North-South Transportation Needs for the Coastal Communities Feasibility Study Report

Miami-Dade TPO  GPC-VII #4

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Miami-Dade Transportation Planning Organization

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1 Introduction

The North-South Transportation Needs for the Coastal Communities Feasibility Study provides context and direction for the development of the multimodal transportation network for the Coastal Communities in Miami-Dade County. The study is strongly informed by previous and on-going studies/plans and the project’s Study Advisory Committee (SAC), in order to provide an integrated future vision.

1.1. Statement of Purpose

The intent of the Coastal Communities Feasibility Study is to evaluate North-South transportation needs and assess the feasibility of implementing transit and complementary options to improve mobility in the Coastal Communities along the SR A1A corridor and mainland connections.

1.2. Background

The Miami-Dade Transportation Planning Organization (TPO) Governing Board approved Resolution #38-18, dated September 27, 2018, authorizing the TPO Executive Director to prepare a Scope of Work and budget to evaluate the North-South transportation needs for the Coastal Communities. Several past studies in the corridor provided additional useful information. This study focused on transit strategies to facilitate travel options along the SR A1A corridor and connecting to the mainland.

1.3. Study Area

The study area for the Coastal Communities in Miami-Dade County is approximately 14-miles long from the Miami-Dade/Broward County Line to the South Pointe district of Miami Beach. The Coastal Communities are comprised of portions of unincorporated Miami-Dade County and the following eight cities shown in Figure 1-1:

- City of Aventura
- Bal Harbour Village
- Town of Bay Harbor Islands
- Town of Golden Beach
- City of Miami Beach
- North Bay Village
- City of Sunny Isles Beach
- Town of Surfside

The primary north-south corridor within the Coastal Communities is State Road (SR) A1A. The character of SR A1A varies greatly along the corridor and includes sections with two, three, four, and six lanes, divided and undivided cross sections, one-way and two-way flow, with and without on-street parking. The character of the corridor varies as well, from commercial and tourist sections to high-end residential.
In terms of multi-modal facilities, there are continuous sidewalks throughout the corridor with intermittent bicycle lanes and sharrows. Transit is provided by the Miami-Dade County Department of Transportation and Public Works (DTPW) along several corridor bus routes and community transit services provided by seven of the eight communities.

1.4 Stakeholder Coordination and Community Outreach

A key feature of the study was the involvement of the SAC, which included representatives from the Coastal Communities, DTPW, and FDOT District 6. The SAC provided the study team with information on recent efforts and current initiatives, guidance on deficiencies and needs, and input on potential mobility projects. Three SAC meetings were held throughout the study – on April 11th, 2019, July 23rd, 2019, and September 27th, 2019. Each of these meetings included a brief presentation followed by open discussion. The project team provided maps at each meeting to support the discussions. Many of the enhancement projects proposed in this study were suggested by individual SAC members and discussed with the full committee. In addition, two community meetings were held in conjunction with partner local governments. The first was held on October 21st, 2019 in Sunny Isles Beach, with the second meeting in Miami Beach on October 24th, 2019. At the meetings, the project team presented the purpose of the study, a summary of the data collected, the multimodal deficiencies identified, and the proposed enhancement projects developed. Maps were available for the public to view and project team members were accessible to answer questions and receive input.

Finally, the study recommendations were presented to the Transportation Planning Technical Advisory Committee (TPTAC) and the Citizens Advisory Committee (CTAC) on December 4th, 2019. Material presented at the SAC meetings, the community meetings, and TPTAC and CTAC meetings are included in Appendix A.
2 Existing Conditions

The purpose of establishing the existing conditions within the study area is to establish context and to compile and review recent studies relevant to this effort. An overview of previous and related studies and existing conditions within the study area is provided in this section.

2.1. Overview of Previous and Related Studies

A review of previous and related studies and plans was performed to identify planned and programmed improvements throughout the study area. The review includes summaries of documentation regarding improvements of roadways, intersections, pedestrian and bicycle facilities, and transit service within the Coastal Communities. The following documents were reviewed:

- FYs 2020 – 2024 Transportation Improvement Program (TIP)
- Miami-Dade 2040 Long Range Transportation Plan (LRTP)
- FDOT-6 Work Program
- Miami-Dade Transit FYs 2019 – 2028 Department of Transpor
tation and Public Works Transit Development Plan (TDP)
- Coastal Communities Transportation Master Plan (2007)
- SR 943/71 Street/Normandy Drive Exclusive Transit Lanes/
Protected Buffered
- Beach Corridor Rapid Transit Project Development and
Environment (PD&E) Study
- City of Miami Beach Bicycle Pedestrian Master Plan (2016)
- Miami-Dade County Transportation Improvement Program
(TIP) Fiscal Years 2018/2019 to 2022/2023
- Miami-Dade County 2040 Long Range Transportation Plan
(LRTP)

Summaries of several of these documents and other studies are detailed below.

A. Coastal Communities Transportation Master Plan (2007)

The 2007 Coastal Communities Transportation Master Plan was a joint effort between neighboring Coastal Communities in north-eastern Miami-Dade County, including the City of Miami Beach, City of Aventura, City of Sunny Isles Beach, Town of Bal Harbour Village, Town of Bay Harbor Islands, Town of Surfside, and North Bay Village. This plan assessed the traffic and transportation issues on the barrier islands and included short, mid, and long-term multi-modal solutions to those issues on a sub-regional basis. The transportation master plan included the following objectives:

- Study the sub-regional transportation network through data collection, analysis, and public involvement.
- Examine existing studies and plans to assess future conditions.
- Develop a multi-modal list of projects designed to address identified needs based on the scientific and subjective nature of the project.
- Quantify the cost of these projects relative to their planning, design and construction.
- Prioritize the list of projects into an Implementable Coastal Communities Transportation Master Plan.
- Achieve community consensus.
- Enhance regional mobility in a coordinated manner.

Public engagement took place throughout the duration of the plan development, with a goal of community consensus. The following meetings took place during the course of the study:

- Steering Committee — made up of representatives from the Cities of Aventura, Sunny Isles Beach, North Bay Village and Miami Beach, the Towns of Bal Harbour Village, Bay Harbor Islands and Surfside, Miami-Dade Metropolitan Planning Organization (MPO), Miami-Dade-Transit (MDT) and the FDOT.
- Stakeholders Meetings — with the various city/town managers and mayors of the eight cities/towns comprising the Coastal Communities.
- Community Workshops — four community workshops were held to obtain input from the public.
A major part of the analysis was related to travel behavior on the Coastal Communities. As noted, there are relatively few opportunities for ingress or egress to the transportation system, and additionally, travel within the system may not be related between zones. Data for the analyses was collected via origin/destination surveys, which were used to anticipate present and future traffic patterns, especially the demand to be placed on the road network in the future.

The study area was divided into three zones for analysis purposes.

- **Zone 1 North Coastal Communities:** Golden Beach, Sunny Isles Beach, Haulover Beach and Aventura
- **Zone 2 Mid Coastal Communities:** Bal Harbour, Bay Harbor Islands, Surfside, Miami Beach
- **Zone 3 South Coastal Communities:** Miami Beach

The study conclusions are summarized below:

- Sub regional trip making in the study area is occurring but not the primary cause of congestion.
- Drivers tend to enter or exit the system on the causeway closest to their beach origin or destination.
- East/West movement is the most prevalent.
- Traffic is a product of the existing density, diverse land uses, and a well-balanced economy.
- The roadway network is mature, meaning that there is good connectivity between areas, and that no major capacity projects have been implemented.
- The vast majority of the traffic originates internal to the study area.

A total of 49 projects were developed for the project bank. Those projects were prioritized within four categories (alternative mode improvements, corridor enhancements, capacity projects, and policy projects). Following is a summary of key recommendations from the study.

- **Alternative mode improvements**
  - Comprehensive Intermodal Center Feasibility Study project (Zone 1)
  - Integrated municipal shuttles (all Zones)
  - North, Middle and South Beach circulators (Zones 2 and 3)
  - Transit bus priority (all Zones)
  - Coastal Communities Transit Development Plan
- **Corridor enhancements**
  - Biscayne Boulevard corridor study (Zone 1)
  - Collins Avenue and 41st Street corridor studies (Zone 3)
  - Reexamine Collins/Harding one-way pair (Zone 2)
- **Capacity projects**
  - Causeway and East/West Flow Enhancements (all Zones)
  - Miami Beach Intersection LOS Improvements (Zones 2 and 3)
  - Advanced parking management systems (all Zones)
  - Lehman Causeway/Aventura Mall connection (Zone 1)
- **Policy projects**
  - Traffic Demand Management (TDM), Intelligent Transportation Systems (ITS), Transportation Systems Management (TSM), shared cars, motorized personal mobility devices policies, driver behavior campaign, etc.

Some of these recommendations, such as providing transit circulators, have been implemented. Others, such as the Lehman Causeway/Aventura Mall connection continue to be identified in local and regional studies but have not been implemented yet.
B. Strategic Miami Area Rapid Transit (SMART) Plan

In 2002, Miami-Dade County voters approved a one-half percent local surtax with the purpose of improving, among other things, rapid transit corridors within the county through the People’s Transportation Plan (PTP). While the PTP is a locally funded initiative administered by the Citizens Independent Transportation Trust (CITT), the Miami-Dade TPO remains committed to assisting in the development of rapid transit corridors.

On February 16, 2016, the TPO Governing Board unanimously approved a policy to set as “highest priority” the advancement of rapid transit corridors and transit supportive projects for the county. On April 21, 2016, the Miami-Dade TPO Governing Board officially adopted and endorsed the proposed SMART Plan.

The SMART Plan intends to advance six of the PTP’s rapid transit corridors, along with a network system of Bus Express Rapid Transit (BERT) service, in order to implement mass transit projects in Miami-Dade County. To ensure the SMART Plan moves forward, the TPO Governing Board directed the Miami-Dade TPO Executive Director to work with the TPO Fiscal Priorities Committee (FPC) to determine the costs and potential sources of funding for Project Development and Environment (PD&E) studies for the projects, and to also take all necessary steps to implement the SMART Plan.

To ensure the community is included in the planning and visioning process to select the best technology and highest, best land uses along each corridor there are two separate major activities occurring for each corridor as follows:

- Land Use Scenario & Visioning Planning Studies – Headed by the Miami-Dade TPO.
- Project Development & Environment Studies aka PD&Es – Headed by the Miami-Dade Department of Transportation & Public Works (DTPW) and the Florida Department of Transportation (FDOT) District Six

The projects from the SMART Plan most relevant to the Coastal Communities include the following:

- Beach corridor rapid transit from Midtown Miami to Miami Beach Convention Center
- BERT Beach Express North, Central and South:
  - North - Miami Beach Convention Center to Golden Glades via I-95
  - Central - Miami Beach Convention Center to Civic Center via Julia Tuttle Causeway
  - South - Miami Beach Convention Center to Downtown Miami via MacArthur Causeway

C. Beach Corridor Rapid Transit PD&E Study

The Beach Corridor is one of the six rapid transit corridors of the SMART Plan. The Beach Corridor runs from the Design District/Midtown Miami and Downtown Miami to the Miami Beach Convention Center area.

The Department of Transportation and Public Works (DTPW) is studying the implementation of the Beach Corridor Rapid Transit project. The study aims to identify locations for transit stations, park and ride/transit terminal facilities, and the implementation of a cost-effective, high-ridership, new premium transit service with supporting pedestrian and bicycle facilities.

The Beach Corridor Rapid Transit project would be a major east-west connection between the Coastal Communities and the Mainland, and provide a needed alternative to alleviate high levels of traffic congestion in the AM and PM peak hours. The primary goals of the study include the following:

- Connect to and provide direct, convenient and comfortable rapid transit service to serve existing and future planned land uses.
• Provide enhanced interconnections with Metrorail, Tri-Rail, Brightline, Metromover, Metrombus routes, Broward County Transit (BCT) bus routes, Miami and Miami Beach circulators, jitneys, shuttles, taxis, Transportation Network Companies (TNC’s) and/or other supporting transportation services.

• Promote pedestrian and bicycle-friendly solutions in the corridors of the study area.

The Tier I evaluation considered seven rapid transit alternatives and developed alignments which recommended further analysis of four rapid transit alternatives. Additionally, a Miami Corridor Analysis report was completed to analyze north-south corridors that connect Midtown to Downtown Miami. The Tier II evaluation of the four shortlisted rapid transit alternatives is being finalized. This Tier II evaluation includes additional scope of work for an expanded study area (Miami Beach).

The following modes were considered in the Tier II analysis, all of which include pedestrian and bicycle-friendly considerations:

• AGT/Monorail: Recommended for study of alignment alternatives in Design District, Downtown Miami, and Bay Crossing segments.

• AGT/Metromover: Recommended for study of alignment alternatives in Design District, Downtown Miami, and Bay Crossing segments.

• BRT/Express Bus: Recommended for BRT and/or Express Bus from Downtown to Convention Center and Express Bus only along a freeway loop alignment using I-95, I-195, I-395 in Miami and 5th Street, Washington Avenue and Alton Road, Collins Avenue, Dade Boulevard in the Miami Beach segment.

• LRT/Modern Streetcar: Recommended for study of alignment alternatives in the Design District, Bay Crossing, and Miami Beach segments.

At their January 30, 2020 meeting, the Miami-Dade TPO Governing Board selected elevated rubber tire technology as the Locally Preferred Alternative (LPA) for the Beach Corridor. The elevated rubber tire segment would be some form of automated guideway transit and extend from the mainland to 5th Street & Washington Avenue in Miami Beach. The LPA also includes dedicated lanes for bus and/or trolley service along Washington Avenue from 5th Street to the Convention Center area.
D. Plan NOBE, Proposed North Beach Master Plan

Plan NoBe provides the basis for public policy in the North Beach area of the City of Miami Beach regarding physical development, and establishes priorities for public-sector action while at the same time providing direction for complementary private-sector decisions. The Plan and its guidelines serve as a tool to evaluate new development proposals, direct capital improvements, and to guide public policy in a manner that ensures North Beach continues to be the community that its residents want it to be.

The City of Miami Beach is comprised of three distinct districts, North Beach, Mid-Beach, and South Beach. South Beach has become known as the hip and trendy part of both Miami Beach and Miami in general. Mid-Beach consists of a blend of single-family to high-rise residences and tourist destinations. The North Beach District stretches from the Atlantic Ocean to Biscayne Bay, and from 63rd Street to the border with the Town of Surfside on 87th Terrace. North Beach, by contrast, has seen a lot less development than Mid or South Beach, growing up organically, driven by the needs of its residents. As a result, the neighborhood is diverse, with a small-town feel. Throughout this planning process, members of the community made it clear they wanted to retain this “small town” feel, while developing strategically to remain economically competitive.

The North Beach study area is characterized by a mix of single-family, multi-family, low- and high-rise condominiums, as well as a mix of neighborhood parks, a golf course, the North Shore Open Space Park, hotels, access to Biscayne Bay, and two miles of beachfront. It includes the neighborhoods or sections known as Normandy Shores, Normandy Isles, Biscayne Point, Stillwater Drive, Biscayne Beach, North Shore, Altos del Mar, Parkview Island and Atlantic Heights.

Five big ideas were developed as part of this study:

- Make a Town Center
- Provide more mobility options
- Protect and enhance neighborhoods
- Better utilize public lands
- Build to last

Key recommendations include the following:

- Recommendations that can be implemented immediately:
  - Regulatory changes: As additional transit services and options are added to the neighborhood, consider further reducing parking requirements.
  - Promote the MiMo District through wayfinding and signage
- Create a Business Improvement District to help coordinate streetscape improvements, marketing programs and facade improvements.

• Recommendations that can be implemented in the near term:
  - Rebuild 71st Street as a walkable Main Street.
  - Parking Strategies (to both park vehicles and shift to more of a multi-modal island mobility):
    › Create a trolley service that connects the North Beach Trolley to Mid-Beach and South Beach,
    › Create dedicated bus lanes where possible,
    › Convert bike lanes into protected bike lanes,
    › Create new public parking structures if needed,
    › Reduce parking requirements,
    › Synchronize traffic lights, and
    › Plant shade trees to encourage walking/cycling.

• Recommendations that can be implemented within the mid-term:
  - Parking Strategies (to both park vehicles and shift to more a multi-modal island mobility):
    › Create intercept parking garages and require the use of trolleys and buses to get around North Beach,
    › Create bike parking stations,
    › Plant shade trees to encourage walking/cycling, and
    › Install electric charging stations.

• Redesign Normandy Drive and 71st Street to include wider sidewalks for pedestrians, on-street parallel parking, two traffic lanes, dedicated transit lanes, and protected bike facilities.

• Recommendations that can be implemented within a longer term:
  - Parking Strategies (to both park vehicles and shift to more a multi-modal island mobility):
  - More frequent buses that are faster due to dedicated transit lanes,
  - Pay-before-you-board options for transit,
  - Create more protected bike lanes, and
  - Plant even more shade trees to encourage walking/cycling.

E. City of Miami Beach Bicycle Pedestrian Master Plan, 2016

This document marks a shift in the priorities of the City of Miami Beach leaders and staff toward a balanced transportation network that elevates human based modes - bicycling, walking and taking transit - as viable forms of transportation for a majority of city residents.

The projects and implementation strategy shared within the Plan reflect the desire of the Mayor, City Commission, and City Manager and Staff to increase the proportion of city residents who walk and bike as their main form of transportation from 15% in 2015 up to 27% in 2035.

The Bicycle Network Plan envisions a $20 million-dollar investment over the next 20 years on over 40 miles of new and improved bikeways. Existing bike lanes and sharrows on major corridors are recommended for conversion to protected bicycle facilities, with proposed critical connections at 71st Street, 63rd Street, 51st Street, and Alton Road at Chase Avenue.
Separated bike facilities are planned for state and county roads, where the volume of traffic is above 25,000 ADT or the speed above 35 mph. In general, the plan eschews conventional (unprotected) bike lanes in favor of protected and low stress facilities. Critical regional connections at the MacArthur Causeway, the Venetian Causeway, the Julia Tuttle and the JFK Causeway all require investments in separated bicycle and pedestrian infrastructure to accommodate inter-city regional travel between Miami Beach and mainland Miami. Notable in the long term plan is a synthesis with potential rail linkages on 5th Street and Washington. These investments in rail transit infrastructure along with the improvements outlined in the plan are projected to lead to a 10% bicycle mode share by 2035 from 5% in 2015.

For implementation purposes, the routes in the master plan have been divided into three distinct project categories: Category 1 (Filling the Gaps), Category 2 (Improvement to Existing), and Category 3 (Aspirational). A summary of key improvements categorized by project category is as follows:

Category 1 (Filling the Gaps)
- Protected bike lanes along MacArthur Causeway between the Fisher Island Ferry Terminal and 5th/Alton Intersection.
- Extend bike lanes from Collins Avenue to the Atlantic Trail along 5th Street.

