Final Report and Appendices

March 2019

Prepared for

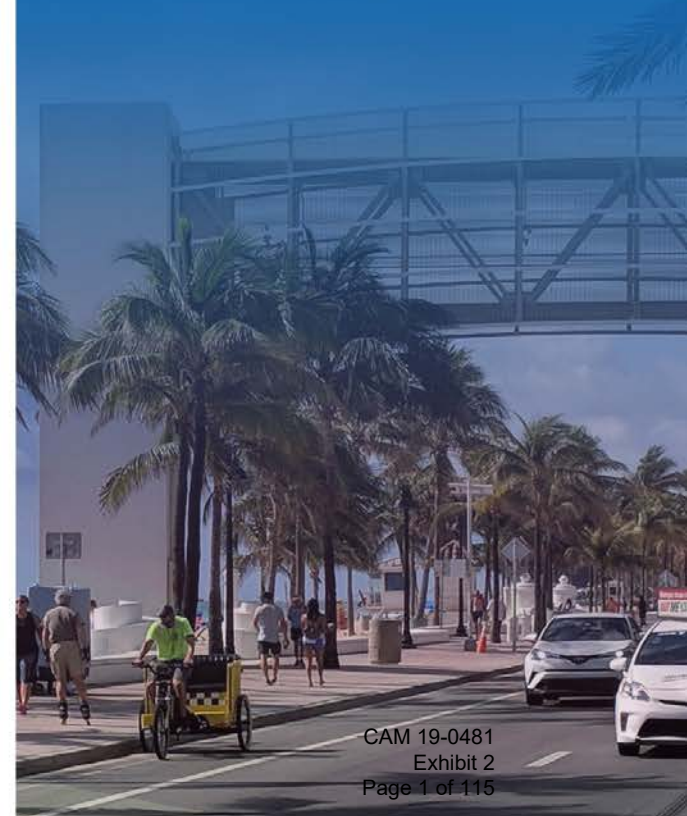


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Appendices

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Appendix 2: Resident/Business and Visitor Surveys

Appendix 3: Stakeholder Interview Summaries

Appendix 4: Implementation Planning Meeting Summaries

Appendix 5: Select Project Cost Information



Section 1: Multimodal Assessment

This Section provides an overview of the multimodal assessment performed as part of the Fort Lauderdale Beach Mobility study. The assessment serves as an inventory and map series to document the existing conditions in the study area as shown in Figure 1-1. Characteristics of the adjacent areas just beyond the study area have been included to provide a better picture of mobility in the area.

The following sections are included in this report:

- Section 1.1: Traffic Safety Hotspots
- Section 1.2 and 1.3: Traffic Congestion
 - Existing and Future Daily Level of Service (LOS)
 - AM/PM Peak-Hour Directional LOS
 - AM/PM Major Intersection Estimated Volume/Capacity Ratio
- Section 1.4: Bicycle and Pedestrian Network Gaps/Mobility Barriers
- Section 1.5: Transit Routes with Ridership and Focus Areas
- Section 1.6: Development Density/Intensity, Activity Centers, and Planned Infill and Redevelopment
- Section 1.7: Las Olas Boulevard Corridor and SR-A1A Streetscape Improvements
- Section 1.8: Phase Two Critical Data Needs

Study Area



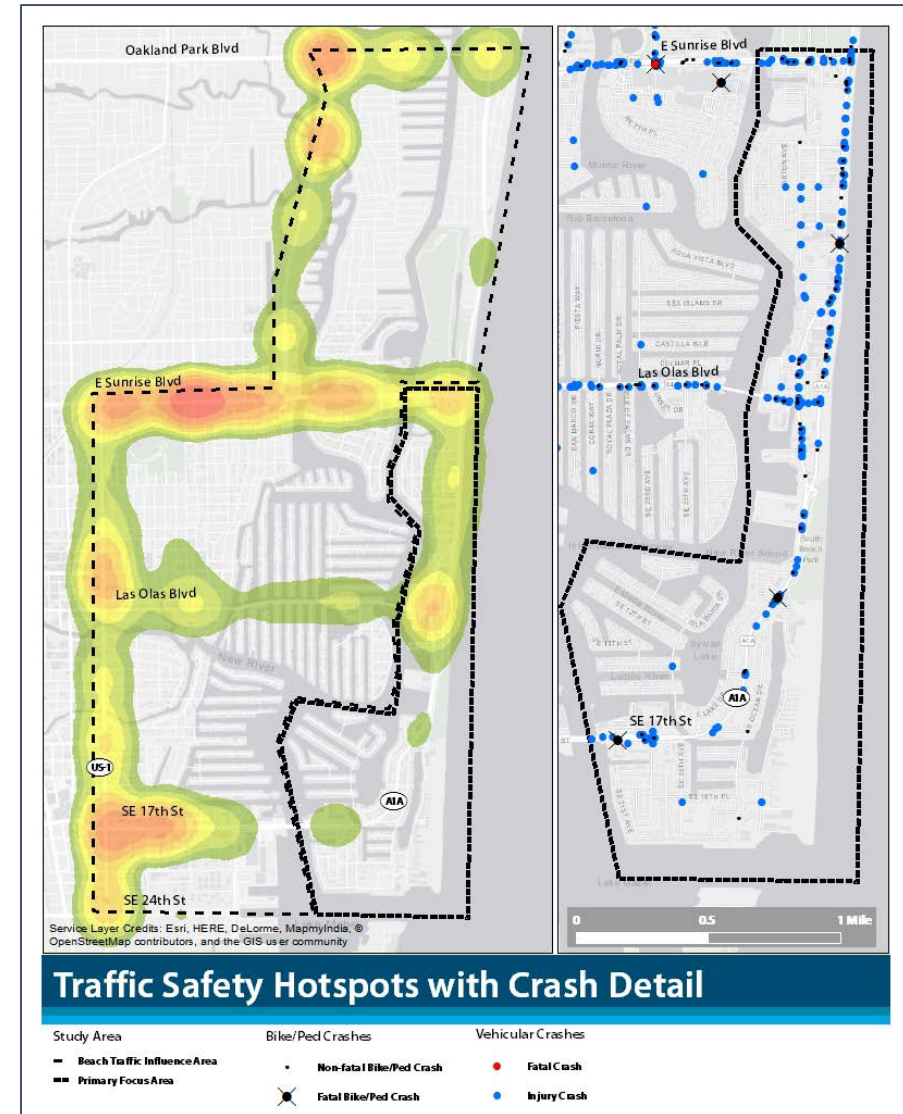


1.1 Traffic Safety Hotspots

To understand the issues at the street level, it is important to document locations at which crashes are occurring for both motorized and non-motorized modes of transportation. As shown in Figure 1.1, the greatest concentration of crashes within the study area occurs at the intersections of Las Olas Boulevard at A1A and Sunrise Boulevard at A1A. The concentration is slightly higher on the southbound (Seabreeze Boulevard) portion of the one-way pairs. The key findings in the primary focus area are the following:

- A majority of crashes occur on arterials.
- Most bike/pedestrian crashes occur away from intersections.
- The peak time for pedestrian crashes was 2:00–3:00 PM. Bicycle crashes were more evenly distributed.

Figure 1.1-1: Traffic Crash Heat Map and Crash Location Detail



*Source: FDOT Crash Data Management System, 2012–2016



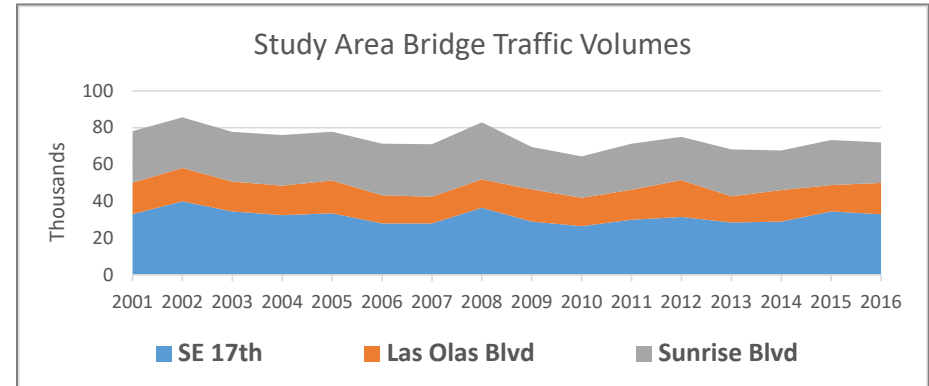
1.2 Traffic Congestion

Figures 1.2-1 and 1.2-2 display the overall traffic volumes on the major corridors in the study area. Congestion is shown in Map 1.2-1 by displaying the ratio of peak traffic volume compared to the capacity of the roadways in the study area for 2013 (the most recent available analysis from the Broward MPO), as well as forecasted conditions in 2035.

Key findings are the following:

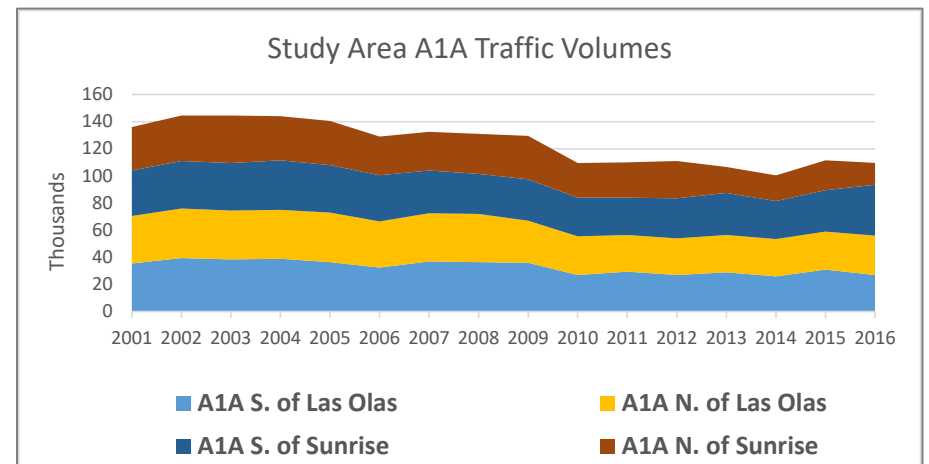
- Overall traffic is decreasing. Peak congestion is projected to increase slightly in the vicinity of A1A and Las Olas Boulevard.
- Congestion is likely to effect travel times to and from the barrier island by automobile and transit operating in mixed traffic.

Figure 1.2-1: Bridge Traffic Volume History



Source: <http://flto.dot.state.fl.us/website/FloridaTrafficOnline/viewer.html>

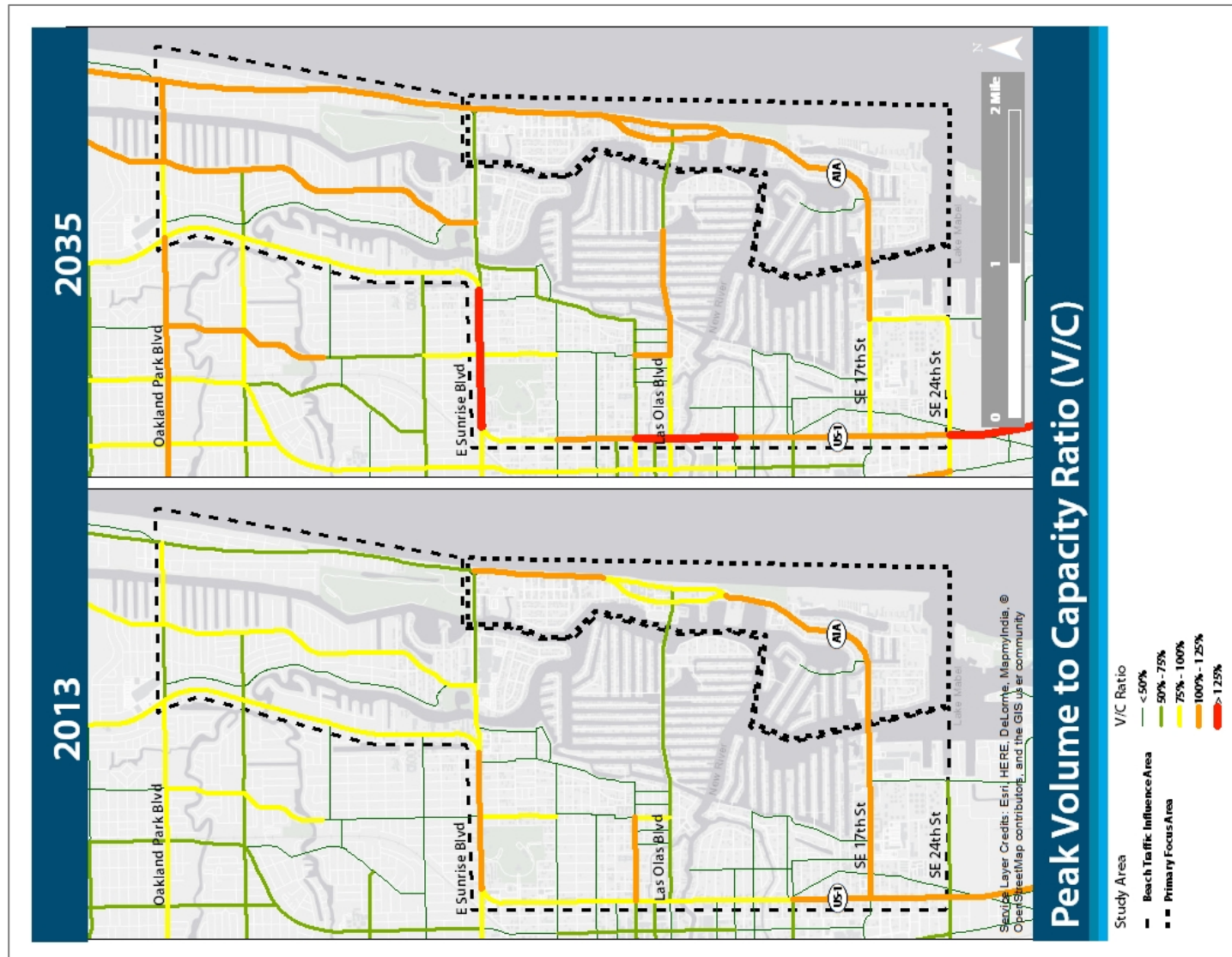
Figure 1.2-2: SR A1A Traffic Volume History



Source: <http://flto.dot.state.fl.us/website/FloridaTrafficOnline/viewer.html>



Figure 1.2-3: Peak Hour Volume to Capacity Ratios



Source: Broward Metropolitan Planning Organization



1.3 24-Hour Directional Traffic Volumes

To understand the directional and hourly flow of traffic on major roadways during an average weekday, directional traffic volumes were taken from Florida Traffic Online based on data gathered in April 2016 and are displayed in Figures 1.3-1 through 1.3-14.

Key findings include the following:

- Generally, the 24-hour directional traffic volumes do not show that the normal AM and PM peak conditions are more common to suburban roadways; instead, they show traffic building throughout the day, with relatively high traffic volumes extending into the evening hours.
- Generally, traffic towards the Beach (Las Olas Boulevard at A1A) is heaviest during midday from all directions but remains steady throughout the day. Traffic moving away from the beach peaks primarily in the early evening but remains slightly higher on Las Olas Boulevard later into the evening.

Traffic volumes for three count stations along the roadways crossing the Intracoastal Waterway and four count stations along SR A1A are described and shown in the following figures.

Figures 1.3-1 and 1.3-2 show a consistent level of traffic on Southeast 17th Street throughout the day. Lunch-hour traffic eastbound peaks above a consistent traffic flow all day. Westbound traffic peaks in the early evenings as vehicles move off of the barrier island.

* Source: <http://fto.dot.state.fl.us/website/FloridaTrafficOnline/viewer.html>

Figure 1.3-1: SE 17th Street Eastbound at ICWW Bridge

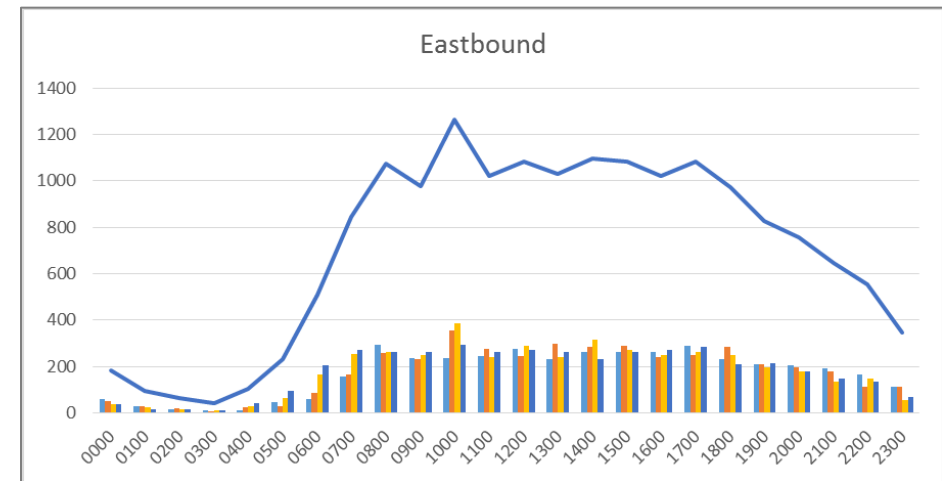
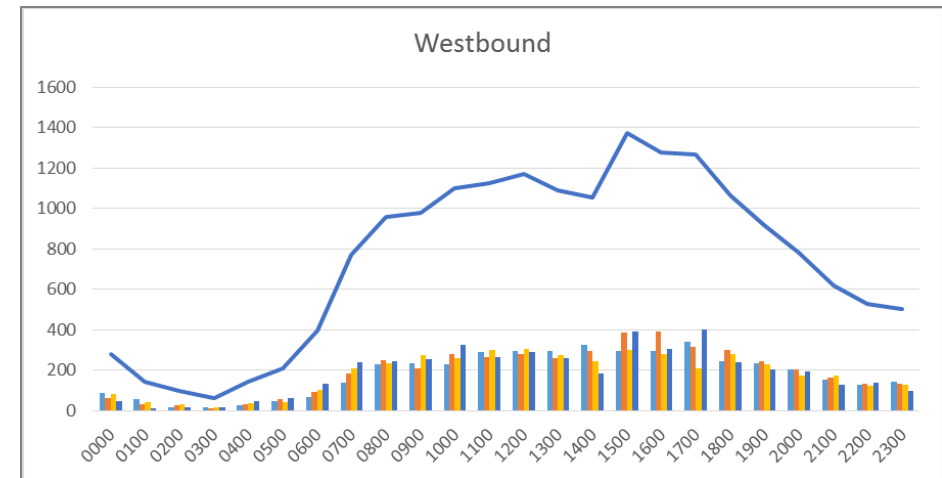


Figure 1.3-2: SE 17th Street Westbound East at ICWW Bridge





As shown in Figures 1.3-3 and 1.3-4, Las Olas Boulevard has more traffic in the afternoon and evening, typical of a dining and entertainment district.

Figure 1.3-3: Las Olas Boulevard Eastbound West of Intracoastal

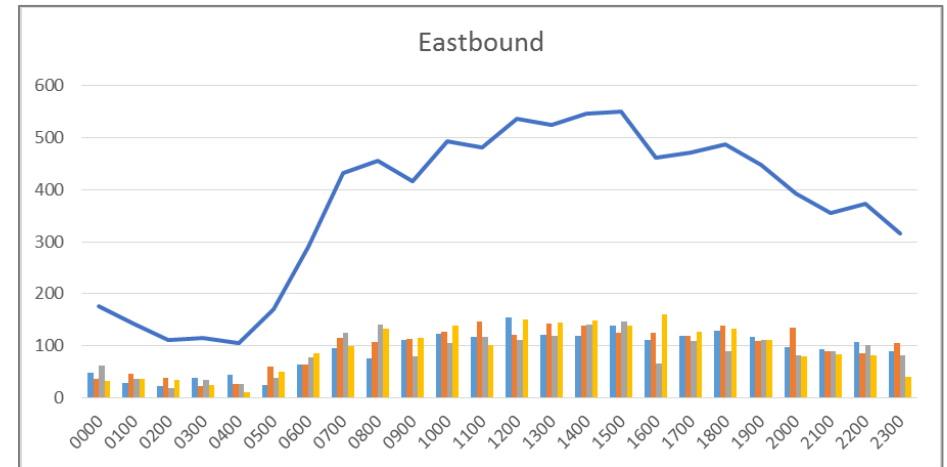
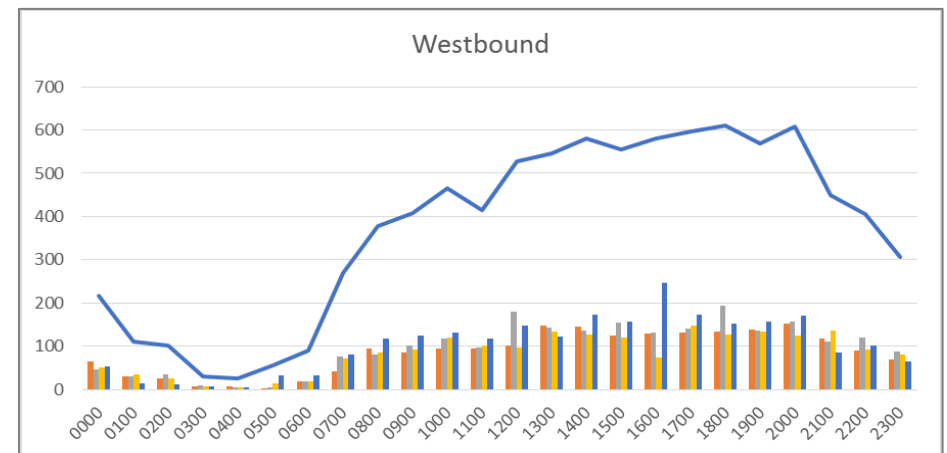


Figure 1.3-4: Las Olas Boulevard Westbound West of Intracoastal





Figures 1.3-5 and 1.3-6 display traffic volumes south of Sunrise Boulevard on A1A. The northbound traffic peaks more in the evening, and the southbound movement is more evenly spread throughout the day.

Figure 1.3-5: A1A Northbound South of Sunrise Boulevard

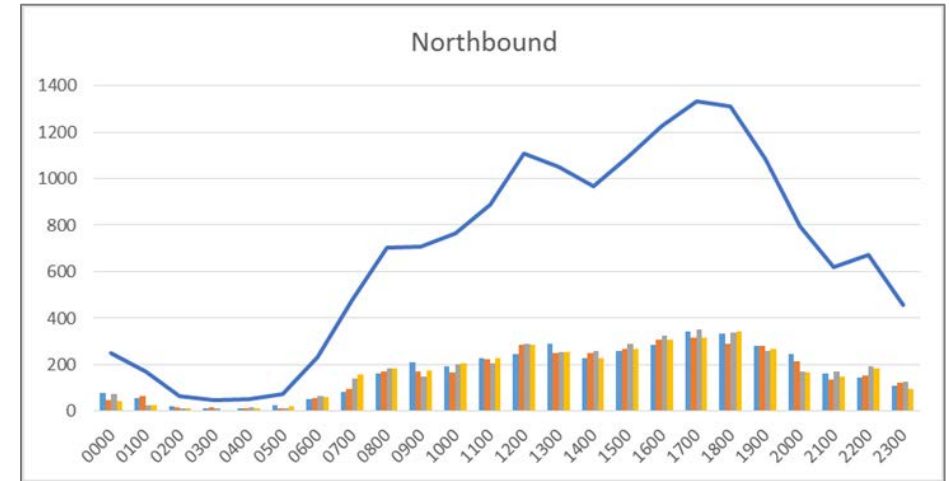
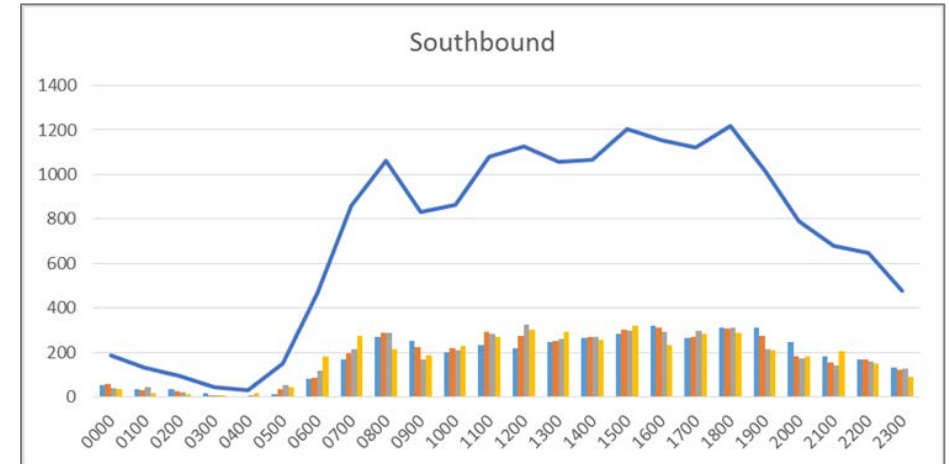


Figure 1.3-6: A1A Southbound South of Sunrise Boulevard





As shown in Figures 1.3-7 and 1.3-8, southbound A1A traffic is more typical of rush hour, with peaks in the morning and afternoon and a drop in traffic during the day, although minor. Northbound traffic is more consistent with other corridors in the study area.

Figure 1.3-7: A1A Southbound South of Las Olas Boulevard

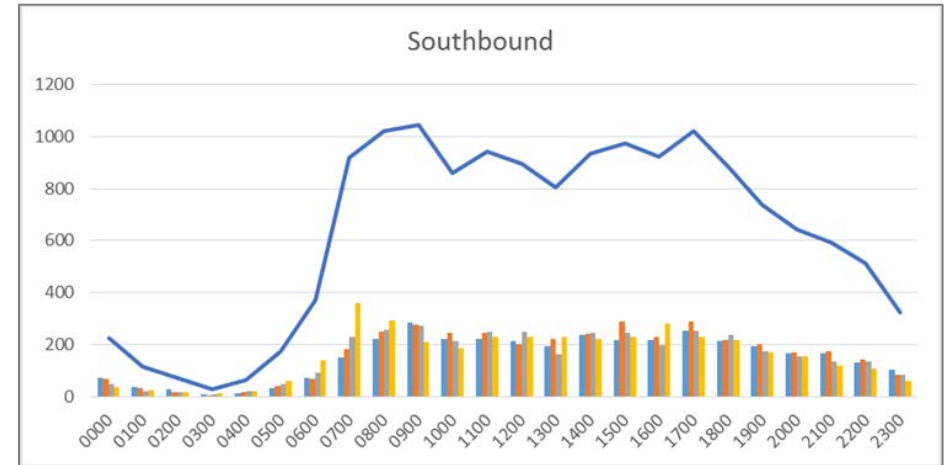
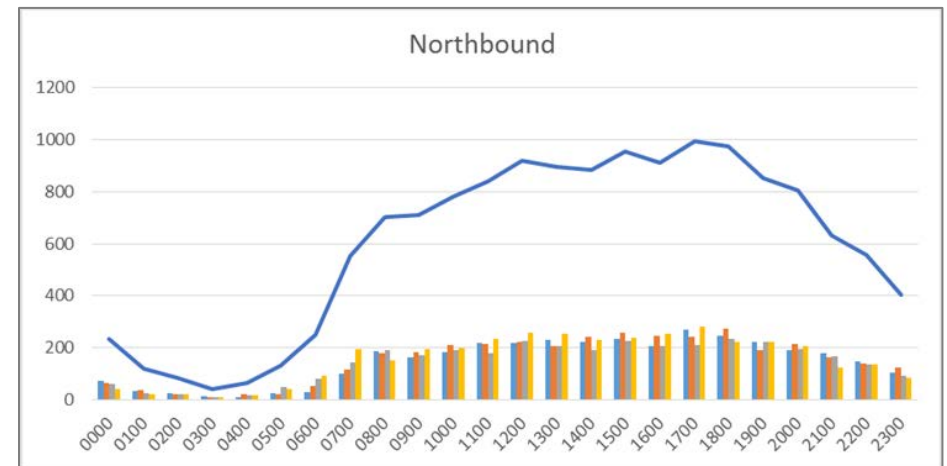


Figure 1.3-8: A1A Northbound South of Las Olas Boulevard





As shown in Figure 1.3-9 and 1.3-10, this section of A1A has a consistent traffic volume throughout the day, with a slight peak 5:00–7:00 PM in both directions.

Figure 1.3-9: A1A Southbound North of Las Olas Boulevard

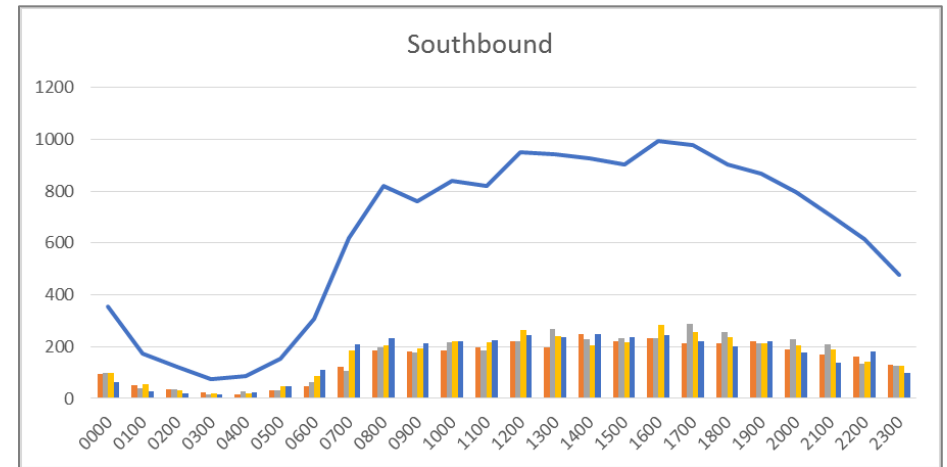
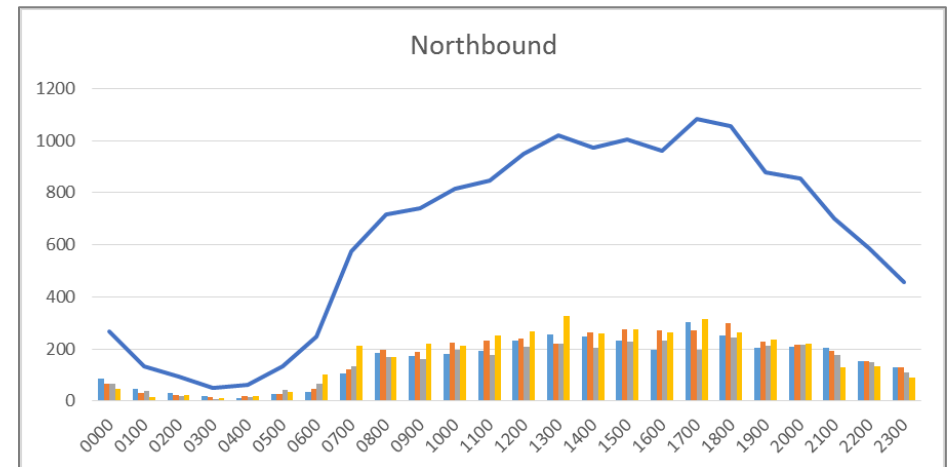


Figure 1.3-10: A1A Northbound North of Las Olas Boulevard





Figures 1.3-11 and 1.3-12 display traffic volumes north of Sunrise Boulevard on A1A. The movements are more typical of morning and evening rush hours with a directional flow.

Figure 1.3-11: A1A Northbound South of Sunrise Boulevard

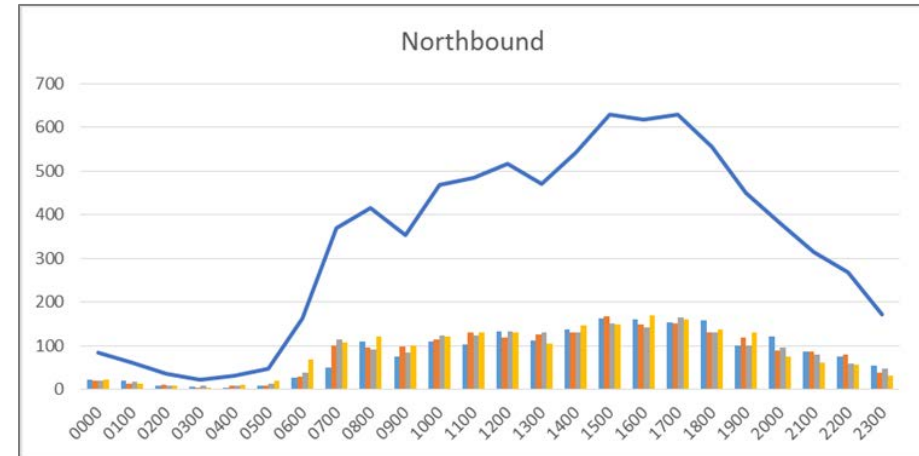
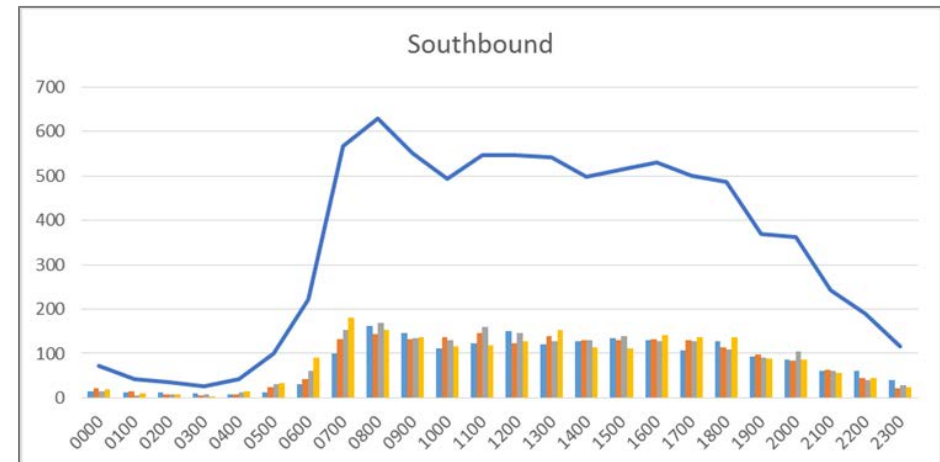


Figure 1.3-12: A1A Southbound South of Sunrise Boulevard





Figures 1.3-13 and 1.3-14 display traffic volumes for Sunrise Boulevard west of A1A. The movements are similarly spread out throughout the day, with slight directional peaks eastbound in the evening and westbound around noon.

Figure 1.3-13: Sunrise Boulevard Eastbound West of A1A

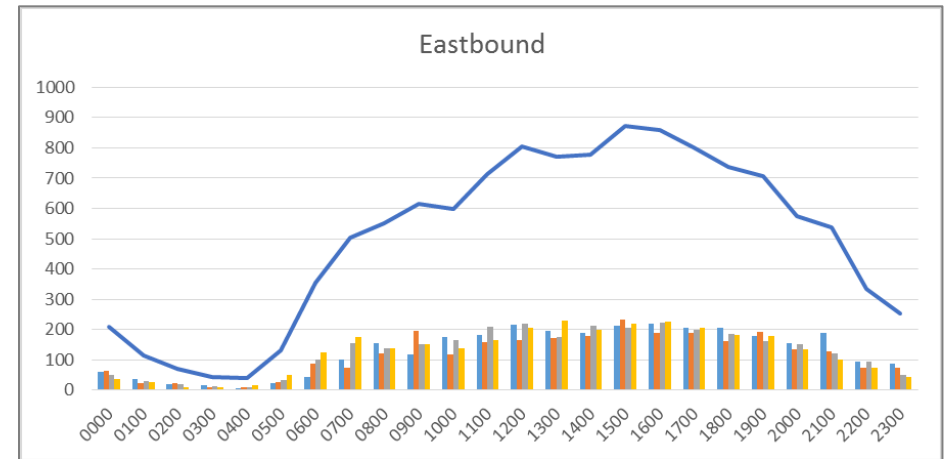
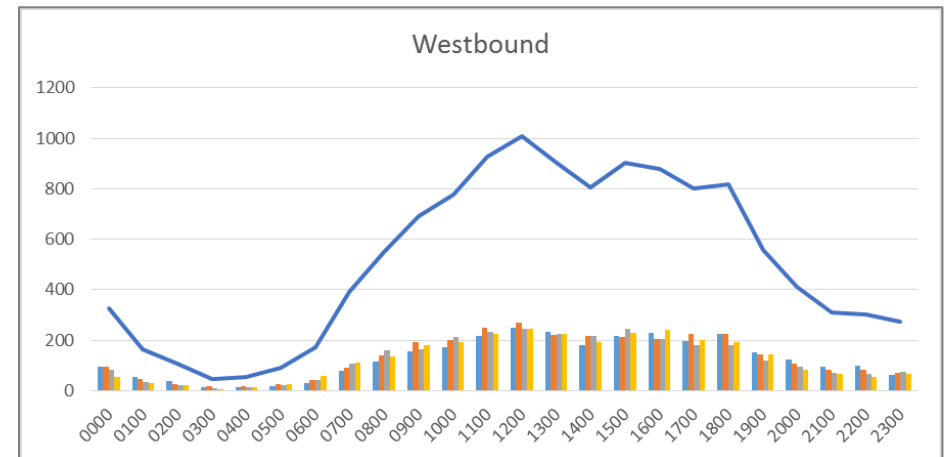


Figure 1.3-14: Sunrise Boulevard Westbound East of A1A





1.4 Bicycle Network Gaps and Mobility Barriers

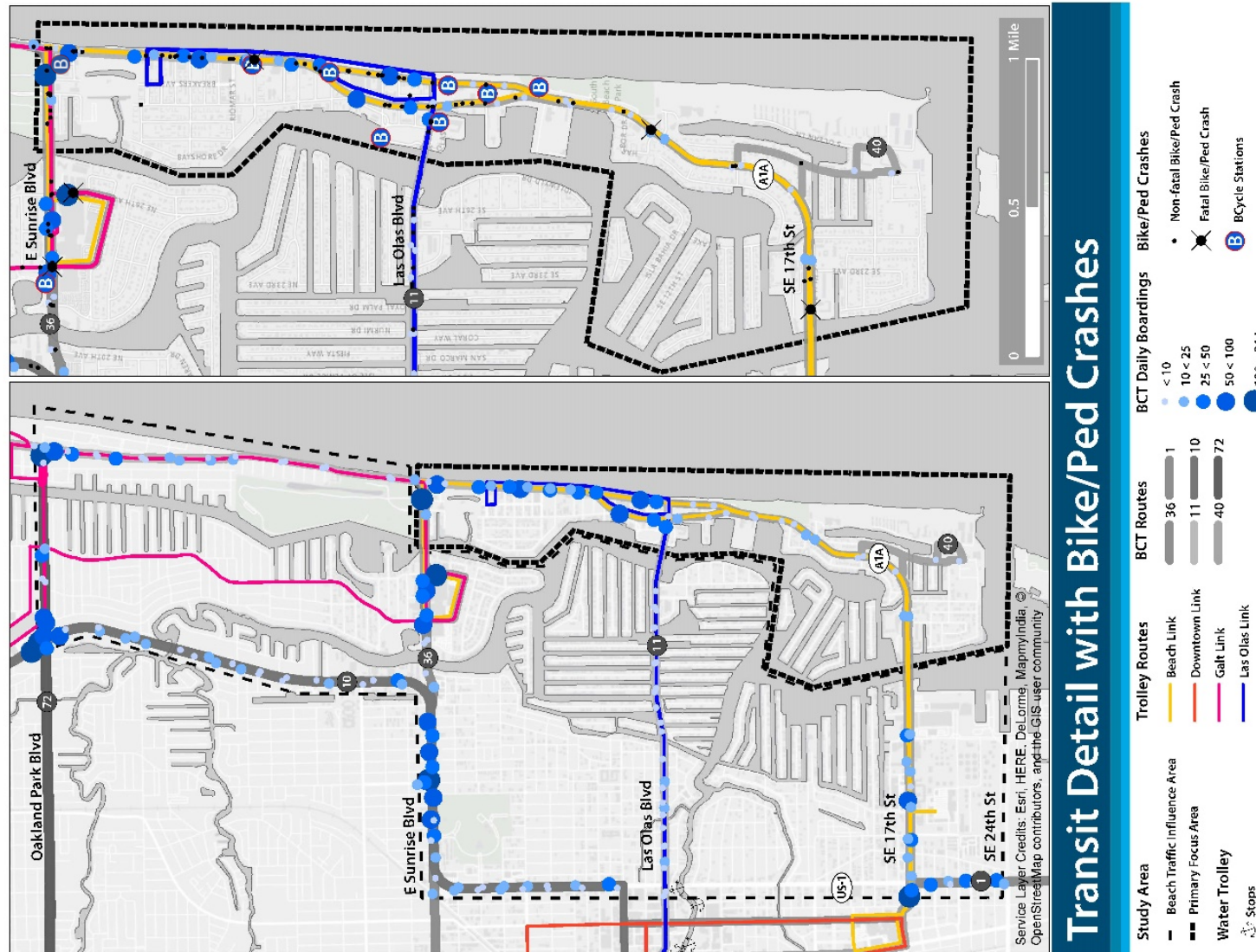
To enhance overall mobility, it is necessary to assess non-motorized transportation mobility with an analysis of network gaps in the existing system. This section documents the existing gaps and related barriers associated with the bicycle and pedestrian network. For context, Map 1.4-1 displays bicycle and pedestrian crash data with transit and B-Cycle Stations in the study area.

Key findings include the following:

- There are many unmarked crosswalks from at-grade sidewalks off of the main arterials in the study area. Space is not clearly defined for pedestrians and often is blocked by parked vehicles.
 - There are no contraflow bicycle facilities on one-way sections of A1A, which can lead to pedestrian-bicycle conflicts on sidewalks.
 - Narrow and/or obstructed sidewalks on the ocean side, mixed with low light levels, create unsafe conditions.
 - Transitions between bike lanes and shared lanes may be seen as barriers to utilization.
 - Bike lanes and adjacent sidewalks often are blocked by taxis, Uber/Lyft, construction, delivery, and maintenance vehicles that create hazardous conditions and disrupt motorized and non-motorized traffic flow.
- Sidewalks often are obstructed by outdoor seating encroaching into public space. This also can lead to conflicts, with contraflow bicyclists using sidewalk space on the west side of A1A.
 - B-Cycle Station gaps may create a barrier to utilization in the following areas:
 - Fort Lauderdale Beach Park and Convention Center
 - Between Las Olas Boulevard and Sebastian Street
 - The “Sunrise and Ocean Station” at Sunrise Boulevard and A1A



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Source: City of Fort Lauderdale, Broward County Transit, FDOT



The following bicycle and pedestrian gap descriptions are used in Figures 1.4-1 through 1.4-5. These represent an inventory of gaps in the network and not recommendations or prioritization of locations to be addressed. Gated communities were not included.

- *Sidewalk Gaps* – sections of roadway that are missing sidewalks on one or both sides of the roadway. Insufficient sidewalks are identified in later sections and are not included in the inventory.
- *No Marked Crosswalks* – intersections without any marked crossings. Some intersections that do not have crossings on each leg of the intersection are addressed in later sections.
- *Existing Shared Lanes* – roadways marked with “sharrows.”
- *Bike Facility Gap* – no marked bicycle facility present. Not all bike gaps are displayed, particularly those in the residential neighborhoods. Focus was to identify likely connectors.

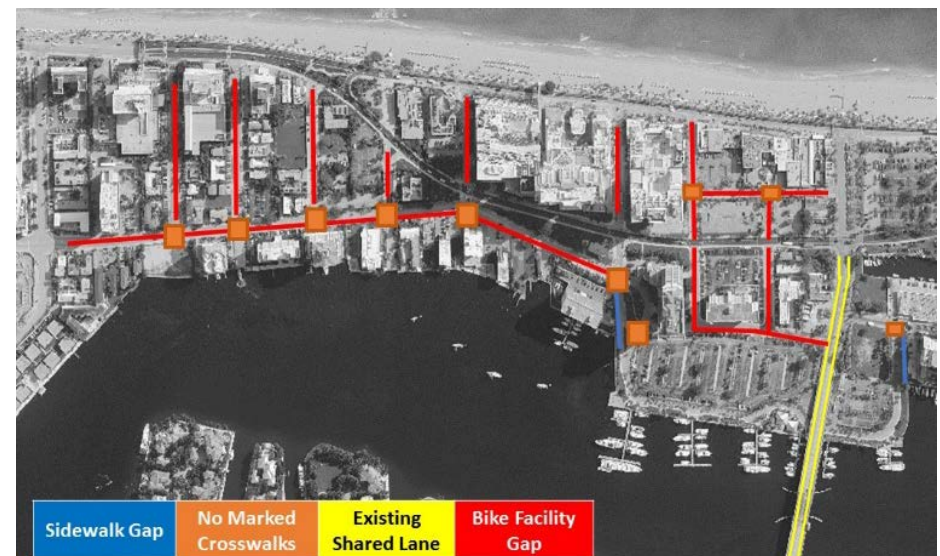
Study Area Sections 1 and 2

Issues: Lack of defined space for pedestrians and cyclists exists throughout much of sections 1 and 2. Although sidewalks are provided along most roadways in these areas, cars often park on the sidewalks where there is continuous dropped curb. Most intersections do not include crosswalk markings.

Figure 1.4-1: Section 1 – Bayshore Drive to Sunrise Boulevard



Figure 1.4-2: Section 2 – Las Olas Boulevard to Bayshore Drive





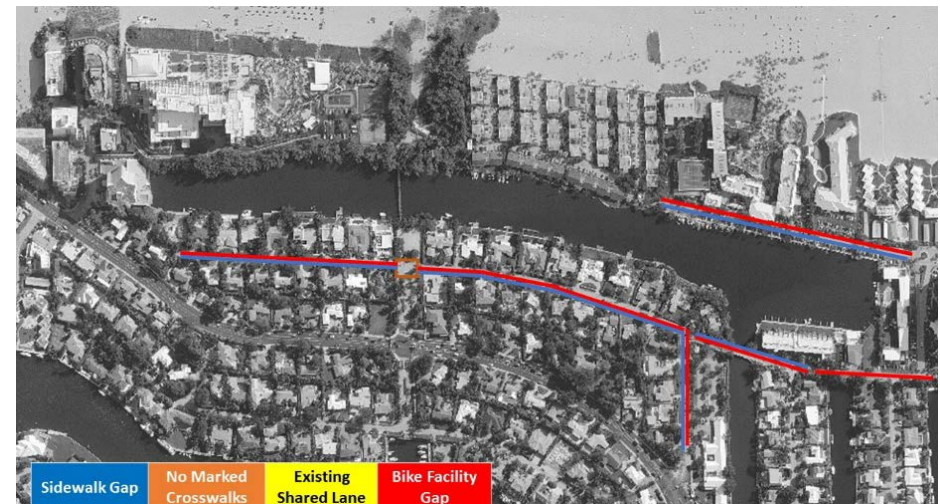
Study Area Sections 3 and 4

Issues: Some sidewalk gaps are present, particularly in residential areas. Bike facilities transition to and from shared lane markings in this section of A1A. Single-family residential streets not included in inventory.

Figure 1.4-3: Section 3 – Holiday Drive to Las Olas Boulevard



Figure 1.4-4: Section 4 – Barbara Drive to Holiday Drive





Study Area Section 5

Issues: Some sidewalk gaps are present, particularly in residential areas with limited right-of-way. Bike facilities transition to and from shared lane markings in this section of A1A and SE 17th Street. Roundabouts in section 5 have no marked crosswalks where sidewalks are present.

Figure 1.4-5: Section 5 – Intracoastal Waterway to Mayan Drive





1.5 Transit Routing and Ridership Focus Areas

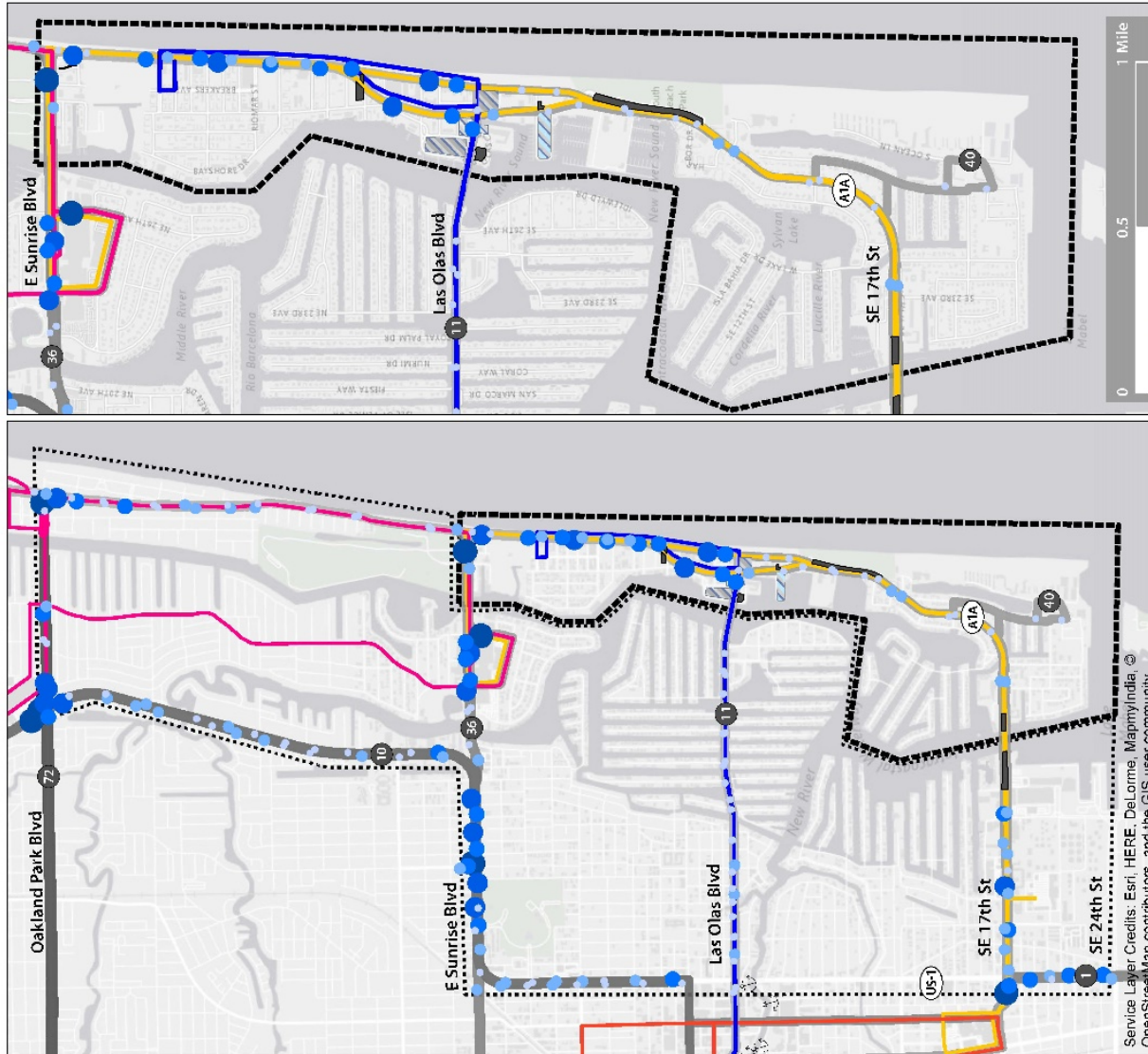
This section documents the existing transit routes, ridership, and areas of focus in the study area. A critical component of this mobility study is understanding what transit is available and how it is being used by the existing community. Table 1.5-1 shows the transit service detail in the study area that is displayed in Map 1.5-1. Fares vary by service. BCT routes are \$2.00 one-way and \$5.00 for an all-day pass, the Beach and Las Olas Sun Trolleys are \$1.00 for a single ride and \$3.00 all-day, and the other Sun Trolleys are free to ride.

Key findings include the following:

- Transit trips from the airport require transfer to reach the barrier island. No luggage larger than a backpack is permitted.
- Primary BCT boarding activity occurs north of Las Olas Boulevard on A1A and on Sunrise Boulevard.
- Ridership and bicycle/pedestrian crash activity are similarly clustered. This often is due to both visitors and workers accessing these locations by foot, bicycle, and/or transit.
- Trolley schedules are inconsistent and do not operate into the evening hours, which can create confusion.
- BCT has clearly-defined stops. Sun Trolley uses a flag-down service with no physical stops, which may cause confusion for potential users.

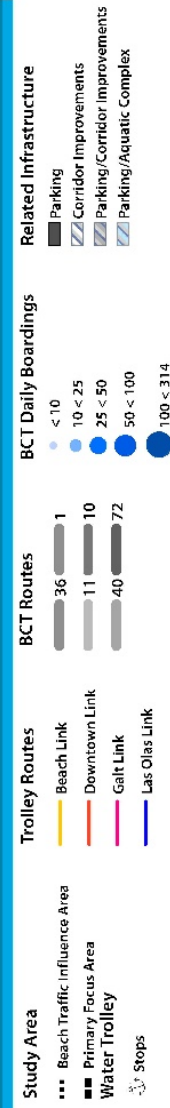
Table 1.5-1: Transit Routes and Frequencies

Route/ Trolley	Peak Weekday Frequency	Saturday Peak Frequency	Sunday Peak Frequency
BCT 11	20/30	-	-
BCT 40	20	30	30
BCT 36	20	20	30
Beach	7-day continuous loop (9:30am–6:30pm)		
Las Olas	Fri/Sat/Sun/Mon continuous loop (9:30am–6:30pm)		
Downtown	15–20	-	-
Galt	Temporarily Suspended until May 2019		
Neighborhood	(8:15am–2:30pm)	-	-
Airport	-	60	60



Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, ©
OpenStreetMap contributors, and the GIS user community

Transit Detail and Parking





1.6 Development Density/Intensity, Activity Centers, and Planned Development

This section documents the development currently underway, approved, and under review within the study area. Based on data tracked by the City of Fort Lauderdale and the Broward County Planning Council as part of the Central Beach Regional Activity Center (RAC), the total quantities of net new development (new construction less demolished buildings) are shown in Table 1.6-1.

Key findings include the following:

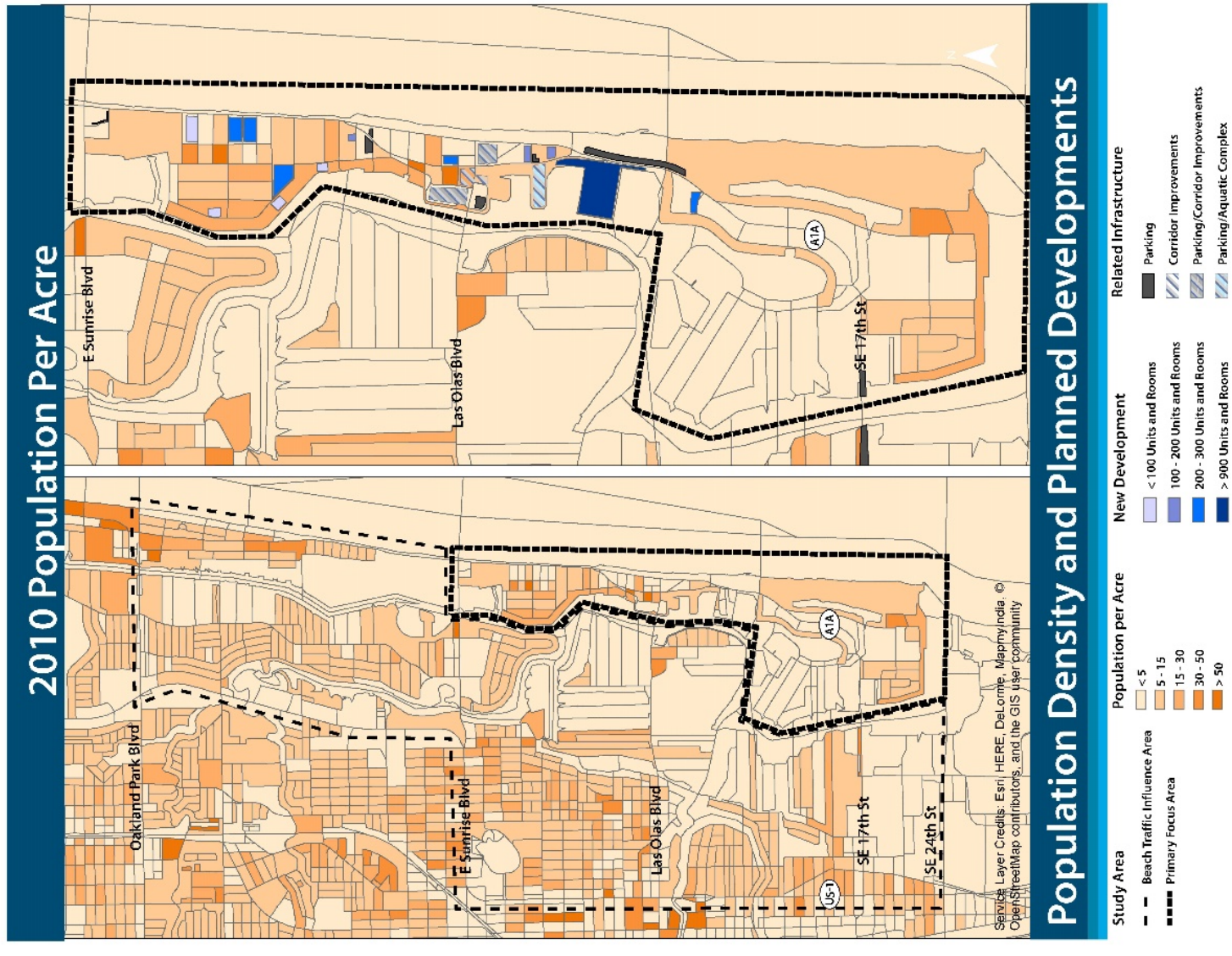
- The Beach Regional Activity Center is located on the barrier island between Sunrise Boulevard and Harbor Drive. As of April 5, 2018, total net new built, approved, and pending development, including Bahia Mar, in the Beach Regional Activity Center is expected to generate 3,088 new peak hour trips. Of the total new trips being tracked in the Beach Regional Activity Center, approximately half (1,524) are already constructed and accounted for in recent traffic count/level-of-service data. Nonetheless, greater availability of alternative travel modes is critical to help manage traffic generated by existing, approved, and pending development.
- Planned developments are clustered in areas with higher density and existing transit services.
- The entire study area serves as a regional activity center, with many smaller points of interest within it, highlighting the need for local circulation with more regional connectivity.

Table 1.6-1: Development Details

Land Use	Units	Built, Under Construction or Approved	Under Review	Total
Condominium	each	1,043	407	1,450
Hotel	room	2,173	205	2,378
Super Market	sq.ft.	28,342		28,342
Retail	sq.ft.	212,753	2,010	214,763
Restaurant	sq.ft.	94,561	36,445	131,006



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Source: City of Fort Lauderdale, U.S. Census Bureau



1.7 Pending Infrastructure Projects

Several important infrastructure projects are underway within the Central Beach area which will influence mobility within the study area. These include:

- **SR-A1A Streetscape Improvements:** The City is investing in reconstruction of the sidewalks along the northbound segment of SR-A1A from the South Beach Parking Lot to Alhambra Street. A key aspect of this project is removing/relocating palm trees planted within the sidewalk area and planting new trees in a single line closer to the curb of SR-A1A. This will make for a more organized walking environment and could also allow low-speed, recreational cyclists, to more safely share the sidewalk area with pedestrians.
- **Las Olas Streetscape Project:** Las Olas Boulevard from Seabreeze Boulevard to SR-A1A will be reconstructed as a “festival street” with wide sidewalks and traffic calming streetscape features.
- **Las Olas North Parking Garage:** Part of the space currently occupied by a surface parking north of Las Olas Boulevard along the Intracoastal Waterway is being converted into a 660 space parking garage with event space. The Las Olas North Parking Garage will be completed prior to the conversion of the Las Olas beach parking area to an Oceanfront Park (discussed below).

- **Oceanfront and Intracoastal Waterway Parks:** The area currently occupied by the 251 space beach parking area south of Las Olas Boulevard between Seabreeze Boulevard and SR-A1A is being converted into an Oceanfront Park. Among other features, this will incorporate a pick up/drop-off area which can help mitigate impacts from ridesharing services to the busy intersection of Las Olas Boulevard and SR-A1A. The 90 space surface parking area along the Intracoastal Waterway South of Las Olas Boulevard will also be converted into a greenspace.
- **Marina Expansion:** 237 parking spaces remaining in the surface parking along the Intracoastal Waterway to the north of the new Las Olas North parking garage is planned to be converted to an expanded marina north of Las Olas Boulevard.

Table 1.7-1 summarizes the impact of these projects on the city’s public parking supply in the Las Olas Corridor. At the end of Phase I, which includes the new garage and parks spaces, there is a net gain of 67 spaces. After Phase II, which incorporates expansion of the marina, there is a net loss of 164 spaces.



Table 1.7-1: Parking Impacts of Las Olas Corridor Projects

	Pre-Project		Phase I		Phase II	
	Surface	Garage	Surface	Garage	Surface	Garage
Beach Parking/Oceanfront Park Area	251					
Intracoastal Waterway North Parking	494		237	660		
Intracoastal Waterway South Parking	90		5			
Subtotals	835		242	660	5	660
Total	835		902		665	
Net Total	N/A		+67		(164)	



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1.8 Phase Two Data Needs

Based on the review of existing conditions, the following data are expected to be necessary to identify, evaluate, and prioritize mobility solutions for the Fort Lauderdale Beach area:

- **Ridesharing company data:** Focus groups comments and field observations indicate that ridesharing (e.g., Uber, Lyft, etc.) has grown in popularity as a means to access the beach study area as well as to circulate within it. However, drivers picking up and dropping off passengers along thoroughfare roadways can create congestion issues by stopping traffic and also may lead to safety issues in terms of motor vehicle-to-vehicle crash risks (rear-end and sideswipe crashes) and vehicle-pedestrian risks for passengers crossing to/from the ridesharing vehicle and/or drivers helping with luggage, etc. Data that show high activity pick-up and drop-off areas will help the study team identify pick-up/drop-off zones that can improve safety and mobility along the beach but also respond to the needs of the rideshare company drivers. In addition to reducing crash risks, this may help drivers identify passengers for more efficient pick-ups.
- **Roadway typical section and right-of-way data:** Preliminary analysis suggests that protected/low-stress bicycle facilities are needed in the beach area, and alternatives are necessary where the marked bike lane along A1A is missing between Harbor Drive and the beginning of the one-way section at the northern end of "Beach Park."
- **Parking utilization data:** Parking data will help to understand needs for wayfinding and also indicate whether spaces could be sacrificed for other mobility needs such as pick-up/drop-off areas or non-motorized facilities. Parking data also can help indicate where multimodal improvements are needed.
- **Water taxi trip data:** The Fort Lauderdale Water Taxi connects Downtown, the Convention Center, and three locations within the study area (Bahia Mar, Birch State Park, and the Galleria Mall). Water taxi ridership data may help clarify the extent to which the water taxi (or similar services) could help take automobile trips off the bridges or A1A and also indicate where multimodal improvements are needed.
- **Sun Trolley ridership and operating data:** Available data showing Sun Trolley ridership by link and also boarding/alighting data by segment or major destination can help inform recommendations to enhance this service. In addition, operating data that includes service cost per revenue hour will assist in evaluating service efficiency of Sun Trolley relative to BCT fixed-route service.



Section 2: Multimodal Strategies

This Technical Appendix provides an overview of the refinement of preliminary strategies developed throughout Phase I of the project and the feedback from the Needs Assessment.

The following sections are included:

- Section 2-1: Traffic Improvements
 - Intersection of Sunrise Boulevard at SR A1A
 - FDOT TSM&O Projects
 - Speed Management
 - Pick-up/Drop-off Restrictions along SR A1A
- Section 2-2: Bicycle and Pedestrian Improvements
 - Pedestrian Improvements
 - Bicycle Improvements
- Section 2-3: Transit Improvements
 - Sun Trolley Enhancements
 - On-Demand, Low-Speed Vehicle Service
 - Water Taxi
- Section 2-4: Parking, Wayfinding and Technology



2.1 Traffic Improvements

2.1.1 Sunrise Boulevard at SR A1A

Based on the project needs assessment, this location was identified for potential traffic operational improvements as well as geometric and sign and pavement marking improvements to improve non-motorized mobility and safety. Key issues at this location as denoted in Figure 2.1-1 are as follows:

1. **Eastbound right turn operation:** This movement is signed “RIGHT TURN ON RED RIGHT LANE ONLY.” Field observation also indicated that the signal does not operate in an “overlap” mode to allow the eastbound right turn and northbound left movements to operate concurrently. Some drivers in the inside right turn lane became impatient, and honked their horns because drivers ahead of them would not disregard the inside lane right-turn-on-red prohibition. Drivers in the outside right turn lane were observed not making right-turns-on-red when available gaps were present—presumably having misunderstood the partial right-turn-on-red prohibition.