Category 2 (Improvements to Existing)
- Protected bike lanes along Washington Avenue between South Pointe Drive and Dade Boulevard.
- Protected bike lanes along 16th Street, from Collins Avenue to Bay walk.
- Protected bike facilities along the Julia Tuttle Causeway from City limits to Alton Road interchange.

Category 3 (Aspirational)
- Lincoln Road Shared space from Washington Avenue to Atlantic Trail.
- Protected bike lanes along Collins Avenue from South Pointe to mid-beach.
- Collins Avenue, protected bike lanes from 41st to 63rd Street.
- Implement a protected bike lane on Collins Avenue from 73rd Street to City limits.
F. City of Miami Beach Transportation Master Plan, Final Report, 2016

The Transportation Master Plan is intended to provide future directions for the City of Miami Beach’s transportation system. In an effort to provide a guide for future transportation strategies, this plan includes a project bank for the City composed of multi-modal projects, and an analysis of funding prospects. The project bank is structured into three categories: Priority 1, Priority 2 and Priority 3 Projects.

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<thead>
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</tr>
<tr>
<td>SR 112 / 41st Street; SR A1A / Indian Creek Drive / Alton Road; Dade Boulevard; 17th Street</td>
<td>6.4 (Total Distance of One Loop)</td>
</tr>
<tr>
<td>SR 934 / 71st Street</td>
<td>0.79</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>SR 112 / Julia Tuttle Causeway</td>
<td>0.25</td>
</tr>
<tr>
<td>SR A1A / Collins Avenue BLK 5400</td>
<td>0.8</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Table 1: Key Priority Projects from Miami Beach Transportation Master Plan (Continued)

<table>
<thead>
<tr>
<th>Project No.</th>
<th>Project Name</th>
<th>City Area</th>
<th>Project Type</th>
<th>From</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority 2 Projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>SR A1A / Collins Avenue / Indian Creek Drive Exclusive transit and protected/buffered bicycle lanes</td>
<td>South Middle</td>
<td>Transit/Bike &amp; Ped</td>
<td>17th Street</td>
</tr>
<tr>
<td>10</td>
<td>44th Street AND SR A1A / Collins Avenue Safety Feasibility Study</td>
<td>Middle</td>
<td>Bike/Ped</td>
<td>44th Street</td>
</tr>
<tr>
<td>Priority 3 Projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>SR A1A / Collins Avenue Protected/buffered bicycle lanes</td>
<td>South</td>
<td>Bike/Ped</td>
<td>South Pointe Drive</td>
</tr>
<tr>
<td>3</td>
<td>SR A1A Collins Avenue Exclusive transit lanes</td>
<td>Middle</td>
<td>Transit</td>
<td>44th Street</td>
</tr>
<tr>
<td>4</td>
<td>SR A1A Collins Avenue / Indian Creek Drive Exclusive transit and protected/buffered bicycle lanes</td>
<td>Middle / North</td>
<td>Transit/Bike/Ped</td>
<td>SR A1A Collins Avenue / Indian Creek Drive Split</td>
</tr>
<tr>
<td>5</td>
<td>SR 934 / 79th Street Causeway Exclusive transit, Shared Uses Path, and protected/buffered bicycle lanes</td>
<td>North</td>
<td>Transit/Bike/Ped</td>
<td>US 1 / Biscayne Boulevard</td>
</tr>
<tr>
<td>12</td>
<td>Washington Avenue Exclusive transit and protected/buffered bicycle lanes</td>
<td>South</td>
<td>Transit</td>
<td>South Pointe Drive</td>
</tr>
<tr>
<td>13</td>
<td>Venetian Causeway Conventional Bike Lanes</td>
<td>South</td>
<td>Bike/Ped</td>
<td>US 1 / Biscayne Boulevard</td>
</tr>
<tr>
<td>21</td>
<td>SR A1A Collins Avenue / Indian Creek Drive / Harding Avenue Exclusive transit lanes and Protected Bicycle Lanes</td>
<td>Middle / North</td>
<td>Transit</td>
<td>SR A1A Collins Avenue / Indian Creek Drive Split</td>
</tr>
<tr>
<td>25</td>
<td>SR A1A / MacArthur Causeway Light Rail Connection/ Shared-Use Path</td>
<td>South</td>
<td>Transit/Bike&amp;Ped</td>
<td>US 1 / Biscayne Boulevard</td>
</tr>
<tr>
<td>27</td>
<td>SR 112 / Julia Tuttle Causeway Exclusive Transit Lane/Shared-Use Path</td>
<td>Middle</td>
<td>Multimodal</td>
<td>US-1 / Biscayne Blvd</td>
</tr>
<tr>
<td>28</td>
<td>SR A1A/ Indian Creek Drive Protected Bicycle Lanes</td>
<td>North</td>
<td>Bike/Ped</td>
<td>Abbott Avenue</td>
</tr>
<tr>
<td>To</td>
<td>Project Length (Miles)</td>
<td>Project Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>44th Street</td>
<td>2.76</td>
<td>Exclusive transit and protected/buffered bicycle lanes (Lane repurposing and/or roadway widening), Enhanced crosswalks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR A1A / Collins Avenue</td>
<td>N/A</td>
<td>Safety Feasibility Study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17th Street</td>
<td>1.68</td>
<td>Protected/buffered bicycle lanes (Lane repurposing and/or roadway widening) Enhanced crosswalks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR A1A Collins Avenue / Indian Creek Drive Split</td>
<td>2</td>
<td>Exclusive transit lanes (Lane repurposing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR 934 / 71st Street</td>
<td>2.05</td>
<td>Exclusive transit and protected/buffered bicycle lanes (Lane repurposing and/or roadway widening),</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bay Drive</td>
<td>2.67</td>
<td>Exclusive transit, Shared Uses Path, and protected/buffered bicycle lanes (Lane repurposing and/or roadway widening),</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR A1A / 5th Street</td>
<td>0.44</td>
<td>Exclusive transit and protected/buffered bicycle lanes (Lane repurposing and/or roadway widening), Enhanced crosswalks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Avenue</td>
<td>3.21</td>
<td>Conventional Bike Lanes (Lane repurposing and/or roadway widening) Enhanced crosswalks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>88th Street</td>
<td>4.36</td>
<td>Exclusive transit lanes (Lane repurposing) and protected Bicycle Lanes along Harding Avenue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR 907 / Alton Road</td>
<td>3.41</td>
<td>Light Rail Connection across the Bay/ Protected Bicycle Lanes (Lane repurposing and/or roadway widening), Enhanced crosswalks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR 907 / Alton Road</td>
<td>3.18</td>
<td>Exclusive Transit Lane and Shared-Use Path. This project required extensive bridge work.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dickens Avenue</td>
<td>0.33</td>
<td>Protected Bicycle Lanes (Lane repurposing and/or roadway widening)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
G. Fiscal Years 2019 – 2028 Miami-Dade Transit Ahead 10; DTPW Transit Development Plan (TDP), Annual Update

Transit Development Plans are required for grant program recipients pursuant to Section 341.052, F.S. A TDP serves as the provider’s planning, development, and operational guidance document, based on a ten-year planning horizon and covering the year for which funding is sought and the nine subsequent years.

The MDT10Ahead 2018 Annual Update, the agency's TDP, serves as the agency's strategic guide for public transportation in Miami-Dade County over the course of the next ten years. The 2014 Major Update, MDT10Ahead, was adopted by the Board of County Commissioners, pursuant to resolution R-1036-14. The last annual update, the 2017 Annual Update, was approved by FDOT District Six on September 20, 2017.

The TDP is a benchmark document that describes the current state of DTPW, and the direction it intends to go in the coming years. MDT10Ahead is fiscally constrained, and the proposed ten-year improvements were developed with this constraint. The TDP is subject to change in correspondence with the County's Adopted Budget and Multi-Year Capital Plan.

Key projects identified in the TDP, related to the Coastal Communities, include the following:

- SMART Plan Beach Corridor Extension project: will serve the cities of Miami and Miami Beach along a 9.7-mile corridor, crossing Biscayne Bay to link Downtown Miami to Miami Beach. The Beach Corridor area is an epicenter for population and economic growth and a major employment center and tourist destination in the region. As a result, the roadways between Miami and Miami Beach are typically heavily congested. This high bus transit ridership corridor has been identified as a candidate for consideration for premium transit over the past two decades as part of a strategy to address east-west directional travel demands. DTPW initiated a Project Development & Environment (PD&E) study to evaluate premium transit solutions in this corridor in May 2017.

- Miami Beach Convention Center Terminal at Convention Center Drive and 19th Street to construct a transit terminal facility. Total project cost is estimated at $3.9 million and is to be paid by the City of Miami Beach.

- 79th Street Enhanced Bus Service (FKA Route 79/79th Street MAX) from Northside Metrorail to Collins Avenue via NW 79th Street. Extend route to Miami Beach Convention Center. Improve peak headways from 24 to 10 minutes. Introduce weekend service with 15-minute headways. Route to be converted to Enhanced Bus Service. This project is expected to include the addition of nine (9) new buses.

- Beach Express North: The route will provide express bus service from Golden Glades Intermodal Terminal to the Earlington Heights Metrorail Station, the future Mt Sinai Transit Terminal, and the Miami Beach Convention Center. Headways will be 10 minutes during peak hours and 30 minutes during off-peak hours. Saturday service will provide headways of 20 minutes during the peak hours and 30 minutes in the off-peak hours, while Sunday service will provide headways of 40 minutes during the peak hours and 60 minutes in the off-peak hours. Service span will be from 5:00am to 12:00am. This project is expected to include the addition of 10 new articulated buses.

- Beach Express South: The route will provide express bus service from Miami Central Station to the Miami Beach Convention Center. Service will run all day with 10-minute headways. Service Span will be from 5:00am to 2:00am. Service is expected to operate with 12 articulated buses.

- Beach Express Central: The route will provide express bus service from Civic Center Metrorail Station to the Miami Beach Convention Center. Headways will be 10 minutes during peak hours and 20 minutes during off-peak hours. Service span will be from 5:30am to 12:00am. This project is expected to include the addition of eight (8) new articulated buses.
H. FDOT District 6 Five-Year Work Program
(Years 2019 – 2024)

The District 6 Five-Year Work Program includes funded State projects for the five-year period from 2019 to 2024.

Key projects identified in the Work Program, related to the Coastal Communities, include the following:

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>From</th>
<th>To</th>
<th>Work Type</th>
<th>Phase</th>
<th>Year</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>430813-2</td>
<td>SR A1A/Collins Avenue and Indian Creek Drive</td>
<td>5800 Block SR 907/63 Street</td>
<td>Resurfacing</td>
<td>PE</td>
<td>2020</td>
<td>$262,000</td>
<td></td>
</tr>
<tr>
<td>430949-1</td>
<td>SR A1A/Collins Avenue Bayview Drive SR 856/192 Street</td>
<td>Resurfacing</td>
<td>CST</td>
<td>2019 ($491,287)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>430949-2</td>
<td>SR A1A/Collins Avenue South of Haulover Inlet North of Bayview Drive</td>
<td>Resurfacing</td>
<td>PE</td>
<td>2019 $778,436</td>
<td>CST</td>
<td>2022 $5.56 million</td>
<td></td>
</tr>
<tr>
<td>434773-3</td>
<td>SR A1A/Collins Avenue 4700 Block 5800 Block Planning</td>
<td>Planning</td>
<td>PE</td>
<td>2020 $300,000</td>
<td>CST</td>
<td>2020 $82,450</td>
<td></td>
</tr>
<tr>
<td>441886-1</td>
<td>SR A1A/Collins Avenue at 36th, 83rd and 87th Streets</td>
<td>Pedestrian improvements</td>
<td>PE</td>
<td>2019 $187,758</td>
<td>CST</td>
<td>2020 $691,909</td>
<td></td>
</tr>
<tr>
<td>422713-2</td>
<td>Venetian Causeway North Bayshore Drive Purdy Avenue PD&amp;E/EMO Study</td>
<td>PD&amp;E/EMO Study</td>
<td>PE</td>
<td>2019 $25,000</td>
<td>CST</td>
<td>2020 $715,562</td>
<td></td>
</tr>
<tr>
<td>443432-1</td>
<td>SR A1A/Macarthur Causeway SR-5/Biscayne Blvd SR-997/Alton Road</td>
<td>Bike path/trail</td>
<td>PE</td>
<td>2019 $25,000</td>
<td>CST</td>
<td>2020 $715,562</td>
<td></td>
</tr>
<tr>
<td>444622-1</td>
<td>SR 112/I-195/Julia Tuttle Causeway E. of SR-5/ Biscayne Blvd Alton Road</td>
<td>Miscellaneous construction</td>
<td>PE</td>
<td>2020 $460,000</td>
<td>CST</td>
<td>2020 $4.26 million</td>
<td></td>
</tr>
</tbody>
</table>

Information on the tentative 2020-2025 FDOT District 6 Five-Year Work Program can be found here:
https://fdotwp1.dot.state.fl.us/fmsupportapps/workprogram/WorkProgram.aspx

The new Work Program will take effect on July 1, 2020
I. Miami-Dade County Transportation Improvement Program (TIP) Fiscal Years 2019/2020 to 2023/2024

The TIP is a staged multi-year program that sets the priorities with federal, state and local funding. The TIP is also the capital improvements element of the Long-Range Transportation Plan. The TIP is updated every year as required by federal government regulations.

Key projects identified in the TIP, related to the Coastal Communities, include the project on Table 3:

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>From</th>
<th>To</th>
<th>Work Type</th>
<th>Phase</th>
<th>Year</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>DT4408411</td>
<td>Northshore Boardwalk</td>
<td>79th Street</td>
<td>87th Terrace</td>
<td>Bike-Ped/Trail</td>
<td>CST</td>
<td>2022</td>
<td>$3.0 million</td>
</tr>
<tr>
<td>TAMDT287</td>
<td>Beach Corridor (from SMART Plan)</td>
<td>Midtown Miami (at or near NE 41st Street and NE 2nd Avenue)</td>
<td>Transit Hub Connector (near 5th Street &amp; Alton Road)</td>
<td>Transit</td>
<td>PD&amp;E</td>
<td>2020</td>
<td>$3.0 million</td>
</tr>
<tr>
<td>DT4291931</td>
<td>SR 907/Alton Road</td>
<td>Michigan Avenue</td>
<td>S of Ed Sullivan Drive/43rd Street</td>
<td>Flexible pavement reconstruction</td>
<td>CST</td>
<td>2021</td>
<td>$25.5 million</td>
</tr>
<tr>
<td>DT4304441</td>
<td>SR 907/Alton Road</td>
<td>S of 43rd Street</td>
<td>N of West 48th Street</td>
<td>Flexible pavement reconstruction</td>
<td>CST</td>
<td>2022</td>
<td>$17.9 million</td>
</tr>
<tr>
<td>DT4304442</td>
<td>SR 907/Alton Road</td>
<td>N of West 48th Street</td>
<td>E of Allison Road</td>
<td>Flexible pavement reconstruction</td>
<td>Railroad and Utilities</td>
<td>2021</td>
<td>$5.0 million</td>
</tr>
<tr>
<td>DT4309492</td>
<td>SR A1A/Collins Avenue</td>
<td>Haulover Inlet Drive</td>
<td>S of Bayview Drive</td>
<td>Resurfacing</td>
<td>CST</td>
<td>2022</td>
<td>$5.6 million</td>
</tr>
<tr>
<td>DT4416461</td>
<td>City of Sunny Isles Beach – Government Center/Beach Access Pedestrian Bridge</td>
<td>CST</td>
<td>2021</td>
<td>$4.5 million</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DT4418861</td>
<td>SR A1A/Collins Avenue</td>
<td>at 36th, 63rd, and 87th Streets</td>
<td>Pedestrian safety improvements</td>
<td>CST</td>
<td>2023</td>
<td>$700,000</td>
<td></td>
</tr>
</tbody>
</table>

J. Miami-Dade County 2040 and 2045 Long Range Transportation Plan (LRTP)

The 2040 LRTP’s primary purpose is to assist citizens, businesses, and elected officials in cultivating their transportation vision for the County through the next 26 years. The 2040 LRTP serves as an instrument to identify the needed improvements to the transportation network, and provides a long-term investment framework to address current and future challenges.
The update of the Miami-Dade County LRTP to the Year 2040 is a primary activity in Miami-Dade County's transportation planning process to meet federal and state requirements for an update of the Transportation Plan every five years. Federal law requires that the LRTP address minimum of a 20-year planning horizon from the date of the TPO adoption. The last LRTP update, the 2035 LRTP, was approved by the Metropolitan Planning Organization (TPO) Governing Board in October 2009.

The 2040 LRTP updated includes in-depth consideration of intermodal improvement opportunities, freight movement, Intelligent Transportation System technologies, and Congestion Management. A major emphasis of the 2040 LRTP was the inclusion of projects that improve the operation of the existing system. This emphasis on increasing the efficiency of the current infrastructure, in light of soaring construction costs, is embodied in the Congestion Management Process, adopted concurrently and incorporated into the LRTP. Congestion management includes the implementation of strategies designed to reduce vehicle trips; shift trips from single-occupancy vehicles to high-occupancy vehicles; and maximize the effectiveness and efficiency of the existing transportation system.

Key projects identified in the 2040 LRTP, related to the Coastal Communities, include the following:

- Beach Corridor (from SMART Plan) (MDT287) SMART Plan Beach Corridor Study. This is a Priority I (years 2015-2020) funded PD&E study for the SMART Plan Beach Corridor project, with limits from Midtown Miami (at or near NE 41st Street and NE 2nd Avenue) to Transit Hub Connector located in the vicinity of 5th Street and Alton Road.
- Beach Connection (aka Baylink) from Miami Downtown Terminal to Miami Beach Convention Center (MDT135). This premium transit project is scheduled for PE by year 2030 and ROW by years 2030 and 2040.
- 79th St Causeway (JFK Cwy) Enhanced Bus from Northside Metrorail Station to Miami Beach Convention Center (MDT150). This transit improvement is included as a Priority 2 funded project for construction in years 2021-2025, and operations and maintenance in years 2026-2040.
- Atlantic Trail (north of Miami Beach) from North Shore Park to Haulover Park (NM150). This trail improvement project is included as a Priority 4 project in year 2040.
- Atlantic Trail (north of Haulover Park) from Haulover Park to Broward County Line (NM151). This trail improvement project is included as a Priority 4 project in year 2040.
- Lehman Causeway Pedestrian Facility (NM69). Bicycle/Pedestrian Improvements from Aventura to Sunny Isles Beach. This pedestrian facility improvement is included as a Priority 2 funded project in years 2021-2025.