There are also very long queues in the outside lane of Sunrise Boulevard approaching SR A1A and some drivers will remain in the center eastbound lane and then merge into the right turn lane cutting off other drivers.

2. **Southbound right turn pedestrian crossing alignment and geometry:** This right turn movement uses a right turn channel with a very large radius and has a free-flow approach onto westbound Sunrise Boulevard that can contribute to high-speed motor vehicle movements. The alignment of the crosswalk, at the northernmost end of the right turn island requires significant out-of-direction travel for pedestrians crossing from the beach or the south leg of the intersection towards the westbound side of Sunrise Boulevard.
3. **Eastbound bike lane transition:** To access the bike lane “keyhole,” eastbound cyclists must navigate across the outside lane of eastbound Sunrise Boulevard which “drops” into the eastbound right turn lanes. Cyclists wishing to turn right from eastbound Sunrise Boulevard onto southbound SR A1A must travel from Birch Street to SR A1A sharing the right turn lane with motor vehicle traffic.
4. **Northbound to westbound bike lane:** Cyclists must merge across 2-lanes of northbound SR A1A to access the left turn lane to travel west on Sunrise Boulevard.
5. **Southbound delay:** Southbound queues along SR A1A in the single southbound lane to the north of Sunrise Boulevard extend past the southbound to westbound right turn lane contributing to driver frustration at this intersection.



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Figure 2.1-1: Sunrise Boulevard at SR A1A Issues





Potential solutions to address these issues are illustrated in Figure 2.1-2 and discussed below:

1. **Request FDOT District 4 perform an operational analysis and consider changes to the intersection geometry to address queuing and delay issues:**
 - a. Consider modifying the eastbound approach so that the dual left turn lanes are served by the single inside lane and the center and right-most lanes each serve one of the eastbound right turn lanes. This will help to balance approach volumes against turn lane storage capacity and help to eliminate the long queue in the outside lane.
 - b. Correct crosswalk alignment and prohibit right-turn-on-red. Operate the eastbound right turn movements in “overlap” phasing with the northbound left turn movement to increase capacity through this intersection.
2. **Modify southbound right turn geometry:** Currently, the single southbound lane to the north of Sunrise Boulevard transitions into a southbound right turn only lane and a southbound thru lane. Southbound thru queues currently block access to the right turn lane contributing to driver frustration. The current geometry of the southbound right turn lane creates a high-speed, free-flow condition that is adverse to pedestrians and cyclists.

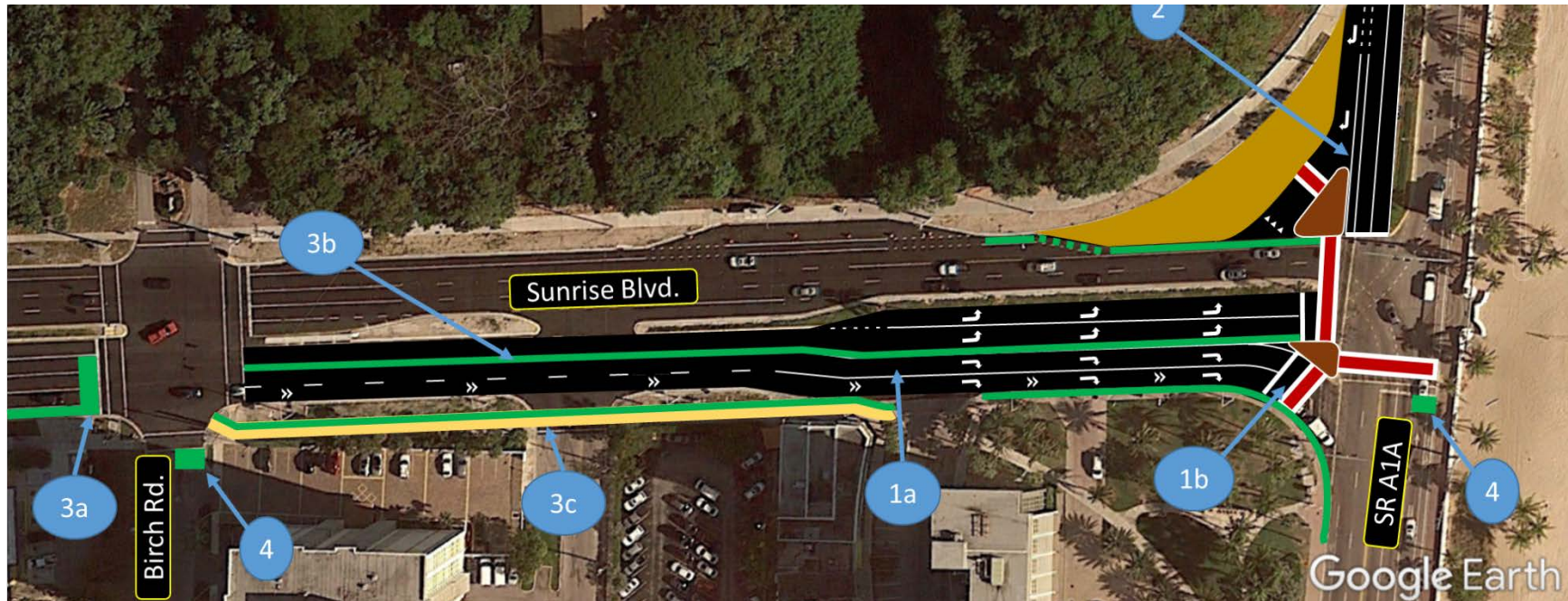
Consider converting the southbound right turn only lane to a 2nd thru lane and developing a short right turn lane immediately prior to Sunrise Boulevard by modifying the large right turn channel. This will reduce turning speeds and reduce out-of-direction travel for pedestrians.

3. **Provide eastbound bicycle enhancements:**
 - a. Consider providing a bike box at Birch Road so that cyclists seeking to travel north on SR A1A can more easily access the bike lane “key-hole.”
 - b. Provide green bike lane markings for the “key-hole” lane.
 - c. Widen the sidewalk and allow for directional bike travel from Birch Street to SR A1A. Provide a ramp to re-enter the southbound bike lane just beyond the radius return. Provide shared lane arrow markings in the outside lane for cyclists who choose not to use the side path facility.
4. **Northbound left turn bike lane treatments:** Provide northbound to westbound “bike box” and green bike lane markings to help cyclists navigate the intersection. Also provide a bike box on northbound Birch Road at Sunrise Boulevard to help cyclists access Birch State Park.



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Figure 2.1-2: Proposed Improvements for Sunrise Boulevard at SR A1A





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2.1.2 FDOT Arterial Traffic Management System Project

FDOT District 4 has programmed an Arterial Traffic Management Systems deployment project along SE 17th Street/SR A1A from Federal Highway to Sunrise Boulevard. This project also includes portions of Las Olas Boulevard from west of the Intracoastal Waterway to SR A1A and Sunrise Boulevard from the western intersection with Federal Highway to SR A1A.

The project will be designed in FY20 and will be constructed in FY23 and includes the following elements:

- Real-time traffic sensors to evaluate traffic conditions within the project area.
- Interconnected traffic signal system to increase traffic efficiency AND enable off-peak traffic signal timing strategies to enhance pedestrian connectivity and help manage traffic speeds
- Interconnection of traffic signals and draw bridge opening

2.1.3 Speed Management

Traffic data collected by the City of Fort Lauderdale Department of Transportation and Mobility indicates speeding concerns along SR A1A from Harbour Inlet Drive to Holiday Drive as well as along the one-way segment of southbound SR A1A south of NE 9th Street. When average traffic speeds exceed the posted speed limit, the ability of law enforcement to correct the condition is limited and changes to the roadway geometry and roadside environment are necessary to provide drivers with cues that make it less comfortable to travel at higher speeds.

Strategies that decrease drivers' perception of safety without actually increasing their crash risk are preferred. Examples include narrowing the roadway cross section, introducing landscaped shoulders and median features, increasing signal density (consistent with Manual of Uniform Traffic Control Devices [MUTCD] warranting criteria), and introducing land use features that convey an "urban" environment.

Potential strategies for both problem segments include the following:

- Narrow roadway pavement area by converting separate bike lane and sidewalk facilities into a single shared use side-path facility.
- Ensure signal timing plans progress traffic at or below the posted speed and consider strategies to reduce signal cycle lengths to discourage speeding.

Additionally, along the segment of SR A1A from Harbour Inlet Drive to Holiday Drive, consider, providing raised, landscaped median islands where possible to do so without adversely impacting access to private driveways and intersecting streets.



2.1.4 SR A1A Pick-Up/Drop-Off Restrictions

During field review pick-up and drop-off activity by ridesharing companies (e.g. Uber, Lyft) were observed along SR A1A and along the north side of Las Olas Boulevard adjacent to the intersection of Beach Drive. This activity blocks the bicycle lane—a potential safety issue for cyclists—and also creates friction for automobile travel. Passenger drop-off along SR A1A may also contribute to pedestrians crossing away from crosswalks to access the beach or businesses along the beach.

Under Florida Statute, 316.1945(1)(a)10, when prohibited by a traffic control device, it is unlawful to stop along a roadway except when necessary to avoid conflict with other traffic, or in compliance with law or the directions of a police officer or official traffic control device (e.g. traffic signal). Within the MUTCD, sign R8-5 can be used to designate areas where stopping is prohibited. It is recommended that these are used along SR A1A to restrict pick-up and drop-off activity to designated bays, local side-streets, private driveways, and commercial and public parking areas.



R8-5 Sign

South of the one-way pair system and along the southbound (Seabreeze Boulevard) portion of the one-way pair system, SR A1A is either residential in character or has ample business parking areas at which pick-up and drop-off activities can occur. Southbound traffic along SR A1A from Sunrise Boulevard to the one-way pair system can generally make a right turn onto local streets to facilitate pick-up and drop-off activity.

Northbound along SR A1A, there are existing bays for passenger pick-up and drop-off at the following locations:

- North of SE 5th Street
- North of Cortez Street
- North of Granada Street
- North of Terramar Street

Each of these bays is reasonably close to existing signalized or unsignalized crosswalks and, in some cases, also near to pedestrian bridges. Signage should be provided directing pedestrians to the nearest crossing option. In addition to these passenger bays, a pick-up/drop-off area will be constructed as part of the Las Olas Beach Park project immediately south of Las Olas Boulevard.

To ensure that the walking distance to the nearest pick-up/drop-off bay is less than a 2 – 3 minute walk (about 1/8th mile), consideration should be given to adding additional bays in the vicinity of Alahambra Street, Riomar Street, and between Vistamar and NE 9th Street. The cost of constructing a new pick-up/drop of bay is estimated to range from \$50 – 100k. A new mid-block crossing should be considered to serve the proposed bay between Vistamar Street and NE 9th Street which could cost an additional \$50k.

Prior to installation of “No Stopping” signs, the City should coordinate with taxi and ridesourcing companies to alert them to the designation of pick-up/drop-off zones and provide an opportunity for these companies to update mobile applications and/or dispatching procedures to reflect the zone system. At the City’s discretion, it may be appropriate to provide a warning period prior to issuing citations/fines for stopping along the travel lanes.



2.2 Pedestrian Improvements

Pedestrian mobility and safety are critical to circulation within the beach area and is also necessary for using existing and potential transit services. The following four main focus areas for enhancing pedestrian infrastructure are discussed in this section:

- Consistent design of unsignalized intersection and mid-block pedestrian crossings
- Sign, pavement marking, and lighting improvements at all signalized intersections
- Specific intersection improvements
- Completing missing sidewalks and other sidewalk improvements

2.2.1 Consistent design of mid-block and unsignalized pedestrian crossings

Consistency in signs, pavement markings, and traffic control devices is important for achieving appropriate driver behaviors. Table 2-1 summarizes the marked crosswalks along SR A1A/Seabreeze Boulevard at mid-block and unsignalized intersection locations and with the type of infrastructure at each. This table illustrates an overall lack of consistency in crosswalk design including a mixture of pavement marking types and lack of consistency in supplemented with warning devices.

Use of pedestrian-actuated warning beacons, pedestrian hybrid beacons, or pedestrian traffic signals substantially increase driver compliance at unsignalized crosswalks and are recommended for multilane crossings when speeds are 40mph or greater and two-way traffic volumes exceed 15,000 average daily trips.

Additionally, advance stop bars or yield lines are a recommended best practices to help avoid “multiple-threat” crashes for crosswalks that span more than one uncontrolled lane.

Table 2.2-1: SR A1A Crosswalk Inventory

Location	Control	Markings
SR A1A., South of Harbor Dr.	Signalized	High-Emphasis Ladder
Beach Blvd., North of Seabreeze Blvd.	Unsignalized	Textured Pavement*
Beach Blvd., North of SE 5 th St.	In-Pavement Beacons	High-Emphasis Ladder*
Beach Blvd., Poinsettia St.	Unsignalized	High-Emphasis Ladder*
Beach Blvd., Cortez St.	Unsignalized	Textured Pavement*
Beach Blvd., North of Cortez St.	In-Pavement Beacons	High-Emphasis Ladder*
Beach Blvd., Castillo St.	Unsignalized	Textured Pavement*
Beach Blvd., Sebastian St.	Signalized	Textured Pavement
SR A1A, Alahambra St.	Unsignalized	High-Emphasis Ladder*
SR A1A, Seville St.	In-Pavement Beacons	High-Emphasis Ladder*
SR A1A, Granada St.	In-Pavement Beacons	High-Emphasis Ladder*
SR A1A, Viramar St.	In-Pavement Beacons	High-Emphasis Ladder*
SR A1A, Windamar St.	In-Pavement Beacons	High-Emphasis Ladder*
SR A1A, Auramar St.	In-Pavement Beacons	High-Emphasis Ladder*
SR A1A, Belmar St.	In-Pavement Beacons	High-Emphasis Ladder*
Seabreeze Blvd., Sebastian St.	Signalized	High-Emphasis Ladder
Seabreeze Blvd., Castillo St.	Unsignalized	Textured Pavement*
Seabreeze Blvd., Poinsettia St.	Unsignalized	Transverse Lines Only*
Seabreeze Blvd., Banyan St.	Unsignalized	Transverse Lines Only*
Seabreeze Blvd., SE 5 th St.	Unsignalized	Transverse Lines Only*
Seabreeze Blvd., North of SR A1A	Unsignalized	High-Emphasis Ladder*



Recommended strategies to improve the effectiveness and consistency of crosswalks in the beach study area include the following:

- **Provide advance stop bars:** Florida law allows for stop bars and accompanying “Stop Here for Pedestrians” signs to be placed 30-40ft in advance of crosswalks at unsignalized or mid-block locations. This should be done throughout the study area.
- **Standardize crosswalk markings:** The preferred standard marking is the high-emphasis “ladder” style crosswalk; however, colored/textured crosswalks are acceptable provided that they are bordered by white, thermoplastic lateral lines.
- **Standardize unsignalized crosswalk warning devices:** Due to their well-documented high compliance rates, pedestrian-actuated Rectangular Rapid Flashing Beacons (RRFBs) are a proven warning device for unsignalized crosswalks along four-lane divided roadways. However, consistent application of pedestrian-actuated in-pavement lighting systems is an acceptable alternative, especially along lower-speed roadways and this method is already in use at 8 of 21 crossings along the SR A1A/Seabreeze Boulevard corridor. Either method should be used consistently for all unsignalized multi-lane crossings throughout the study area.
- **Evaluate lighting and enhance as necessary:** Crosswalk lighting should meet the standards established in Table 231.2.1 of the FDOT Florida Design Manual (FDM). Typically this means that a luminaire must be placed slightly in advance of the crosswalk for each approach.

Figure 2.2-1: Advance Stop Bar Concept

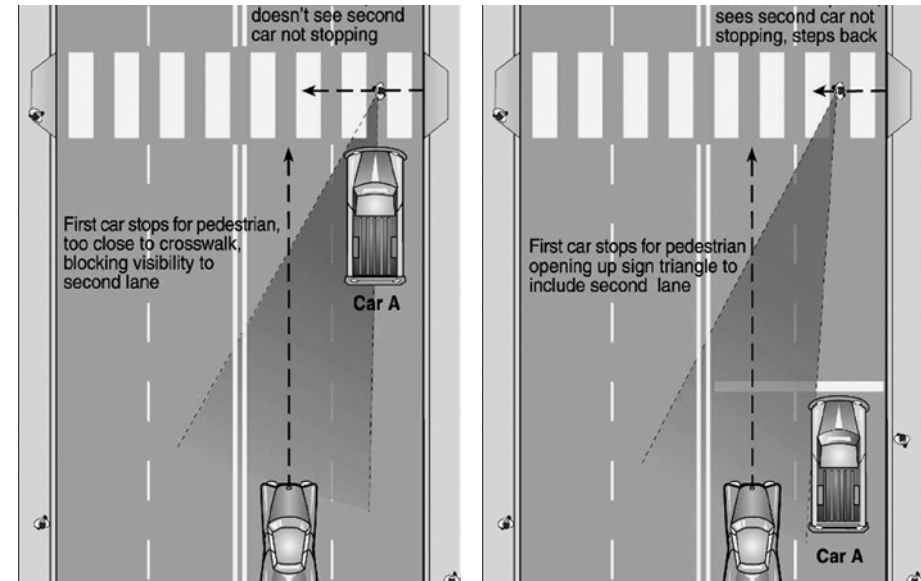
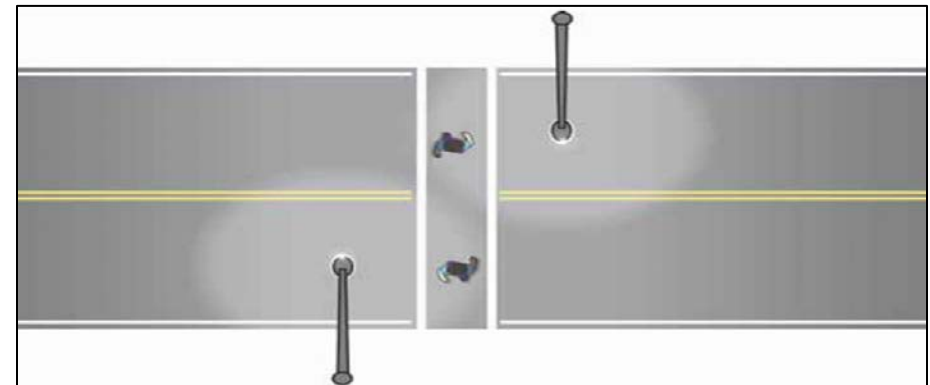


Figure 2.2-2: Preferred Crosswalk Lighting Position





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2.2.2 Sign, pavement marking, and lighting improvements at all signalized intersections

Similar to unsignalized and mid-block crosswalks, pedestrian features at signalized intersections should be consistent and conform to best-design practices. The following are recommended for each signalized intersection within the Study Area:

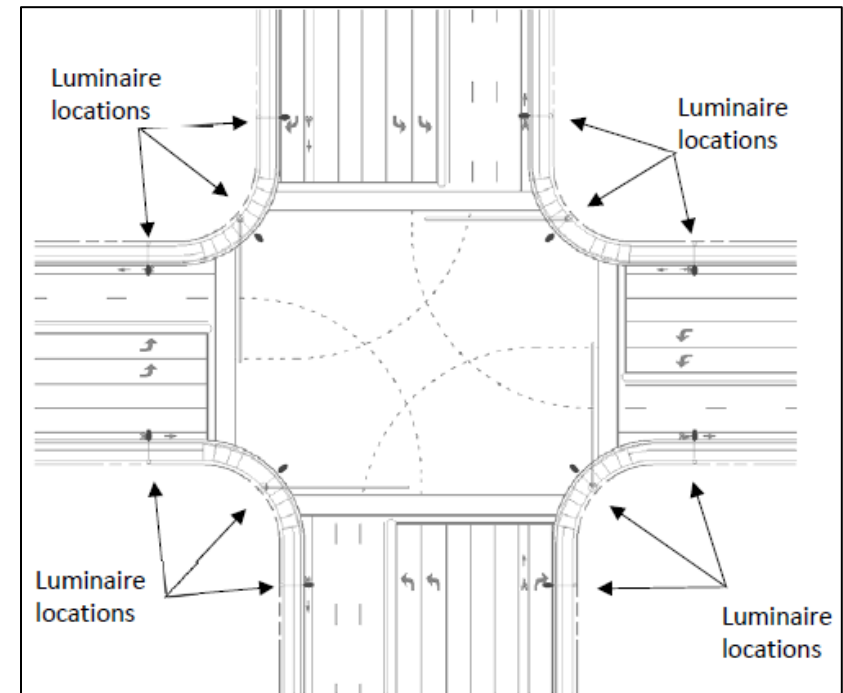
- **High emphasis crosswalk markings:** FDOT standard high-emphasis “ladder” crosswalk markings should be applied at each signalized intersection. If colored/textured crosswalks are part of an overall design motif within a sub-section of the corridor, these should be bordered by white, thermoplastic lateral crosswalk markings.



- **Countdown pedestrian signal heads:** Countdown pedestrian signals are more intuitive and provide more precise information to pedestrians crossing at signalized locations. Signals that do not currently have countdown signals should be retrofitted with countdown pedestrian inserts.



- **R10-15 (right turn yield to pedestrian) signs:** These signs help remind drivers of their obligation to yield to pedestrians when turning right on green and should be provided for major roadway approaches
- **Lighting:** Signalized intersection lighting should conform to standards defined in FDM Table 231.2.1





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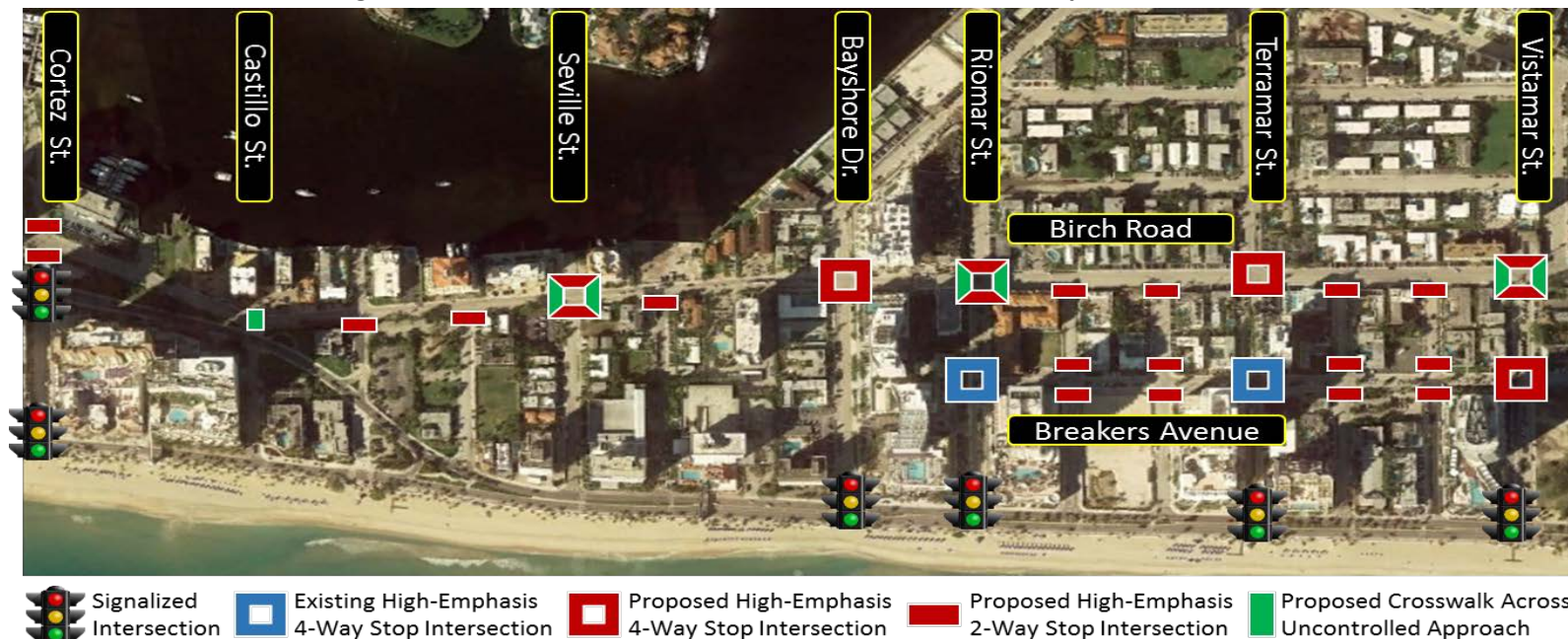
2.2.3 Specific intersection improvements

There are several specific signalized intersections within the beach study area where pedestrian improvements are desirable. These include:

- **SR A1A at Mayan Drive:** At this location, the crosswalk across SR A1A is at a skew and is marked significantly beyond the southbound stop bar. In addition to providing high-emphasis crosswalk markings, If possible without adversely impacting the adjacent residential driveways, realign this crosswalk to cross SR A1A in a more perpendicular direction.
- **SR A1A at Sunrise Boulevard:** See recommendations incorporated in Section 1.1.

- **Birch Road and Breakers Avenue high-emphasis crosswalk markings:** These roadways are more significant thru streets running parallel and to the west of SR A1A. To enhance pedestrian mobility and safety along these corridors, provide high-emphasis crosswalk markings along these roadways at existing four-way stop controlled intersections and along Birch Road and Breakers Avenue at two-way stop controlled intersections. Also consider providing marked crosswalks across the uncontrolled approaches of the two-way stop controlled intersections of Birch Road at Castillo Street, Seville Street, Riomar Street and Vistamar Street as shown in Figure 2.2-3.

Figure 2.2-3: Birch Road and Breakers Avenue Short-Term Improvements





2.2.4 Central Beach Streetscape Improvements

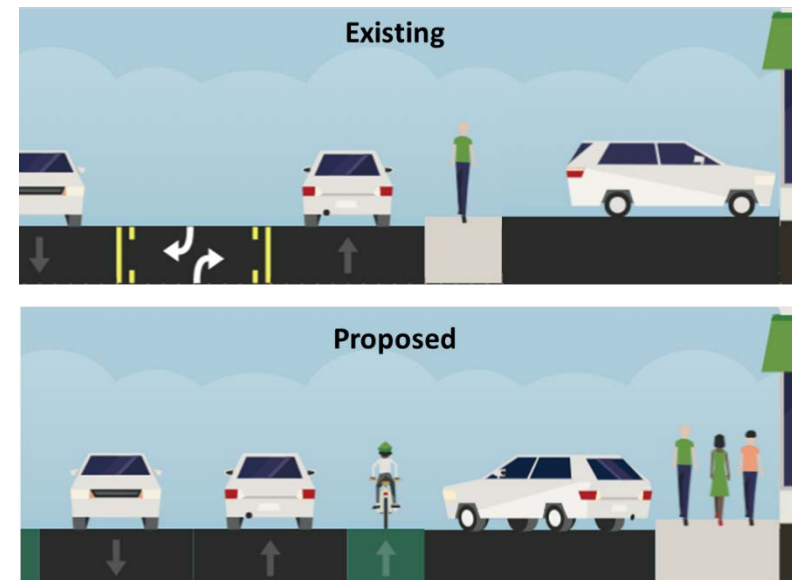
The City's Central Beach Master Plan contemplates "streetscape" improvements to various components of the local street grid from Las Olas Boulevard to Vistamar Street. Key elements of the Central Beach Master Plan are summarized below:

- **Birch Road (Riomar Street to Vistamar Street):** The Central Beach Master Plan recommends reconfiguring this segment of Birch Road from four lanes with no median to two lanes with a painted center median and bicycle lanes. Longer-term strategies for this segment of Birch Road call for a wide landscaped center median with a shared-use path and conversion of back-out to parallel parking with improved sidewalks.
- **Breakers Avenue (Riomar Street to Vistamar Street):** The Central Beach Master Plan identifies options for this segment of Breakers Avenue to convert back-out parking to parallel parking and, through an easement, provide improved sidewalks between the parking and private property.
- **Other Streetscape Improvements (Central Beach Area):** Throughout the Central Beach Area, strategies are defined in the Master Plan to narrow lane widths, swap back-out parking for on-street parking, and improve sidewalk facilities. When converting back-out parking to on-street parking, consideration should be given to back-in angle parking as an alternative to parallel parking in order to reduce the overall loss of parking spaces.

In addition to the improvements identified in the Central Beach Master Plan, the following strategies are recommended for further consideration along Birch Road from Las Olas Boulevard to Riomar Street:

- Consider converting the stop controlled intersections of Birch Road at Riomar Street and Birch Road at Bayshore Drive to urban compact roundabouts and eliminate the center turn lane on Birch Road between these intersections to provide bike lanes and/or wider sidewalks.
- Consider converting the two-lane divided segment of Birch Road south of Riomar Street to a two-lane undivided roadway with bike lanes.
- South of Riomar Street coordinate with property owners to swap back-out parking over sidewalks for on-street back-in angle parking and reconstruct sidewalks between the parking bays and buildings.

Figure 2.2-4: Back-Out Off-Street Parking to Back-In Angle On-Street Parking Conversion





2.2.5 Additional Mid-Block Crossings

The Bonnet House property has a pedestrian exit gate along SR A1A approximately equidistant from Vistamar Street and NE 9th Street which is staffed by an off-duty police officer by Bonnet House to facilitate pedestrian crossing of SR A1A. Consider evaluating the potential to provide a marked mid-block crosswalk at this location based on the criteria in Chapter 3.8 of FDOT's Traffic Engineering Manual.



2.3 Bicycle Improvements

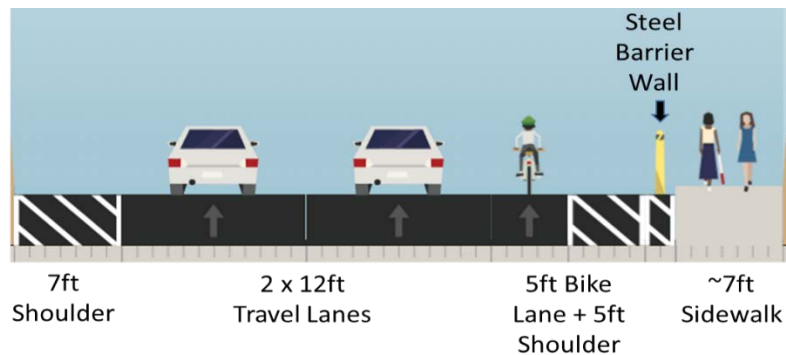
The Beach Study Area is sufficiently compact and sufficiently close to Downtown Fort Lauderdale for many trips within the Study Area and between the Study Area and the Downtown to be completed by bicycle in 15 minutes or less. A barrier to cycling as a viable mode for completing these shorter trips is that most of the cycling public prefers protected/separated bicycle facilities when travelling along arterial streets such as SR A1A or the roadways that connect the Beach to the mainland across the Intracoastal Waterway.

To make cycling a viable mobility choice for a larger proportion of the community, the following strategies are recommended to provide protected/separated bicycling facilities where possible.

2.3.1 SE 17th Street

SR A1A/SE 17th Street crossing the Intra-coastal Waterway consists of two bridge spans, each with a 7ft inside shoulder, two, 12ft travel lanes, and a 10ft outside shoulder, of which the interior 5ft is marked as a bike lane. Beyond the outside shoulder, each bridge span has a steel barrier wall with a 7ft wide sidewalk along the edge of the bridge, as shown in Figure 2-5.

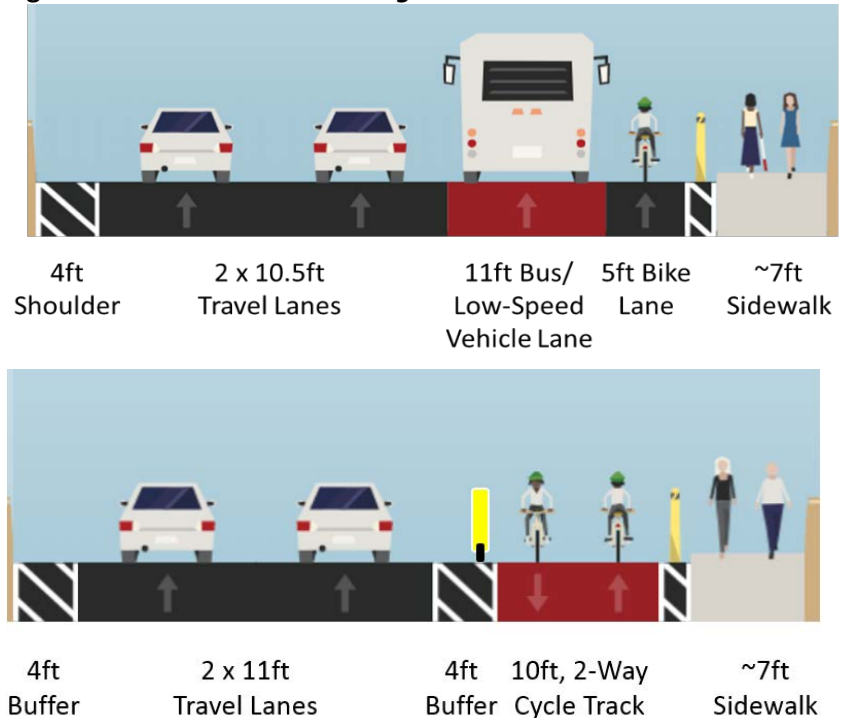
Figure 2.3-1: SE 17th Street Bridge Existing Cross-Section



Potential alternatives identified by this study reduce the inside shoulder from 7ft to 4ft and reduce the general purpose travel lane width from 12ft to 11ft. This provides the following options:

- Option 1: Shift the bicycle lane to the outside of the 10ft shoulder and allow transit vehicles and neighborhood electric vehicles to operate on the shoulder.
- Option 2: Narrow the outside shoulder to four feet on the eastbound span and provide a protected two-way cycle track adjacent to the sidewalk.

Figure 2.3-2: SE 17th Street Bridge Alternative Cross-Sections





2.3.2 SR A1A

SR A1A has marked bicycle lanes along most of its length from the SE 17th Street Bridge to Sunrise Boulevard with two exceptions:

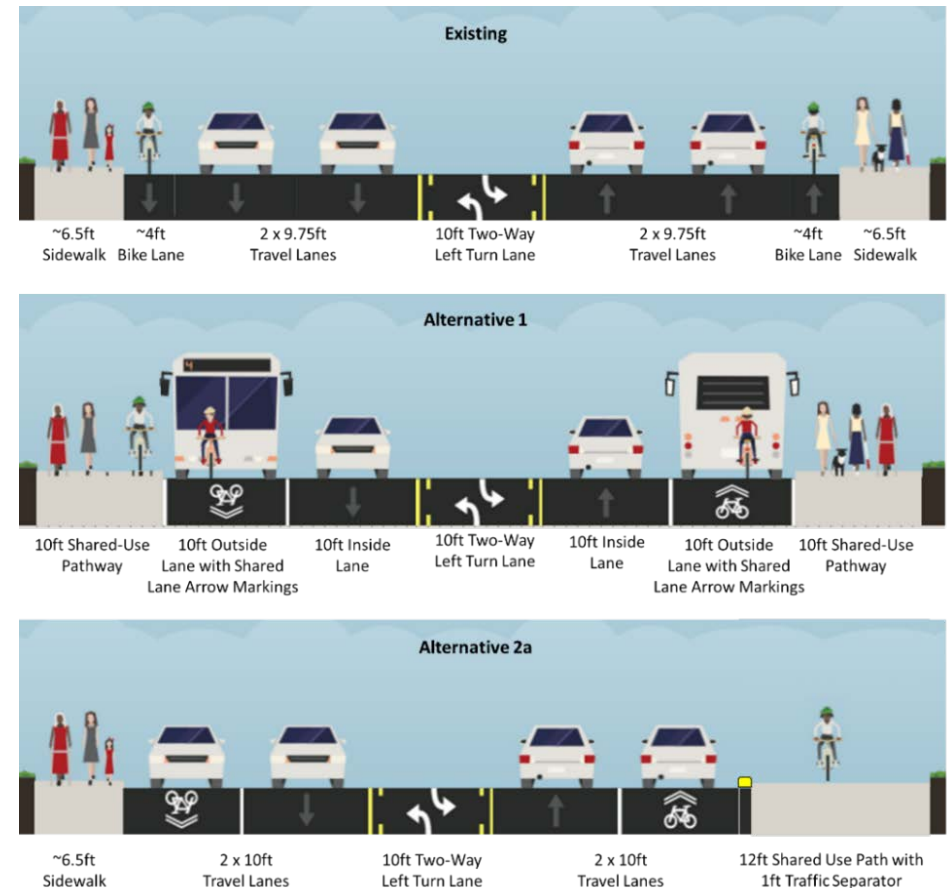
- Southbound SR A1A from Mayan Drive to the “Mercedes River” Bridge (~ 550ft)
- From Harbor Drive to Beach Boulevard (~ 1,700ft)

In some places, the existing bike lane does not meet the minimum width requirements with the bike lane stripe less than 5ft from the face of the curb. Because the adjacent motor vehicle travel lanes are only 10ft wide, travelling in the bicycle lane can be stressful—especially for less confident cyclists.

Strategies to improve bicycle mobility along SR A1A should include measures to address these bicycle lane gaps as well as provide for separated bicycle facilities where possible.

- Short-term improvements to address bike lane gaps:
 - From Mayan Drive to the “Mercedes River” Bridge reduce the width of the median to provide for a continuous southbound bike.
 - From Harbor Drive (north intersection) to Beach Drive (southern one-way pair apex) provide advance warning that the bike lane will terminate and provide a ramp for cyclists to switch to the sidewalk for southbound bicycle traffic as well as wayfinding to turn into the beach parking area for northbound bicycle traffic.
- Harbor Inlet Drive to Holiday Drive (70ft ROW):
 - Alternative 1: Convert the existing substandard bike lanes and 6.5ft sidewalks into 10ft shared use pathways.
 - Alternative 2: Shift the existing roadway to west/ north. Widen and lower the northbound sidewalk to provide a 12ft shared use path with mountable curbs between travel lane, path, and driveways.

Figure 2.3-3: SR A1A Existing and Alternative Cross-Section Concepts





- Holiday Drive to Harbor Drive (north intersection): Consider widening the sidewalks to provide 10ft minimum, 12ft preferred shared use pathways. On-road bike lanes to remain.
- Harbor Drive (north intersection) to Beach Boulevard (southern apex of one-way pair):
 - Southbound the existing sidewalk is 8ft wide and meets the minimum criteria for a shared path. Widen sidewalk along the southbound side of the road to 10ft minimum (15ft preferred) as possible as part of Bahia Mar redevelopment to improve the utility as a shared path for cyclists and pedestrians
 - Northbound convert the landscaped buffer between SR A1A and the beach parking lot to an 8ft shared path.
- One-way Pair South Apex to Sunrise Boulevard – No substantive short or mid-term recommendations. Longer-term:
 - Consider widening the beach promenade to provide space for a bicycle path between the pedestrian area and the northbound lanes of SR A1A.
 - Consider expanding the sidewalk into the bicycle lane on southbound SR A1A to provide for a 12ft shared use path from the SR A1A south apex to Castillo Street.
 - Integrate with recommended Birch Road improvements referenced in Section 2.1.4

Figure 2.3-4: Separated/Protected Bike Way (Federal Hwy to NE 32nd Ave)

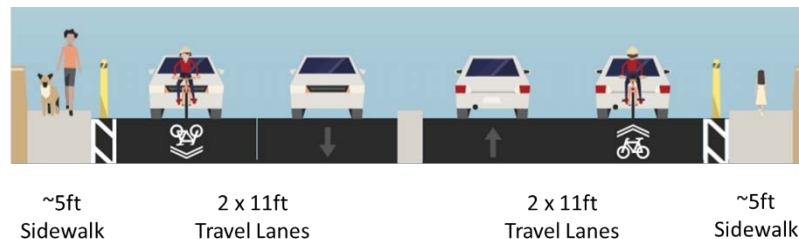




2.3.3 Las Olas Boulevard

Las Olas Boulevard is the most direct connection between the beach and Downtown and the subject of a future, comprehensive corridor study by the City of Fort Lauderdale based on input from the Las Olas Mobility Working Group. However, the bridge across the Intracoastal Waterway is outdated and constrained with two, 11ft lanes in each direction divided by a narrow concrete median. The bridge has approximately 5ft wide sidewalks on each side which are too narrow to be shared by cyclists and pedestrians. Accordingly, there are no options to reconfigure the bridge's cross-section to improve facilities for other modes while maintaining the current space for automobile travel lanes.

Figure 2.3-5: Las Olas Boulevard Bridge Existing Cross Section



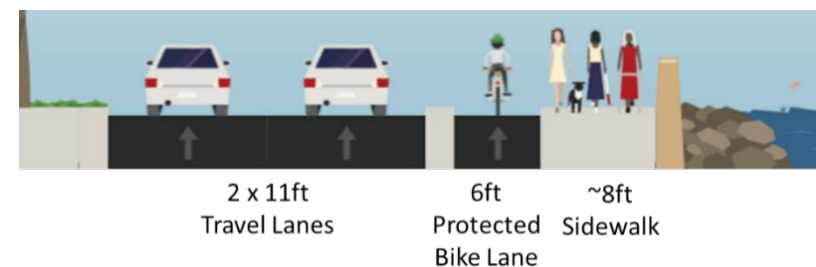
Based on data collected annually by FDOT, average annualized daily traffic (AADT) volumes on the bridge since 2002 have ranged from a high of 20,000 vehicles per day in 2012 to a low of 13,100 vehicles per day in 2017 with an average of about 16,000 vehicles per day. This translates to an observed peak directional volume ranging from 600 - 800 vehicles per hour from about 1:00 PM to 6:00 PM. Along a signalized arterial roadway, a single travel lane can generally accommodate 700 – 900 vehicle per hour. Because the average maximum volumes on the bridge can reasonably be accommodated by a single lane in each direction, strategies to prioritize the outside lane for bicycles, transit vehicles, and lower-speed neighborhood electric vehicles should be considered.

At a minimum, the existing shared lane arrows along the outside lanes of the bridge should be refurbished and centered in the lanes to clarify that motor vehicles and cyclists cannot safely co-occupy the lane. Consideration should be given to supplemental signs and flashing beacons to encourage motor vehicle drivers to use the inside lanes and remind them of their obligation to share the outside lane with cyclists and other lower-speed vehicles.

Pending execution of the Las Olas Corridor Streetscape Study, from SR A1A to Andrews Avenue, there are opportunities to provide buffered and protected bike lanes without reconstructing the roadway. These lower-stress, on-road cycling facilities should be considered interim to a more transformative redesign of Las Olas Boulevard being considered by the Las Olas Mobility Working Group.

- From the Intracoastal Waterway Bridge to Seven Isles Drive (SE 23rd Ave), narrow travel lanes from 12ft to 10ft and provide buffered bike lanes.
- From SE 23rd Ave to the Sospiro Canal Bridge, narrow travel lanes from 12ft to 11ft and provide protected bike lanes.
- Across the Sospiro Canal Bridge from SE 17th Avenue to S. Gordon Road, consider reducing the travel lanes from 11ft to 10ft and widening the sidewalks from 5ft to 7ft.

Figure 2.3-6: Interim Las Olas Boulevard Bike Improvements





2.3.4 Sunrise Boulevard

Sunrise Boulevard connects SR A1A and the beach to the Galleria Mall and Federal Highway and has nominal 5ft bike lanes from SR A1A to NE 26th Avenue. In addition to the bicycle components of the operational improvements identified in Section 1.1 of this report, the following improvements should be considered:

- Reduce the width of the travel lanes from east of the Intracoastal Waterway Bridge to a minimum of 11ft for the outside lane and 10ft for the inside and center lanes to provide for a 7ft-wide buffered bike lane.
- Where possible, widen the sidewalks from Middle River Drive to Birch Road to a minimum of 8ft to allow for pedestrians and lower-speed cyclists to share the sidewalk area.

2.3.5 Birch Road Trail Extension

In addition to crosswalk improvements identified in Section 2.1.3 and sidewalk and complete street improvements discussed in Section 2.1.4 the City of Fort Lauderdale is developing plans to provide a non-motorized connection from the end of Birch Road at

Vistamar Street through the Bonnet House property to NE 9th Street. The project will also connect Birch Road through Birch State

Park to NE 32nd Avenue at NE 19th Street. This trail connection, in conjunction with the above-referenced improvements to Birch Road, will help to provide a parallel non-motorized mobility alternative to SR A1A from Las Olas Boulevard to Oakland Park Boulevard.



2.4 Transit Improvements

Transit is an important part of the overall Beach Mobility strategy for connecting the Beach Study Area to the broader region, making convenient connections between the beach and Downtown, and providing for circulation within the Study Area. Currently three scales of transit operate within the Study Area:

- Regional Transit: Broward County Transit (BCT) provides scheduled regional bus service to the Beach Study Area along two fixed routes:
 - Route 11 travels between the Downtown Broward Central Terminal and the beach along Las Olas Boulevard and then travels along SR A1A between Las Olas Boulevard and the 14th Street Causeway in Pompano Beach. This route operates approximately every 35 minutes within the study area from approximately 5:30 AM to 11:30 PM weekdays with less frequent service on weekends.
 - Route 40 travels between the Downtown Broward Central Terminal and the beach via Federal Highway and SE 17th Street to Sunrise Boulevard to the Galleria Mall. The service runs every 20 minutes during peak periods and every 30 minutes off peak from 6:00 AM to 11:00 PM on weekdays with less frequent service on weekends.
- Circulator Transit: Sun Trolley operates trolley bus service from 9:30 AM to 6:30 PM on the following routes:
 - Las Olas Link service operates Friday through Monday between the Brightline Station in Downtown Fort Lauderdale along Las Olas Boulevard to Vistamar Street via SR A1A.
 - Beach Link service operates seven days a week between the Galleria Mall on Sunrise Boulevard and the Broward Health Center on SE 17th Street at Andrews Avenue. Both Sun Trolley routes operate as hop-on/hop-off service without defined stops and run in continuous loops which means the frequency of trolley service varies with traffic conditions. A free mobile application is available to provide real-time tracking of Sun Trolley vehicles to help riders predict when the next vehicle will arrive.
- Micro-Transit: The following point-to-point or deviated route “micro-transit” services operate in the Beach Study Area:
 - Free Ride neighborhood electric vehicles operate throughout the Beach Study area and connect the area to Downtown from 11:30 AM to 10:00 PM. Rides may be requested via a free mobile application or available vehicles may be hailed for a ride similar to hailing a taxi. This service relies on advertising revenue and driver tips to cover costs.
 - Pedicab services operate within the beach study area and can be hailed or requested via telephone dispatch
 - Beachhopper gas powered golf cart shuttles operate in the beach area and along Las Olas Boulevard via telephone dispatch.



2.4.1 Sun Trolley Improvements

Sun Trolley has significant potential to circulate people within the Beach Study Area and join the Beach and the Downtown into one connected activity center. However, fleet maintenance issues and limited service span and frequency have limited its use as an alternative to driving or ride-hailing services for utilitarian trips. The following should be considered to improve the Sun Trolley:

- Define stops and service schedules to improve predictability for those not familiar with the real-time tracking application. Co-locate stops with bike-share stations.
- Ensure that hotel and resort concierges are familiar with the Sun Trolley tracking application and/or provide tracking kiosks in larger hotel/resort lobbies
- Provide daily service for the Las Olas Link to serve as a reliable connection between Downtown Fort Lauderdale, including the Brightline station and Broward Central Bus Terminal, and the Central Beach area.
- Truncate the Beach Link to terminate at the Harbor Shops
- Modify the Las Olas Link to orbit the one-way pair segment of SR A1A, thereby reducing per trip service costs.
- Increase Las Olas Link and Beach Link frequencies to 4 trolleys per hour during the core hours of 9:30 – 6:30.
- Combine the Las Olas Link and Beach Link service between 6:00 AM and 9:30 AM and from 6:30 PM to 10:00 PM and operate at a frequency of 2 trolleys per hour to provide a connection between the Broward Central Terminal and the Beach for hotel and other service workers.
- Consider truncating BCT Route 40 at the Convention Center and reallocating revenue hours of service to help fund additional Beach Link service. Coordinate Beach Link and BCT Route 40 schedules to facilitate efficient transfers.
- Encourage use of Downtown parking surplus in conjunction with Las Olas Link Trolley Service to park-and-ride.

Figure 2.4-1: Sun Trolley Concept Map





2.4.2 On-Demand Low-Speed Vehicle Service

Services similar to the Free Ride neighborhood electric vehicles bridge the gap between fixed route transit and ride-hailing services such as Uber, Lyft, and taxis. Rides can be hailed using a mobile application or waved-down from the curb, and generally fill the same trip length as bicycle trips but they may serve to provide mobility for those who are less comfortable biking or fulfill trip purposes (e.g. grocery shopping) where biking is a less practical option.

To extend mobility options beyond the service hours provided by Sun Trolley and provide for reliable point-to-point service as an alternative to cycling, partnerships with on-demand low vehicle services should be expanded as follows:

- Service should be concentrated on the barrier islands within the Sun Trolley Beach Link service loop and should focus primarily on providing circulation within the Study area, relying on the expanded Las Olas Link Sun Trolley Service to connect the beach and Downtown Activity Centers during the Sun Trolley's core 9:30 AM to 6:30 PM service hours
- Provide late night service depending on market conditions on Thursday through Saturday nights.
- Consider options to combine bicycle facilities and dedicated space for low-speed vehicles (as designated by Florida Statute) as part of concepts for the SE 17th Street/SR A1A bridge (Section 2.2.1) and the Las Olas Mobility Working Group efforts and Las Olas Boulevard concepts (Section 2.2.2)

2.4.3 Water Taxi

The current water taxi service operates from 10 AM to 10 PM along the New River between the Riverside Hotel/Stranahan House and the beach with mainland stops at the Shops of Las Olas, 15th Street Fisheries, Hilton Marina/Convention Center and Beach stops at Bahia Cabana, Beach Place, Galleria Mall, Birch State Park, and points further north. The service also has a free tracking application to show real time location of the taxis.

Daily fares are oriented towards tourists with adult all day and "happy hour" fares at \$28 and \$18 respectively. However, a \$99 monthly pass is available, which, if used for daily commuting, equates to about \$2.50 per trip. To enhance the viability of the water taxi for non-tourist trip making, consider the following:

- Evaluate single ride fare options to make the water taxi more viable for single trips (e.g. from Central Beach hotels to the Convention Center) or from Downtown to the beach for a day trip.
- Identify opportunities to improve water taxi station areas with shelters and other common transit stop amenities.



2.5 Parking, Wayfinding, and Technology

2.5.1 Parking:

The City's recently-completed parking master plan identifies significant reserve capacity exceeding 50% at several of the publicly operated Downtown parking garages and lots as shown in the excerpted table below (Table 4.3 from the Parking Study).

Parking Type	Supply	Demand	Surplus/Deficit
On-Street	774	628	146
Off-Street			
Public	5,449	2,241	3,208
Private, Publicly Accessible	2,638	995	1,643
Private, Restricted Access	3,504	2,130	1,374
Total	12,365	5,994	6,371

If paired with expanded Sun Trolley services (Section 3.1) and on-demand low speed vehicle service such as the Free Ride (Section 3.2), surplus Downtown parking could be used to supplement beach parking and could result in less beach automobile traffic and allow for existing beach parking real estate to be re-allocated for other uses. Strategies to use Downtown parking for beach access should initially focus on weekends and special events using the following measures:

- Route expanded Sun Trolley service adjacent to major Downtown public parking structures
- Provide Downtown and beach parking lot real-time occupancy data and rates (i.e., XX spots available) for major beach lots with wayfinding information arrows on beach bridges/approaches and mobile applications

- Evaluate beach parking pricing (compared to neighboring communities) and ensure that park-and-ride options are cost competitive.
- Integrate privately owned public parking (e.g. Hotel/Resort parking garages) into public parking inventory and information management systems.
- Work with private parking managers to evaluate parking needs incident to new development and relax minimum parking requirements accordingly.

2.5.2 Information Technology

- Kiosks:
 - Provide "Mobility Kiosks" in concierge area of major hotels/resorts or at Sun Trolley terminals
 - Provide real-time Sun Trolley location and links to hail micro-transit services.
 - Provide Brightline, Tri-Rail, and BCT bus schedule/connection information.
- Mobile applications:
 - Consider a consolidated app for Sun Trolley location, low-speed vehicle shuttle hailing, with a map including rideshare pick-up/drop off zones, bike share stations, water taxi stops, etc.
 - Provide brochures/paper maps of Sun Trolley and Water Taxi routes as well as service area and hailing information for micro-transit services. These should be distributed in hotel lobbies, the convention center, Harbor Shops, and Galleria Mall.



Section 3: Implementation Plan, Funding, and Cost Information

The mobility strategies identified in Section 2 of this report include some short-term actions that the City of Fort Lauderdale can address on its own, but many of the strategies require participation of the City's partner agencies including the Broward County Traffic Engineering Department (BCTED), Broward County Transit (BCT), the Broward Metropolitan Planning Organization (BMPO) and the Florida Department of Transportation District 4 (FDOT D4). Likewise, some of the strategies proposed here can be accomplished using agency operating budgets, while others will require City, County, or FDOT capital projects to be established and implemented.

3.1 Implementation Plan

Table 3.1-1 provides an overview of implementation considerations for each of the mobility projects identified in Section 2 and includes the following elements:

- Project ID # and Location
- Project Description
- Modal Focus – which travel modes does the project seek to improve (automobile traffic circulation, walking, biking, transit, other)
- Cost – Order-of-magnitude cost range where Low is less than \$100k, Medium is \$100 - \$500k and High is > \$500k
- ROW – Likely impacts to private property
- Other Impacts – potential impacts to businesses, residences, or other issues
- Implementing Agency – Partner agency that will be primarily responsible for implementing the project
- Next Steps – Discussion of implementation tasks.

Table 3.1-2 provides a detailed summary of improvements necessary to bring existing crosswalks along SR A1A into consistency with current sign and pavement marking standards. The table also identifies existing unsignalized crosswalks that do not have lighted, push-button actuated beacons. Of the 21 existing pedestrian crosswalks, eight require upgrades to crosswalk markings, 18 require thermoplastic advance stop bars and corresponding R1-5b "Stop Here for Pedestrians" signs, and 10 unsignalized crosswalks lack push-button actuated, lighted beacons.

Table 3.1-3 provides a summary of signalized intersections throughout the Study Area indicating the status of the following items:

- Crosswalk Markings: Are the intersection crosswalks marked using standard high-emphasis markings?
- Lighting: Does the intersection appear to have adequate lighting with at least one luminaire at each quadrant of the intersection?
- Countdown Signals: Does the intersection have count-down pedestrian signals?

A summary of implementation stakeholder meeting outcomes is provided in Appendix 4.



Table 3.1-1: Implementation Matrix

ID#	Project Location	Project Description	Modal Focus					Implementation Considerations			Lead Agency	Next Steps
			Traffic	Walking	Biking	Transit	Other	Cost	ROW	Other Impacts		
2.1.1	Sunrise Boulevard from Birch Road to SR A1A	Geometric and operational improvements	X	X	X			High		None	FDOT D4	Coordinate with BCTED to request overlap phasing for EBRT w/ NBLT; Coordinate with FDOT District 4 to request safety and operational study. Coordinate with BMPO to include project on Charter County Sales Tax priority list
2.1.2	SR A1A from Federal Highway to north of Sunrise Boulevard; Las Olas Boulevard from ICW to SR A1A	FDOT ATMS Project	X	X				High		None	FDOT D4	Coordinate with FDOT District 4 to ensure pending ATMS project addresses bridge opening recovery and signal timing for pedestrian access and speed management
2.1.3	SR A1A from Harbour Inlet Drive to Holiday Drive	Landscaped medians for speed management	X				X	Medium		Design to minimize driveway access impacts	FDOT D4	Coordinate with FDOT District 4 as part of implementation of Project ID# 2.3.2
2.1.4	SR A1A, Harbor Drive to Sunrise Boulevard	Pick-up/drop-off restrictions	X					Low			FDOT D4	Coordinate with FDOT D4 Traffic Operations to place "No Stopping" signs. Coordinate with City of Fort Lauderdale Police Department to handle enforcement.
2.1.4	SR A1A, Harbor Drive to Sunrise Boulevard	Additional pick-up/drop-off bays	X				X	Medium		Widening of Beach Walk toward beach necessary	City of Fort Lauderdale	Coordinate with FDOT for Construction Permitting



Table 3.1-1: Implementation Matrix (Continued)

ID#	Project Location	Project Description	Modal Focus					Implementation Considerations			Lead Agency	Next Steps
			Traffic	Walking	Biking	Transit	Other	Cost	ROW	Other Impacts		
2.2.1	SR A1A, Harbor Drive to Belmar Street	Retrofit existing mid-block crosswalks for consistency and ensure crosswalk lighting meets standards		X				Medium		None	FDOT D4	Coordinate with FDOT D4 Traffic Operations. To update as follows. 10 in-pavement beacons, 8 Ladder Markings, 18 Advance Stop Bars and Signs. Conduct Lighting Evaluation Inventory Included in Table 3.1-2
2.2.2	Throughout Study Area	Retrofit existing signalized intersections with High Empahsis Markings, Countdown Signal Heads, and Pedestrian Intersection Lighting		X				Medium		None	FDOT D4	Coordinate with FDOT D4 Traffic Operations. Inventory included in Table 3.1-3
2.2.3	Birch Road and Breakers Ave	Crosswalk Marking Improvements & Stop Control Changes		X				Low		Coordinate with Central Beach Master Plan	City of Fort Lauderdale	Develop concept plans. Review uncontrolled appraoch crosswalks with BCTED
2.2.4	Birch Road and Breakers Ave	Central Beach Streetscape Interim Improvements Convert Birch Road from 4U to 2D cross-section from Riomar to Vistamar Street		X	X			Medium		Coordinate with Central Beach Master Plan	City of Fort Lauderdale	Birch Road: Conduct traffic study and develop concept plans. Review with BCTED and implemenet through resurfacing. Breakers Ave in Design FY19/20
2.2.4'	Birch Road and Breakers Ave	Central Beach Streetscape Improvements	X	X	X			High	Easements	Coordinate with Central Beach Master Plan	City of Fort Lauderdale	Birch Road: Program project for design and construction. Breakers Avenue: In Design FY19/20
2.2.5	Bonnet House Crosswalk at SR A1A	Evaluate provision of a marked, mid-block crosswalk at the Bonnet House pedestrian exist between Vistamar		X				Low		None	FDOT D4	Conduct crosswalk justification study consistent with Chapter 3.8 of the FDOT Traffic Engineering Manual



Table 3.1-1: Implementation Matrix (Continued)

ID#	Project Location	Project Description	Modal Focus					Implementation Considerations			Lead Agency	Next Steps
			Traffic	Walking	Biking	Transit	Other	Cost	ROW	Other Impacts		
2.3.1	SE 17th Street ICW Bridge to Harbour Inlet Drive (Westbound Span)	Narrow travel lanes to provide westbound transit/low-speed vehicle lane				X	X	Low		Converts directional bike lanes to 2-way cycle track.	FDOT D4	See Appendix 3.1
2.3.1	SE 17th Street ICW Bridge to Harbour Inlet Drive (Eastbound Span)	Narrow inside shoulders and travel lanes, and provide a two-way cycle track.				X		Medium		Converts directional bike lanes to 2-way cycle track.	FDOT D4	See Appendix 3.1
2.3.2	SR A1A Harbour Inlet Drive to One-Way Pair	Shift motor-vehicle lanes to the north/west curb-line and reconstruct the east/south sidewalk as a 12ft shared-use path.			X	X		High		Converts directional bike lanes sharrows + shared-use path.	FDOT D4	See Appendix 3.1
2.3.3	Las Olas Boulevard ICW Bridge to Himarshee Canal	Narrow travel lanes and provide buffered/protected bike lanes				X		Low			FDOT D4	Coordinate with pending Las Olas Streetscape Project as potential interim improvement.
2.3.3	Las Olas Boulevard Himarshee Canal Bridge	Reduce lane widths and widen sidewalks			X	X		Medium			FDOT D4	Coordinate with pending Las Olas Streetscape Project as potential interim improvement.
2.3.4	Sunrise Boulevard from Birch Road to Middle River Drive	Narrow lanes to provide for buffered bike lanes and widen sidewalks where possible to 8ft minimum.			X	X		Medium			FDOT D4	Incorporate as BMPO Local Mobility project candidate together with ID# 2.1.1.
2.3.5	Birch Road Trail Extension	Provide Non-Motorized Trail Connection from the End of Birch Road through Bonnet House property to NE 9th Street and through Birch State Park Connecting to NE 32nd Avenue at NE 19th Street.			X	X		High	Easement through Bonnet House Property		City of Fort Lauderdale	Continue Fort Lauderdale Transportation and Mobility Department implementation activities.