While this study of transportation needs of the Coastal Communities was underway, the 2045 LRTP Update was completed. The intent and purpose of the 2045 LRTP is to encourage, shape, promote and sustain transportation choices, economic competitiveness, the safe and efficient management, operations and development of a cost feasible intermodal transportation system that will serve the mobility needs of people and freight within the Miami-Dade urbanized area, while reducing transportation-related fuel consumption and air pollution. The 2045 LRTP, as adopted on September 26th, 2019, contains numerous projects of note to the Coastal Communities. Key funded projects are:

- Adopt and Implement Complete Streets Policy for SR A1A from 63rd Street to William Lehman Causeway per 2019 Congestion Management Plan (2025-2035)
- Bus Express Rapid Transit (BERT) service along MacArthur Causeway, Collins/Washington Avenues, and I-195/Julia Tuttle Causeway in Miami Beach (2021-2025)
- Express Bus service connecting Midtown with Miami Beach Convention Center along I-195 (2021-2025)
- Mount Sinai Transit Terminal in Miami Beach (2021-2025)
- Safe Routes to School enhancements in Sunny Isles Beach (2021-2025)
- Sunny Isles Beach Government Center/Beach Access Pedestrian Bridge (2021-2025)
- Northshore Open Space Beachwalk in Miami Beach (2021-2025)
- Aventura Transit terminal Park & Ride (2026-2030)
- Corridor Improvements to I-195/Julia Tuttle Causeway (2026-2030)
- Protected Bicycle Lanes on 72nd Street in Miami Beach (2036-2045)
- Beach Corridor Premium Transit (Partially Funded)
2.2. Overview of Corridor Features

The following sections include summaries of the following categories:

- Existing and Future land uses
- Population and employment
- Upcoming developments and projects
- Roadway inventory, traffic counts and LOS
- Transit service and ridership information

A. Existing and Future Land Uses

The generalized composition of existing land uses is summarized in Table 4. Over half of the study area is comprised of residential land uses, with the majority being low and medium-density as defined in Miami-Dade County. Commercial uses, including offices represent about 24%. The remaining 22% is parks, recreation, and open space. Figure 2-1 depicts future land uses. While residential land uses still dominate, there is expected to be some densification. Furthermore, some of the existing commercial areas transition to mixed-use, encouraging more walkable and transit oriented areas.

Table 4: Existing Land Use

<table>
<thead>
<tr>
<th>Existing Land Use</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>54%</td>
</tr>
<tr>
<td>- Low Density</td>
<td>29%</td>
</tr>
<tr>
<td>- Med Density</td>
<td>23%</td>
</tr>
<tr>
<td>- High Density</td>
<td>2%</td>
</tr>
<tr>
<td>Commercial</td>
<td>24%</td>
</tr>
<tr>
<td>Recreational</td>
<td>20%</td>
</tr>
<tr>
<td>Conservation</td>
<td>1%</td>
</tr>
</tbody>
</table>
B. Population and Employment

Population and employment data were compiled using the US Census American Community Survey (ACS) 2017 data sets. The results are summarized as follows and displayed in Figures 2-2 through 2-18:

- Over 90,000 households in 2017
- 2017 population over 188,000
- Average household income of $73,600
- Nearly 26,000 people below the poverty level
- Over 4,000 households below the poverty level
- Race
  - 83% of the population identifies as ‘White Alone’
  - 3% of the population identifies as ‘Black or African American Alone’
- Ethnicity
  - 49% of the population is reported as having ‘Hispanic or Latino of Any Race’ ethnicity

Who Lives in the Study Area & How Do They Travel?

Although the corridor serves regional trips, it is important to understand who lives in the study area as well as how they travel. Figures 2-2 through 2-18 display some demographic information for study area residents.

The Corridor has significant Millennial & elderly/soon to be elderly populations.

The corridor primarily consists of young and elderly/soon to be elderly residents. Millennials make up one third of the Coastal Communities’ population. The Baby Boom Generation makes up almost 37% of the resident population, which is currently transitioning into the elderly population. These two segments of the population tend to rely on public transportation and other active transportation modes (walking and bicycling).

Corridor residents have higher than average educational attainment levels with higher than average median wages.

92% of study area residents have graduated from high school. 27% have some college education, with an additional 47% of residents living in the Coastal Communities have obtained a college degree. In line with the high education levels, the median wage of working age corridor residents is $64,000. Approximately half of the households earn more than $50,000. However, 16% of all households are at or below the poverty level.

A higher than average percentage of corridor residents are walking and bicycling to work.

Within the Coastal Communities, the primary mode of travel is the personal automobile, which accounts for 71% of all travel modes. Nine percent of residents use transit, and 13% walk or bike to work.
The relatively high rate of transit, bicycle and pedestrian modes within the Coastal Communities can partially be attributed to higher than average households without access to a vehicle. Seventeen percent of households don’t have access to a vehicle.
Figure 2-2 Population, 2017
Figure 2-3 Median Age, 2017
Figure 2-5 Median Household Income, 2017
Figure 2-6 Poverty, 2017

Legend
2017 Below Poverty Level
0 - 150
151 - 350
351 - 500
> 500
Costs/Comm
Figure 2-7 No High School Degree, 2017
Figure 2-8 Minority Population, 2017

Legend
2017 Minority Population
- 0 - 300
- 301 - 500
- 501 - 1,000
- 1,001 - 1,500
- 1,501 +

Coastal/Comm
Figure 2-9 English Speaking Households, 2017

Legend
- CoastalComm
- 2017 English Speaking Households
  - 0 - 490
  - 401 - 990
  - \( \leq 1,500 \)

Map showing English speaking households in various coastal communities, including Miami-Dade County, Golden Beach, Aventura, Sunny Isles Beach, Unincorporated Miami-Dade County, Bal Harbour, Bay Harbor Islands, Surfside, North Bay Village, S.R. A1A/Collins Avenue, and Miami Beach.
Figure 2-11 Spanish Speaking Households, 2017
Figure 2-12 Zero Car Households, 2017
Figure 2-13 Mode of Travel to Work, 2017
Figure 2-14 Drive to Work, 2017

Legend
2017 Mode of Travel to Work
1 Dot = 100
- TRAN_BIKE
- TRAN_WALK
- TRAN_PUB
- TRAN_CAR
- S.R. A1A
- CoastalComm

Broward County
Miami-Dade County

Golden Beach

Aventura

Sunny Isles Beach

Unincorporated
Miami-Dade County

Bal Harbour

Bay Harbor Islands

Surfside

North Bay Village

S.R. A1A/
Collins Avenue

Miami Beach
Figure 2-15 Transit to Work, 2017
Figure 2-16 Bike to Work, 2017
Figure 2-17 Walk to Work, 2017
Figure 2-18 Jobs, 2015
C. Upcoming developments and projects

The following list of proposed projects were identified in other plans relevant to the study area:

- Enhanced sidewalks and crossings on SR A1A in Cities of Miami Beach and Sunny Isles Beach
- Protected bicycle lanes on Harding-Abbot from Indian Creek Drive to 87th Street (Plan NoBe)
- Exclusive bus transit lanes on Collins Avenue from 63rd to 87th Streets and on Harding-Abbot from Indian Creek Drive to 87th Street (Plan NoBe)
- Bike lanes and/or greenways throughout Miami Beach (Miami Beach Transportation Master Plan)
- Exclusive curb transit lane on SR A1A throughout City (Miami Beach Transportation Master Plan)
- Continuous protected bike lanes and exclusive transit lanes for 71st Street / Normandy Drive from Beach to City Limits (Plan NoBe)
- 41st Street Complete Streets Concept from SR A1A to Alton Road (City of Miami Beach)
- I-195 Enhanced Bicycle/Pedestrian Path (I-195 Master Plan)
- Dade Boulevard shared path from Venetian Causeway to 23rd Street (City of Miami Beach study)
- 17th Street reconfiguration from West Avenue to the Beach Walk – part of Beach Connection BRT option (Beach Corridor Rapid Transit PD&E Study)
- MacArthur Causeway / 5th Street: Beach Connection premium transit options (Beach Corridor Rapid Transit PD&E Study)
- Indian Creek Drive reconstruction from 41st Street to 26th Street (underway)

D. Roadway Inventory, Traffic Counts and Level of Service (LOS)

The project is focused on SR A1A/Collins Avenue traversing the full length of the corridor. As shown in Figures 2-19 through 2-25, SR A1A within the corridor has the following characteristics:

- Number of lanes range from 2 lanes to 6 lanes
- Right-of-way ranges from 37 feet to 138 feet
- Speed ranges from 30 to 40 miles per hour
- 108 traffic signals
- 10 mid-block pedestrian crossings
- 1 Emergency Signal
- Designated bicycle facilities on the MacArthur Causeway and other sporadic segments of the corridor
- Sidewalks are present along most of the corridor, except for the Haulover Park area in unincorporated Miami-Dade County

The Average Annual Daily Traffic (AADT) ranges from 10,000 vehicles per day (vpd) to over 40,000 vpd. The locations with the higher AADTs are across the MacArthur Causeway which connects the mainland to Miami Beach, and the stretch of SR A1A from Bal Harbour to south of Golden Beach.
Figure 2-20 Right-of-Way (ROW)
Figure 2-21 Speed Limits
Figure 2-22 Signals and Crossings
Figure 2-23 Annual Average Daily Traffic (AADT)
E. Transit service and ridership information

Both community transit service and Miami-Dade transit (Metrobus) are available in the project area.

Metrobus routes that service the Coastal Communities include the following:

- Limited stop and express service routes
  - Routes 79 and 120 – Limited stop
  - Route 150 – Express
- East/west routes
  - Routes 101 A, 107 G, 110 J, 112 L and 113 M
- North/south routes
  - Routes 103 C, 105 E, 108 H and 119 S
- Local circulator
  - Route 115 – Miami Beach Shuttle
- Metrorail and Metromover
  - Via Metrobus routes 120, 101 A, 113 M, and 119 S

In addition to the Metrobus service, there are numerous community circulator shuttles. Community transit services include the following:

- Aventura
- Bal Harbour
- Bay Harbor Islands
- Miami Beach
- North Bay Village
- Surfside
- Sunny Isles Beach

A map of the current community transit service routes is displayed in Figure 2-26. Note that Surfside, Bal Harbour, and Bay Harbor Islands work together on planning and operating their shuttle routes. Further, they have agreed to offer a combined Surf-Bal-Bay route in the near future.

A map of the Metrobus routes is displayed in Figure 2-27, Metrobus stops are displayed in Figure 2-28, and ridership data is displayed in Table 5.
Figure 2-27 Metrobus Routes
### Table 5 Metrobus Ridership Data

<table>
<thead>
<tr>
<th>Route</th>
<th>Mar-19 Ave</th>
<th>Mar-18 Ave</th>
<th>Diff</th>
<th>Mar-19 Month</th>
<th>Mar-18 Month</th>
<th>Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID 79 Limited</td>
<td>381</td>
<td>181</td>
<td>200</td>
<td>8,010</td>
<td>3,984</td>
<td>4,026</td>
</tr>
<tr>
<td>115 MB Shuttle</td>
<td>131</td>
<td>122</td>
<td>9</td>
<td>3,388</td>
<td>3,409</td>
<td>(21)</td>
</tr>
<tr>
<td>101-A E/W</td>
<td>150</td>
<td>134</td>
<td>16</td>
<td>3,785</td>
<td>3,334</td>
<td>451</td>
</tr>
<tr>
<td>103-C N/S</td>
<td>432</td>
<td>429</td>
<td>3</td>
<td>11,760</td>
<td>11,674</td>
<td>86</td>
</tr>
<tr>
<td>105-E N/S</td>
<td>1,181</td>
<td>1,238</td>
<td>(57)</td>
<td>31,279</td>
<td>33,104</td>
<td>(1,825)</td>
</tr>
<tr>
<td>107-G E/W</td>
<td>1,590</td>
<td>1,673</td>
<td>(83)</td>
<td>43,265</td>
<td>46,742</td>
<td>(3,477)</td>
</tr>
<tr>
<td>108-H N/S</td>
<td>499</td>
<td>459</td>
<td>40</td>
<td>14,452</td>
<td>13,556</td>
<td>896</td>
</tr>
<tr>
<td>112-L E/W</td>
<td>7,164</td>
<td>7,353</td>
<td>(83)</td>
<td>203,563</td>
<td>210,756</td>
<td>(7,193)</td>
</tr>
<tr>
<td>113-M E/W</td>
<td>736</td>
<td>773</td>
<td>(37)</td>
<td>19,814</td>
<td>20,954</td>
<td>(1,140)</td>
</tr>
<tr>
<td>119-S N/S</td>
<td>8,970</td>
<td>8,863</td>
<td>107</td>
<td>259,064</td>
<td>260,908</td>
<td>(1,844)</td>
</tr>
<tr>
<td>120-Beach Max</td>
<td>5,969</td>
<td>6,256</td>
<td>(287)</td>
<td>164,057</td>
<td>175,188</td>
<td>(11,131)</td>
</tr>
<tr>
<td>150-MB Airport Flyer Express</td>
<td>1,806</td>
<td>1,810</td>
<td>(4)</td>
<td>53,836</td>
<td>54,082</td>
<td>(246)</td>
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</tbody>
</table>


### Table 5 Metrobus Ridership Data

<table>
<thead>
<tr>
<th>Route</th>
<th>Feb-19 Ave</th>
<th>Feb-18 Ave</th>
<th>Diff</th>
<th>Feb-19 Month</th>
<th>Feb-18 Month</th>
<th>Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID 79 Limited</td>
<td>393</td>
<td>210</td>
<td>183</td>
<td>7,850</td>
<td>4,209</td>
<td>3,641</td>
</tr>
<tr>
<td>115 MB Shuttle</td>
<td>142</td>
<td>250</td>
<td>(108)</td>
<td>3,238</td>
<td>6,157</td>
<td>(2,919)</td>
</tr>
<tr>
<td>101-A E/W</td>
<td>163</td>
<td>130</td>
<td>33</td>
<td>3,732</td>
<td>2,993</td>
<td>739</td>
</tr>
<tr>
<td>103-C N/S</td>
<td>457</td>
<td>441</td>
<td>16</td>
<td>11,023</td>
<td>10,880</td>
<td>143</td>
</tr>
<tr>
<td>105-E N/S</td>
<td>1,224</td>
<td>1,269</td>
<td>(45)</td>
<td>30,084</td>
<td>30,516</td>
<td>(432)</td>
</tr>
<tr>
<td>107-G E/W</td>
<td>1,580</td>
<td>1,685</td>
<td>(105)</td>
<td>39,594</td>
<td>41,731</td>
<td>(2,137)</td>
</tr>
<tr>
<td>108-H N/S</td>
<td>501</td>
<td>485</td>
<td>16</td>
<td>12,965</td>
<td>12,653</td>
<td>312</td>
</tr>
<tr>
<td>110-J E/W</td>
<td>2,545</td>
<td>2,463</td>
<td>82</td>
<td>63,928</td>
<td>61,031</td>
<td>2,897</td>
</tr>
<tr>
<td>112-L E/W</td>
<td>7,088</td>
<td>7,364</td>
<td>(276)</td>
<td>182,847</td>
<td>189,202</td>
<td>(6,355)</td>
</tr>
<tr>
<td>113-M E/W</td>
<td>776</td>
<td>773</td>
<td>3</td>
<td>18,947</td>
<td>19,417</td>
<td>(470)</td>
</tr>
<tr>
<td>119-S N/S</td>
<td>8,710</td>
<td>8,742</td>
<td>(32)</td>
<td>230,274</td>
<td>203,853</td>
<td>26,391</td>
</tr>
<tr>
<td>120-Beach Max</td>
<td>3,101</td>
<td>6,248</td>
<td>(3,147)</td>
<td>152,989</td>
<td>156,855</td>
<td>(3,866)</td>
</tr>
<tr>
<td>150-MB Airport Flyer Express</td>
<td>1,794</td>
<td>1,735</td>
<td>59</td>
<td>48,490</td>
<td>46,958</td>
<td>1,532</td>
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Table 5 Metrobus Ridership Data, continued

<table>
<thead>
<tr>
<th>Route</th>
<th>ID</th>
<th>Desc</th>
<th>Jan-19 Ave</th>
<th>Jan-18 Ave</th>
<th>Diff Ave</th>
<th>Jan-19 Month</th>
<th>Jan-18 Month</th>
<th>Diff Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>79</td>
<td>298</td>
<td>Limited</td>
<td>6,551</td>
<td>3,850</td>
<td>2,701</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>122</td>
<td>MB Shuttle</td>
<td>3,225</td>
<td>5,783</td>
<td>(2,558)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101-A</td>
<td>153</td>
<td>E/W</td>
<td>4,140</td>
<td>3,236</td>
<td>904</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>103-C</td>
<td>398</td>
<td>N/S</td>
<td>10,841</td>
<td>9,425</td>
<td>1,416</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>105-E</td>
<td>1,132</td>
<td>N/S</td>
<td>30,510</td>
<td>30,884</td>
<td>(374)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>107-G</td>
<td>1,525</td>
<td>E/W</td>
<td>41,299</td>
<td>39,991</td>
<td>1,308</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>108-H</td>
<td>491</td>
<td>N/S</td>
<td>13,940</td>
<td>12,076</td>
<td>1,864</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>110-J</td>
<td>2,305</td>
<td>E/W</td>
<td>61,916</td>
<td>65,547</td>
<td>(3,631)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>112-L</td>
<td>6,913</td>
<td>E/W</td>
<td>195,044</td>
<td>198,621</td>
<td>(3,577)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>113-M</td>
<td>711</td>
<td>E/W</td>
<td>19,164</td>
<td>19,458</td>
<td>(294)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>119-S</td>
<td>8,596</td>
<td>N/S</td>
<td>248,420</td>
<td>239,679</td>
<td>8,741</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120-Beach Max</td>
<td>5,782</td>
<td>Limited</td>
<td>160,842</td>
<td>161,058</td>
<td>(216)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150-MB Airport Flyer</td>
<td>1,685</td>
<td>Express</td>
<td>49,942</td>
<td>48,873</td>
<td>1,069</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Better Bus Project

Miami-Dade County has been evaluating potential improvements to existing bus service. TransitAlliance Miami, a local non-profit advocating for the systemic reform and expansion of mass transit in Miami-Dade County, has been working with Miami-Dade DTPW on this effort. According to TransitAlliance, only five County bus routes currently operate with 15 minute or better frequencies. Their Better Bus Project initiative is focused on a redesign of the County’s bus system that aims to provide better service using existing budget resources. TransitAlliance’s redesign is focused on addressing route accessibility, ridership, and bus frequency that will create a bus system that is more useful for more people. The three main goals of the new bus network are:

1. **Connect residents to jobs.** The new system could allow the average resident to access 30-50% more jobs in 45 minutes via transit.