Table 3.1-1: Implementation Matrix (Continued)

ID#	Project Location	Project Description	Modal Focus					Implementation Considerations			Lead Agency	Next Steps
			Traffic	Walking	Biking	Transit	Other	Cost	ROW	Other Impacts		
2.4.1	Sun Trolley Improvements	Service span, frequency, and route adjustments					X	High		Potential truncation of BCT Route 40 at Convention Center.	Sun Trolley/ BCT	Coordinate with Sun Trolley and BCT as part of pending BCT Comprehensive Operational Analysis (COA)
2.4.2	Expand Free Ride (or Similar) Service)	Consider subsidizing service to reduce wait times--especially outside of core Sun Trolley service hours.					X	Medium			City of Fort Lauderdale	Coordination meeting with Free Ride vendor to better understand business parameters and potential to provide additional system capacity.
2.4.3	Water Taxi Point-to-Point Service	Evaluate point to point service between Merle Fogg Park and Existing Station 6 at the Las Olas Marina.					X	Medium			City of Fort Lauderdale	Coordination meeting with Water Taxi vendor to better understand parameters
2.5.1	Parking Strategies	Link SunTrolley routes and fairs with downtown parking. Incorporate privately owned, public parking into realtime public parking availability system					X	Medium			City of Fort Lauderdale	Coordination with parking study recommendations
2.5.2	Mobility Brochures for Hotels/Resorts	Provide brochures/paper maps of Sun Trolley and Water Taxi routes as well as service area and hailing information for micro-transit services. These should be distributed in hotel lobbies, the convention center, Harbor Shops, and Galleria Mall.					X	Low			City of Fort Lauderdale	Coordinate with beach businesses

**Table 3.1-2: Pedestrian Crosswalk Inventory**

Location	Existing Control	Existing Markings	Provide In-Pavement Beacons	Update Markings	Provide Advance Stop Bar and R1-5B Signs
SR A1A., South of Harbor Dr.	Signalized	High-Emphasis Ladder			
Beach Blvd., North of Seabreeze Blvd.	Unsignalized	Textured Pavement	YES	Transverse	YES
Beach Blvd., North of SE 5 th St.	In-Pavement Beacons	High-Emphasis Ladder			YES
Beach Blvd., Poinsettia St.	Unsignalized	High-Emphasis Ladder	YES		YES
Beach Blvd., Cortez St.	Unsignalized	Textured Pavement	YES	Transverse	YES
Beach Blvd., North of Cortez St.	In-Pavement Beacons	High-Emphasis Ladder			YES
Beach Blvd., Castillo St.	Unsignalized	Textured Pavement	YES	Transverse	YES
Beach Blvd., Sebastian St.	Signalized	Textured Pavement		Transverse	
SR A1A, Alahambra St.	Unsignalized	High-Emphasis Ladder	YES		YES
SR A1A, Seville St.	In-Pavement Beacons	High-Emphasis Ladder			YES
SR A1A, Granada St.	In-Pavement Beacons	High-Emphasis Ladder			YES
SR A1A, Viramar St.	In-Pavement Beacons	High-Emphasis Ladder			YES
SR A1A, Windamar St.	In-Pavement Beacons	High-Emphasis Ladder			YES
SR A1A, Auramar St.	In-Pavement Beacons	High-Emphasis Ladder			YES
SR A1A, Belmar St.	In-Pavement Beacons	High-Emphasis Ladder			YES
Seabreeze Blvd., Sebastian St.	Signalized	High-Emphasis Ladder			
Seabreeze Blvd., Castillo St.	Unsignalized	Textured Pavement	YES	Transverse	YES
Seabreeze Blvd., Poinsettia St.	Unsignalized	Transverse Lines Only	YES	Ladder	YES
Seabreeze Blvd., Banyan St.	Unsignalized	Transverse Lines Only	YES	Ladder	YES
Seabreeze Blvd., SE 5 th St.	Unsignalized	Transverse Lines Only	YES	Ladder	YES
Seabreeze Blvd., North of SR A1A	Unsignalized	High-Emphasis Ladder	YES		YES



Table 3.1-3: Signalized Intersection Inventory

Signalized Intersection Location	Markings (Intersection Leg)				Lighting	Pedestrian Signals
	North	East	South	West		
SR A1A @ Harbour Inlet Drive	Textured w/Borders	Longitudinal Lines Only	Textured w/Borders	No Marked Crosswalk	Pedestal Lighting; One Pedestal per Quadrant	NOT Countdown
SR A1A @ Mayan Drive	N/A T-Int.	Transverse Lines Only	Transverse Lines Only	No Marked Crosswalk	Pedestal Lighting; One Pedestal per Quadrant	NOT Countdown
SR A1A @ Harbor Beach Parkway	Transverse Lines Only	Textured w/Borders	Transverse Lines Only	Textured w/Borders	Pedestal Lighting; One Pedestal per Quadrant	NOT Countdown
SR A1A @ Holiday Drive	Transverse Lines Only	Transverse Lines Only	No Marked Crosswalk	N/A T-Int.	Pedestal Lighting; No Lighting in SW Quadrant	NOT Countdown
SR A1A @ Harbor Drive	Transverse Lines Only	N/A T-Int.	No Marked Crosswalk	Transverse Lines Only	Pedestal Lighting; One Pedestal per Quadrant	Countdown North Leg Only
SR A1A @ Bahia Mar Entrance	No Marked Crosswalk	N/A T-Int.	Transverse Lines Only	Transverse Lines Only	Pedestal Lighting; One Pedestal per Quadrant	Countdown
Beach Boulevard @ SE 5th Street	Textured w/Borders	N/A T-Int.	Textured w/Borders	Textured w/Borders	Pedestal and Overhead; NW Quadrant Missing	Countdown
Beach Boulevard @ Las Olas Boulevard	This intersection will be reconstructed as part of the Las Olas 'Festival Street' project.					
Beach Boulevard @ Bayshore Drive	Textured w/Borders	N/A T-Int.	Textured w/Borders	Textured w/Borders	Pedestal and Overhead Lighting	Countdown
Beach Boulevard @ Riomar Street	Textured w/Borders	N/A T-Int.	Textured w/Borders	Textured w/Borders	Pedestal and Overhead Lighting	Countdown
Beach Boulevard @ Terramar Street	Textured w/Borders	N/A T-Int.	Textured w/Borders	Textured w/Borders	Pedestal and Overhead Lighting	Countdown
Beach Boulevard @ Vistamar	Textured w/Borders	N/A T-Int.	Textured w/Borders	Textured w/Borders	Pedestal Along East Side Only	Countdown
Beach Boulevard @ Sunrise Boulevard	No Marked Crosswalk	N/A T-Int.	Textured w/Borders	Textured w/Borders	Pedestal and Overhead Lighting	Countdown
Sunrise Boulevard @ Birch Road	Transverse Lines Only	Transverse Lines Only	Transverse Lines Only	Transverse Lines Only	Overhead Along South Side Only	Countdown; No Ped Signal for North Leg
Seabreeze Boulevard @ Cortez Street	Transverse Lines Only	Transverse Lines Only	Transverse Lines Only	Transverse Lines Only	Overhead; Northwest quadrant missing	NOT Countdown
Seabreeze Boulevard @ Las Olas Boulevard	This intersection will be reconstructed as part of the Las Olas 'Festival Street' project.					
Seabreeze Boulevard @ SE 5th Street	Transverse Lines Only	Transverse Lines Only	No Marked Crosswalk	Sidewalk	Overhead; Northwest and Northeast Missing	Countdown



3.2 Funding Options

3.2.1 Multimodal Transportation Impact Fees:

Presently, the city participates in the Countywide Transit Concurrency program by which developers mitigate their transportation impacts by contributing to fund transit service on a pro-rata basis commensurate with the number of peak-hour automobile trips they are expected to generate. The City may elect to adopt a Multimodal Transportation Impact Fees (MMTIF) in lieu of or as a supplement to participation in the countywide transit concurrency program.

MMTIF assessments are one-time fees on development that can be used to fund capital improvements to provide transportation system capacity proportional to the development's impacts. Based on the level of development under review in Table 1.6-1, future development approvals along the beach may generate approximately \$950,000 in Transportation Concurrency Fees. A typical MMTIF fee could generate approximately \$1.8 million or a net of approximately \$850,000. Because the Beach Regional Activity Trip Bank is fully allocated, additional development contributions are not expected unless additional trips are allocated by the Broward Planning Council or analysis concludes that past beach development has not consumed the quantity of trips indicated in the trip bank calculations.

3.2.2 Beach Business Improvement District

The Beach Business Improvement District (BID) funds operational costs for services, enhancements, and special programs and events on the beach. The BID relies on a special assessment on business properties for commercial use at a rate of are generated \$0.8525 for each \$1,000 of assessed.

The BID special assessment generates approximately \$950,000 in annual revenues; however, these are fully committed to existing programs. Increases to the assessment rate or expansion of the assessment (geographically or by land use) would require the City Commission to amend or replace its ordinance governing the BID.

3.2.3 Beach CRA

The Beach Community Redevelopment Agency (CRA) extends from North of Harbor Drive to Alhambra Street. Tax Increment Financing (TIF) revenues from the CRA are committed through FY2020. The CRA was established in 1989 and will sunset concurrent with FY2020. As such, no TIF revenues are available thereafter unless the CRA is reestablished by the County Commission.

3.2.4 Transportation Surtax

Over 30 years, the transportation surtax will add \$4.4 billion to new bus transit service and \$2.7 Billion (10% of overall revenues) to city-initiated transportation capital projects throughout the County. This funding can be used to implement Beach Mobility Study recommendations as follows:

- Expansions to bus transit service and increased funding for community bus service could be used to fund recommendations for expanded sun trolley or other beach bus service as identified in recommendation 2.4.1.
- City project funding, as prioritized by the Broward MPO can be used to fund higher-cost intersection operational improvements and bicycle/pedestrian facility investments such as recommendations 2.1.1, 2.1.3/2.3.2, and 2.2.4.

3.2.5 Existing MPO CSLIP Program Funding

Many of the bicycle and pedestrian improvements recommended in the Beach Mobility Study are eligible for funding under the BMPO's Complete Streets and Localized Initiatives Program (CSLIP). These projects are awarded countywide on a competitive basis and are constructed by FDOT in coordination with the applicant and the MPO.

3.2.6 Federal BUILD Grants

Formerly known as Transportation Investment Generating Economic Recovery (TIGER) grants, the Better Utilizing Investments to Leverage Development (BUILD) Grant program is a competitive grant process to fund projects of significant local or regional impact. In urban areas, grant minimums are \$5 million with a maximum grant amount of \$25 million.

Table 3.2-1 provides a matrix linking the funding sources described above to each of the project recommendations identified in this report. Within the funding matrix, consideration should be given to combining some individual recommendations into larger projects to better compete for competitive surtax, CSLIP, or BUILD grant programs. Recommended project groupings are illustrated in Table 3.2-2.

3.3 Cost

As noted in Table 3-1.1, project recommendations have been grouped into general cost categories as follows:

- Low: Less than \$100,000 or equivalent 10-year Operating and Maintenance
- Medium: Between \$100,000 and \$500,000
- High: Greater than \$500,000

Appendix 5 includes more specific cost information for the following recommendations 2.1.1, 2.1.2, 2.3.2, and 2.1.4



Table 3.2-1: Funding Matrix

ID#	Project Location	Cost	Project Description	Surtax (Transit)	Surtax (City)	BMPO CSLIP	BUILD Grant	BID	MMTIF	FDOT 5yr WP	FDOT O&M	Parking	General Fund
2.1.1	Sunrise Boulevard from Birch Road to SR A1A	High	Geometric and operational improvements		X	X			X				
2.1.2	SR A1A from Federal Highway to north of Sunrise Boulevard; Las Olas Boulevard from ICW to SR A1A	High	FDOT ATMS Project							X			
2.1.3	SR A1A from Harbour Inlet Drive to Holiday Drive	Medium	Landscaped medians for speed management		X	X							
2.1.4	SR A1A, Harbor Drive to Sunrise Boulevard	Low	Pick-up/drop-off restrictions								X		
2.1.4	SR A1A, Harbor Drive to Sunrise Boulevard	Medium	Additional pick-up/drop-off bays										X
2.2.1	SR A1A, Harbor Drive to Belmar Street	Medium	Retrofit existing mid-block crosswalks for consistency and ensure crosswalk lighting meets standards								X		
2.2.2	Throughout Study Area	Medium	Retrofit existing signalized intersections with High Emphasis Markings, Countdown Signal Heads, and Pedestrian Intersection Lighting								X		
2.2.3	Birch Road and Breakers Ave	Low	Crosswalk Marking Improvements & Stop Control Changes			X							
2.2.4	Birch Road and Breakers Ave	Medium	Central Beach Streetscape Interim Improvements Convert Birch Road from 4U to 2D cross-section from Riomar to Vistamar Street		X	X							
2.2.4'	Birch Road and Breakers Ave	High	Central Beach Streetscape Improvements		X	X							
2.2.5	SR A1A between Vistamar Street and NE 9th Street	Low	Mid-Block Crosswalk		X					X			
2.3.1	SE 17th Street ICW Bridge to Harbour Inlet Drive (Westbound Span)	Low	Narrow travel lanes to provide westbound transit/low-speed vehicle lane	X							X		
2.3.1	SE 17th Street ICW Bridge to Harbour Inlet Drive (Eastbound Span)	Medium	Narrow inside shoulders and travel lanes, and provide a two-way cycle track		X	X	X						
2.3.2	SR A1A Harbour Inlet Drive to One-Way Pair	High	Shift motor-vehicle lanes to the north/west curb-line and reconstruct the east/south sidewalk as a 12ft shared-use path.		X	X	X						
2.3.3	Las Olas Boulevard ICW Bridge to Himarshee Canal	Low	Narrow travel lanes and provide buffered/protected bike lanes		X	X	X						
2.3.3	Las Olas Boulevard Himarshee Canal Bridge	Medium	Reduce lane widths and widen sidewalks		X	X	X						
2.3.4	Sunrise Boulevard from Birch Road to Middle River Drive	Medium	Narrow lanes to provide for buffered bike lanes and widen sidewalks where possible to 8ft minimum.		X	X	X						
2.3.5	Birch Road Trail Extension	High	Provide Non-Motorized Trail Connection from the End of Birch Road through Bonnet House property to NE 9th Street and through Birch State Park Connecting to NE 32nd Avenue at NE 19th Street.		X	X	X						
2.4.1	Sun Trolley Improvements	High	Service span, frequency, and route adjustments	X					X**				
2.4.2	Expand Free Ride (or Similar) Service)	Medium	Consider subsidizing service to reduce wait times--especially outside of core Sun Trolley service hours.					X					X
2.4.3	Water Taxi Point-to-Point Service	Medium	Evaluate point to point service between Merle Fogg Park and Existing Station 6 at the Las Olas Marina.	X					X**				X
2.5.1	Parking Strategies	Medium	Link SunTrolley routes and fairs with downtown parking. Incorporate privately owned, public parking into realtime public parking availability system	X				X				X	X
2.5.2	Mobility Brochures for Hotels/Resorts	Low	Provide brochures/paper maps of Sun Trolley and Water Taxi routes as well as service area and hailing information for micro-transit services. These should be distributed in hotel lobbies, the convention center, Harbor Shops, and Galleria Mall.					X				X	X

** Capital Only



Table 3.3-2: Project Grouping Recommendations

Group	ID#	Project Location	Cost	Project Description	Notes
1	2.1.1	Sunrise Boulevard from Birch Road to SR A1A	High	Geometric and operational improvements	Combine into one project with limits along Sunrise Boulevard from Middle River Drive to SR A1A.
	2.3.4	Sunrise Boulevard from Birch Road to Middle River Drive	Medium	Narrow lanes to provide for buffered bike lanes and widen sidewalks where possible to 8ft minimum.	
2	2.1.3	SR A1A from Harbour Inlet Drive to Holiday Drive	Medium	Landscaped medians for speed management	Combine into one project to provide a continuous separated/low-stress cycling facility along the following segments: 1) SE 17th Street from Andrews to Causeway 2) SE 17th Street Causeway 3) SR A1A/Beach Blvd from SE 17th Street Causeway to Seabreeze Avenue 4) SR A1A/Seabreeze Avenue from Beach Boulevard to Birch Road ROW 5) Birch Road from Seabreeze Avenue to Bonnet House 6) Birch Road thru Bonnet House to Sunrise Blvd. 7) Birch Road thru Birch State Park to NE 19th Street 8) NE 32nd Avenue from NE 19th Street to Oakland Park Blvd.
	2.2.4	Birch Road and Breakers Ave	Medium	Central Beach Streetscape Interim Improvements Convert Birch Road from 4U to 2D cross-section from Riomar to Vistamar Street	
	2.3.1	SE 17th Street ICW Bridge to Harbour Inlet Drive (Westbound Span)	Low	Narrow travel lanes to provide westbound transit/low-speed vehicle lane	
	2.3.1	SE 17th Street ICW Bridge to Harbour Inlet Drive (Eastbound Span)	Medium	Narrow inside shoulders and travel lanes, and provide a two-way cycle track	
	2.3.2	SR A1A Harbour Inlet Drive to One-Way Pair	High	Shift motor-vehicle lanes to the north/west curb-line and reconstruct the east/south sidewalk as a 12ft shared-use path.	
	2.3.5	Birch Road Trail Extension	High	Provide Non-Motorized Trail Connection from the End of Birch Road through Bonnet House property to NE 9th Street and through Birch State Park Connecting to NE 32nd Avenue at NE 19th Street.	
	2.3.5	Birch Road Trail Extension	High	Provide Non-Motorized Trail Connection from the End of Birch Road through Bonnet House property to NE 9th Street and through Birch State Park Connecting to NE 32nd Avenue at NE 19th Street.	
3	2.2.1	SR A1A, Harbor Drive to Belmar Street	Medium	Retrofit existing mid-block crosswalks for consistency and ensure crosswalk lighting meets standards	Consider combining sign & pavement marking components into one work order and combining lighting and signalization components into a separate work program project.
	2.2.2	Throughout Study Area	Medium	Retrofit existing signalized intersections with High Emphasis Markings, Countdown Signal Heads, and Pedestrian Intersection Lighting	
	2.2.5	SR A1A Between Vistamar Street and SE 9th Street	Low	Provide a marked mid-block crosswalk proximate to the Bonnet House pedestrian access point if warranted per FDOT TEM Chapter 3.8	
4	2.3.3	Las Olas Boulevard ICW Bridge to Himarshee Canal	Low	Narrow travel lanes and provide buffered/protected bike lanes	Incorporate in Las Olas Streetscape Project
	2.3.3	Las Olas Boulevard Himarshee Canal Bridge	Medium	Reduce lane widths and widen sidewalks	
5	2.4.1	Sun Trolley Improvements	High	Service span, frequency, and route adjustments	Incorporate in transit service improvements for the beach study area. Expansion of freeride service would not be funded as part of the public transportation system improvements, but should be coordinated to provide overall coverage as needed.
	2.5.1	Parking Strategies	Medium	Link SunTrolley routes and fairs with downtown parking. Incorporate privately owned, public parking into realtime public parking availability system	
	2.5.2	Mobility Brochures for Hotels/Resorts	Low	Provide brochures/paper maps of Sun Trolley and Water Taxi routes as well as service area and hailing information for micro-transit services. These should be distributed in hotel lobbies, the convention center, Harbor Shops, and Galleria Mall.	
	2.4.2	Expand Free Ride (or Similar) Service)	Medium	Consider subsidizing service to reduce wait times--especially outside of core Sun Trolley service hours.	
	2.4.2	Expand Free Ride (or Similar) Service)	Medium	Consider subsidizing service to reduce wait times--especially outside of core Sun Trolley service hours.	
6	2.1.4	SR A1A, Harbor Drive to Sunrise Boulevard	Low	Pick-up/drop-off restrictions	Pick-up/drop-off restriction signing and enforcement should be accompanied by provision of additional legal pick-up/drop-off bays.
	2.1.4	SR A1A, Harbor Drive to Sunrise Boulevard	Medium	Additional pick-up/drop-off bays	
N/A	2.1.2	SR A1A from Federal Highway to north of Sunrise Boulevard; Las Olas Boulevard from ICW to SR A1A	High	FDOT ATMS Project	These are stand-alone projects.
	2.2.3	Birch Road and Breakers Ave	Low	Crosswalk Marking Improvements & Stop Control Changes	
	2.2.4	Birch Road and Breakers Ave	High	Central Beach Streetscape Improvements	
	2.4.3	Water Taxi Point-to-Point Service	Medium	Evaluate point to point service between Merle Fogg Park and Existing Station 6 at the Las Olas Marina.	



Appendix 1: Focus Group Summaries

Beach Mobility

Resident Focus Group Summary
11/17/2017

Prepared for



CITY OF FORT LAUDERDALE

Prepared by



Beach Mobility – Resident Focus Group

On November 17, 2017 the first Beach Mobility Resident Focus Group was held at the Beach Community Center at 3351 NE 33rd Avenue. The goal of this focus group was to discuss key issues and mobility options in the area, provide feedback from the public to the City's team, and inform the evaluation process that will guide recommended strategies for implementation within the area.

This summary is to document the input of those who were generous enough to donate their time to attend and also to provide an overview for interested residents who could not attend the focus group meeting. We kindly ask for feedback by December 15, 2017 for any additional comments or clarifications that need to be included in the record.

Section 1 Resident Focus Group

1.1 General Themes

Some discussion was had about preserving and enhancing the value of the barrier islands. Some stated they recognize that they are attracted to the area for the same reasons as tourists and local visitors, but there should be a balance between their quality of life and those who visit.

1.2 Traffic Issues

Many of the residents agreed that traffic seems to be getting somewhat worse over time, or at least consistently bad throughout the day. There were mentions of previous plans not coming to fruition and that speeding was a problem primarily on the one-way southbound segment of Seabreeze Blvd, but also throughout the study area. Numerous maintenance and freight vehicles are clogging up, blocking access, and disrupting traffic flow throughout the day. Allocating space to serve multiple needs throughout the day should be explored. Other comments include:

- Funding/Implementation
 - They've done studies before but nothing gets implemented
- Extension of Birch to Sunrise previously considered
- Need overarching plan for system continuity
- Overall congestion is an issue
- Congestion on 17th Street
- Safety of back-out parking on Birch
- Pick-up/Drop-offs/Freight/Maintenance vehicles
 - Uber and Lyft pick-ups are problematic and create weaving traffic.
 - Freight in travel lanes is a major issue creating blind spots and weaving.
 - Designated areas for these activities could provide safety benefit.
 - Coordination of freight to off-peak
 - Could be a shared space that is utilized at different times of the day by different vehicles
 - City maintenance/landscaping and waste collection vehicles block travel lanes, are on sidewalks, and create more weaving and block bike/pedestrian paths creating conflict points.

- Consideration should be given to making Seabreeze the thoroughfare and A1A being made into a more bike-ped-transit friendly environment where slow speeds and safety is prioritized above throughput.
- Circulation has worsened particularly in the afternoon/evening.
- Sunrise and A1A Operations are problematic.
- Conversation about old 3+2 plan for bypass of A1A from Sunrise to Birch (concept resisted)
- Sunrise to A1A southbound right turn is an issue.
 - Signage is confusing, only right-on-red from inside lane. Observed many rolling through outside on red phase.
- Concern about multiple major special events and inconsistent management of traffic and parking—discussed further below.

1.3 Bike and Pedestrian Specific Issues

There was considerable concern expressed for overall safety and that on-street bike facilities were likely only appealing to a small portion of potential cyclists. The existing environment doesn't seem to be inviting to tourists and/or families that may not feel safe/comfortable on the roadway with vehicles. Exploring potential for shared space separated from traffic was discussed at length.

- Property Redevelopment for Bike/Ped Facilities
- West side of A1A encroachment of businesses, café tables, etc.
- East side of A1A should be considered, with SE 17th Street, to provide a side path for a continuous bike-ped path that connects all the way to the beach.
- Bicycle safety and education, and biking on sidewalk
 - Some confusion on legality of biking on sidewalk
 - Better defined space on sidewalk could facilitate less confusion/conflicts
- Cyclists should be able to ride next to each other in a bike-facility and enjoy themselves when riding recreationally. This is not safe to do on current facilities. Should be safe for leisurely cycling that includes children.
- Florida Statute States:
 - (9) A person propelling a vehicle by human power upon and along a sidewalk, or across a roadway upon and along a crosswalk, has all the rights and duties applicable to a pedestrian under the same circumstances.
 - (10) A person propelling a bicycle upon and along a sidewalk, or across a roadway upon and along a crosswalk, shall yield the right-of-way to any pedestrian and shall give an audible signal before overtaking and passing such pedestrian.
- Sidewalk conditions are a big need (cracks/slopes/street flooding) and can be impassable.
- Sidewalk connectivity is lacking.
- Need more B-cycle stations.

1.4 Transit Issues

Transit needs to be improved both with county buses and the trolley routes. More frequency and dependability with the trolleys was brought up multiple times.

- Trolley stops and schedules need to be defined for predicatbility
- Need to be a fun open-air vehicle
 - Some people loved it as is, others stated it was dark and uninviting
- Trolleys have had maintenance issues which has reduced the fleet size having negative effects on ridership/public perception.

1.5 Special Events

More coordination of special events is necessary for the multiple festivals that occur annually. The lack of public restrooms is something that desperately needs to be addressed.

- Tortuga and Spring Break are getting more raucous
- More and more college students
- Litter and debris are an issue
- Public restrooms on the beach are a big need

1.6 Maintenance of Transportation Issues

There doesn't seem to be good coordination of preserving safe access around construction sites. Bridge opening are also problematic and seem to be inconsistent.

- Maintaining public right-of-way during building construction

1.7 Parking/Infrastructure/Signage

A cohesive strategy for addressing parking and wayfinding is needed for all modes to facilitate safe connections and reduce circulating traffic and confusion. Flooding issues persist in specific areas, both old and new. Some discussion was had about the business community commenting how much capacity they now have available since the Uber/Lyft entrance to the market. Potentially exploring parking arrangements to utilize this parking more efficiently should be explored. However, careful consideration should be given to how this could impact overall traffic.

- Bonnet House
- Intelligent wayfinding signage is needed
- Diagonal parking north of Sunrise?
- Back out parking on Birch
- Parking availability a perceived issue
- Lighting for turtles is affecting safety for 6 months out of the year
- Intercept visitors at parking facility and circulate them seamlessly
- Lighting/Turtle Issues:
 - Very dark south of Sunrise
 - Explore alternative concepts for lighting, look at Volusia County and some lower LED pathway lights that stay below seawall on west side of A1A.
 - Public safety concern for traffic and crime
 - Crosswalks with flashing beacons deactivated in turtle season? Safety concern.

Beach Mobility

Business Focus Group Summary
11/16/2017

Prepared for



CITY OF FORT LAUDERDALE

Prepared by



Beach Mobility – Business Focus Group

On November 16, 2017 the first Beach Mobility Business Focus Group was held at the Beach Community Center at 3351 NE 33rd Avenue. The goal of this focus group was to discuss key issues and mobility options in the area, provide feedback, and inform the evaluation process that will guide recommended strategies for implementation within the area.

This summary is to document the input of those who were generous enough to donate their time to attend and also to provide an overview for interested parties who could not attend the focus group meeting. We kindly ask for feedback by December 15, 2017 for any additional comments or clarifications that need to be included in the record.

Section 1 Business Focus Group

1.1 Traffic Issues

The general consensus was that traffic seems to be getting a little worse over time, or at least consistently bad throughout the day. There were mentions of previous plans not coming to fruition and that speeding was a problem primarily on the one-way southbound segment of Seabreeze Blvd. Numerous maintenance and freight vehicles are clogging up, blocking access, and disrupting traffic flow throughout the day. Allocating space to serve multiple needs throughout the day should be explored.

- Overall flow is poor
- Pick-up/Drop-offs/Freight/Maintenance vehicles
 - Uber and Lyft pick-ups are problematic and create weaving traffic
 - Freight in travel lanes is a major issue creating blind spots and weaving
 - Designated areas for these activities could provide safety benefit
 - Coordination of freight to off-peak
 - Could be a shared space that is utilized at different times of the day by different vehicles
 - City maintenance/landscaping and waste collection vehicles block travel lanes, are on sidewalks, and create more weaving and block bike/ped paths creating conflict points
- Signal timing/coordination is an issue along Sunrise Blvd.
- Circulation has worsened particularly in the afternoon/evening
- Sunrise and A1A Operations are problematic
- Conversation about old 3+2 plan for bypass of A1A from Sunrise to Birch (concept resisted)
- Sunrise to A1A southbound right turn is an issue
 - Signage is confusing, only right-on-red from inside lane. Observed many rolling through outside on red phase.

1.2 Bike and Pedestrian Specific Issues

There was considerable concern expressed for overall safety and that on-street bike facilities were likely only appealing to a small portion of potential cyclists. The existing environment doesn't seem to be inviting to tourists and/or families that probably don't feel safe/comfortable on the roadway with vehicles. Exploring potential for shared space separated from traffic was discussed at length.

- Safe sharing of ROW between all modes is needed
- Pedi-cabs in bike lanes seem to work well and are clean
 - Funding for a larger fleet?
- Crossings near Bonnet House
- No continuity between crosswalks (several different designs and can confuse drivers, especially tourists)
- Maintenance/Freight/Uber-Lyft in bike lanes and blocking through travel in auto-travel lanes

1.3 Transit Issues

Transit needs to be improved both with county buses and the trolley routes. More frequency and dependability with the trolleys was brought up multiple times.

- Access is very difficult
- Trolleys
 - Designated routes and times with frequency improvements -> Dependability
 - Seem to have no set schedule and stop traffic
- Think about commuters onto and off of island
- BCT Buses
 - Block intersection/parking when turning/layover around near Sunrise.
- Workforce access to beach: Need frequency and ease of access
- Sunrise & A1A block Birch access: Layover issues at
- Bus into neighborhood at 9th & Sunrise 7-11

1.4 Special Events

The perception of efficient traffic maintenance of special events has shown that the proper coordination can lead to effective execution of these large events.

- Events have done well
- Look at Tortuga for a positive example
- Concierge coordination for event travel

1.5 Maintenance of Transportation Issues

There doesn't seem to be good coordination of preserving safe access around construction sites. Bridge opening are also problematic and seem to be inconsistent.

- Not very pleased with (mostly) private construction and preserving space for bike/ped/traffic
- Bridge Openings are problematic
 - Hotels need info, can impact travel times to airport
 - Length of opening
 - Are rules being followed?
 - Mass communication of these opening are needed to facilitate better mobility.

1.6 Parking/Infrastructure/Signage

A cohesive strategy for addressing parking and wayfinding is needed for all modes to facilitate safe connections and reduce circulating traffic and confusion. Flooding issues persist in specific areas, both old and new.

- Map should be available on mobile device
- Should be more intuitive with wayfinding signage that could help people navigate to spaces/garages and reduce circulating traffic.
- Flooding issues are problematic in specific areas and on Intracoastal
 - W Hotel Area
- Water Taxi
 - Shelter/Security is an issue at the Water Taxi Stop
 - Wayfinding signage to and from docks is poor
 - Possible public docs at Las Olas and Sunrise? Event docking locations.
- Multiple Names of A1A is confusing
- Arterial wayfinding would be an improvement too
- Pedestrian wayfinding from Parking Deck to Beach, be proactive and think about it now!
- Lighting/Turtle Issues:
 - Very dark south of Sunrise
 - Explore alternative concepts for lighting, look at Volusia County and some lower LED pathway lights that stay below seawall on west side of A1A.
 - Public safety concern for traffic and crime
 - Crosswalks with flashing beacons deactivated in turtle season? Safety concern.



Appendix 2: Resident/Business and Visitor Surveys

Fort Lauderdale Beach Mobility

Resident/Business and Visitor Surveys

February 2018

Prepared for



CITY OF FORT LAUDERDALE

Prepared by



CITY OF FORT LAUDERDALE





1. Introduction and Summary

Resident/business owner and visitor surveys were conducted as part of the Fort Lauderdale Beach Mobility study to understand patterns and preferences of transportation and mobility in the area. Conducted from December of 2017 through February of 2018, links to on-line surveys were emailed to project stakeholders, placed on the project website, placed on sidewalks through decals, and recirculated via social media. Visitors to the area were asked similar questions during the day and early evenings of January 12th and 13th about transportation and mobility habits to highlight different perspectives and habits. Survey responses will help the project team determine and evaluate mobility strategies that serve all who travel in and around Fort Lauderdale Beach.

Major takeaways from the surveys are as follows, and detailed survey responses are included in the figures and tables on the following pages:

- Congestion and travel times are a major concern to residents and business owners.
- Residents and business owners felt that the pedestrian infrastructure is inadequate, primarily off the main arterials and walking between the beach and the mainland. Bicycle facilities were identified as inadequate, primarily along A1A/Fort Lauderdale Beach Boulevard, off major arterials, and between the beach and the mainland.
- Residents and business owners most often use a personal automobile when traveling within and to and from the study area. Other modes of travel that are relatively frequently used when traveling within the study area include ride-sharing services, bicycling, and walking. Ride-sharing services and personal automobiles are most used when traveling to and from the study area.
- Residents and business owners indicated that more frequent trolley service, safer bike facilities, and safer, more complete sidewalks with improved crossings would most encourage them to choose a mode other than an automobile to make trips within as well as to and from the study area.
- Many residents indicated that over-development, tourism, and large events are major contributors to traffic and congestion in the area.
- The majority of visitors used an automobile, whether personal or ride-share, to travel to Fort Lauderdale Beach. Once beachside, the majority walked within the study area as their primary mode.
- Most visitors indicated that no improvements could be made that would encourage them to use other modes of transportation within and to and from the study area, despite the majority walking as their primary mode for traveling within the study area.
- Visitors felt that the pedestrian infrastructure is very good, with most of their perception based on their experience crossing A1A.
- Although many visitors were comfortable walking, many expressed hesitation about biking on the corridors due to vehicle speeds.



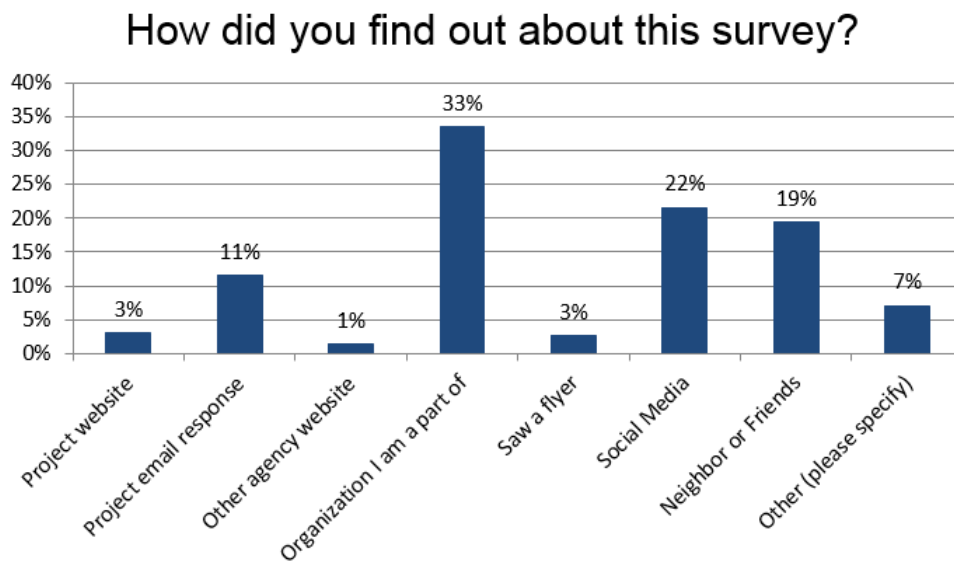
2. Resident and Business Owner Surveys

Resident and business owner surveys were completed as part of the Fort Lauderdale Beach Mobility study to understand patterns and preferences of transportation and mobility in the area. Approximately 230 residents and business owners participated in the online survey, with the majority of responses completed December 18, 2017, to January 8, 2018, the results of which are shown below.