2. **Affordability and equity.** The new system could double or even triple the number of frequent bus routes.

3. **Environment and quality of life.** Making the bus network useful to more people will help take more cars off the road thus reducing vehicle emissions.

The Better Bus – Coverage option seeks to hold total revenue bus hours of service constant while providing extensive geographic coverage. The Better Bus – Ridership option seeks to hold total revenue bus hours of service constant while maximizing ridership.

Table 6 provides a comparison of frequency/headways proposed under the Better Bus Project within the study area. In general, the concepts developed to date provide reduced service as compared to the existing transit system in the beach area. A draft of the new transit network developed as part of the Better Bus Project initiative has recently been completed. TransitAlliance is hosting community meetings to gather feedback as they prepare the final plan. The final network plan for the Better Bus Project will be voted on by the Board of County Commissioners. If approved, the plan is intended to be implemented in 2020.

Finally, it should be noted that some planned projects outlined in this section conflict with multimodal enhancements presented elsewhere in the report. Further evaluation should focus on resolving any conflicts.

Table 6
Figure 2-28 Bus Stops
<table>
<thead>
<tr>
<th>Segment</th>
<th>Average Daily Headway (min.) [Excludes Community Transit Routes]</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SR A1A (North-South)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>County Line to Lehman Causeway</td>
<td>---</td>
<td>Better Bus concepts reduce combined headways</td>
</tr>
<tr>
<td>Lehman Causeway to NE 163rd St.</td>
<td>5.71 12.00 15.00</td>
<td>Better Bus concepts reduce combined headways</td>
</tr>
<tr>
<td>NE 163rd St. to Broad Causeway</td>
<td>6.92 15.00 15.00</td>
<td>Better Bus concepts reduce combined headways</td>
</tr>
<tr>
<td>Broad Causeway to NE 79th St.</td>
<td>6.92 10.00 5.00</td>
<td>Better Bus Ridership concept provides improvement while Coverage concept reduces headways</td>
</tr>
<tr>
<td>NE 79th St. to I-195</td>
<td>2.41 6.00 5.00</td>
<td>Better Bus headways are slightly higher, but still very frequent</td>
</tr>
<tr>
<td>I-195 to Venetian Causeway</td>
<td>2.59 3.75 3.75</td>
<td>Better Bus headways are slightly higher, but still very frequent</td>
</tr>
<tr>
<td>Venetion Causeway to MacArthur Causeway</td>
<td>5.14 6.00 6.00</td>
<td>Better Bus headways are slightly higher, but still very frequent</td>
</tr>
<tr>
<td><strong>Causeways (East-West)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lehman Causeway</td>
<td>5.63 12.00 15.00</td>
<td>Better Bus concepts reduce combined headways</td>
</tr>
<tr>
<td>NE 163rd St.</td>
<td>32.73 60.00 30.00</td>
<td>Better Bus concepts reduce combined headways</td>
</tr>
<tr>
<td>Broad Causeway</td>
<td>30.00 30.00 15.00</td>
<td>Better Bus Ridership concept provides headway improvement</td>
</tr>
<tr>
<td>NE 79th St.</td>
<td>10.59 22.50 15.00</td>
<td>Better Bus concepts reduce combined headways</td>
</tr>
<tr>
<td>I-195</td>
<td>10.00 15.00 15.00</td>
<td>Better Bus concepts reduce combined headways - does not reflect implementation of BERT</td>
</tr>
<tr>
<td>Venetian Causeway</td>
<td>52.50 45.00 30.00</td>
<td>Better Bus concepts increase combined headways</td>
</tr>
<tr>
<td>MacArthur Causeway</td>
<td>6.00 6.00 6.00</td>
<td>No change - does not reflect implementation Beach premium transit project or BERT</td>
</tr>
</tbody>
</table>
3.0 Mobility Enhancements

This section includes strategies & concepts based on stakeholder feedback from workshops, meetings, and analyses. Through the study process the following multimodal deficiencies and needs were identified:

- Need for dedicated transit on SR A1A linking all communities, with transit hubs in walkable areas
- Bicycle facility deficiencies including gaps in the north-south network and the need for east-west bicycle facilities linking to the mainland
- Need for enhanced pedestrian facilities such as improved shade along the corridor, enhanced crosswalks at intersections, and mid-block crossings

To address these needs, a series of mobility enhancements were developed. The list, as detailed in this section, includes:

- Waterborne Transit Service
- Transit Hubs
- Lehman Causeway Shared-Use Path
- SR A1A Shared Bike-Bus Lanes
- Northeast 79th Street Complete Street
- Other Transit, Bicycle, and Pedestrian Improvements

3.1 Waterborne Transit Service

Implementing a waterborne transit service would provide an alternative mode to potentially improve travel time and accessibility between Downtown Miami and the Coastal Communities. The concept has been explored previously in Miami-Dade County, including a Miami-Dade MPO study in 2003 and a Miami-Dade DTPW study in 2016. One route identified in the 2016 study is an express service connecting Haulover Park Marina with Sea Isle Marina near midtown.

In early 2019, Miami-Dade County issued a Request for Information (RFI) for this potential Waterborne Express route. The goal of the RFI is to obtain information from the industry to better determine the most effective service for the area. The RFI envisioned the following:

- Peak period service (6 hours daily) with 15-20 minute headways
- $2.25 fare similar to Metrobus/ Metrorail
- Off-peak service frequency, cost, and stops can be determined by operator
- Passenger-only vessels (less than 50 people) and able to operate at average speed of 25 knots per hour
- Vessels must be low enough to clear the Venetian Causeway Bridge and be able to use current Sea Isle Marina dock

The waterborne transit service proposed in this study is a bit different as it proposes four stops in the coastal area and one stop along the mainland. As shown on Figure 3-1, the proposed stops include:

- Bayfront Park (Miami)
- Maurice Gibb Memorial Park (Miami Beach)
- Grandview Palace Marine (North Bay Village)
- Haulover Park (Miami-Dade County)
- Bella Vista Park (Sunny Isles Beach)
Many waterborne transit services around the world are focused on daily transportation for locals, while others are aimed at tourists. Further study is needed to determine frequency of service, on-demand vs. fixed timetable, costs and fares, and type of vehicle. In addition, potential propulsion technologies (liquified natural gas (LNG), electric) should be evaluated.
3.2 Transit Hubs

The purpose of a transit hub is to efficiently connect people and goods through multiple modes of travel. According to *Improving the Quality of Life Through Transit Hubs*, the facilities in and around transit hubs make the area a destination itself and can provide a ripple effect that encourages investment in the area, generate new revenue streams, and boost wider prosperity. Transit hubs within the study area will provide connectivity between community circulators, local and express bus routes, premium transit, and micro-mobility services. Each of the hubs envisioned in this study has been identified by others previously, and several have been evaluated for feasibility and/or implementation.

As shown on **Figure 3-3**, Transit Hubs for the corridor are proposed at the following locations:

- Convention Center (Miami Beach), consistent with the SMART Plan Beach Corridor Terminus
- Between 72nd & 73rd Streets (Miami Beach)
- Haulover Park (Miami-Dade County)
- NE 163rd Street near Bella Vista Park (Sunny Isles Beach)
- Aventura Mall Bus Terminal – Existing hub expanded to connect with Virgin Trains Aventura Station

Each hub would be designed to serve the surrounding community and may have unique amenities. For example, the proposed hub at Haulover Park could include a park-and-ride facility and also waterborne transit connections. The 72nd/73rd Hub in Miami Beach would be along parallel streets (see image above).
### 3.3 Lehman Causeway Shared-Use Path

The William Lehman Causeway (SR 856) connects Biscayne Boulevard/US 1 with SR A1A, providing vehicular connectivity between the mainland and beach. As this is a controlled-access facility, there are no sidewalks and limited bicycle facilities. As shown on Figure 3-4, the concept developed in this study includes a 10- to 12-foot wide shared-use path along the south side of the Lehman Causeway in the eastbound travel direction, coupled with a 2-foot barrier/separator and an 8- to 10-foot shoulder. As envisioned, the path is primarily directly adjacent to the roadway, but deviates from the Causeway mainline to the southern service road between Country Club Drive and the eastern U-turn loop. The shared-use path would replace one existing eastbound travel lane, but westbound travel lanes would be maintained for daily travel as well as hurricane evacuation. Although further study and coordination with FDOT is necessary, an analysis of existing and 2040 projected traffic volumes show there would likely be no capacity issues along the causeway. This analysis is included in Appendix B.

At the western end, a crosswalk would be constructed across Biscayne Boulevard, along with appropriate pedestrian signalization. Construction of a sidewalk to the north on the west side of Biscayne Boulevard would provide access to bus stops along the roadway as well as to the new Virgin Trains Aventura Station scheduled to open in 2020. Once the shared-use path has opened, the pilot bike lanes installed on the Lehman Causeway shoulders approximately five years ago would be removed.

Conceptual layouts for the shared-use path were developed, along with projected costs using FDOT’s Long-Range Estimating (LRE) System. The LRE calculates construction of the shared-use path would be approximately $3.7 million. Assuming an additional 35% would be needed for design, permitting, and construction engineering inspection (CEI), it is expected the project would cost approximately $5 million to complete. Conceptual layout plan sheets are included in Appendix C and the LRE calculations are included in Appendix D.

If the shared-use path envisioned in this study is determined not to be feasible, other alternatives that accommodate bicycle and pedestrian traffic between Sunny Isles Beach and Aventura should be evaluated.

### 3.4 SR A1A Shared Bike-Bus Lanes

Generally, dedicated bus lanes increase urban transport system efficiency and equity. This is achieved by carrying more passengers than general traffic lanes, thereby increasing the total capacity of the roadway. The increase in transit efficiency may also motivate travelers to shift travel mode from automobile to transit, yielding a positive effect on various transportation issues. Recent research published by UCLA’s Institute of Transportation Studies found that dedicated bus lanes can speed up travel times by as much as 15%, and that the faster time led to increased ridership.
A shared bike-bus lane is a traffic lane dedicated for exclusive use by buses, bicyclists, and typically right-turning vehicles. Shared bike-bus lanes tend to be implemented where street right-of-way constraints exist, and are a solution for better accommodating buses and bicycles. Shared bike-bus lanes have been studied for FDOT and have been implemented on several corridors throughout Florida.

The City of Miami Beach has identified the desire for dedicated bus lanes in several recent mobility studies, including the 2016 Transportation Master Plan. The SAC meetings and community outreach revealed there is support for implementing dedicated transit lanes throughout the corridor. The proposed SR A1A Shared Bike-Bus Lanes concept extends from the Lehman Causeway on the north to 17th Street on the south, with limited areas of mixed-traffic, as detailed below:

- AIA from Lehman Causeway to 189th Street - Mixed Traffic
- A1A from 189th Street to Bayview Drive - Dedicated Lane
  - Small southbound segment just north of 163rd Street - Mixed Traffic
  - Small northbound segment just south of 163rd Street - Mixed Traffic
- A1A from Bayview Drive to Harbor Way - Mixed Traffic (Haulover Park section)
- A1A from Harbor Way to 17th Street (Convention Center) - Dedicated Lane

Figure 3-5 Shared Bike-Bus Lanes Map in North Beach Area of Miami Beach
Figure 3-6 Shared Bike-Bus Lane Renderings in Bal Harbour and Miami Beach
In addition, dedicated transit lanes have been proposed on Washington Avenue from 17th Street to 5th Street as part of the Beach Corridor Rapid Transit PD&E Study.

As proposed, the shared bike-bus lanes would be implemented through conversion of the outside travel lane in both northbound and southbound directions. Special signage, lane markings, and colorization would delineate the shared bike-bus lanes. The Federal Highway Administration (FHWA) recently granted interim approval for red-colored pavement to delineate bus lanes, as shown in Figures 3-5 and 3-6, providing jurisdictions the ability to access federal funds for projects. Conceptual layout plans for several segments have been developed, and are included in Appendix E.

### 3.5 Northeast 79th Street Complete Street

Complete Streets is a transportation policy and design method that creates streets for all users and transportation modes. Ideally, Complete Streets make it easier to cross the street, bicycle to work, walk to shops, and have transit run on time. Additionally, Complete Streets are context-sensitive and designed specifically for each unique location to best satisfy the needs of the community.

A Complete Street concept is being considered by North Bay Village along the SR 934/79th Street/Kennedy Causeway. The causeway connects Bayshore Court in Miami to Bay Drive in Miami Beach, but modifications would be focused on a one-mile segment traversing North Bay Village. The Complete Street modifications could include some of the following elements:

- Lane reduction from 6 lanes (3 in each direction) to 4 lanes (2 in each direction)
- Wider sidewalks/bicycle paths
- Wider median
- Transit amenities
- On-street parking

Potential concepts, as shown in Figure 3-7, were developed as part of a city visioning process. Further analysis and coordination with FDOT and the TPO is needed prior to implementing the concept. North Bay Village is already coordinating with FDOT on these analysis requirements, as well as the potential for adding bike lanes to the causeway connecting to and from the mainland. Furthermore, coordination with Miami-Dade County DTPW regarding signalization and enhanced safety for pedestrians crossing 79th Street at key intersections is also recommended.
Figure 3-7 NE 79th Street Complete Street Conceptual Renderings

**SHORT-TERM CATALYTIC PROJECTS – KENNEDY CAUSEWAY – EXISTING CONDITIONS**

C4 – Urban General FDOT Context-Sensitive Designation

**MID-TERM CATALYTIC PROJECTS – KENNEDY CAUSEWAY – PROPOSED**

C4 – Urban General FDOT Context-Sensitive Designation
3.6 Other Pedestrian, Bicycle, and Transit Improvements

In addition to the major concepts detailed in this section, there are a series of smaller bicycle, pedestrian, and transit improvements that could be made along the corridor to enhance mobility. As there is a complete sidewalk network on SR A1A, pedestrian enhancements on the corridor are primarily focused on crossing the roadway. Proposed projects include:

- **Pedestrian Bridges (Sunny Isles Beach)**
  - Collins Ave @ 163rd St, @ 174th St, and @ 180th St
  - Collins Ave @ Heritage Park
- **Signalized Crosswalks**
  - Collins Avenue and 36th Street, Flashing Beacon
  - Collins Avenue between 43rd and 44th Streets, Flashing Beacon
  - Collins Avenue and 79th Street, New Traffic Signal
  - Collins Avenue and 83rd Street, Flashing Beacon
  - Collins Avenue and 87th Street, Flashing Beacon
- **Providing leading pedestrian intervals at signals along SR A1A and SR 934 through Miami Beach and North Bay Village.**

In addition, the City of Miami Beach has proposed a new traffic signal on 41st Street at Jefferson Avenue. This new signal is being coordinated with FDOT, as 41st Street is a state facility.

In order to enhance bicycle mobility and safety, the City of Miami Beach has identified the need for protected bike lanes on several roadways, including:

- Washington Avenue from South Pointe Drive to Dade Boulevard
- Along SR A1A / Collins Avenue from South Pointe Drive to 87th Street
- Along I-195 / Julia Tuttle Causeway
- Along I-395 / MacArthur Causeway

It should also be noted that the City of Miami Beach has been investing in their beachfront promenade, recently branded the Miami Beach Walk. The final phase of the project, including demolition of the boardwalk (shown in Figure 3-8) and construction of the new promenade from 23rd Street to 45th Street, is underway. Once complete, the Miami Beach Walk will offer a continuous, smooth surface path for walkers, joggers/runners, cyclists, and rollerbladers from South Pointe Drive to 87th Street.
In order to maximize the potential of the dedicated bus lanes on SR A1A, transit service improvements are necessary. While there is no specific requirement regarding service frequency for dedicated bus lanes, guidance from Australia (Figure 3-9) suggests that buses should run at least every 5 minutes. Each route does not need to provide frequency at this level, as long as the combined frequency of all routes on the corridor met it. Transit amenity investments should also be made, with shelters and benches provided at all stops.

Finally, a review was conducted of the east-west corridors connecting the beach with the mainland. While concepts have been presented in this study for the Lehman Causeway and Northeast 79th Street, multimodal enhancement projects have been identified for each of the connections between the beach and the mainland. Table 7 provides a summary of existing and proposed bicycle, pedestrian, and transit facilities along the causeways.

**Figure 3-9 Desired Bus Lane Service Frequency**

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Warrants</th>
</tr>
</thead>
</table>
| **Segregated Busway.** When warrants are met a busway should be investigated for the corridor | All of the following conditions met:  
  • > 75 buses per one hour peak direction at time of commissioning.  
  • Without bus lanes, congestion increases bus travel times > 80%.  
  • Without bus lanes, < 85% of buses arrive on time.  

| **Conversion of traffic lane.** Conversion of an existing general traffic lane to an exclusive bus lane is preferred. Dependent upon the location (such as physical, environmental financial considerations) conversion to transit / HOV lane may be acceptable, if similar outcomes with exclusive bus lane | Bus lane if, without bus lanes three or more of the following are met:  
  • Buses carry 65% - 80% of passengers in adjacent traffic lanes.  
  • > 12 buses per hour.  
  • Without bus lanes, bus travel times increase 35% - 65% under congested condition.  
  • Without bus lanes, < 75% of buses arrive on time.  

| **Road widening.** When an additional traffic lane is being provided (i.e., road widening) the preference is for this additional lane to be converted to an exclusive bus lane. If warrants are not met then a transit lane should be considered in the additional lane being provided. | Bus lanes if the following is met  
  • Buses carry more than 50% of passengers carried in adjacent lanes.  
  • 10 buses per hour.  
  There should be a plan for the corridor to move public transport towards a medium level of warrant (> 80% of people being carried in adjacent general traffic lane and > 15 buses / hour)  

| **Queue Jump.** Should be provided when travel times or service reliability improvements can be achieved | Queue jumps are warranted where:  
  • > 50% of people being carried in the adjacent traffic lane.  
  • > 10% increase in travel time when congestion is present.  

| **Signal Priority.** Should be provided when travel times or service reliability can be improved | Signal Priority is warranted where:  
  • Queue jumps are already in place.  
  • > 10% increase in travel time when congestion is present.  

| **Bus bays.** To be provided on corridors with bus or transit lanes where they improve the efficiency of bus operations or the safety of buses, general traffic cyclists or passengers | • If the service headway is less or close to the average dwell time, bus bays are warranted.  
  • If a road safety audit identifies the need for a bus bay.  
  • Where parking consistently hinders access to bus stops.  

*The Australian Capital Territory (ACT) developed these bus and HOV lane warrants. Other Australian transportation organizations have developed similar criteria.*
<table>
<thead>
<tr>
<th>Causeway</th>
<th>Route</th>
<th>Jurisdiction</th>
<th>Existing Bicycle Facilities</th>
<th>Proposed Bicycle Facilities</th>
<th>Existing Pedestrian Facilities</th>
<th>Proposed Pedestrian Facilities</th>
<th>Existing County Transit Routes</th>
<th>SMART Plan Connectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lehman Causeway</td>
<td>SR 856</td>
<td>FDOT</td>
<td>Bicycles permitted to use expressway shoulders under special pilot program.</td>
<td>Study proposes 12-foot shared use trail along eastbound roadway, with connections to surface paths.</td>
<td>None. However, some pedestrians use the shoulder improperly (local residents, tourists, religious members).</td>
<td>Study proposes 12-foot shared use trail along eastbound roadway, with connections to surface paths.</td>
<td>E/105, S/119, 120</td>
<td>NE 197th Ave. (Aventura)</td>
</tr>
<tr>
<td>NE 163rd St.</td>
<td>SR 826</td>
<td>FDOT</td>
<td>There are no designated bicycle facilities in this corridor, neither bicycle lanes nor sharrows.</td>
<td>Better accommodation of bicycles through designated bicycle lanes, desirably with buffers, would be preferred, but is a high cost solution.</td>
<td>There is sidewalk continuity along this corridor from Miami Beach to the mainland.</td>
<td>No actions needed.</td>
<td>E/105</td>
<td>NE 163rd St.</td>
</tr>
<tr>
<td>Broad Causeway</td>
<td>SR 922</td>
<td>FDOT</td>
<td>There is continuous accommodation of bicycles in both travel directions with marked sharrows in the right lanes.</td>
<td>Better accommodation of bicycles through designated bicycle lanes, desirably with buffers, would be preferred, but is a high cost solution.</td>
<td>There is sidewalk continuity along this corridor from Miami Beach to the mainland.</td>
<td>No actions needed.</td>
<td>G/107</td>
<td>NE 125th St.</td>
</tr>
<tr>
<td>NE 79th St.</td>
<td>SR 934</td>
<td>FDOT</td>
<td>There are 5-foot bicycle lanes with no buffer in both travel directions between Miami Beach and the mainland, except for tow gaps in the Normandy Isles area.</td>
<td>North Bay Village recently completed town planning charrettes that call for Complete Streets treatments on the arterial in the village. These include buffered bicycle lanes and long-term wider sidewalks. On the mainland, FDOT has completed a PD&amp;E Study of the one-way couplet with recommendations for sharrows and bike lane treatments. Miami Beach is considering resolving gaps in the bike lane corridor in the Normandy Isles area.</td>
<td>There is sidewalk continuity along this corridor from Miami Beach to the mainland.</td>
<td>No actions needed.</td>
<td>79, L/112</td>
<td>NE 79th St.</td>
</tr>
</tbody>
</table>
### Table 7 Multimodal Facilities on East-West Causeways (continued)

<table>
<thead>
<tr>
<th>Causeway</th>
<th>Route</th>
<th>Jurisdiction</th>
<th>Existing Bicycle Facilities</th>
<th>Proposed Bicycle Facilities</th>
<th>Existing Pedestrian Facilities</th>
<th>Proposed Pedestrian Facilities</th>
<th>Existing County Transit Routes</th>
<th>SMART Plan Connectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-195</td>
<td>SR 112</td>
<td>FDOT</td>
<td>Bicycles permitted to use expressway shoulders under special pilot program.</td>
<td>The I-195 Master Plan is examining future improvement strategies for this corridor. Planning options are considering bicycle and pedestrian accommodation options.</td>
<td>None. However, some pedestrians use the shoulder improperly.</td>
<td>The I-195 Master Plan is examining future improvement strategies for this corridor. Planning options are considering bicycle and pedestrian accommodation options.</td>
<td>J/110, 150</td>
<td>Wynwood/Design District/NE 36th St.</td>
</tr>
<tr>
<td>Venetian Causeway</td>
<td>---</td>
<td>Miami-Dade County</td>
<td>There are continuous green-painted unbuffered bicycle lanes from Miami Beach to the mainland, but with no connections in Miami. The speed limit of 25 mph compensates for the lack of buffers.</td>
<td>No actions needed.</td>
<td>There is sidewalk continuity along this corridor from Miami Beach to the mainland.</td>
<td>No actions needed.</td>
<td>A/101</td>
<td>---</td>
</tr>
<tr>
<td>MacArthur Causeway</td>
<td>SR A1A</td>
<td>FDOT</td>
<td>Bicycle lanes marked in both directions. Protected by barrier at east bridge; uses shoulder area between Terminal Isle signal and Watson Island with some buffer separated segments; no connection from Watson Island to mainland.</td>
<td>Pedestrian movement is possible at east bridge in narrow barrier protected path marked for bicycles. Otherwise, not specifically accommodated except for sidewalk treatments at Fountain St., Bridge Rd., and Terminal Isle traffic signals for bus stop access. No connection from Watson Island to mainland.</td>
<td>Current Beach Link transit alternatives PD&amp;E Study is investigating transit alternatives. Locally preferred alternative expected to preserve current bicycle conditions or modify as needed. Full bicycle connection from Alton Road to mainland is considered cost prohibitive.</td>
<td>Current Beach Link transit alternatives PD&amp;E Study is investigating transit alternatives. Locally preferred alternative expected to preserve current pedestrian conditions or modify as needed. Full pedestrian connection from Alton Road to mainland is considered cost prohibitive.</td>
<td>M/112, S/119, 120</td>
<td>MiamiCentral Station (Down-town)</td>
</tr>
</tbody>
</table>
4.0 Implementation

This section summarizes the prioritization and next steps for the mobility enhancements outlined in the Coastal Communities Feasibility Study.

Many of the projects outlined in the previous section require further analysis and evaluation prior to moving into implementation phases. Close coordination between the Miami-Dade TPO, cities, Miami-Dade DTPW, and FDOT District 6 is necessary. Funds will need to be programmed through local capital improvements plans (CIP), the TPO’s Transportation Improvement Plan (TIP), and/or FDOT’s 5-Year Work Program. In addition to coordination at the local and state level, many of the projects outlined in this study will need to be included in the Miami-Dade TPO’s Long Range Transportation Plan (LRTP) and/or Program Priorities.

As with the SMART Plan initiative begun in 2016, a philosophical shift away from vehicular mobility to person mobility is paramount. Several of the projects involve replacing vehicular travel lanes with space dedicated for transit, bicycles, and pedestrians. A summary of the next steps needed for each of the major concepts outlined in the previous section follows.

**Waterborne Transit**

Studies on the feasibility of implementing waterborne transit services in the Miami area have been completed in the past. In order to better understand the opportunities and challenges of implementing a service connecting the beach communities with downtown Miami, an updated evaluation should be conducted. This effort would identify potential technologies, estimate projected ridership, and develop cost, funding, and regulatory schemes. If the concept is determined to be feasible, environmental and engineering analyses would need to then be completed. Note that Miami-Dade County, the City of Miami, and the City of Miami Beach are in the permitting phase for a privately operated commuter water transportation service. The service, expected to be implemented in 2020, will connect downtown Miami and South Beach.

**Transit Hubs**

Several of the transit hubs identified are in various stages of programming and implementation currently. Most have been identified in local government plans. For example, The City of Miami Beach is studying the potential location for a Convention Center hub. This hub would serve as the endpoint for the SMART Plan Beach Corridor. The city has also been planning a transit hub at 71st/72nd Streets in the north beach area.

Development of a transit hub in Haulover Park requires extensive coordination with multiple Miami-Dade County departments. Ideally, this hub would include a park-and-ride facility, as well as connections to the waterborne transit services. The Sunny Isles Beach hub is consistent with the City’s plans, and would also serve as a connecting point with the waterborne transit services. The next steps for both of these locations would be further evaluation to determine potential size and function of the hubs. Once those efforts are complete, estimated costs can be calculated and programs for implementation can be developed.
The Aventura Mall hub is a bit different in that it already exists. The focus here should be on providing safe pedestrian connections between the hub and the planned Virgin Trains Aventura station expected to open in late 2020. This connection would involve two new pedestrian bridges:

- Over Biscayne Boulevard/US 1
- Over the Florida East Coast (FEC) railroad tracks

Partial funding has already been identified for the larger crossing over US 1, through agreements between the City of Aventura and several of the property owners at the mall. Additional funds will likely be required though, and this will need to be a top priority for FDOT and the area’s local governments.

**Lehman Causeway Shared-Use Path**

Implementation of the proposed shared-use path along the Lehman Causeway requires extensive coordination with, and approval from, FDOT District 6. As removal of an eastbound travel lane is contemplated, a lane elimination analysis may need to be completed. This study would evaluate traffic operations, safety, impacts to multimodal systems, opportunities for economic development, and other effects of potential corridor modification. Some analysis has already been completed as part of this study, and is included in Appendix B. The path had been identified in an earlier Miami-Dade TPO study of potential trail systems countywide. The refined trail outlined in this study could be implemented with no right-of-way acquisition and minimal cost, as it would primarily use infrastructure already in place. The cities of Sunny Isles Beach and Aventura should begin discussions with FDOT, and prioritize this project in their local plans.

If the shared-use path envisioned in this study is determined not to be feasible, other alternatives that accommodate bicycle and pedestrian traffic between Sunny Isles Beach and Aventura should be evaluated.

**SR A1A Shared Bike-Bus Lanes**

Similarly, implementation of the shared bike-bus lanes on SR A1A also require coordination with, and approval from, FDOT District 6. It is possible a lane elimination analysis would need to be completed for this proposal, as the outside travel lanes would be repurposed for bicycles and transit vehicles. Vehicular congestion is common on much of SR A1A, so repurposing travel lanes will likely yield worsening travel times for automobiles. Conversely, person throughput, travel times, and reliability for transit are expected to improve. A concerted effort to shift users of the corridor from automobiles to transit will be key to this concept succeeding.

The shared bike–bus lanes could also be implemented on Washington Avenue from 17th Street to 5th Street in the South Beach area. Coordination between Miami-Dade DTPW, FDOT and the City of Miami Beach will be necessary. The SMART Plan Beach Corridor Rapid Transit PD&E Study selected a Locally Preferred Alternative (LPA) which includes dedicated transit lanes on Washington Avenue.

As noted in the previous section, ideally buses in dedicated lanes would run with frequencies of at least every 5 minutes. The current Miami-Dade transit system meets this standard on much of SR A1A, but the Better Bus concepts contemplated at this time do not. As the County progresses with its system redesign, and new routes are implemented, focus should be given to the beach communities. Furthermore, in order to maximize effectiveness of the dedicated transit lanes, additional features such as transit signal priority (TSP) should be implemented on the corridor.

**Northeast 79th Street Complete Street**

As with the two projects above, implementation of these enhancements will require completion of a lane elimination analysis. North Bay Village is already working with FDOT District 6 to facilitate modifications, some of which could be accomplished through resurfacing and minor operational projects. Eliminating travel lanes on the causeway should be evaluated carefully, as it serves as a key evacuation route for the north beach area of Miami Beach.
Appendices
Appendix A

SAC, Community, and TPTAC/CTAC Meeting Presentations
Miami-Dade TPO
North-South Transportation Needs for the Coastal Communities Feasibility Study
Study Advisory Committee (SAC)–Meeting #1

Date: April 11, 2019
Location: Miami Beach, FL
City Hall Building – 4th Floor
Meeting Agenda

I. Introductions

II. Study Overview
   A. Purpose and background
   B. Study area
   C. Scope and schedule
   D. Role of the SAC

III. Study Corridor
   A. Review of previous studies
   B. Data collection
   C. Corridor highlights

IV. Open Discussion

V. Summary and Closing

Source: tripadvisor, Miami Photo: Collins Avenue & 42nd Street
The purpose of this study is to evaluate North-South transportation needs and assess the feasibility of implementing transit options to improve mobility in the Coastal Communities along the SR A1A corridor and mainland connections.
Background and Goals

➢ Resolution #38-18 (September 27, 2018)
  o Authorized by the Miami-Dade TPO Governing Board
  o Feasibility study to evaluate the North South transportation needs for the coastal communities
    • Aventura, Bal Harbour, Bay Harbor, Golden Beach, Indian Creek, Miami Beach, North Bay Village, Sunny Isles Beach and Surfside

➢ Study will focus on transit strategies to facilitate travel options along the SR A1A corridor and mainland connections
Study Area

- City of Aventura
- Bal Harbour Village
- Town of Bay Harbor Islands
- Town of Golden Beach
- City of Miami Beach
- City of North Bay Village
- City of Sunny Isles Beach
- Town of Surfside
- Miami-Dade County
Key Scope Items

Key Stakeholder Groups

- SAC
- FDOT
- DTPW
- CTAC
- TPC/TPTAC
- TPO Governing Board
**Schedule**

### SCHEDULE

#### 2019

<table>
<thead>
<tr>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
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<tr>
<td>Literature Review</td>
<td>Literature Review</td>
<td>Corridor Analysis &amp; Evaluation</td>
<td>Corridor Analysis &amp; Evaluation</td>
<td>Corridor Analysis &amp; Evaluation</td>
<td>Corridor Analysis &amp; Evaluation</td>
<td>Draft Report</td>
<td>Final Report</td>
<td>TPO Presentations</td>
<td>TPO Presentations</td>
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<td>Data Collection</td>
<td>Data Collection</td>
<td>Data Collection</td>
<td>Proposed Actions</td>
<td>Proposed Actions</td>
<td>Proposed Actions</td>
<td>Action Plan</td>
<td>Action Plan</td>
<td>SAC Meeting #4</td>
<td>Ongoing Plan Coordination with STUDY ADVISORY COMMITTEE, Agencies, Stakeholders, TPO Committees</td>
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<td>Identify Stakeholders</td>
<td>SAC Meeting #1</td>
<td>SAC Meeting #2</td>
<td>SAC Meeting #3</td>
<td>TPO Presentations</td>
<td>TPO Presentations</td>
<td>Recommendations</td>
<td>Recommendations</td>
<td></td>
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</table>

* Schedule is subject to change.*
SAC Responsibilities

➢ Four meetings during key project milestones
  o Meeting #1 – April 11, 2019 (today)
  o Meeting #2 – June 2019
  o Meeting #3 – August 2019
  o Meeting #4 – November 2019
➢ Identify stakeholders that need to be engaged
➢ Provide information and feedback relative to data, issues, and strategies to address identified corridor needs
➢ Share your local knowledge and history

This Photo by Unknown Author is licensed under CC BY-SA
Previous and Related Studies

- FYs 2019 – 2023 Transportation Improvement Program (TIP)
- 2040 Long Range Transportation Plan (LRTP)
- FDOT-6 Work Program
- FYs 2017 – 2026 DTPW Transportation Development Plan (TDP)
- Coastal Communities Transportation Master Plan (2007)
- Coastal Communities Transit Plan (2007)
- SR 943/71 Street/Normandy Drive Exclusive Transit Lanes/Protected Buffered
- Beach Corridor Rapid Transit Project PD&E Study
- Bicycle Lanes Study (On-Going City of Miami Beach)
- Strategic Miami Area Rapid Transit (SMART) Plan Corridors available studies
- Local municipal transportation plans and comprehensive plans
Overview of Key Recommendations from Previous and Related Studies

Coastal Communities Transportation Master Plan (2007)

➢ Joint effort between coastal communities
➢ Master plan that assesses barrier island transportation issues
➢ Goal was to produce short, mid, and long term multi-modal solutions to transportation issues on a sub-regional basis

Study Area Description

Zone 1: Golden Beach, Sunny Isles Beach, Haulover, Aventura
  • Connections
    ➢ AIA (Brookside)
    ➢ Leeward Causeway
    ➢ Sunny Isles Blvd
  • 51,800 Residents
  • 10,300 Jobs
  • Major Employment Center:
    ➢ Aventura Mall
    ➢ 12,600 Employees

Zone 2: Bal Harbour, Bay Harbour Islands, Surfside, North Bay Village, North Beach
  • Connections
    ➢ Broad Causeway
    ➢ Kennedy Causeway
  • 55,000 Residents
  • 11,700 Jobs
  • Major Employment Center:
    ➢ Bal Harbour/Bay Harbor Islands
    ➢ 5,400 Employees

Zone 3: Middle Beach, South Beach
  • Connections
    ➢ Juna Tuttle
    ➢ MacArthur
  • 77,000 Residents
  • 42,500 Jobs
  • Major Employment Centers:
    ➢ 41st Street (16,300 Employees)
    ➢ Lincoln Road (9,300 Employees)
    ➢ Ocean Drive (4,200 Employees)
Overview of Key Recommendations from Previous and Related Studies

Coastal Communities Transportation Master Plan (2007)

➢ Recommendations broken out by type
  - Alternative mode improvements
    • North and Middle Beach circulators, transit bus priority, etc.
  - Corridor enhancements
    • Biscayne Boulevard, Collins Avenue, 41st Street, and Collins/Harding one-way pair
  - Capacity projects
    • Intersection LOS improvements, advanced parking management systems, Lehman Causeway to Aventura Mall direct connection, etc.
  - Policy projects
    • TDM, ITS, TSM, shared cars, driver behavior campaign, etc.
Overview of Key Recommendations from Previous and Related Studies

SMART Plan

- Developed by Miami-Dade County and TPO
- Adopted by TPO Governing Board on April 21, 2016
- Advances six rapid transit corridors to PD&E study phase to determine costs and potential funding sources
  - Beach corridor rapid transit
  - Bus express rapid transit – Beach Express North, Central and South
Data to be Collected

➢ Existing and future land uses
➢ Population and employment projections
➢ Existing and proposed developments
➢ Roadway inventory, traffic counts and LOS
➢ Roadway characteristics (number of lanes, speed)
➢ Transit service and ridership information
➢ Transit facilities (park and ride, terminals and stations)
➢ Travel patterns
➢ Field reviews
Demographics (for entire study area)

- 83,677 households
- 2017 population of 175,671
- Average median income of $73,600
- 18.7% below the poverty level*

Race and Ethnicity
- 83% of the population identifies as ‘White Alone’
- 3% of the population identifies as ‘Black or African American Alone’
- 49% of the population is reported as having ‘Hispanic or Latino of Any Race’ ethnicity

*Poverty level and means of transportation data based on 2017 US Census data at the Census Tract level.
### Existing Land Use

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Cumulative Percentage</th>
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<tbody>
<tr>
<td>Residential</td>
<td>54%</td>
</tr>
<tr>
<td>Low Density</td>
<td>29%</td>
</tr>
<tr>
<td>Med Density</td>
<td>23%</td>
</tr>
<tr>
<td>High Density</td>
<td>2%</td>
</tr>
<tr>
<td>Commercial</td>
<td>24%</td>
</tr>
<tr>
<td>Recreational</td>
<td>18%</td>
</tr>
<tr>
<td>Conservation</td>
<td>1%</td>
</tr>
</tbody>
</table>

Data Source: Miami-Dade County GIS Open Data, Land Use, created 12/24/2018.