2.1 Survey Takers

Residents and business owners were directed to the project primarily by a local organization, friend/neighbor, or social media.

Figure 1: Survey Takers





2.2 Age and Description

The typical respondent to the survey was a resident in the study area and over the age of 55, as shown in the following figures.

Figure 2: Age

How old are you?

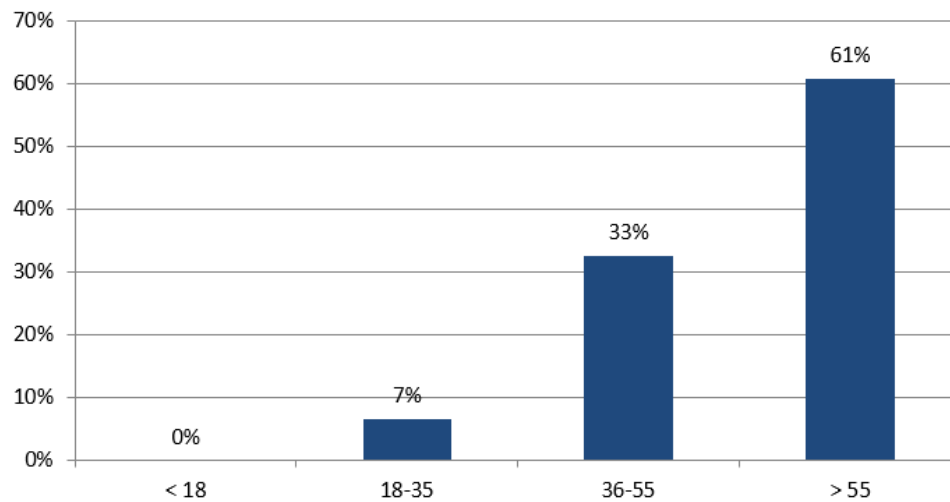
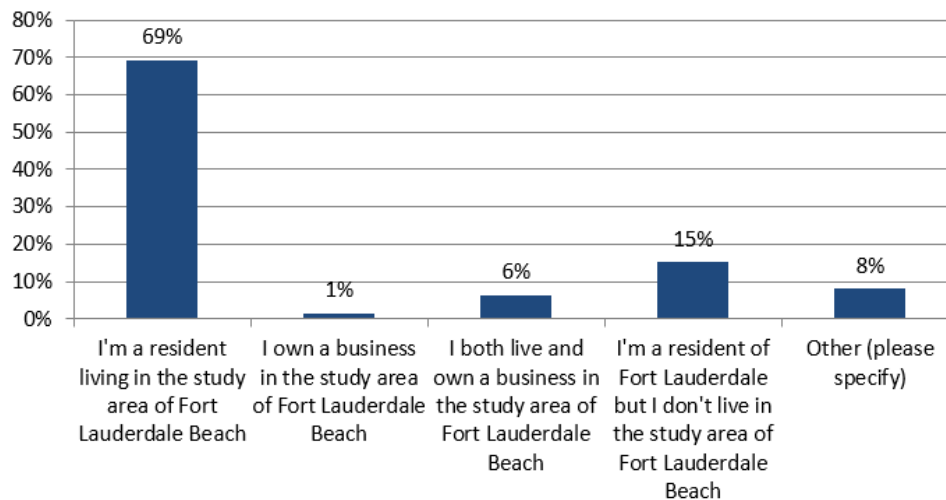


Figure 3: Description of Survey-Taker

Select the one that fits you best:



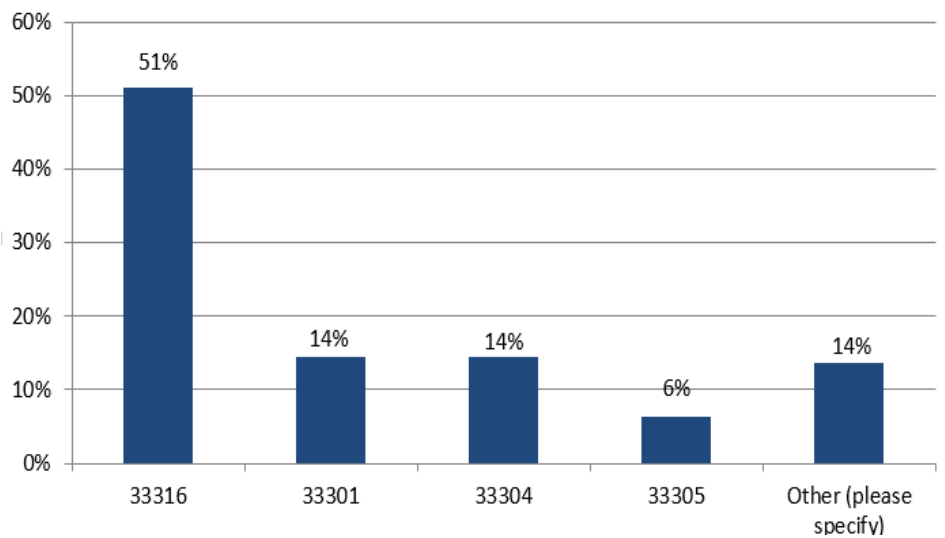


2.3 ZIP Code

The most common ZIP code indicated by respondents was 33316, as shown in Figure 4. This ZIP code includes the barrier island south of Cortez Boulevard, which is just north of Las Olas Boulevard. Outside of the 4 ZIP codes provided, responses included individuals from Georgia, Illinois, Massachusetts, New York, New Jersey, Pennsylvania, and Texas.

Figure 4: Home ZIP Code

What is your home ZIP code?





2.4 Most Frequently Traveled Corridors

Business owners and residents used different primary corridors for traveling to and from the beach, with residents preferring to use SE 17th Street and business owners using SE 17th Street and Las Olas Boulevard equally. Figure 5 and Figure 6 show the differences between residents and business owners in their corridor choice to and from the beach.

Figure 5: Frequent Corridors (Business Owners)

Which of the following corridors do you travel on most often to get to or from the Beach?

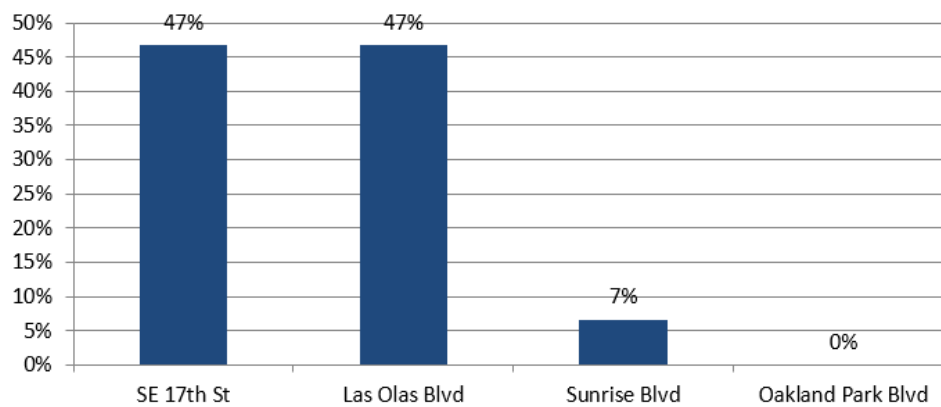
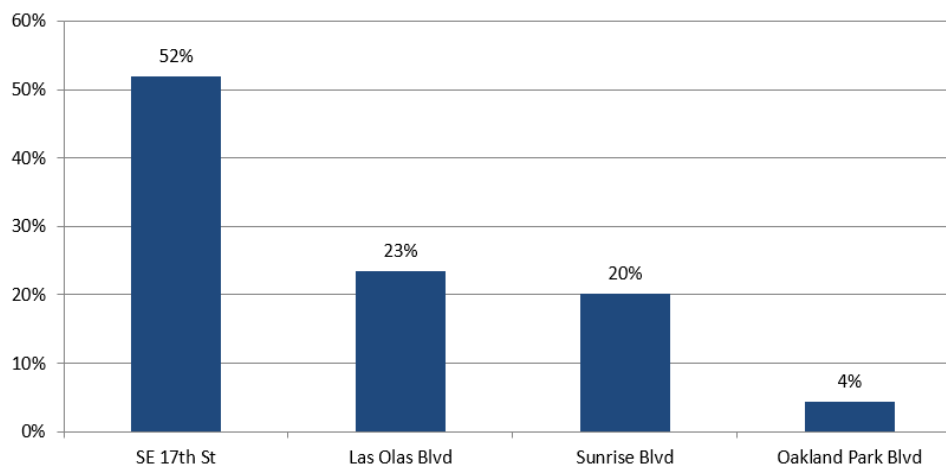


Figure 6: Frequent Corridors (Residents)

Which of the following corridors do you travel on most often to get to or from the Beach?

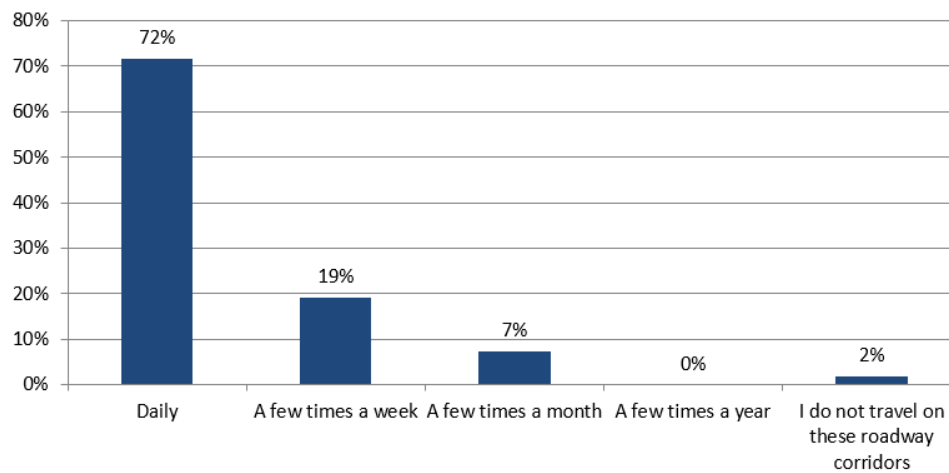




Following up on the previous question about which corridor respondents travel on most frequently to access the beach, around 70% indicated they traveled along the corridor daily.

Figure 7: Frequency of Travel

How often do you travel along the corridor chosen in the previous question?

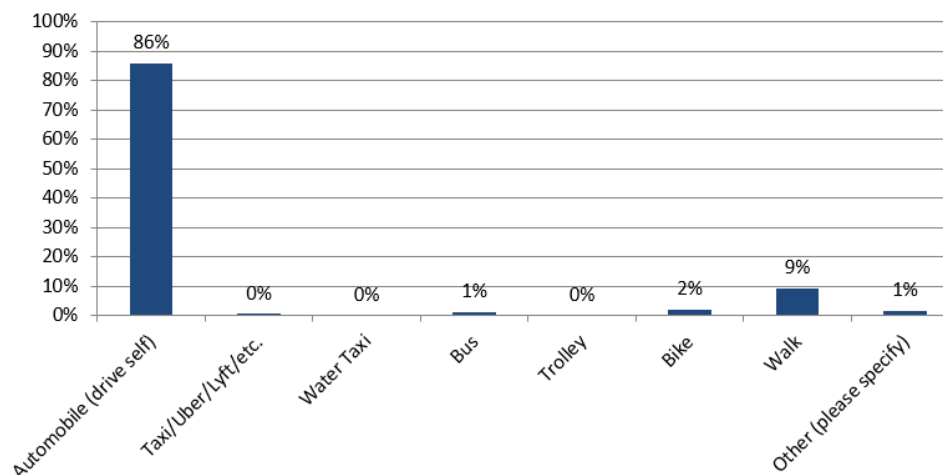


2.5 Modes of Travel

Automobiles were the most frequent mode of travel within the study area among respondents.

Figure 8: Primary Travel Mode within Study Area

How do you most often travel within the study area (the barrier island)?

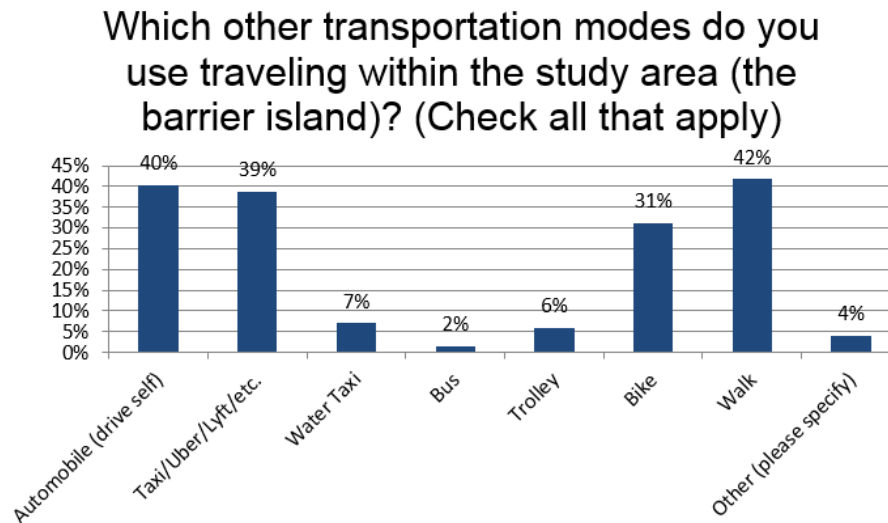




2.6 Other Modes of Travel

Other modes of transportation frequently used within the study area include personal automobile, taxi/Uber/Lyft and other ride sharing services, biking, and walking. The trolley and water taxi are used infrequently, with bus being the least-used transportation mode. Figure 9 shows the frequency of usage for other modes of transportation within the study area.

Figure 9: Other Modes within Study Area





2.7 Travel Outside Study Area

The personal automobile is the primary mode for traveling outside the study area. Respondents also indicated using ride-sharing services a significant amount to travel outside of the study area when not taking a personal automobile, as well as walking and biking.

Figure 10: Primary Mode outside Study Area

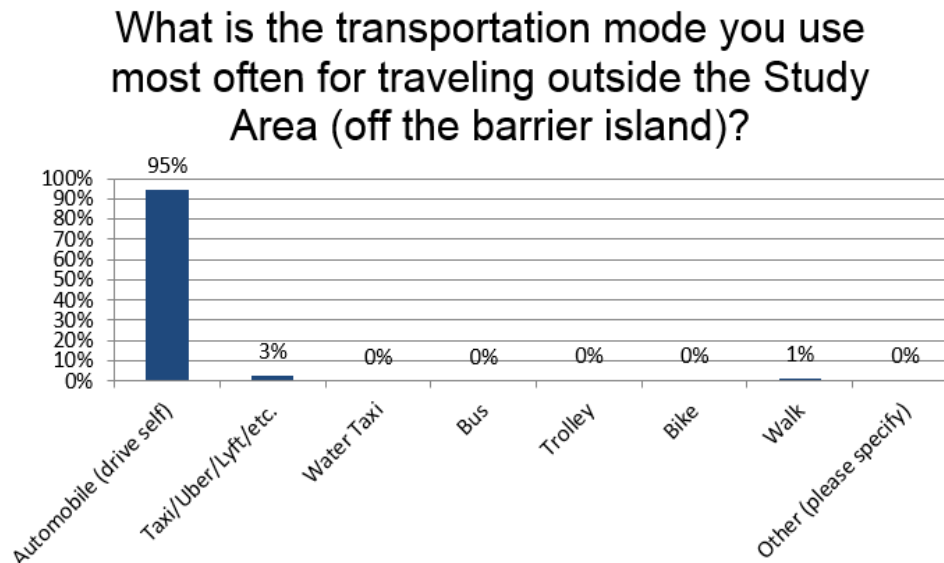
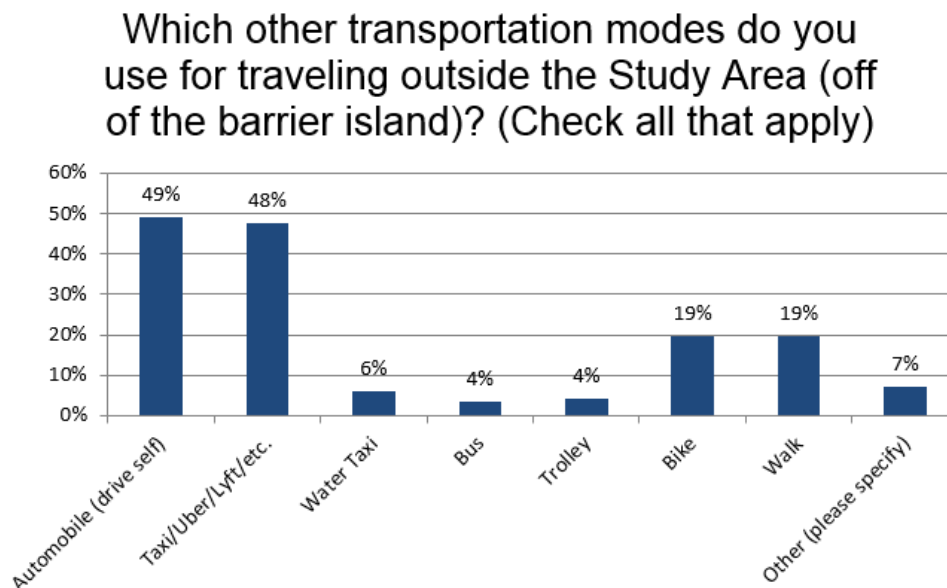


Figure 11: Other Modes outside Study Area



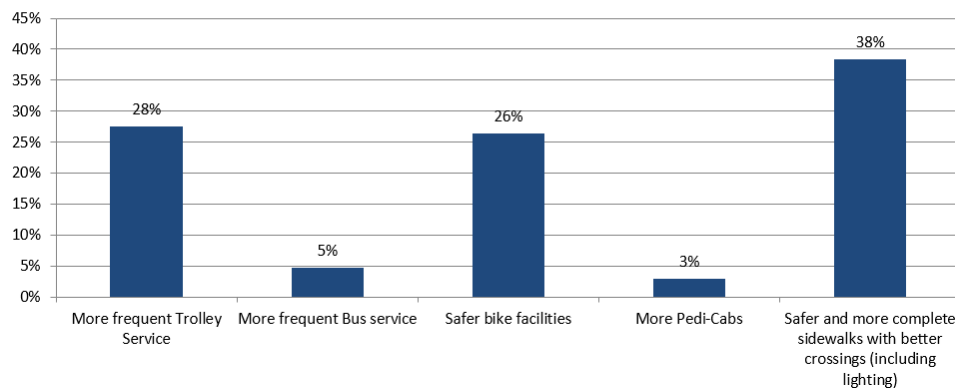


2.8 Encouraging Other Modes

Respondents noted several improvements that would most encourage them to choose something other than an automobile to travel within the study area, including more frequent trolley service, safer bicycle facilities, and safer, more complete sidewalks with improved crossings.

Figure 12: Encouraging Other Modes within Study Area

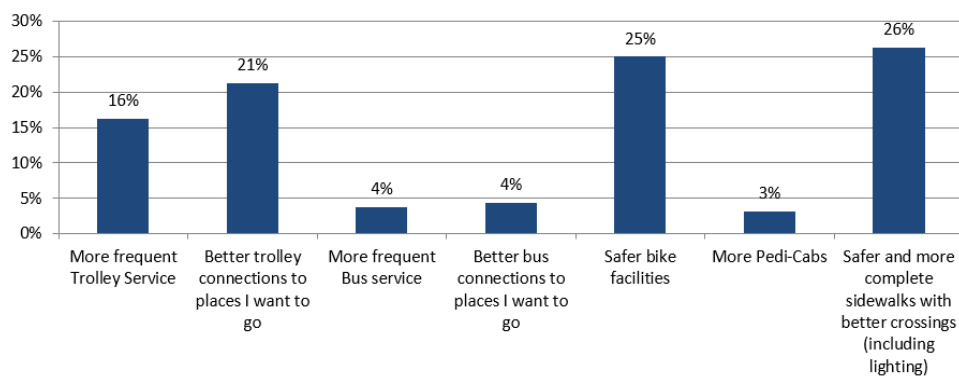
What improvement would most encourage you to choose something other than an automobile (your own, or a taxi/uber/lyft) to make a trip within the study area?



When asked what would encourage them to travel to or from the study area other than using an automobile, respondents noted more frequent trolley service with improved trolley connections, safer bicycle facilities, and safer, more complete sidewalks with improved crossings.

Figure 13: Encouraging Other Modes outside Study Area

What improvement would most encourage you to choose something other than an automobile (your own, or a taxi/uber/lyft) to make a trip to-or-from the study area?

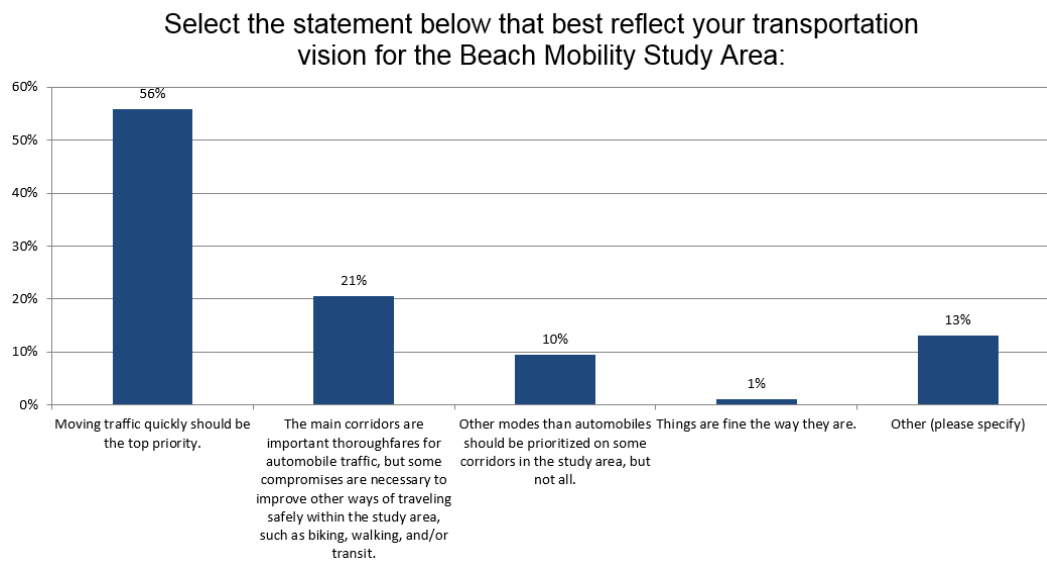




2.9 Transportation Vision

Respondents were asked to select a statement that best reflected their vision for transportation in the study area. The majority indicated that moving traffic quickly should be the top priority, and around 20% stated that some compromises on automobile traffic would be necessary to improve other modes of travel and safety. Other statements mostly focused on stopping or slowing development on the island to prevent increased traffic and congestion.

Figure 14: Transportation Vision Statement

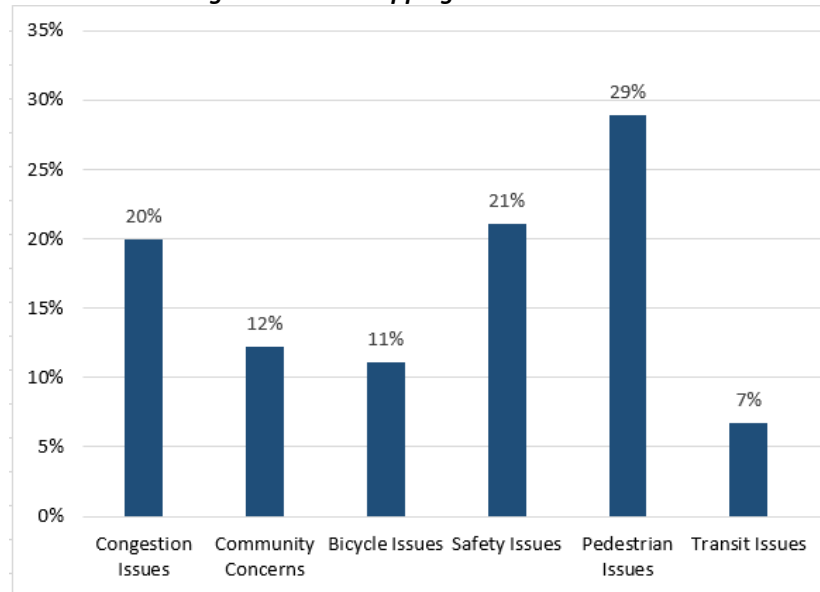




2.10 Wikimapping Results

A Wikimapping exercise, which is a public engagement tool to help planners and the public to spatially identify problems, barriers, and safety concerns, was conducted for residents, business-owners, and visitors, the results of which are provided in aggregate form below. Figure 15 shows the category of comments and pins from the wikimapping tool, with pedestrian issues the most frequently cited issue. Other specific issues included poor cross-walk signals, bicycle infrastructure to the beach, unclear wayfinding signage, lighting, and flooding in the roadway. Additional takeaways are listed below.

Figure 15: Wikimapping Comment Results



- Bicycle comments primarily focused on safer 'protected' facilities.
- Pedestrian issues focused on enhancing crosswalks, insufficient or lack of sidewalks, and lighting issues along A1A.
- Safety issues included flooding, sight obstructions, and delivery/maintenance vehicles obstructing traffic flow.
- Congestion comments focused on intelligent signage/wayfinding, and the intersection of Sunrise Boulevard and A1A.
- Transit comments included an indication of a shuttle being needed from downtown to the beach and some issues near Sunrise Boulevard with layovers and turning conflicts.
- Community Concern comments included signage issues on E Las Olas Boulevard for right turn lane, rideshare signage on A1A, lighting, and trolley/transit issues.



2.11 Current Perceptions

Respondents were asked to rank their perceptions of the current conditions of various modes and services provided within the study area, including their perceptions of driving, walking, biking, Sun Trolley, and Broward County Transit. Respondents ranked the conditions of each mode on a scale of 1 to 5, with 1 being “very bad” and 5 being “very good.” Figure 166 through Figure 22 show the weighted average of the rankings for all respondents.

Figure 16: Current Driving Perceptions

Please rate the current condition of the following issues from 1 to 5 - Driving

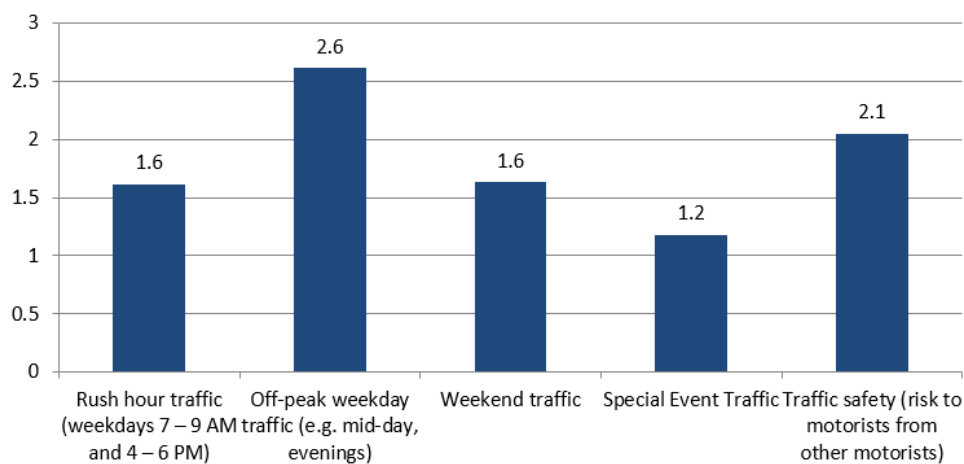


Figure 17: Current Walking Perceptions

Please rate the current condition of the following issues from 1 to 5 - Walking

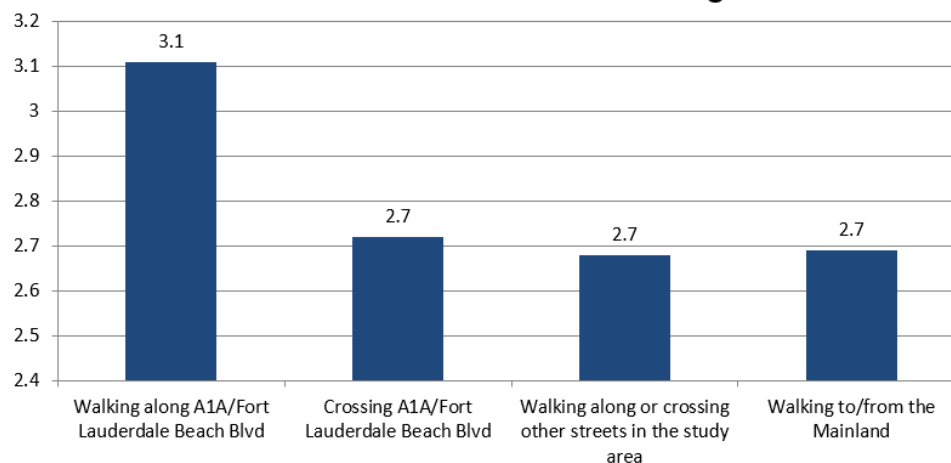




Figure 18: Current Biking Perceptions

Please rate the current condition of the following issues from 1 to 5 - Biking

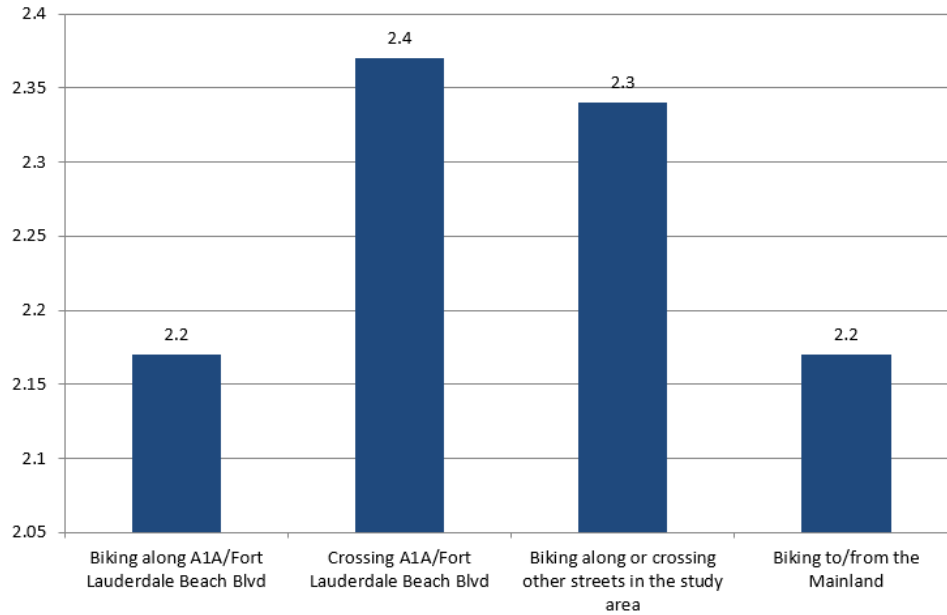


Figure 19: Current Trolley Perceptions

Please rate the current condition of the following issues from 1 to 5 - Sun Trolley

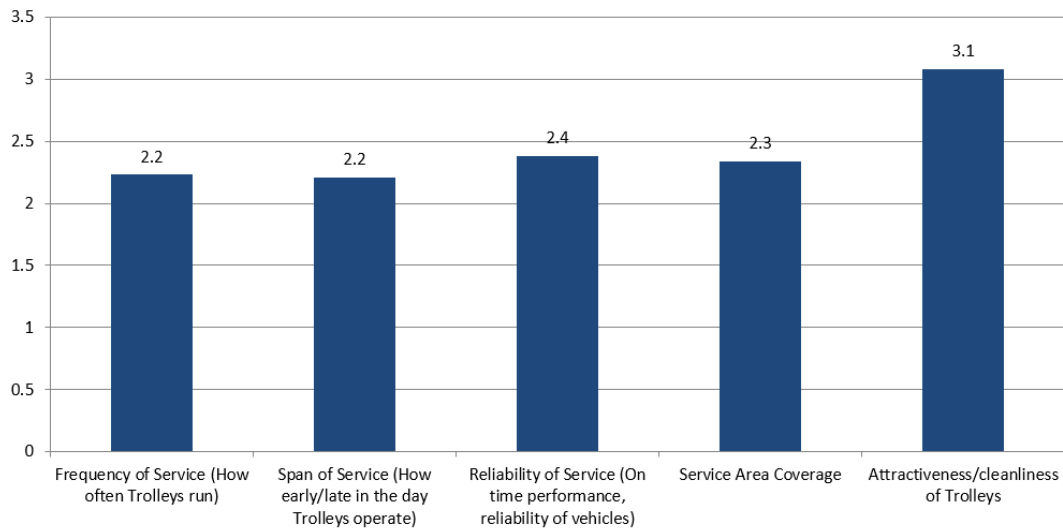




Figure 20: Current BCT Perceptions

Please rate the current condition of the following issues from 1 to 5 - Broward County Transit