### Future Land Use

Adopted 2020 and 2030 Land Use Plan for Miami-Dade County, Florida

Legend:
- Low Density Residential
- Med Density Residential
- High Density Residential
- Commercial
- Public Facilities
- Industrial/Office
- Parks and Recreation
- Env Protected

Adopted 2011 Urban Boundary
Adopted Metropolitan Urban
Adopted Community Urban

2000 Urban Development Boundary
2030 Urban Expansion Area Boundary

Water
- Canal
- Level Canal
Study Area Transit Services

➢ Metrobus routes that service the barrier islands
  o Limited stop and express service routes
    • Routes 79 and 120 – Limited stop
    • Route 150 – Express
  o East/west routes
    • Routes A, G, J, L and M
  o North/south routes
    • Routes C, E, H and S
  o Local circulator
    • Route 115 – Miami Beach Shuttle

➢ Metrorail and Metromover
  o Via Metrobus routes 120, A, M, and S
Study Area Transit Services

➢ Community transit services
  o Aventura
  o Bal Harbour
  o Bay Harbor Islands
  o Miami Beach
  o North Bay Village
  o Sunny Isles Beach
  o Surfside
Transit Conditions

Bal Harbour bus shelter – A1A north of Balfour Drive

Miami Beach bus stop – Collins Ave at 18th Street

Miami Beach bus shelter – Collins Ave at 0.75 miles south of 63rd Street

Sunny Isles Beach bus shelter – A1A @ 174th Street

Surfside bus stop – Collins Ave at 96th Street

Golden Beach bus stop – A1A north of Ravena Avenue

Sunny Isles Beach bus shelter – A1A @ 174th Street

TPA
Miami-Dade Transportation Planning Organization

North South Transportation Needs for the Coastal Communities Feasibility Study

A1A
Pedestrian/Bicycle Conditions

Figure 1: Existing Pedestrian Facilities
Miami-Dade County

Figure 2: Existing Bicycle Facilities
Miami-Dade County

Figure 12: Cost Feasible Plan
Miami-Dade County

Legend
- Existing Sidewalks
- Major Roads
- Miami-Dade County

Legend
- Existing Bike Lanes
- Existing Paved Paths
- Existing Paved Shoulders
- Existing Wide Curb Lanes
- Funded Bike Lanes
- Funded Paved Paths
- Funded Paved Shoulders
- Funded Wide Curb Lanes
- Major Roads
- Miami-Dade County

Legend
- Priority 1 (2015-2019)
- Priority 2 (2015-2019)
- Priority 3 (2015-2019)
- Illustrative Projects
- Greenways
- Neighborhood Greenways
- Bike Commuter Stations
- Safe Routes to Schools
- Existing Bike Lanes
- Existing Paved Shoulders
- Existing Wide Curb Lanes
- Existing Paved Paths
- Major Roads
- Miami-Dade County
Open Discussion

➢ Questions and comments…

- What services do you see as currently working well, and should be continued/expanded?
- What services do you see as not working well?
- What kind of transit service would you like to see on A1A (Rapid Transit options, limited bus stop service, circulators, etc.)?
- What are your thoughts about micromobility/on-demand rideshare/shared mobility options on the barrier islands and along the A1A corridor?
- Should the study include recommendations for AV/CVs, and if so, what uses/areas could they service?
- Are there defined subsectors on the barrier islands? If so where?
- What are your thoughts on transit connections to the north (Broward County)?
- In terms of the functionality of A1A and mobility on/off the barrier islands, how is the facility being used, and who are the current and potential users?

➢ Suggestions and Requests…
Summary and Closing

➢ Meeting Recap
➢ Action Items
➢ Next Steps

*S Schedule subject to change.*
Contact Information

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Lisa began the meeting by providing the purpose, background and goals of the Coastal Communities Feasibility Study. Introductions by the SAC members were made, followed by an overview of the project scope and schedule by Jack. The project is expected to be completed by November 2019, with a final presentation to the Miami-Dade TPO Board in December 2019, and will include 4 SAC meetings (including this meeting) at various stages of the study.

Following the scope and schedule overview, Jack provided a brief summary of the study area and SR A1A corridor characteristics related to demographics, land use, bicycle and pedestrian facilities, and transit service and infrastructure. The study will include more detailed data collection efforts and reviews of previous and related studies.

After the corridor overview, the meeting was opened up to a general discussion of concerns and needs. Following is a highlight of key discussion points:

1. Miami Beach
   a. Discussion of the SMART Plan recognized the planned Beach Link along MacArthur Causeway and the Bus Express Rapid Transit (BERT) line from the Convention Center to the mainland via I-195/Julia Tuttle Causeway.
   b. The Washington Avenue Business Improvement District (BID) is advancing the idea of transit along the beach corridor; potentially turning Collins Avenue into a transit boulevard serving pedestrians, bicyclists and transit, with Washington Avenue serving vehicular traffic. The BID is holding a Washington Avenue Workshop on April 16, 2019 with City
Commissioners. The major recommendations from that workshop are expected to go to a future City Commission meeting for consideration.

c. The City’s Transportation Plan should be referenced in relation to this study and in consultation with City staff.

2. Surfside

a. FIU is working on a transit circulator study that would serve Surfside, Bal Harbour and Bay Harbor.

b. There are concerns about hurricane evacuation. The Town had a difficult time getting the government up and running due to traffic congestion leaving and returning to the Town.

c. There was discussion about the need for pedestrian facilities in the Town and adjacent communities. There is a large Orthodox Jewish community in this area that walk to Temple.

d. There are some issues with improper use of public roadway right-of-way.

e. Seeking to reach a walkable community for local trips.

f. There was a concern about the location of transit stops/stations. They are often in areas where no one uses transit. They should be located where the users are, and provide “first mile/last mile” options for those users.

g. Strategies should include demand management strategies, and not just physical improvements.

3. Sunny Isles Beach

a. Would like to take bicyclists off Collins Avenue and put them on an “off-Collins” corridor of streets/facilities that better support bicycle and pedestrian use, and/or add separated bicycle facilities. Collins Avenue is a heavy vehicular corridor in Sunny Isles Beach and is where transit stops are located. As a result, bicycle/pedestrian accessibility on Collins is needed due to the bus stops and commercial activities.

b. The City is pro-pedestrian bridges and is looking to develop several of these facilities per their Transportation Plan.

c. The City is interested in identifying technological improvements such as adaptive signals.

d. The City would like to have some recommendation for the bicycle lanes along Lehman Causeway…the City notes that it is currently not safe for bicyclists and would like to address that situation. Pedestrians are not allowed but there is a demand which needs to be addressed.

4. Aventura

a. Discussion centered around the high transit use on the community transit in Aventura (25,000 to 30,000 riders per month). The City would like to see enhanced transit, especially for those connections to the north.

b. The transit hub at Aventura Mall is working well and interconnects the community transit with Miami-Dade and Broward County transit lines.

c. The City mentioned the increased use of water taxis and the potential for bus stops near the water taxi stops.

General discussion:

• The topic of repurposing existing travel lanes on SR A1A was brought up, and no one in attendance objected to the idea.

• It was suggested that the study identify the mode priority for the various segments of the corridor and base the analysis and recommendations on the preferred modes.
• It was suggested that the study gather data on the throughput of people versus bus frequency and traffic volumes.

• It was noted that SR A1A is the primary transit spine for the coastal communities, and that the study needs to help identify the branches of the spine to improve the “first mile/last mile” dilemma. Many of the bridges to the mainland serve as east-west transit spines as well.

• It was also noted to be careful when developing recommendations for bicycle access. Miami Beach just recently passed a resolution not to enhance bicycle lanes on the MacArthur Causeway. Having bicycle lanes on the shoulder of the Julia Tuttle Causeway prohibited the City from participating in an FDOT BERT demonstration project that would have utilized the shoulder.

Next steps:
• Atkins to continue data collection and literature review efforts.
Miami-Dade TPO
North-South Transportation Needs for the Coastal Communities Feasibility Study
Study Advisory Committee (SAC)–Meeting #2

Date: Tuesday, July 23, 2019 at 10:00 AM
Location: Sunny Isles Beach Government Center
4th Floor Conference Room
18070 Collins Avenue, Sunny Isles Beach, FL 33160
Meeting Agenda

I. Schedule

II. Overview of Data Collection
   A. Literature Review
   B. Area and Corridor Conditions
      a. Data Collected
      b. Field Review

III. Needs/Deficiencies

IV. Working Session

V. Next Steps
# Schedule*

<table>
<thead>
<tr>
<th>SCHEDULE</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>Literature Review</td>
</tr>
<tr>
<td>April</td>
<td>Literature Review</td>
</tr>
<tr>
<td>May</td>
<td>Corridor Analysis &amp; Evaluation</td>
</tr>
<tr>
<td>June</td>
<td>Corridor Analysis &amp; Evaluation</td>
</tr>
<tr>
<td>July</td>
<td>Corridor Analysis &amp; Evaluation</td>
</tr>
<tr>
<td>August</td>
<td>Corridor Analysis &amp; Evaluation</td>
</tr>
<tr>
<td>September</td>
<td>Proposed Actions</td>
</tr>
<tr>
<td>October</td>
<td>Proposed Actions</td>
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<tr>
<td>November</td>
<td>Proposed Actions</td>
</tr>
<tr>
<td>December</td>
<td>Proposed Actions</td>
</tr>
</tbody>
</table>

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* Schedule is subject to change / ** SAC Meeting #3, proposed for September 16, 2019.
Overview of Literature Review

- FYs 2019 – 2023 Transportation Improvement Program (TIP)
- 2040 Long Range Transportation Plan (LRTP)
- FDOT 5-Year Work Program (FYs 2020 – 2024)
- FYs 2017 – 2026 DTPW Transit Development Plan (TDP)
- Coastal Communities Transportation Master Plan (2007)
- SR 943/71 Street/Normandy Drive Exclusive Transit Lanes/ Protected Buffered
- Strategic Miami Area Rapid Transit (SMART) Plan
  - TPO Corridor Rapid Transit Project PD&E Study
  - TPO SMART Demonstration Projects
    - City of Miami Beach South Beach Trolley Service
    - Town of Surfside, Bal Harbour Village, and Bay Harbor Islands On-Demand Responsive Project
    - Miami Beach SMART Plan BERT Route (Beach Express North)
    - North Bay Village – North Village Connector
- City of Miami Beach Bicycle Lanes Study (On-Going)
- Local municipal transportation plans and comprehensive plans
Overview of Literature Review (Key Projects)

Previous Studies Support the Following Projects

- **Transit Improvements**
  - Beach Corridor Rapid Transit Project (study underway, 5 Alternatives studied)
  - Dedicated bus lanes along SR A1A/Collins Ave
  - Enhanced bus on along 79th Street Causeway
  - Use of transit technology and shared mobility (network of mobility options, integration etc.)
  - Transit terminal/intermodal facilities
  - Transit signal priority (TSP)

- **Roadway/Traffic Improvements**
  - Synchronize and optimize signals
  - Adaptive signal controls
  - Intersection improvements

- **Pedestrian Improvements**
  - Protected bike lanes, including:
    - Washington Ave from South Pointe Dr to Dade Blvd
    - Along Collins Ave from South Point to 63rd St
    - Along Julia Tuttle Causeway
    - Along MacArthur Causeway
    - Along SR A1A one-way pairs
  - Pedestrian Bridge (Sunny Isle Beach)
    - Collins Ave @ 163rd St, @ 174th St, and @ 180th St (Priority 1)
    - Collins Ave @ Heritage Park (Priority 3)
  - Shared-use paths
Data Collected

- Existing and future land uses
- Population and employment
- Existing and proposed developments
- Roadway inventory, traffic counts and Level of Service (LOS)
- Roadway characteristics (number of lanes, speed)
- Transit service and ridership information
- Field reviews
Overview of Data Collection
Corridor Characteristics

➤ Existing and Future Land Uses
Overview of Data Collection
Corridor Characteristics

- Demographics

- US Census 2017 ACS, Population: 188,695
- US Census 2017 ACS, Housing Units: 152,461
- US Census 2017 ACS, Median Household Income: $64,237
- US Census 2017 ACS, Households: 90,418
Who Lives in the Study Area & How Do They Travel?

- Millennials and Baby Boomers
  - Millennials make up one third of the population
  - Baby Boomers make up almost 37% of the population, and are currently transitioning into the elderly population
  - These two segments tend to rely on public transportation and other active transportation modes (walking and bicycling)

- 16% of all households are at or below the poverty level
- Primary mode of travel is personal automobile (71% of all travel modes)
- 9% percent use transit
- 13% walk or bike to work
- 17% have no access to a vehicle

### Overview of Data Collection

#### Corridor Characteristics

<table>
<thead>
<tr>
<th>Coastal Communities Generations Defined</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Millennial Generation</strong></td>
<td></td>
</tr>
<tr>
<td>Born: After 1980</td>
<td></td>
</tr>
<tr>
<td>Age in 2017: 20 to 36</td>
<td></td>
</tr>
<tr>
<td>Share of adult population: 33%</td>
<td></td>
</tr>
<tr>
<td><strong>Generation X</strong></td>
<td></td>
</tr>
<tr>
<td>Born: 1965 to 1980</td>
<td></td>
</tr>
<tr>
<td>Age in 2017: 37 to 52</td>
<td></td>
</tr>
<tr>
<td>Share of adult population: 18%</td>
<td></td>
</tr>
<tr>
<td><strong>The Baby Boom Generation</strong></td>
<td></td>
</tr>
<tr>
<td>Born: 1946 to 1964</td>
<td></td>
</tr>
<tr>
<td>Age in 2017: 53 to 71</td>
<td></td>
</tr>
<tr>
<td>Share of adult population: 37%</td>
<td></td>
</tr>
<tr>
<td><strong>The Silent Generation</strong></td>
<td></td>
</tr>
<tr>
<td>Born: 1928 to 1945</td>
<td></td>
</tr>
<tr>
<td>Age in 2017: 72 to 89</td>
<td></td>
</tr>
<tr>
<td>Share of adult population: 8%</td>
<td></td>
</tr>
<tr>
<td><strong>The Greatest Generation</strong></td>
<td></td>
</tr>
<tr>
<td>Born: Before 1928</td>
<td></td>
</tr>
<tr>
<td>Age in 2017: 90 to 102</td>
<td></td>
</tr>
<tr>
<td>Share of adult population: 4%</td>
<td></td>
</tr>
</tbody>
</table>

#### Travel Mode Distribution

- **Total**: 68,840
- **Car**: 9,196
- **Transit**: 6,899
- **Bicycling**: 6,300
- **Walking**: 2,517
- **No Access to Vehicle**: 3,407

<table>
<thead>
<tr>
<th>Mode</th>
<th>Total</th>
<th>Car</th>
<th>Transit</th>
<th>Bicycling</th>
<th>Walking</th>
<th>No Access to Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>71%</td>
<td>9%</td>
<td>7%</td>
<td>6%</td>
<td>3%</td>
<td>4%</td>
</tr>
</tbody>
</table>

US Census 2017 ACS, Mode of Travel to Work
2014-2018 Crash Severity

Legend
Pedestrian/Bicycle Crash Severity
- Injury
- Fatality
- Coastal Communities

2014-2018 Crash Type

Legend
CC_s4_crash
Crash Type
- Bicycle
- Pedestrian
- Coastal Communities
Study Area Transit Services

- Metrobus routes that service the barrier islands
  - North/south routes
    - Routes C, E, H and S
    - Routes 79 and 120 – Limited stop
  - East/west routes
    - Routes A, G, J, L, M and S
    - Route 150 – Express
    - Routes 79 and 120 – Limited stop
  - Local circulator
    - Route 115 – Miami Beach Shuttle
- Metrorail and Metromover
  - Via Metrobus routes 120, A, M, and S
Study Area Transit Services

- Community transit services
  - Aventura
  - Bal Harbour
  - Bay Harbor Islands
  - Miami Beach
  - North Bay Village
  - Sunny Isles Beach
  - Surfside

- Proposed:
  Bal-Bay-Surf On Demand
## Transit Ridership

### Metrobus Routes Ridership Data

<table>
<thead>
<tr>
<th>ID</th>
<th>Route</th>
<th>Desc</th>
<th>Mar-19 Ave Weekday</th>
<th>Mar-18 Ave Weekday</th>
<th>Diff</th>
<th>Mar-19 Month</th>
<th>Mar-18 Month</th>
<th>Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>79</td>
<td>Limited</td>
<td></td>
<td>381</td>
<td>181</td>
<td>200</td>
<td>8,010</td>
<td>3,984</td>
<td>4,026</td>
</tr>
<tr>
<td>115</td>
<td>MB Shuttle</td>
<td></td>
<td>131</td>
<td>122</td>
<td>9</td>
<td>3,388</td>
<td>3,409</td>
<td>(21)</td>
</tr>
<tr>
<td>101-A</td>
<td>E/W</td>
<td></td>
<td>150</td>
<td>134</td>
<td>16</td>
<td>3,785</td>
<td>3,334</td>
<td>451</td>
</tr>
<tr>
<td>103-C</td>
<td>N/S</td>
<td></td>
<td>432</td>
<td>429</td>
<td>3</td>
<td>11,760</td>
<td>11,674</td>
<td>86</td>
</tr>
<tr>
<td>105-E</td>
<td>N/S</td>
<td></td>
<td>1,181</td>
<td>1,238</td>
<td>(57)</td>
<td>31,279</td>
<td>33,104</td>
<td>(1,825)</td>
</tr>
<tr>
<td>107-G</td>
<td>E/W</td>
<td></td>
<td>1,590</td>
<td>1,673</td>
<td>(83)</td>
<td>43,265</td>
<td>46,742</td>
<td>(3,477)</td>
</tr>
<tr>
<td>108-H</td>
<td>N/S</td>
<td></td>
<td>499</td>
<td>459</td>
<td>40</td>
<td>14,452</td>
<td>13,556</td>
<td>896</td>
</tr>
<tr>
<td>112-L</td>
<td>E/W</td>
<td></td>
<td>7,164</td>
<td>7,353</td>
<td>(189)</td>
<td>203,563</td>
<td>210,756</td>
<td>(7,193)</td>
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<tr>
<td>113-M</td>
<td>E/W</td>
<td></td>
<td>736</td>
<td>773</td>
<td>(37)</td>
<td>19,814</td>
<td>20,954</td>
<td>(1,140)</td>
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<tr>
<td>119-S</td>
<td>N/S</td>
<td></td>
<td>8,970</td>
<td>8,863</td>
<td>107</td>
<td>259,064</td>
<td>260,908</td>
<td>(1,844)</td>
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<tr>
<td>120-Beach Max</td>
<td>Limited</td>
<td></td>
<td>5,969</td>
<td>6,256</td>
<td>(287)</td>
<td>164,057</td>
<td>175,188</td>
<td>(11,131)</td>
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<tr>
<td>150-MB Airport Flyer</td>
<td>Express</td>
<td></td>
<td>1,806</td>
<td>1,810</td>
<td>(4)</td>
<td>53,836</td>
<td>54,082</td>
<td>(246)</td>
</tr>
</tbody>
</table>

Emergency Evacuation Zones and Bus Pick-up Sites

Storm Surge Planning Zones

- **Zone A**: At greatest risk for storm surge for Category 1 and higher storms
- **Zone B**: At greatest risk for storm surge for Category 2 and higher storms
- **Zone C**: At greatest risk for storm surge for Category 3 and higher storms
- **Zone D**: At greatest risk for storm surge for Category 4 and higher storms
- **Zone E**: At greatest risk for storm surge for Category 5 storms
- **Outside of the Storm Surge Planning Zone**

Disclaimer:
Mobile home residents and people on electrically dependent life sustaining medical equipment should evacuate when any hurricane evacuation order is issued, regardless of their storm surge planning zone.
Field Review
Field Review: Transit
Field Review: Pedestrian
Deficiencies and Needs

- Dedicated transit along SR A1A that links all communities
- Lack of walkable pockets of development – transit hubs
- East/west bicycle facilities linking the mainland
- Pedestrian facilities
  - Improve shade along corridor
  - Enhanced crosswalks at intersections
  - Mid-block crossings (at-grade/bridges)
Open Discussion – Improvements/Strategies

- Dedicated transit along SR A1A
- On-Demand Responsive Services & Shared Mobility
  - Status
  - Shared use with transit-only lanes
- Proposed Town of Surfside, Bal Harbour Village, and Bay Harbor Islands On-Demand Responsive Project
- Bicycle, Pedestrian and Safety
- Working session

Freebee service areas. Source: https://ridefreebee.com/
Next Steps

- Finalize deficiencies and needs identification
- Develop/refine potential improvements
Contact Information

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Jack S. Schnettler, P.E.
Project Manager
Jack.Schnettler@atkinsglobal.com
305-514-3369
Lisa began the meeting by providing a brief recap of the study and its purpose. Introductions by the SAC members were then made. Rohan provided an overview of the project scope and schedule status. The project is expected to be completed by late 2019, with a final presentation to the Miami-Dade TPO Board in December 2019, with SAC meetings (including this meeting) at various stages of the study. This meeting summary includes the meeting agenda and attendance sheets attached. The meeting presentation is provided as a companion attachment.