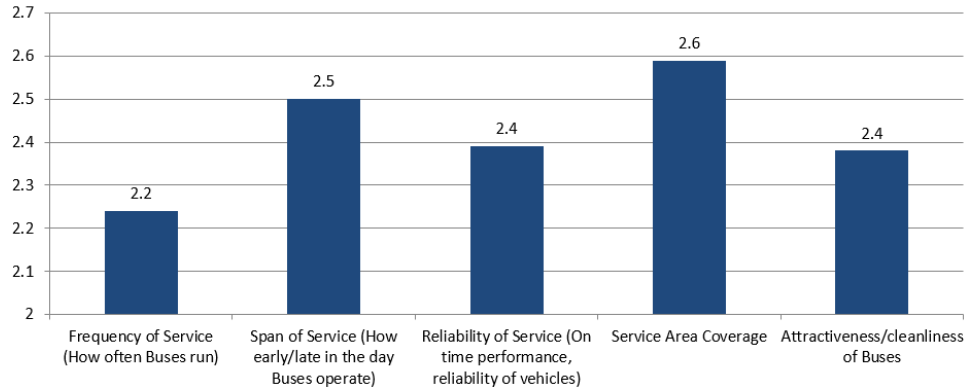


Figure 21: Community Importance

Please rate the importance of the following issues from 1 to 5 - Community

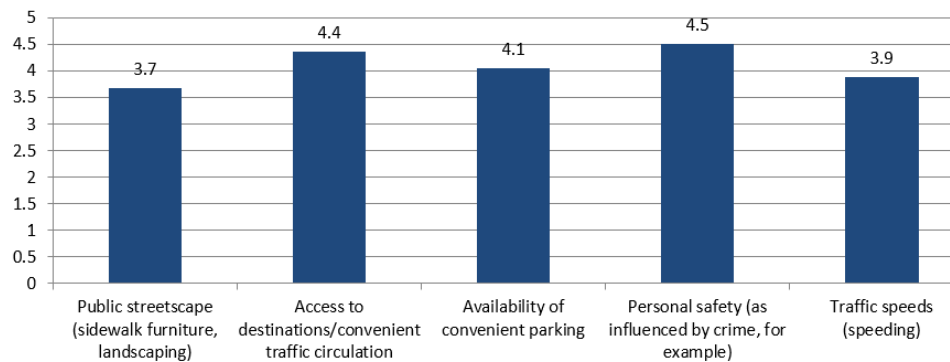
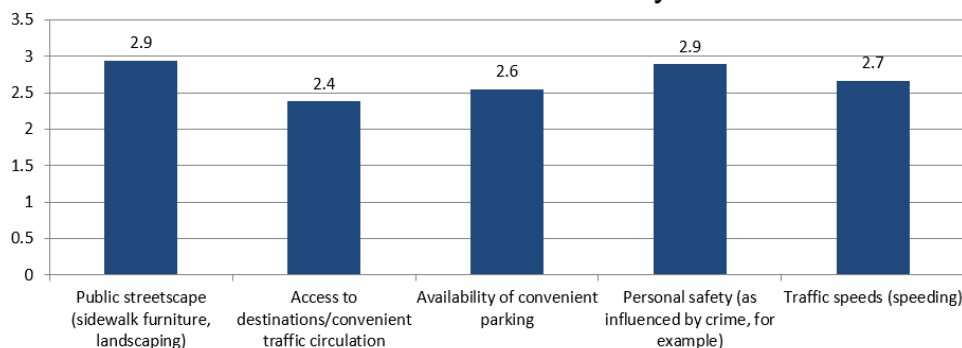


Figure 22: Current Community Perceptions

Please rate the current condition of the following issues from 1 to 5 - Community





2.12 Other Results and Comments

In addition to responding to survey questions, residents and business owners were invited to make comments on a variety of issues addressed throughout the survey. Following are general concerns or recommendations indicated:

- A significant number of people expressed concerns with over-development on the barrier island, with calls to slow down or put a moratorium on new development and to not allow increased density.
- Several respondents expressed concern with removing or narrowing travel lanes to improve bicycle, pedestrian, or trolley service.
- Several residents and business owners stated that they would not switch modes to biking, walking, or taking the bus regardless of infrastructure or service improvements.
- A significant number of people expressed concern with the overall safety of the transportation infrastructure on the barrier island, including unsafe, uneven, and blocked sidewalks and bicycle facilities and poor pedestrian crossings. Several expressed concern with pedestrians not complying with traffic laws.
- Several people requested improved signal timing and sequences on roadways on and to and from the barrier island.
- Several people called for improved policing of existing traffic laws, including:
 - Concerns with ride-sharing services and freight/service traffic parking in travel lanes.
 - Not allowing freight/service traffic during peak hours.
 - Concerns with distracted drivers.
- A number of people expressed concerned with the loss of auto capacity on roadways such as Las Olas Boulevard, 17th Street, and Sunrise Boulevard.
- Several respondents called for improved street lighting, shade, and greenspace.
- Several expressed concerns with the comfort, cleanliness (emissions), convenience, accessibility, range, and safety of the Sun Trolleys. Many noted that they did not use Sun Trolley service or Broward County Transit.
 - A significant number of people expressed concern with the congregation of perceived homeless people around Sun Trolley stops.



3. Visitor Surveys

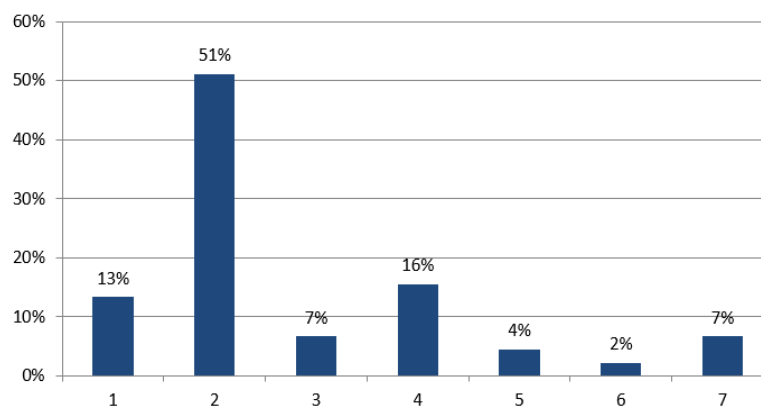
Approximately 45 groups of visitors to Fort Lauderdale took part in the visitor survey for the Fort Lauderdale Beach Mobility study.

3.1 Number of People in Group

Figure 233 shows the number of people in each visitor respondent group, with the majority having two people in their group. Around 126 visitors made up of 45 groups were reached.

Figure 23: Visitor Survey Group Size

How many people are in your group?



3.2 Age and Travel Origin

Age demographics of visitor respondents were about evenly split among groups ages 18–35, 36–55, and >55. Respondents were visiting from both another state or from outside the US. Out of the 18 visitors from out of the country, 13 were from Canada, 2 were from Brazil, 1 was from Norway, 1 was from Australia, and 1 person was from Africa.

Figure 24: Visitor Age

How old are you?

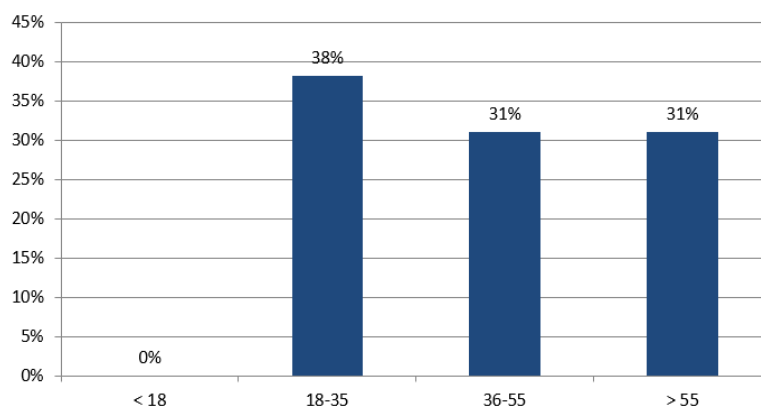
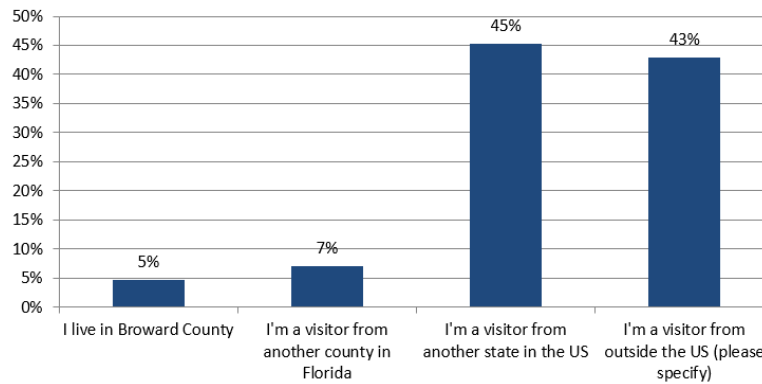




Figure 25: Visiting From

Select the one that fits you best:

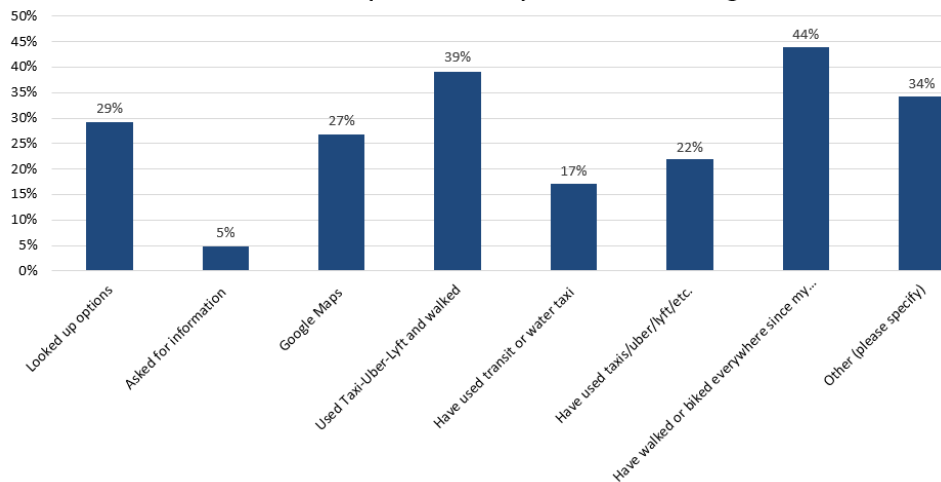


3.3 Transportation Options and Usage

Visitors were asked to indicate what other transportation options they considered for traveling in and around the beach area. As shown, many visitors walked after arriving to Fort Lauderdale Beach. Other considerations included renting a car and driving to the Beach.

Figure 26: Other Transportation Options Visitors Researched and Used Since Arrival

Other Transportation Options and Usage

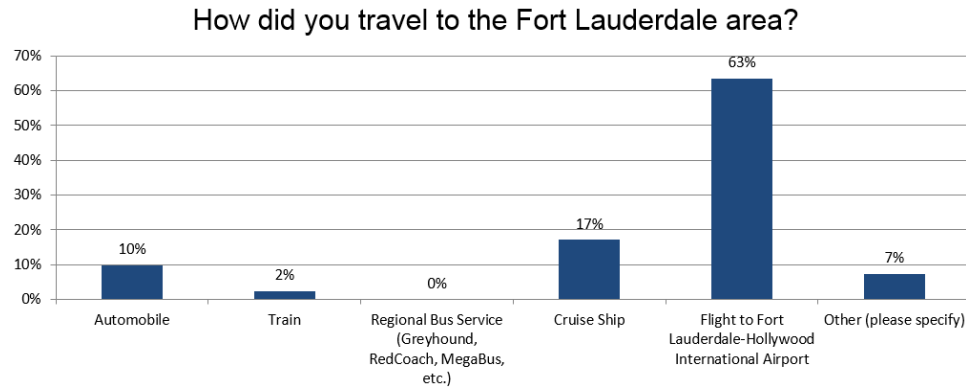




3.4 Travel to Ft. Lauderdale

The majority of visitors surveyed arrived in Fort Lauderdale via the Fort Lauderdale-Hollywood International Airport, with a significantly smaller amount arriving either via a cruise ship or automobile.

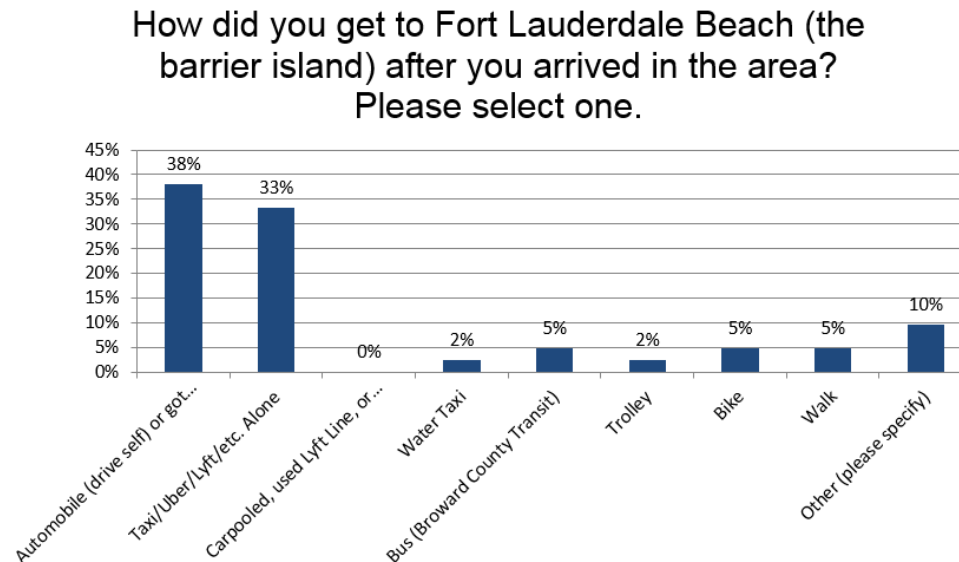
Figure 27: Arrival to Fort Lauderdale



3.5 Travel to Study Area

The majority of visitors surveyed arrive at Fort Lauderdale Beach via automobile, whether personal, friend, family, or through a ride-sharing service.

Figure 28: Travel to Study Area

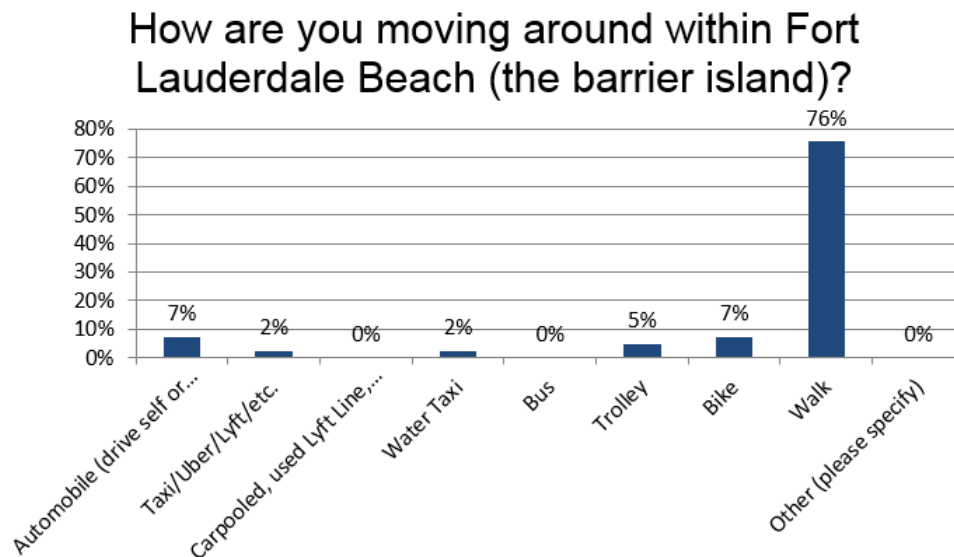




3.6 Travel within Study Area

The majority of visitors surveyed use walking as their primary mode of transportation once they arrived in the study area.

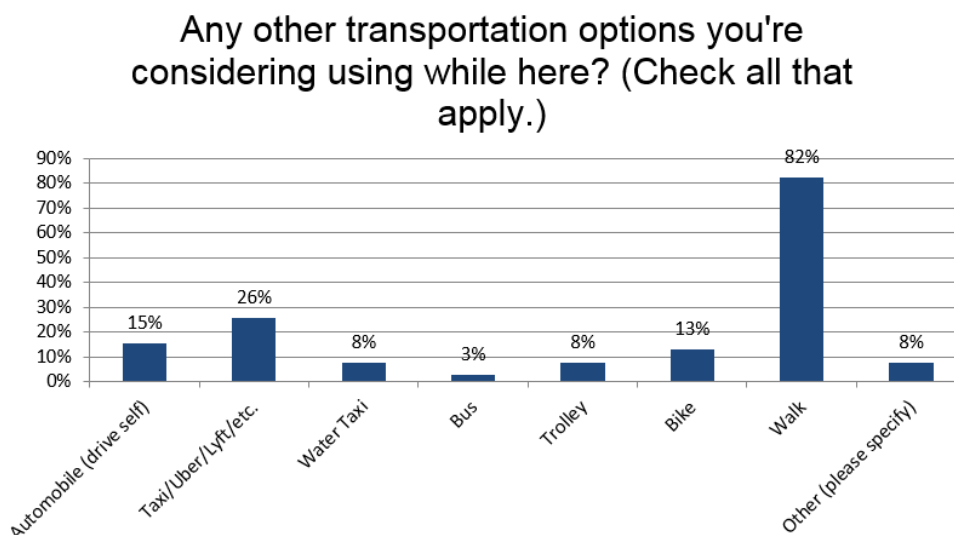
Figure 29: Travel within Study Area



3.7 Other Modes Considered

Visitors taking the survey were asked what other modes of transportation they considered using during their visit. Walking was the mostly heavily-considered mode, with ride-sharing services second but significantly below walking.

Figure 30: Other Travel Options Considered





3.8 Encouraging Other Modes within and to and from Study Area

Visitors taking the survey indicated that no improvements could be made that would encourage them to choose a transportation mode other than automobile for traveling within the study area, in despite of the majority of respondents indicating that walking was their primary mode for transportation within the study area. This seeming contradiction likely arises from confusion about the question, such as respondents thinking the question centered on what would be effective in encouraging them to choose a mode other than an automobile for trips they took specifically using an automobile.

Figure 31: Encouraging Other Modes within Study Area

Which of the following would be most effective in encouraging you to choose something other than an automobile (your own, or a taxi/uber/lyft) to make a trip within the study area (on the barrier island)?

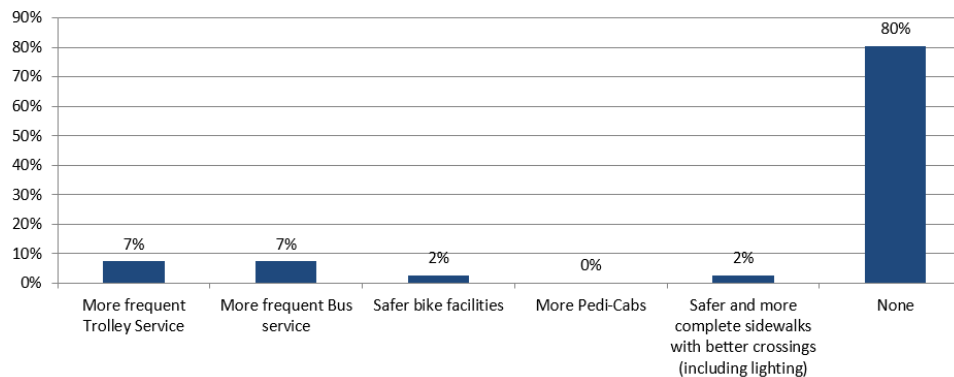
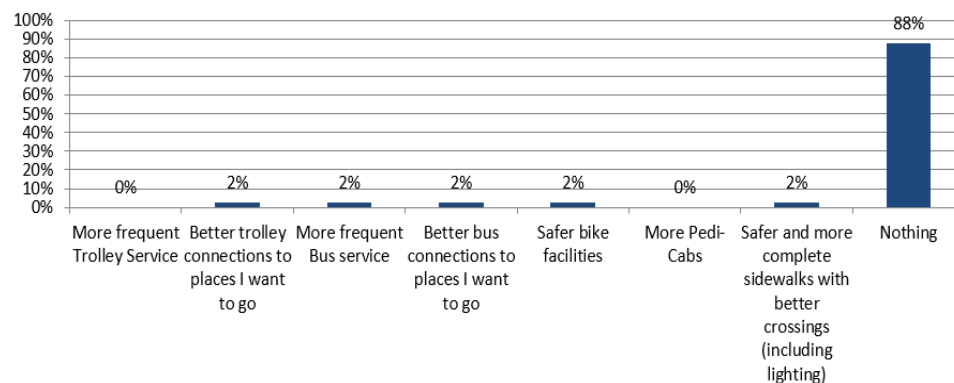


Figure 32: Encouraging Other Modes to-and-from Study Area

Which of the following would be most effective encouraging you to choose something other than an automobile (your own, or a taxi/uber/lyft) to make a trip to-or-from the study area (trips onto and off-of the barrier island)?



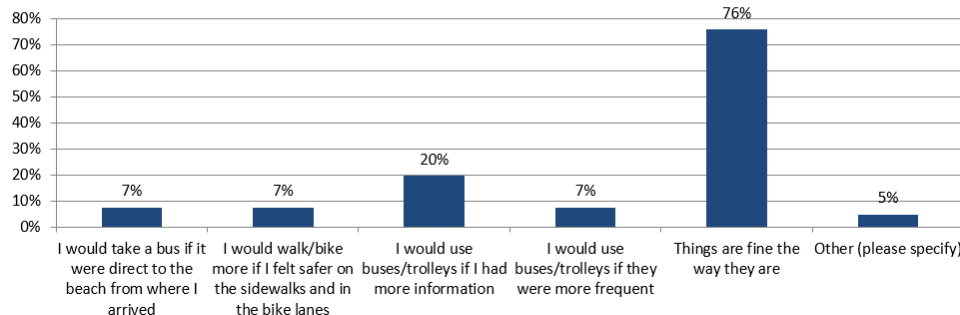


3.9 Perceptions of Transportation within Study Area

Visitors were asked to indicate their perception of transportation in the study area, most of which indicated that things were fine the way they are.

Figure 33: Perception of Transportation within Study Area

Please select the statements below that best reflects your perception of transportation in the Beach Mobility Study Area:

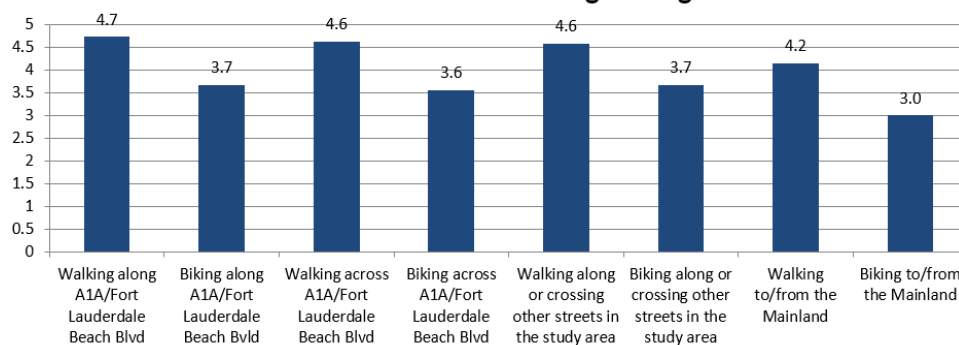


3.10 Perceptions of Walking and Biking

Visitors were asked to rank their perceptions of the current condition of various modes and services provided within the study area, including walking and biking. Respondents ranked the conditions of each mode on a scale of 1 to 5, with 1 being “very bad” and 5 being “very good.” Figure 34 shows the weighted average of the rankings for all respondents.

Figure 34: Visitor Perception of Walking and Biking

Please rate the current condition of the following issues from 1 to 5 - Walking/Biking





Appendix 3: Stakeholder Interview Summaries

Fort Lauderdale Beach Beach Mobility

Agency Stakeholder Interviews

January 2018

Prepared for



CITY OF FORT LAUDERDALE

Prepared by



CITY OF FORT LAUDERDALE





Agency stakeholder interviews were completed to engage local professionals and interested parties to assist in identifying specific issues in the study area. These were valuable in confirming issues discovered throughout the study and bringing others to the surface based on the specific stakeholder comments. Those interviews are highlighted below.

*indicates considerations for project team moving forward, not positions of the interviewees.

Broward County Traffic Engineering Division/Andrew Sebo/Assistant Director (1/4/18)

1.1 General Comments

- Congestion and Overdevelopment from Traffic Impact Standpoint
- Free-for-all pedestrian activity is an ongoing concern
- Special Event and in season traffic is already significant (and out of season)

1.2 Any suggestions to accomplish Vision Zero Principals?

- Enforcement is an issue for pedestrian activity, particularly in the entertainment areas.

1.3 Intersection Specific Comments

1.3.1 Sunrise Blvd and A1A

- Loss of capacity was an issue.

1.3.2 Las Olas and A1A

- Despite all-pedestrian phase, there are still pedestrian compliance issues.

1.4 What mobility enhancements would have the biggest impact?

- Hard for transit to succeed without a dedicated space, mixed traffic operation is just not going to work or appeal to people with options.
- Not overly proactive with coordination on making sure that signals are coordinated and working properly
- Seems like traffic shouldn't be moving too quickly.
- Anything to get a consistent flow of traffic at 20-30 MPH would probably be good from both the city and County perspective
 - *A steadier flow could also moderate platooning. Potentially signalize crosswalks intermittently to facilitate more synchronized crossings and more predictability for all transportation modes.

1.4.1.1 Planned Follow-up Items/Reminders/Takeaways

Told we may follow up later in the project to revisit and discuss recommendations. Better coordination for traffic optimization is necessary. Speed reduction is necessary and should not negatively impact traffic flow with proper coordination. Aggressive measures may be necessary to promote pedestrian compliance.



FDOT D4 Traffic Operations/Mark Plass (1/9/18) 2:00PM

Others on call: Johnathan Overton and Tom Miller, Robert Modys, Melissa Ackert

Intro to project by Demian Miller of Tindale Oliver

1.1 General Comments

Random pedestrian crosswalks (fewer on A1A than US1). Focus on A1A to pedestrian accessibility.

TSMNO Controlled arterials expanding to include A1A.

- FY 19-20 Arterial ITA 17th-A1A-Sunrise: Connect signals with fiber optic and traffic monitoring cameras. Need data collection on the ground. Want to use the information for event management (including TNC monitoring). Expand existing approach east to beach to include “flush plan”. Retiming signals for user-specific heavy times (pedestrian-bike-auto-transit).
- Changing lane use for time of day.
- Schedule of bridge opening and closings. How do we get drivers to anticipate that, is that part of your project? Have bridge-tender document openings electronically and try to get some coordination going.

1.2 Things we noticed in the field

Mid-block crosswalk inconsistency between signals, pavement markings, RRFB, etc. Most of the thermoplastic don't have stop bars or consistently marked crossings. Potentially look at a more systemic approach to pedestrian control on A1A. Active Arterial Control strategy. Some cities have tried to enter into an agreement with Uber/Lyft so drivers are like micro-transit circulators that provide consistent connectivity. Can we get data from them? We'll see how far we can get with the data they are willing to provide.

Consultant working on removal of parking lot on A1A south of Las Olas. This is location for trolley drop off northeast of Intercoastal and Las Olas Blvd. Make sure that wayfinding is intuitive and good.

Signage consistency is critical. Need something that is workable for both pedestrians and drives, and is intuitive.

1.3 Intersection or Roadway-specific Comments

1.3.1 Sunrise Blvd and A1A

Some unusual phasing going on at intersection. Talk with Broward County Traffic about this signal, they have a lot of experience with this intersection. Southeast 9th Street is coordinated and interconnected with signal at Sunrise Blvd. They tend to respond to other suggestions and will have the options they've considered and or done.

1.4 What mobility enhancements (in terms of bicycle/pedestrian/transit) do you think would have the biggest impact increasing non-auto trips to the barrier island?

Bike/Pedestrian network issues and access points. One suggestion is to determine total number of pedestrian crossings are going to occur at certain points, we can say this is where we're going to have these crossings.

1.4.1.1 Planned Follow-up Items/Reminders/Takeaways

Dig deeper into pedestrian counts and channelization of pedestrians to marked crosswalks that are consistent for local, regional, and out-of-town drivers. Coordinate with the County for signalization opportunities at Sunrise Blvd and A1A.



Fort Lauderdale Police Department/Lieutenant Moss (1/12/18) 2:30PM

Introduction to project by Justin Willits of Tindale Oliver

1.1 General Comments

Looking at sidewalk widths for widening bike lane south of A1A on east side. Nice for events but most of the time its wasted space. Crosswalk consistency is an issue. Especially with lights inset in roadway. Geography is definitely going to constrain the possibilities for improvements.

Huge issues with Uber/Lyft at Beach Place and Elbow Room, and if there is an event like the Boat Show or Tortuga, is that it brings traffic to a halt. Going to need something to the south and to the north of Las Olas Blvd for pick-ups and drop offs.

1.2 Intersection or Roadway-specific Comments

1.2.1 Sunrise Blvd

People just blow through it. If you go northbound and you're going to go left, the lanes don't seem to match and it's hard to tell if it's a turn lane or a through lane.

1.2.2 SE 17th Street and 23rd Avenue

This is a pretty serious accident location for cars coming down the bridge

1.2.3 SE 5th Street and A1A

SE 5th Street and A1A is a parking lot and acts as taxi-stand that takes over half of their parking.

LYFT/Brian Kwak (1/23/18) 2:00PM

1.1 General Comments

- Project with City for Las Olas for Pick-up/Drop-off locations on a few blocks of the corridor. They can identify and send us some heat maps.
- Stated that they aren't looking to make people walk too far to these locations but are encouraging improvements where safety is an issue.

1.1.1.1 Planned Follow-up Items/Reminders/Takeaways

Will send heat map info in the next few days for incorporation into project. Roadway design key for promoting pick-up/drop-off compliance.

Uber/Cesar Hernandez & Amanda Brooks (1/24/18) 2:00PM

1.1 General Comments

- Try to manage expectation for pick-ups and drop-off zones. Hard to control where these can occur. Project team recognizes the difficulty with drop-offs but also the optimism that dedicating zones can facilitate pick-ups and provide a net benefit for safety.

1.1.1.1 Planned Follow-up Items/Reminders/Takeaways

They will follow up with heat maps to assist us in the identification of locations for pick-ups and drop-off zones.



Port Everglades/Natacha Yachinthe and Convention Center/Alan Cohen (1/23/18) 2:00PM

Introduction to project by Justin Willits of Tindale Oliver.

1.1 General Comments

Natacha:

- Improvements for alternatives to address traffic from Airport, Residential districts, and information can help facilitate better connections to the Beach.
- Most people coming off the cruise ships are utilizing shuttles for the hotels.
- Most people say if they could take the Wave from the port to the airport they would.
- Messaging for the airport is lacking. Also a lack of connectivity to/from the port to Downtown, the Beach, and Convention Center. A circulator to the Port to the Airport makes sense for such a short connection. Uber is usually only \$6 each way. Messaging and education are huge for promoting these services.
- They've also seen a lot of problems with the suitcases and how they handle their baggage. Airport Master Plan update is looking at how they can accommodate this better.

Alan:

- Convention Center will have intermodal hub to primarily serve existing BCT service but hoping to add to that hub that will run from Convention Center to Mid-port to reduce single occupancy vehicle trips. Trying to improve pedestrian connectivity in small footprint that they occupy.
- Might want to have a talk with Mark Gale from the Airport. Exploring people mover concept to the airport to seaport more seamlessly.

1.1.1.1 Planned Follow-up Items/Reminders/Takeaways

Frequent service by Trolley to the convention center is probably the best way to connect this area due to the restrictions on access to the port and the security requirements.