Following the scope and schedule overview, Rohan continued the presentation covering the progress accomplished since last meeting, including the literature review (including common improvement themes from prior studies) and data collection, with a series of corridor data panels in the presentation summarizing transportation network information, land use, demographics, and transit services. There was brief discussion of the Town of Surfside, Bal Harbour Village, and Bay Harbor Islands On-Demand Responsive Project development grant:

- The application is in final draft form for the new work program cycle (FY 2021).
- The FDOT Work Program process will have prioritized projects by the August/September timeframe.
- The work program should be adopted in Oct. 2019, for an implementation start in July 2020.

It was queried if the project database includes ridership on the municipal trolley services in the corridor. The consultant team indicated that it would check its files to see if all services were captured in the data collection effort. Municipal representatives volunteered to coordinate to provide any missing information.
Next, Rohan addressed highlights from the consultant’s field review work, to include observations regarding existing conditions and opportunities for enhancement. The latter were addressed on a presentation slide that spoke to multimodal deficiencies and needs. As part of this discussion, these points were covered:

- Median fences in Sunny Isles Beach to deter midblock pedestrian crossings were reported to be at least 50% efficient in their intended purpose.
- In Bal Harbour, it was noted that an automatic midblock pedestrian crossing had no pedestrian indicator, requiring pedestrians to pay attention.
- In Sunny Isles Beach, the pedestrian crossing signal is not automatic, and cars sometimes rush to beat the red light.
- For Miami Beach, it was noted that a bus shelter replacement plan was approved, and the city will provide information on this.
- Also, for Miami Beach, the City will send an environmental scan that reports on the city’s daytime population.

At this point in the meeting, the workshop segment began, using a long plot of the study corridor along with markers and sticky notes. The discussion covered a variety of topics as noted below, including pedestrian and bicycle facilities, transit services and dedicated transit lanes, water transportation, and transit hub sites:

- The Aventura transit hub is a definite focal point for transit services, existing or proposed, as it is adjacent to the preliminarily proposed transit station for the Northeast corridor.
- A transit hub in Sunny Isles Beach should be considered.
- Multimodal planning should consider the emergence of scooter services.
- The Lehman Causeway needs improved bicycle and pedestrian facilities.
- Sunny Isles Beach is pursuing additional SR A1A pedestrian bridges.
- In Miami Beach, the Transportation Master Plan is the guiding document, showing dedicated transit lanes for premium transit, but which could also be used for the city’s trolley routes.
- It was noted that attention should be given to the functional role of SR A1A, whether it is viewed as a north-south through facility primarily, or whether that role should be assigned to I-95 and US 1, with SR A1A being “localized” for short to medium length trips primarily.
- Discussion of water transportation covered these points:
  - Miami Beach is looking at docks at Purdy Avenue.
  - Sunny Isles Beach is interested and addressed water transportation their master plan.
  - Miami Beach investigated a pilot program with a vendor 2 years ago, but the cost was too great.
  - There is a successful service in Tampa/St. Petersburg used mainly by tourists due to speed and cost.
  - It was noted that Haulover Park parking lots are used on weekdays for remote parking of construction workers, supported by a shuttle bus connection to job sites.
- Surfside would be interested in repurposing a lane to traffic on SR A1A, if truly multipurpose for other modes and wider sidewalks.
- Indian Creek Drive appears to have excess capacity.
- FDOT is to conduct a planning study on a short section of SR A1A in Miami Beach.
- It was noted that Miami Beach is considering replacing curb parking on 41st Street and part of SR A1A to the south with dedicated bus lanes.
• On I-195/Julia Tuttle Causeway, it was noted that a bus on shoulder concept conflicts with the current bicycle use of the shoulder as a pilot project. FHWA requires at least one shoulder and the bicycle pilot precludes use of the insider shoulder for a bus on shoulder service. It was reported that bicycle bridges are being considered. I-195 traffic volumes are running higher due to the I-395 reconstruction work in downtown Miami. The consultant will check with the ongoing FDOT study of I-195 as to alternatives being considered.

• In North Bay Village, there is a need for benches and shelters at transit stops, along with wider sidewalks. There is a concern that a dedicated bicycle lane would be underutilized. It was noted that a curb dedicated bus lane would need to be shared with vehicles turning in and out of intersecting streets and driveways. On NW 79th Street Causeway, a reduction from 6 to 4 lanes with a Complete Streets approach including wider sidewalks is a possible action. A water transportation service was explored as a pilot project, but the cost was considered too high for service that would likely cater to tourists rather than to local residents.

• Also, in North Bay Village, the intent of the shuttle service revision is to run the service only in peak hours, and then use the on-demand responsive service (with Freebee as a provider) during off-peak periods. It was requested if the Miami Beach trolley could extend into North Bay Village to the County transit stop.

• In the North Beach district of Miami Beach, a recent study identified that transit hub location, and the city recently approved more dense development in the core area. The North Beach Master Plan called for bus and bicycle lanes.

• In Miami Beach, the SMART Plan corridor study connecting to the city is looking at several technology options with differing terminus locations within the city. The Bus Rapid Transit option extends north to the Convention Center and could extend across the I-195 corridor back to the mainland. The city is also looking at 2-3 more signalized pedestrian crossings in the Transportation Improvement Program which the City will send.

• Sunny Isles Beach is developing new median left turn bays on SR A1A at NE 157th and NE 178th Streets.

• There was discussion of possible community level meetings in Miami Beach. Lisa noted that as part of the public outreach, the study will be presenting to the TPO Citizens Transportation Advisory Committee (CTAC) and the Bicycle Pedestrian Advisory Committee (BPAC) to which all citizens are invited. She offered that if the municipalities would like to host a public meeting, perhaps the fourth SAC meeting could be reconfigured as two community-oriented meetings, one north and one south, around the end of October. These would need to be organized by the requesting municipalities (Miami Beach) and the other municipalities. The TPO will attend as an invited guest, and present the project, but the municipalities would be responsible for advertising and hosting the meeting. It was agreed that the municipalities would explore this idea further and provide feedback to the TPO Project Manager.

The meeting was then adjourned, with an additional thanks to Sunny Isles Beach for hosting the session.

Action items:

• Atkins to follow up on open data collection items.
  o Traffic volume/LOS for existing and future conditions
  o Municipal transit service ridership
• Atkins to continue with formulation of improvement concepts for the study corridor.
• Lynda Westin of Miami Beach to provide these items:
  o Miami Beach trolley ridership data
- Environmental screen with daytime population
- Proposed pedestrian signal locations
- Input from the city transit coordinator – Milos Majstorovic
- Input on whether Miami Beach and municipalities will host a public workshop
Meeting Agenda

I. Schedule
II. Review of Existing Conditions
III. Proposed Improvements
IV. Next Steps
**SCHEDULE**

**2019**

<table>
<thead>
<tr>
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<th>May</th>
<th>June</th>
<th>July</th>
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<th>September</th>
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<tbody>
<tr>
<td>Literature Review</td>
<td>Literature Review</td>
<td>Corridor Analysis &amp; Evaluation</td>
<td>Corridor Analysis &amp; Evaluation</td>
<td>Corridor Analysis &amp; Evaluation</td>
<td>Corridor Analysis &amp; Evaluation</td>
<td>Draft Report</td>
<td>Final Report</td>
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<td>Action Plan</td>
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<td>SAC Meeting #4</td>
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<td>Identify Stakeholders</td>
<td>SAC Meeting #1</td>
<td>SAC Meeting #2</td>
<td>SAC Meeting #3</td>
<td>SAC Meeting #4</td>
<td>SAC Meeting #4</td>
<td><strong>SAC Meeting #3</strong></td>
<td><strong>Action Plan</strong></td>
<td><strong>SAC Meeting #4</strong></td>
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</tbody>
</table>

Ongoing Plan Coordination with STUDY ADVISORY COMMITTEE, Agencies, Stakeholders, TPO Committees

* Schedule is subject to change / ** SAC Meeting #3, proposed for September 16, 2019.
Overview of Existing Conditions

➢ Literature Review
  o Various transportation plans and programs
  o Previous and related studies

➢ Data Collection
  o Existing and future land uses
  o Population and employment
  o Existing and proposed developments
  o Roadway inventory, traffic counts and Level of Service (LOS)
  o Roadway characteristics (number of lanes, speed)
  o Transit service and ridership information
  o Field reviews
Overview of Existing Conditions

- **US Census 2017 ACS, Mode of Travel to Work**
  - **Travel Mode**
    - Total: 60,640
    - Percent:
      - Total: 71%
      - Car: 9%
      - Bus: 7%
      - Walk: 6%
      - Bike: 3%
      - Other: 4%

- **US Census 2017 ACS, Population**
  - 188,695

- **US Census 2017 ACS, Housing Units**
  - 152,461

- **US Census 2017 ACS, Median Household Income**
  - 2040
  - $64,237

- **US Census 2017 ACS, Zero Car Households**
  - 90,418

**Coastal Communities Generations Defined**

- **The Millenial Generation**
  - Born: After 1980
  - Age in 2017: 20 to 36
  - Share of adult population: 33%

- **Generation X**
  - Born: 1965 to 1980
  - Age in 2017: 37 to 52
  - Share of adult population: 18%

- **The Baby Boom Generation**
  - Born: 1946 to 1964
  - Age in 2017: 53 to 71
  - Share of adult population: 37%

- **The Silent Generation**
  - Born: 1928 to 1945
  - Age in 2017: 72 to 89
  - Share of adult population: 8%

- **The Greatest Generation**
  - Born: Before 1928
  - Age in 2017: 90 to 102
  - Share of adult population: 4%
Study Area Transit Services

➢ Metrobus routes that service the barrier islands
  o North/south routes
    • Routes C, E, H and S
    • Routes 79 and 120 – Limited stop
  o East/west routes
    • Routes A, G, J, L, M and S
    • Route 150 – Express
    • Routes 79 and 120 – Limited stop
  o Local circulator
    • Route 115 – Miami Beach Shuttle

➢ Metrorail and Metromover
  o Via Metrobus routes 120, A, M, and S
Study Area Transit Services

➢ Community transit services
  o Aventura
  o Bal Harbour
  o Bay Harbor Islands
  o Miami Beach
  o North Bay Village
  o Sunny Isles Beach
  o Surfside

➢ Proposed:
  o Bal-Bay-Surf On Demand
Field Review
Deficiencies and Needs

➢ Dedicated transit along SR A1A that links all communities
➢ Lack of walkable pockets of development – transit hubs
➢ Bicycle facilities
  o East/west bicycle facilities linking the mainland
  o North-south gaps
➢ Pedestrian facilities
  o Improve shade along corridor
  o Enhanced crosswalks at intersections
  o Mid-block crossings (at-grade/bridges)
Proposed Improvements

- Waterborne Transit Services
- Lehman Causeway Path
- SR A1A Bus Lane Concept
- Transit Hubs
- 79th Street Complete Streets
- Transit Services Improvements
- Pedestrian Improvements
Waterborne Transit Services

- 4 Stops in Coastal Area and 1 stop along Mainland
  - Bayfront Park (Miami)
  - Maurice Gibb Memorial Park (Miami Beach)
  - Grandview Palace Marine (North Bay Village)
  - Haulover Park (M-D County)
  - West end of Bella Vista Island (Sunny Isles Beach)
Proposed Improvements – Lehman Causeway Path

➢ Lehman Causeway from Biscayne Boulevard to SR A1A
  o 10-12 foot wide shared use path on the south side of the Causeway (eastbound travel direction), with a 2-foot barrier/separator, and an 8-10 foot shoulder.
  o Generally 2 travel lanes throughout.

➢ The path deviates from the Causeway mainline to the southern service road between Country Club Drive and the eastern U-turn loop.

➢ Maintains WB hurricane evacuation capacity
Proposed Improvements – Bus Lane Concept

➢ Dedicated Bus Lane
  
  o A1A from Lehman Causeway to 189th Street - Mixed Traffic
  o A1A from 189th Street to Bayview Drive - Dedicated Lane
    • small southbound segment just north of 163rd Street - Mixed Traffic
    • small northbound segment just south of 163rd Street - Mixed Traffic
  o A1A from Bayview Drive to Harbor Way - Mixed Traffic (Haulover Park section)
  o A1A from Harbor Way to 17th Street (Convention Center) - Dedicated Lane
  o Washington Avenue from 17th Street to 5th Street - Mixed Traffic
Proposed Improvements – Transit Hubs

➢ Transit Hubs are proposed at the following locations:
  o At Convention Center (Miami Beach)
  o Between 72nd and 73rd Streets (Miami Beach)
  o At Haulover Park (M-D County)
  o At 163rd Street (East end of Bella Island in SIB)
  o At Aventura Mall Transit Station
Proposed Improvements – 79th Street Complete Streets

➢ 79th Street Causeway from Bayshore Court (Miami) to Bay Drive (Miami Beach)

➢ Could include the following:
  - Lane reduction from 6 lanes (3 in each direction) to 4 lanes (2 in each direction)
  - Wider pedestrian/bicycle paths
  - Wider median
  - Transit amenities
Proposed Improvements – 79th Street Complete Streets
Proposed Improvements – 79th Street Complete Streets
Proposed Improvements – Transit Services and Pedestrian

- Increased headways (10 to 15-minutes between buses; Better Bus Concepts)
- Transit stop amenities – shaded shelters
- Protected bike lanes
  - Washington Ave from South Pointe Dr to Dade Blvd
  - Along Collins Ave from South Point to 63rd St
  - Along Julia Tuttle Causeway
  - Along MacArthur Causeway
  - Along SR A1A one-way pairs

- Pedestrian Bridges (SIB)
  - Collins Ave @ 163rd St, @ 174th St, and @ 180th St (Priority 1)
  - Collins Ave @ Heritage Park (Priority 3)

- Signalized Crosswalks
  - Collins Avenue and 36th Street, RRFB (2020)
  - Collins Avenue and 83rd Street, RRFB (2020)
  - Collins Avenue and 87th Street, RRFB (2020)
  - Collins Avenue and 79th Street, New Traffic Signal (2020)
  - 4300 Block of Collins Avenue, RRFB (2024)
  - 41st Street and Jefferson Avenue, New Traffic Signal (2021)
Next Steps

➢ Refine and finalize recommendations
➢ Prepare Draft Action Plan
➢ Municipal public meetings
Contact Information

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305-375-1738

Jack S. Schnettler, P.E.
Project Manager
Jack.Schnettler@atkinsglobal.com
305-514-3369
## Meeting Summary:

Lisa Colmenares opened the meeting by providing a brief recap of the study and its purpose. Introductions by the SAC members were then made. Rohan proceeded with an overview of the project schedule status, which is generally on track. Pending the scheduling of various city workshops, the project could extend into December. This meeting summary includes the meeting agenda and attendance sheets attached. The meeting presentation was sent to SAC members separately.

Rohan continued the presentation with a brief overview of background information including selected transportation network information, land use, demographics, and transit services.

Relative to transit services, it was noted that Miami Beach has extended a pilot on-demand service, using electric vehicles (similar to existing Freebee services) in North Beach through December. Reevaluation is likely to recommend continuation of the service. It was noted that a transfer between North Beach and Middle Beach and other existing services in Miami Beach shuttle services is possible. A proposed development project in Sunny Isles Beach that has a water orientation with possible water taxi service was also mentioned.

A summary of proposed projects based on study analysis was reviewed and discussed by the SAC. The discussion focused on three major study proposals: the Lehman Causeway shared use path, the corridor Business Access and Transit (BAT) lane concept, and the NE 79th Street Complete Streets concept, which were discussed as follows:

- **Lehman Causeway shared use path**
  - Lynda Weston mentioned a shared use lane project in Miami Beach and best practices from Canada. She will share information on these projects with the study team.
  - There was discussion about improved access to the north side of the corridor surrounding the Don Soffer Shared Use Trail, located along Country Club Drive in the City of Aventura, which attracts recreational biking and jogging users. This will be reviewed by Atkins.
  - Lighting at night, possibly with bollards, should be considered.
Concern was mentioned about the westbound sharrow treatment near the east end of the corridor.

Typical sections of the treatments would be helpful to show in the report and at the public meetings.

* Corridor Business Access and Transit Lanes (BAT) lane
  - BAT lane might allow for bicycle movements also.
  - Sunny Isles Beach indicated its support for this concept within the limits of the City and for the corridor.
  - The Transportation Master Plan for Miami Beach shows a continuous transit lane in the 63rd Street area. On a related matter, Lynda will provide a link for a study of transit lanes on 41st Street.
  - Jose Olivo stressed the importance of making the case for the transit lane, including referencing the Transit Alliance’s on-going Better Bus Study information.