Broward County Transit/Arethia Douglas, Trevia Taylor, Tara Crawford (1/29/18)

Introduction to project by Justin Willits of Tindale Oliver.

1.1 Route modifications and planned stop infrastructure?

Planned service improvements for Routes 1, 101, 11, 40, 36, and 20. No current capital projects planned in focus area.

1.2 Potential Airport/Seaport connections?

Looking at a sales tax initiative with the plan for connecting to the airport, conventions center, and rail hubs.

1.3 How does BCT interact with Sun Trolley?

Part of community bus system. But when they do modify services they do run them by BCT to vet them and evaluate.

1.3.1.1 Planned Follow-up Items/Reminders/Takeaways

Tara will send additional information that outlines headway and service span increases if the referendum is successful later in the year.



Sun Trolley/Robyn Chiarelli and Alan Budde (1/29/18)

Introduction to project by Justin Willits of Tindale Oliver.

1.1 Potential Airport/Seaport connections? Luggage barrier?

Airport and Seaport transportation accommodates luggage transportation and checking. Beach Council and Chamber of Commerce are trying to find a better connection from the Airport to the Beach. Totally untapped market that is generating a lot of traffic (taxi-uber-lyft).

Potentially look at leasing a vehicle that could accommodate luggage and partner with the business community to explore funding options.

They are already doing some monthly outreach promoting trolley services to the hotels.

They can also facilitate coordination with hotels in the later phase. Cost-sharing for marketing and outreach efforts would be great.

1.2 How does BCT interact with Sun Trolley? Are there opportunities for increased efficiencies there?

BCT stops are defacto stops for Sun Trolley. Surplus funds are likely to be used for ADA issues and signage to improve wayfinding and advertisement on exiting stops. Additional ideas for increasing trolley awareness are welcomed.

1.3 What is the status of your vehicle fleet and other capital considerations?

Fleet of 17 vehicles of 3 different vehicle types, standard cutaways included. 7 Routes. Beach Link to Gallery (3) (30-45 minute frequency for both, at best it operates at 25, worst is 90 minutes), Las Olas Link (2) Vista Mar back to Broward Center. 20% spare ratio for fleet. Combination of Own and Lease between City, BCT, First Transit.

Fleet changes expected: FTA grant being processed and expected in next couple of months. Of the 6 vehicles city owns, 3 are 2006 models. They are planning to purchase 11-14 new trolleys (2018-2019 models) so the leased vehicles are being retired. If there is a significant funding increase they will explore more vehicles.

Marine traffic can have tremendously negative impacts on service.

1.4 Status of Flag-down vs Stop-placement

Flag down on all routes, some people will use BCT stops and it is encouraged but there is no signage on the stops. There is a dialogue occurring about that. Operational dollars are still the issue they need to find more of before they can really get to the frequency that would make it more appealing.

1.4.1.1 Planned Follow-up Items/Reminders/Takeaways

Will send project team financial data and work to estimate any service recommendations that may come out of project. Consider locations where prioritizing transit/trolleys at intersections for travel time advantage.



Fort Lauderdale Fire Department/Timothy Heiser (1/26/18)

Introduction to project by Justin Willits of Tindale Oliver.

1.1 General Comments

Road Diets have been shutting roads down in the one-lane sections. Specific to A1A from Sunrise Blvd to Oakland Park. There is not enough roadway space to get a vehicle through there and it's killing their response time.

Traffic calming devices are causing more accidents, or having to take alternate routes. 13th Street and Dixie Hwy. Long solid medians on a 2-lane road force them to have to go way out of direction to reach accidents. Some very congested areas at Andrews and Broward Blvd.

Sunrise to 17th there aren't really issues until you get to the Bridge to US1 where it is congested. Bridge openings occur on the half-hour and hour mark when there is a boat waiting.

1.1.1.1 Planned Follow-up Items/Reminders/Takeaways

Fire Department will follow up with heat maps to confirm consistency with the data already gathered.

Fort Lauderdale Parking Services Manager/Jeff Davis (5/21/18)

Introduction to project by Justin Willits and Demian Miller of Tindale Oliver.

1.2 General Comments

Confirmed existing and future parking capacity of various project within study area.

Discussed parking strategies and concepts being evaluated in Mobility study. Discussed park and ride options and various transit concepts associated with Mobility study.

Discussed year-over-year parking utilization.

1.2.1.1 Planned Follow-up Items/Reminders/Takeaways

Continued coordination throughout project and follow-ups as needed.

No Response: Birch State Park Representative

No Response: B. Walker with Water Taxi



Appendix 4: Implementation Planning Meeting Summaries

Fort Lauderdale Beach Mobility

FDOT Coordination Summary

February 2019

Prepared for



CITY OF FORT LAUDERDALE

Prepared by



CITY OF FORT LAUDERDALE





Following the development of the recommended mobility strategies incorporated in Chapter 2 of the Beach Mobility Study Report, a series of meeting and calls were held with various FDOT Traffic Operations, Planning, and Design staff to review project recommendations along the State Highway System, gather constructive feedback, and identify next steps for project implementation.

The following meetings and calls were held with District 4 staff:

- Meeting (12/18/18): FDOT District 4 Traffic Operations/Safety; Thomas Miller (Traffic Ops) and City Staff – Preliminary overview of Draft Report recommendations along SR A1A including discussion of intersection improvement concepts at Sunrise @ SR A1A, concepts for 17th Street Causeway and SR A1A between the 17th St. Causeway and the beach parking area, and discussion of crosswalk and sign and pavement marking improvements.
- Meeting (12/19/18): FDOT D4 Planning/Complete Streets; Larry Wallace joined by Scott Peterson (Design) – Design Review concepts developed as part of the City of Fort Lauderdale’s Beach Mobility Study and gather initial feedback from the District to help formulate next steps for the Study’s implementation plan.
- GoTo Meeting (01/17/2019): FDOT D4 Planning/Complete Streets; Larry Wallace joined by Scott Peterson (Design) and Mark Plass (Traffic Operations) – Discuss next steps and implementation of short-term concepts and 17th Street Causeway/SR A1A bikeway concept. Recommendation to engage Broward MPO to move longer-term projects onto MPO priority list(s).
- Meeting (02/07/2019): FDOT District 4 Typical Section Committee; Larry Wallace (organizer), Scott Peterson and Steve Braun (Design), Ramon Otero (Structures), Cesar Martinez (Project Development) – Discuss refined SE 17th Street Causeway and SR A1A concept.

The following summarizes overall discussions and next steps for project concepts along the State Highway System based on the discussions listed above:

- Operational and geometric changes at SR A1A and Sunrise Boulevard
 - District staff did not identify major concerns with overall configuration but will need to work through concepts related to bike treatments.
 - Traffic Ops is in the process of conducting an operational evaluation of the intersection and collected high-season counts on MLK weekend.
 - **Although there are operational issues at this intersection, it is not a high districtwide safety priority. Accordingly, improvements beyond changes to signal timing/phasing should be prioritized through the MPO process.**
- Restriction of stopping along northbound SR A1A (north of Harbor Drive)
 - Pending City Commission approval of the report recommendations, the City is requesting D4 install R8-5 No Stopping on Pavement signs along northbound SR A1A from Harbor Drive to Sunrise Boulevard.
 - The City will consider installing additional pick-up/drop-off bays based on funding availability.



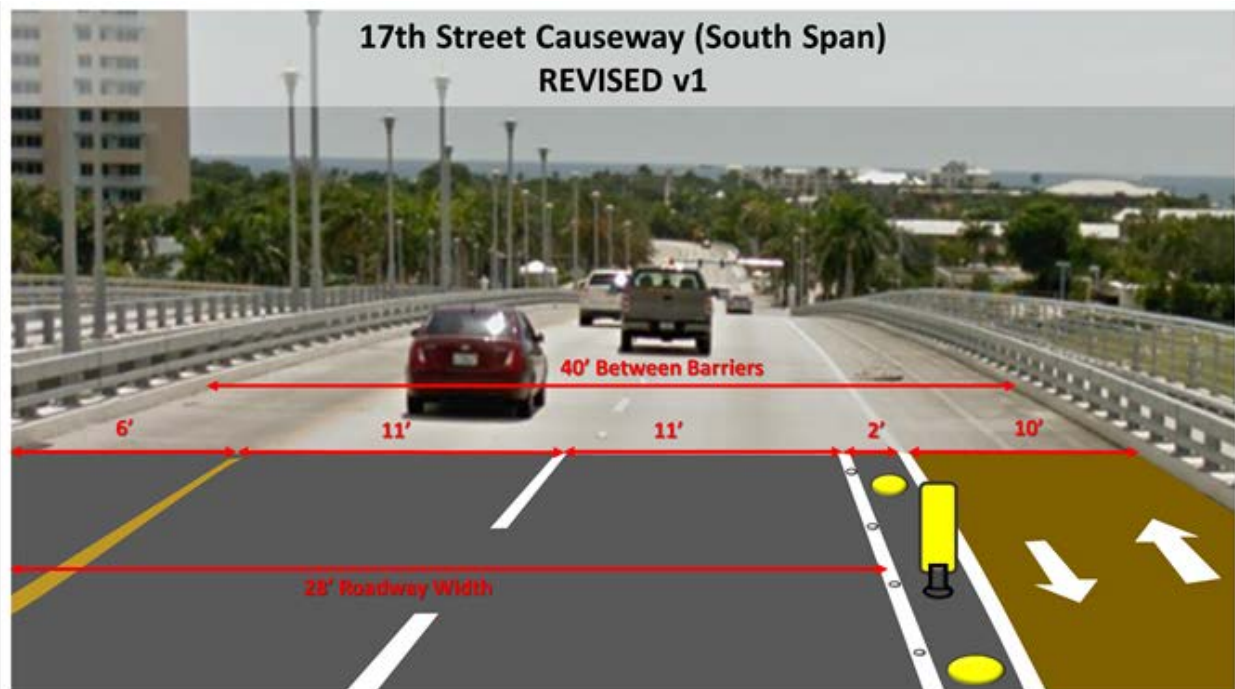
- Some concerns expressed about enforceability. Commitment from police department to enforce no stopping signs should be considered prior to installation.
- Standardization of un-signalized crosswalks along SR A1A:
 - The Beach Mobility Study Report includes an inventory of signalized intersection and mid-block crosswalks along the beach with recommendations to bring lighting and sign and pavement markings up to current FDOT standards for high-pedestrian areas. Also recommendations to provide consistent actuated beacons for all unsignalized crossings
 - **Recommendation to incorporate crosswalk updates in next resurfacing project or as a permit project (City updates crosswalks with FDOT permission)**
- SE 17th Street Cycle Track Concept and SR A1A Shared Use Path Concept:
 - Discussion with the Typical Section Committee focused on consideration of the bridge shoulders as both a recovery area between high-speed motor-vehicle traffic and the bridge's barrier wall system and their use, on longer bridges, they provide a safe space for disabled vehicles to: a) not-block traffic, b) mitigate rear-end/side-swipe crashes, and c) keep the occupants of the disabled vehicles out of harm's way.
 - Because of the 35MPH posted speed/urban context of this bridge, clear zone is less of a factor; however, a safe breakdown lane is still needed.
 - Changes to the bridge typical section should help to bring 85% speeds closer to the 35MPH posted speed. "Calming" traffic on the bridge will also help with speed management along northbound SR A1A.
 - The programmed SR A1A ATMS project should (may?) include incident detection/camera components. This could help mitigate the impact of a disabled vehicle on the bridge—especially during events when law enforcement/tow trucks are likely to be deployed to the area.
 - Because the causeway is a "Segmental" bridge structure, modification of the bridge deck, including drilling dowel-rod holes to affix curbing and other separator elements may be a design constraint.
 - Some potential typical sections (V1-V3), summarized in the table and shown below, better address the breakdown lane need than the Initial Proposal:

Concept	Inside Buffer	Travel Lanes	Outside Buffer	Separator	Cycle Track	Roadway Width
Initial Proposal	2.5'	2 x 11'	16"	2' Curbed Separator (presumably concrete)	12'	26
V1	6'	2 x 11'	NONE	2' Traversable Separator*	10'	28
V2	4'	2 x 11'	16"	2' Traversable Separator*	10'	28
V3	4'	2 x 11'	16"	2' Hybrid Separator**	10'	28

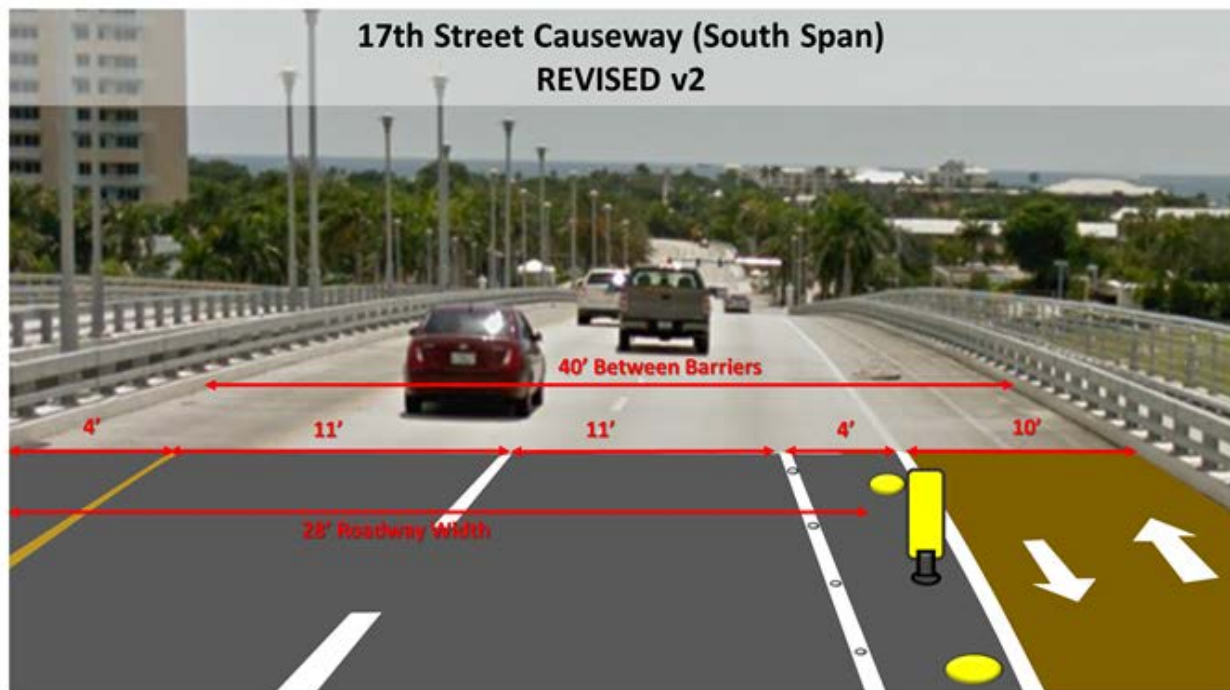
**Traversable Separator: Combination of devices to clearly separate the travel lane and the cycle track. Future coordination with Central Office (DeWayne Carver) will be required to balance criteria for a protected bikeway and the structural, drainage, and safety/operational requirements for the 17th Street Causeway Bridge but one possible treatment could include: Audible/Vibratory edge-line marking (701) "Armadillos/ Ceramic Domes" (no apparent APL#) and/or Intermittent High Visibility Median*

Separator (e.g. 705-004-003) spaced to allow disabled passenger vehicles to pass in between without running over the paddles.

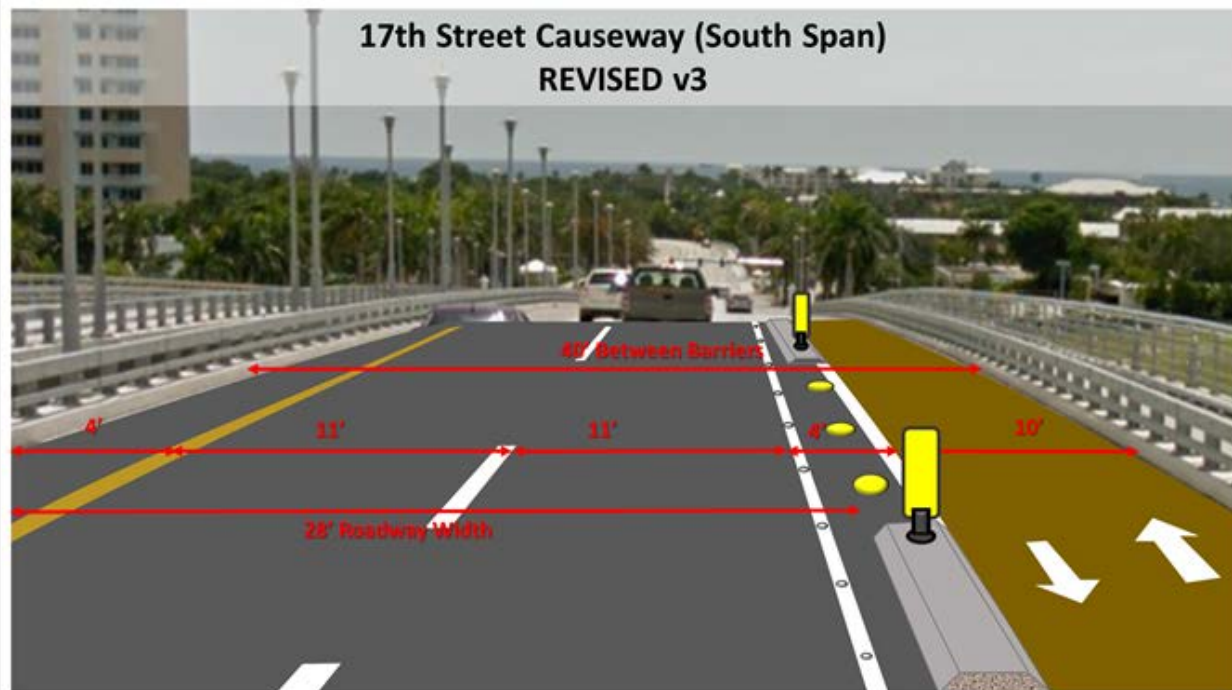
****Hybrid Separator:** Segments of curbed separator (or similar device compatible with segmental bridge structure) with intermittent segments of traversable separator. The intent is to provide cyclists with the “security” of a curbed separator for most of the facility; but provide sufficiently frequent traversable segments for use by disabled vehicles. This probably means more frequent (or 100%) traversable separator on the uphill part of the span and less frequent traversable separator sections on the downhill part of the span.



V1 has the least impact on the existing bridge cross section with the exact “traversable” separator treatment to be determined in an eventual Design phase.

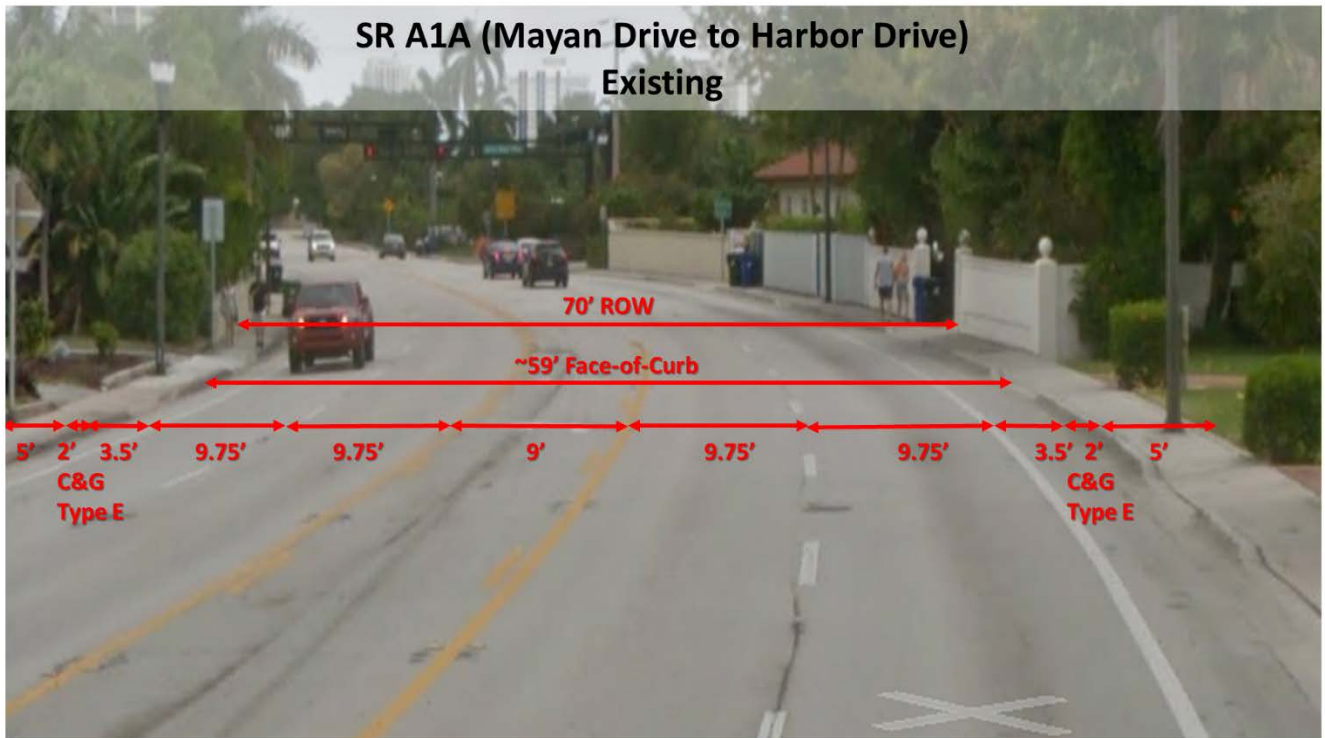


V2 improves lateral separation for cyclists AND this separation likely reduces the maintenance liability on whatever vertical elements are used to “protect” the cycle track. Although the inside shoulder is reduced to 4ft, this should not trigger a design exception AND the drive-able area between the inside barrier and any vertical elements of the separator remains 28ft (2 x 10ft lanes + 8ft-wide disabled vehicle). In other words, if the driver of a disabled vehicle cannot get to the right lane or fails to grasp that they can/should traverse the barrier to stop in the cycle track, 2 lanes of traffic can nonetheless pass around them so long as they pull to either edge of the roadway.



V3 also provides 28ft of passable roadway width but would limit access to the cycle track as a break-down lane to intermittent access points of frequency and length to be determined.

- along SR A1A from east of the SE 17th Street Causeway to south of the Beach Parking Area, the shared use path provides an opportunity to address a compromise typical section as shown in the existing and proposed typical section drawings below.
- Nominally, providing a shared-use path in lieu of on-street bike lanes will require a design variance; however, the problem of serving both vehicular cyclists, who generally prefer on-street bike lanes and more casual cyclists, who generally prefer separated facilities is an ongoing topic of discussion nationally and within FDOT.
- Moving forward care should be taken to manage driveway transitions, ADA cross-slope, placement of light poles, and placement of garbage cans on collection days.
- **Recommendation to consider as a “pilot” project to advance within the MPO’s CSLIP Program including shared use path concept along SE 17th Street from Andrews to the SE 17th Street Bridge and other bike-way components identified in the Beach Mobility Study from north of Harbor Drive to north of Birch State Park.**





Appendix 5: Select Project Cost Estimates

Fort Lauderdale Beach Mobility

Selected Project Costs

February 2019

Prepared for



CITY OF FORT LAUDERDALE

Prepared by



CITY OF FORT LAUDERDALE





Project 2.2.1: Retrofit existing mid-block crosswalks for consistency

This estimate includes sign and pavement markings and actuated beacons but does not include lighting elements.

1. Costs for sign and pavement markings only: \$26,000
2. Item #1 AND new in-pavement beacons: \$425,000
3. Item #1 AND new RRFBs and retrofit existing in-pavement to RRFB: \$269,000

Description	Cost	Unit	Item ID	Item Description
Provide Advance Stop Bar		Advance Stop Bar – 25' & 2 x R1-5b Sign Furnish and Install		
	\$ 57.25	LF (25')	710-11-125	PAINTED PAVEMENT MARKINGS (STANDARD) (WHITE) (SOLID) (24")
	\$ 629.25	LF (25')	711-14-125	THERMOPLASTIC (PREFORMED) (WHITE) (SOLID) (24")
	\$ 608.96	EA (2)	700-3-101	SIGN PANEL (F&I) (GROUND MOUNT) (UP TO 12 SF)
Subtotal	\$ 1,295.46			
Qty Needed	15			
Item Cost	\$ 19,431.90			
Update to Ladder Crosswalk		Add longitudinal markings to existing transverse lines 25' roadway width.		
	\$ 68.70	LF (10'x3)	710-11-125	PAINTED PAVEMENT MARKINGS (STANDARD) (WHITE) (SOLID) (24")
	\$ 755.10	LF (10'x3)	711-14-125	THERMOPLASTIC (PREFORMED) (WHITE) (SOLID) (24")
Subtotal	\$ 823.80			
Qty Needed	3			
Item Cost	\$ 2,471.40			
Provide Transverse Lines		Water blast and replace transverse lines only for 25' roadway width		
	\$ 900.00	SF (10'x2'x3')	711-17	THERMOPLASTIC (REMOVE EXISTING)
	\$ 68.70	LF (10'x3)	710-11-125	PAINTED PAVEMENT MARKINGS (STANDARD) (WHITE) (SOLID) (24")
	\$ 755.10	LF (10'x3)	711-14-125	THERMOPLASTIC (PREFORMED) (WHITE) (SOLID) (24")
Subtotal	\$ 823.80			
Qty Needed	5			
Item Cost	\$ 4,119.00			
Provide in-Pavement Lighting		In Pavement Lighting Assembly (furnish and install) APL 654/002		
	\$ 39,924.63	AS (1)	654-1-20	IN-ROADWAY LIGHTING ASSEMBLY (F&I) (SOLAR POWERED) (COMPLETE ASSEMBLY)
Qty Needed	10			
Item Cost	\$ 399,246.30			
Provide RRFBs & Retrofit Existing		RRFB pedestal mount x 2		
	\$ 13,526.32	EA (2)	654-2-24	RECTANGULAR RAPID FLASHING BEACON (F&I) (SOLAR) (SIGNS AND RRFB UNIT)
Qty Needed	18			
Item Cost	\$ 243,473.76			
	\$ 26,022.30	Sign and Pavement Markings Only		
	\$ 425,268.60	Total with In-Pavement Lighting		
	\$ 269,496.06	Total with RRFB including retrofit 8 existing in Pavement locations		

**Project 2.2.2: Retrofit existing mid-block crosswalks for consistency**

This estimate includes sign and pavement markings and pedestrian signal upgrades but does not include lighting elements.

1. Costs for sign and pavement markings only: \$40,000
2. Item #1 AND new in-pavement beacons: \$70,000

Description	Cost	Unit	Item ID	Item Description
Update to Ladder Crosswalk		Add longitudinal markings to existing transverse lines 25' roadway width.		
	\$ 68.70	LF (10'x3)	710-11-125	PAINTED PAVEMENT MARKINGS (STANDARD) (WHITE) (SOLID) (24")
	\$ 755.10	LF (10'x3)	711-14-125	THERMOPLASTIC (PREFORMED) (WHITE) (SOLID) (24")
Subtotal	\$ 823.80			
Qty Needed	30	estimated including some 4D cross section crosswalks		
Item Cost	\$ 24,714.00			
Provide Transverse Lines		Water blast and replace transverse lines only for 25' roadway width		
	\$ 900.00	SF (10'x2'x3')	711-17	THERMOPLASTIC (REMOVE EXISTING)
	\$ 68.70	LF (10'x3)	710-11-125	PAINTED PAVEMENT MARKINGS (STANDARD) (WHITE) (SOLID) (24")
	\$ 755.10	LF (10'x3)	711-14-125	THERMOPLASTIC (PREFORMED) (WHITE) (SOLID) (24")
Subtotal	\$ 823.80			
Qty Needed	18			
Item Cost	\$ 14,828.40			
Provide Countdown Signals		Replace existing ped head with countdown signal (each). Assume entire housing, not just insert.		
	\$ 73.26	AS (1)	653-1-60	PEDESTRIAN SIGNAL (REMOVE) (POLE TO REMAIN)
	\$ 1,323.56	AS (1)	653-1-12	PEDESTRIAN SIGNAL (F&I) (LED COUNTDOWN) (2 WAY)
Subtotal	\$ 1,396.82			
Qty Needed	22	estimated		
Item Cost	\$ 30,730.04			
	\$ 39,542.40	Sign and Pavement Markings Only		
	\$ 70,272.44	Including Pedestrian Signal Retrofits		



Project 2.3.2: Provide Shared Use Path from Harbor Drive to Beach Parking Area

This project includes milling resurfacing the roadway to shift the motor-vehicle lanes to the north/west side of the existing roadway and reconstructing and widening the sidewalk along the eastbound/northbound side of the road to create a shared use path.

Estimated Construction Cost is \$2.2m not including Design or CEI.

Pay Item	Item Description	Unit Price Avg.	Quantity	Unit	Cost Total
0104 12	Staked Turbidity Barrier	\$ 2.62	10,560.00	LF	\$ 27,667.20
0104 18	Inlet protection System	\$ 133.80	42	EA	\$ 5,651.71
0107 1	Litter removal	\$ 240.00	8.50	AC	\$ 2,040.19
0107 2	Mowing	\$ 240.00	42.24	AC	\$ 10,137.60
0110 1 1	Clearing and Grubbing	\$ 9,558.26	0.36	AC	\$ 3,482.27
0110 2 2	Selective Clearing and Grubbing	\$ 24,055.88	0.73	AC	\$ 17,528.08
0110 4 10	Removal of Existing concrete	\$ 17.62	4,106.67	SY	\$ 72,359.47
0327 70 6	Milling Exist. Pavement Asphalt 1 1/2" Avg. Dep	\$ 3.82	33,440.00	SY	\$ 127,740.80
0334 1 13	Superpave Asphaltic Concrete, Traffic C	\$ 101.17	2,502.74	TN	\$ 253,202.13
0400 2 4	Concrete Class II. Bridge Superstructure	\$ 658.39	37.04	CY	\$ 24,384.81
0425 2 72	Manholes, J-7, >10'	\$ 11,460.78	3	EA	\$ 34,382.34
0425 5	Manhole Adjust	\$ 1,096.70	169	EA	\$ 185,298.43
0425 6	Valve Boxes, Adjust	\$ 442.47	169	EA	\$ 74,759.73
0425 1584	Inlets, DT Bottom, Type H, J Bottom>10'	\$ 20,804.55	3	EA	\$ 62,413.65
0430175148	Pipe culvert, Optional Material, Round, 48" S/CD	\$ 325.77	30.00	LF	\$ 9,773.10
0436 1 1	Trench Drain, Standard	168.31	1,000.00	LF	\$ 168,310.00
0520 1 10	Concrete Curb & Gutter, Type F	\$ 15.08	5,280.00	LF	\$ 79,622.40
0522 2 19	Concrete Sidewalk and Driveways, 6"	\$ 49.12	7,040.00	SY	\$ 345,804.80
0570 1 2	Performance Turf, Sod	\$ 3.12	1,760.00	SY	\$ 5,491.20
0580 2 5	Landscape Relocate Tree, Trees > 5"	\$ 2,650.00	9	EA	\$ 23,320.00
0660 21 06	Loop Assembly, F&I, Type F	\$ 1,106.96	20	EA	\$ 22,139.20
0700 1 50	Single Post Sign, Relocate	\$ 321.90	20	EA	\$ 6,438.00
0700 35 02	Sign Panel, Relocate, 12-20SF	\$ 253.06	90	EA	\$ 22,775.40
0715 4 60	Light Pole Complete Relocate	\$ 2,876.58	11	EA	\$ 30,376.68
0716 4 70	Light Pole Complete, Remove Pole/Foundation	\$ 458.35	11	EA	\$ 4,840.18
1644800	Fire Hydrant, Relocate	\$ 3,275.00	11	EA	\$ 34,584.00
				Sub Total	\$ 1,619,939.37
	Maintenance of Traffic			10%	\$ 161,993.94
	S&PM			5%	\$ 80,996.97
	Mobilization			8%	\$ 129,595.15
	Utility adjustments			0%	\$ -
	Bridge Drainage			6%	\$ 97,196.36
	Contingency			5%	\$ 80,996.97
				Total	\$ 2,170,718.75

Cost does not consider possible underground utility impacts or potential reconstruction of signals (if necessary to maintain lane alignment).