* NE 79th Street Complete Streets
  - The proposed cross-section with bicycle lane/buffer and wider sidewalks needs to be configured to allow the curb lane to be used for hurricane evacuation if needed.
  - An alternative typical section with bicycle lane and parking should be included. Miami Beach has used the configuration of sidewalk/parking/bike lane/buffer rather than the sidewalk/bike lane/buffer/parking configuration.
  - It is recommended to extend a connection eastward past SR A1A to the Miami Beach Walk corridor.
  - It was discussed that continuity with the results of the NE/NW 79th and 81st Streets PD&E study on the mainland should be considered.
  - North Bay Village is to meet with FDOT on Monday, Sept. 30 to discuss this project and other matters, and is also conducting village planning charrettes that same week to include a transportation session. It was agreed that the charrette input should be conveyed to Atkins as useful input to the study.

Final discussion considered the planned community workshops. Dates in late October were arrived at, with related action items as noted below. It was also noted that a meeting will be scheduled with Mayor Gelber of Miami Beach, to brief him on the study, as he was the TPO Governing Board member requesting the study. Also, a coordination meeting will be scheduled with FDOT and M-D DTPW representatives who have been unable to attend the SAC meetings to date.

The meeting was then adjourned, with an additional thanks to North Bay Village for hosting the session.

**Action items:**

- Atkins to review Lehman Causeway path concept to consider access to golf course area, east end access, and typical sections.
- Atkins to refine BAT lane concept mapping.
- Atkins to continue with formulation of improvement concepts for the study corridor.
- Lynda Westin of Miami Beach to provide the following items:
  - 41st Street Study (AECOM) link
  - Photos from Canada of shared paths
  - Miami Beach presentation showing shared use path in a golf course setting
- Jose Olivo of North Bay Village to provide public feedback from Village charrettes occurring during the week of Sept. 30.
- Lynda Westin and Claudia Hasburn to coordinate on fliers for municipal Community Workshops on Oct. 21 (SIB) and Oct. 24 (MB). Jack to review fliers for Lisa. Atkins to prepare short overview presentation and exhibits for the meetings.
- A final meeting of available SAC members will be held following the Oct. 24 meeting
Miami-Dade TPO
North-South Transportation Needs for the Coastal Communities Feasibility Study
City of Miami Beach Community Meeting

Date: Thursday, October 24, 2019 at 6:00 PM
Location: Miami Beach North Shore Park & Youth Center, 501 72 Street, Miami Beach, FL
Meeting Agenda

I. Project Overview
II. Overview of Existing Conditions
III. General Deficiencies & Needs
IV. Proposed Improvements
V. Next Steps
Schedule*

* Schedule is subject to change
Overview of Existing Conditions

➢ Literature Review
  o Various transportation plans and programs
  o Previous and related studies

➢ Data Collection
  o Existing and future land uses
  o Population and employment
  o Existing and proposed developments
  o Roadway inventory, traffic counts and Level of Service (LOS)
  o Roadway characteristics (number of lanes, speed)
  o Transit service and ridership information
  o Field reviews
Overview of Existing Conditions

Existing Land Use

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<td>Low Density</td>
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<td>Med Density</td>
<td>23%</td>
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<tr>
<td>High Density</td>
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<tr>
<td>Commercial</td>
<td>24%</td>
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<tr>
<td>Recreational</td>
<td>20%</td>
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<td>Conservation</td>
<td>1%</td>
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Travel Mode

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<td>Car</td>
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<td>Bus</td>
<td>6,899</td>
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<tr>
<td>Bike</td>
<td>6,300</td>
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<tr>
<td>Walk</td>
<td>2,517</td>
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<td>2+</td>
<td>3,407</td>
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US Census 2017 ACS, Mode of Travel to Work

Coastal Communities
Generations Defined

The Millennial Generation
- Born: After 1980
- Age in 2017: 20 to 36
- Share of adult population: 33%

Generation X
- Born: 1965 to 1980
- Age in 2017: 37 to 52
- Share of adult population: 18%

The Baby Boomer Generation
- Born: 1946 to 1964
- Age in 2017: 53 to 71
- Share of adult population: 37%

The Silent Generation
- Born: 1928 to 1945
- Age in 2017: 72 to 89
- Share of adult population: 8%

The Greatest Generation
- Born: Before 1928
- Age in 2017: 90 to 102
- Share of adult population: 4%
Study Area Transit Services

➢ Metrobus routes that service the barrier islands
  o North/south routes
    • Routes C, E, H and S
    • Routes 79 and 120 – Limited stop
  o East/west routes
    • Routes A, G, J, L, M and S
    • Route 150 – Express
    • Routes 79 and 120 – Limited stop
  o Local circulator
    • Route 115 – Miami Beach Shuttle

➢ Metrorail and Metromover
  o Via Metrobus routes 120, A, M, and S
Study Area Transit Services

➢ Community transit services
  o Aventura
  o Bal Harbour*
  o Bay Harbor Islands*
  o Miami Beach
  o North Bay Village
  o Sunny Isles Beach
  o Surfside*
  o Bal-Bay-Surf On Demand (Freebee)

* may be modified based on Bay-Bal-Surf service
Field Review – Pedestrian Environment along A1A
Field Review – Bus Stops along A1A
Field Review – Linking A1A to Aventura
Deficiencies and Needs

➢ Dedicated transit along SR A1A that links all communities
➢ Lack of walkable pockets of development – transit hubs
➢ Bicycle facilities
  o East/west bicycle facilities linking the mainland
  o North-south gaps
➢ Pedestrian facilities
  o Improve shade along corridor
  o Enhanced crosswalks at intersections
  o Mid-block crossings (at-grade/bridges)
Proposed Improvements

- Waterborne Transit Services
- Transit Hubs
- Lehman Causeway Path
- SR A1A Bus Lane Concept
- 79th Street Complete Streets
- Transit Services Improvements
- Pedestrian Improvements
Waterborne Transit Services

➢ 4 Stops in Coastal Area and 1 stop along Mainland
  o Bayfront Park (Miami)
  o Maurice Gibb Memorial Park (Miami Beach)
  o Grandview Palace Marine (North Bay Village)
  o Haulover Park (M-D County)
  o West end of Bella Vista Island (Sunny Isles Beach)
Proposed Improvements – Transit Hubs

➢ Transit Hubs are proposed at the following locations:
  o At Convention Center (Miami Beach)
  o Between 72nd and 73rd Streets (Miami Beach)
  o At Haulover Park (M-D County)
  o At 163rd Street (East end of Bella Island in SIB)
  o At Aventura Mall Transit Station

Between 72nd and 73rd Streets (Miami Beach), Miami Beach Intermodal Hubs Feasibility Study, 2018.
Proposed Improvements – Lehman Causeway Path

➢ Lehman Causeway from Biscayne Boulevard to SR A1A
  o 10-12 foot wide shared use path on the south side of the Causeway (eastbound travel direction), with a 2-foot barrier/separator, and an 8-10 foot shoulder.
  o Generally 2 travel lanes throughout.

➢ The path deviates from the Causeway mainline to the southern service road between Country Club Drive and the eastern U-turn loop.

➢ Maintains WB hurricane evacuation capacity
Proposed Improvements – Bus Lane Concept (MB)

- **Dedicated Bus Lane**
  - A1A from Lehman Causeway to 189th Street - Mixed Traffic
  - A1A from 189th Street to Bayview Drive - Dedicated Lane
    - small southbound segment just north of 163rd Street - Mixed Traffic
    - small northbound segment just south of 163rd Street - Mixed Traffic
  - A1A from Bayview Drive to Harbor Way - Mixed Traffic (Haulover Park section)
  - A1A from Harbor Way to 17th Street (Convention Center) - Dedicated Lane
  - Washington Avenue from 17th Street to 5th Street - Mixed Traffic
Proposed Improvements – 79th Street Complete Street
North Bay Village

➢ 79th Street Causeway from Bayshore Court (Miami) to Bay Drive (Miami Beach)

➢ Could include the following:
  o Lane reduction from 6 lanes (3 in each direction) to 4 lanes (2 in each direction)
  o Wider sidewalks / bicycle paths
  o Wider median
  o Transit amenities
  o On-street parking
Proposed Improvements – 79th Street Complete Street
North Bay Village
Proposed Improvements – 79th Street Complete Street
North Bay Village
Other Proposed Improvements – Transit and Pedestrian

➢ Increased headways (10 to 15-minutes between buses; Better Bus Concepts)
➢ Transit stop amenities – shaded shelters
➢ Protected bike lanes
  o Washington Ave from South Pointe Dr to Dade Blvd
  o Along Collins Ave from South Point to 63rd St
  o Along Julia Tuttle Causeway
  o Along MacArthur Causeway
  o Along SR A1A one-way pairs

➢ Pedestrian Bridges (SIB)
  o Collins Ave @ 163rd St, @ 174th St, and @ 180th St (Priority 1)
  o Collins Ave @ Heritage Park (Priority 3)

➢ Signalized Crosswalks
  o Collins Avenue and 36th Street, RRFB (2020)
  o Collins Avenue and 83rd Street, RRFB (2020)
  o Collins Avenue and 87th Street, RRFB (2020)
  o Collins Avenue and 79th Street, New Traffic Signal (2020)
  o 4300 Block of Collins Avenue, RRFB (2024)
  o 41st Street and Jefferson Avenue, New Traffic Signal (2021)
Potential Projects from other Miami Beach Plans & Studies

➢ Overall Corridor
  o Enhanced sidewalks and crossings

➢ North Beach (Plan NoBe)
  o Bicycle – Protected lanes on Harding-Abbot
  o Transit – Exclusive curb transit lanes on Collins
  o Roadway – Collins/Harding-Abbott converted to 2-way

➢ Collins and/or Washington
  o Bicycle – Bike lanes and neighborhood greenway (Bike/ped Master Plan)
  o Transit – Exclusive curb transit lane (Transportation Master Plan)
Potential Projects from other Miami Beach Plans & Studies

➢ 71st Street / Normandy Drive
  o Continuous protected bike lanes
  o Exclusive transit lanes

➢ 41st Street / Julia Tuttle Causeway
  o 41st Street complete streets concept (City proposal)
  o I-195 Enhanced Bike/ped path (I-195 Master Plan)

➢ Venetian Causeway / Dade Blvd. / 17th St.
  o Dade Blvd. shared path (City study)
  o 17th Street – part of Beach connection BRT option (PD&E Study)

➢ MacCarthur Causeway / 5th Avenue
  o Beach connection premium transit options (PD&E Study)
Next Steps

➢ Refine recommendations
➢ Prepare Draft Action Plan
➢ Community briefings
➢ Finalize document and present to TPO Board / Committees

Coastal Communities

Generations Defined

The Millennial Generation
Born: After 1980
Age in 2017: 20 to 36
Share of adult population: 32%

Generation X
Born: 1965 to 1980
Age in 2017: 37 to 53
Share of adult population: 18%

The Baby Boom Generation
Born: 1946 to 1964
Age in 2017: 53 to 71
Share of adult population: 37%

The Silent Generation
Born: 1928 to 1945
Age in 2017: 72 to 91
Share of adult population: 8%

The Greatest Generation
Born: Before 1928
Age in 2017: 90 to 102
Share of adult population: 4%

The Corridor has significant Millennial & elderly/senior populations.

The corridor primarily consists of young and elderly/senior residents. Millennials make up one-third of the coastal community’s population. The Baby Boom Generation makes up almost 27% of the resident population, which is currently transitioning into the elderly population. These two segments of the population tend to rely on public transportation and other active transportation modes (walking and biking).

Corridor residents have higher than average educational attainment levels with higher than average median wages.

Ninety-two percent of adult residents have graduated from high school. Twenty-seven percent have some college education, and 47% of residents living in the coastal communities have obtained a college degree. In addition, the median income level, the median wage of working-age residents is $44,000. Approximately half of the households earn more than $50,000. Additionally, 16% of all households are at or below the poverty level.

A higher than average percentage of corridor residents are walking and bicycling to work.

Within the coastal communities, the primary mode of travel is personal automobile, which accounts for 71% of all travel modes. Nineteen percent of residents use transit, and 13% walk or bike to work.

Travel Mode

<table>
<thead>
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<th>Total</th>
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<tbody>
<tr>
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<td>Walk</td>
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<td>Bicycle</td>
<td>6,899</td>
<td>7%</td>
</tr>
<tr>
<td>Car</td>
<td>6,300</td>
<td>6%</td>
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<tr>
<td>Transit</td>
<td>2,317</td>
<td>3%</td>
</tr>
<tr>
<td>Motorbike</td>
<td>3,407</td>
<td>4%</td>
</tr>
</tbody>
</table>

US Census 2017 AACS, Mode of Travel to Work

The relatively high rate of transit, bicycle, and pedestrian modes within the coastal communities can partially be attributed to higher than average household without access to a vehicle. Seventeen percent of households don’t have access to a vehicle.
Contact Information

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Jack S. Schnettler, P.E.
Project Manager
Jack.Schnettler@atkinsglobal.com
305-514-3369
Miami-Dade TPO
North-South Transportation Needs for the Coastal Communities Feasibility Study

TPTAC & CTAC Meetings
December 4, 2019
Study Purpose

➢ Evaluate north-south transportation needs for the coastal communities along SR A1A in Miami-Dade County

➢ Area is often severely congested – evaluation to enhance regional mobility as well as local accessibility

➢ Goal of producing multi-modal solutions – assess feasibility of implementing more transit options

➢ Miami Beach adopted Transportation Master Plan in 2016 – designates A1A/Collins Avenue as transit priority network
# Schedule and Process

## Schedule

### 2019

<table>
<thead>
<tr>
<th>Month</th>
<th>Literature Review</th>
<th>Data Collection</th>
<th>Identify Stakeholders</th>
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</tbody>
</table>

Ongoing Plan Coordination with STUDY ADVISORY COMMITTEE, Agencies, Stakeholders, TPO Committees
SMART Plan Connections

➢ Study connects at either end with ongoing transit initiatives

➢ Potential for connections to mainland and transit stations on Northeast Corridor
Overview of Existing Conditions

➢ Literature Review
  o Various transportation plans and programs
  o Previous and related studies

➢ Data Collection
  o Existing and future land uses
  o Population and employment
  o Existing and proposed developments
  o Roadway inventory, traffic counts and Level of Service (LOS)
  o Roadway characteristics (number of lanes, speed)
  o Transit service and ridership information
  o Field reviews
Overview of Existing Conditions

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Cumulative Percentage</th>
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<tbody>
<tr>
<td>Residential</td>
<td>54%</td>
</tr>
<tr>
<td>Low Density</td>
<td>29%</td>
</tr>
<tr>
<td>Med Density</td>
<td>23%</td>
</tr>
<tr>
<td>High Density</td>
<td>2%</td>
</tr>
<tr>
<td>Commercial</td>
<td>24%</td>
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<tr>
<td>Recreational</td>
<td>20%</td>
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<tr>
<td>Conservation</td>
<td>1%</td>
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US Census 2017 ACS, Mode of Travel to Work

<table>
<thead>
<tr>
<th>Travel Mode</th>
<th>Total</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Car</td>
<td>68,840</td>
<td>71%</td>
</tr>
<tr>
<td>Bus</td>
<td>9,196</td>
<td>9%</td>
</tr>
<tr>
<td>Bike</td>
<td>6,899</td>
<td>7%</td>
</tr>
<tr>
<td>Walk</td>
<td>6,300</td>
<td>6%</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>2,517</td>
<td>3%</td>
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<tr>
<td>Multi</td>
<td>3,407</td>
<td>4%</td>
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</table>

US Census 2017 ACS, Zero Car Households

US Census 2017 ACS, Population: 188,695
US Census 2017 ACS, Housing Units: 152,461
US Census 2017 ACS, Median Household Income: $64,237
US Census 2017 ACS, Households: 90,418

Coastal Communities
Generations Defined
The Millennial Generation
Born: After 1980
Age in 2017: 20 to 36
Share of adult population: 33%

Generation X
Born: 1965 to 1980
Age in 2017: 37 to 52
Share of adult population: 18%

The Baby Boom Generation
Born: 1946 to 1964
Age in 2017: 53 to 71
Share of adult population: 37%

The Silent Generation
Born: 1928 to 1945
Age in 2017: 72 to 89
Share of adult population: 8%

The Greatest Generation
Born: Before 1928
Age in 2017: 90 to 102
Share of adult population: 4%
Study Area Transit Services

➢ Metrobus routes that service the barrier islands
  o North/south routes
    • Routes C, E, H and S
    • Routes 79 and 120 – Limited stop
  o East/west routes
    • Routes A, G, J, L, M and S
    • Route 150 – Express
    • Routes 79 and 120 – Limited stop
  o Local circulator
    • Route 115 – Miami Beach Shuttle

➢ Metrorail and Metromover
  o Via Metrobus routes 120, A, M, and S
Study Area Transit Services

➢ Community transit services
  o Aventura
  o Bal Harbour*
  o Bay Harbor Islands*
  o Miami Beach
  o North Bay Village
  o Sunny Isles Beach
  o Surfside*
  o Bal-Bay-Surf On Demand (Freebee)

* may be modified based on Bay-Bal-Surf service
Field Review – Pedestrian Environment along A1A
Field Review – Bus Stops along A1A
Field Review – Linking A1A to Aventura
Deficiencies and Needs

➢ Dedicated transit along SR A1A that links all communities
➢ Lack of walkable pockets of development – transit hubs
➢ Bicycle facilities
  o East/west bicycle facilities linking the mainland
  o North-south gaps
➢ Pedestrian facilities
  o Improve shade along corridor
  o Enhanced crosswalks at intersections
  o Mid-block crossings (at-grade/bridges)
Proposed Improvements

- Waterborne Transit Services
- Transit Hubs
- Lehman Causeway Path
- SR A1A Bus Lane Concept
- 79th Street Complete Street
- Transit Services Improvements
- Pedestrian Improvements
Waterborne Transit Services

➢ 4 Stops in Coastal Area and 1 stop along Mainland

- Bayfront Park (Miami)
- Maurice Gibb Memorial Park (Miami Beach)
- Grandview Palace Marine (North Bay Village)
- Haulover Park (M-D County)
- West end of Bella Vista Island (Sunny Isles Beach)
Proposed Improvements – Transit Hubs

➢ Transit Hubs are proposed at the following locations:
  o At Convention Center (Miami Beach)
  o Between 72nd and 73rd Streets (Miami Beach)
  o At Haulover Park (M-D County)
  o At 163rd Street (East end of Bella Island in SIB)
  o At Aventura Mall Transit Station
Aventura Train Station

- Project to connect station with Aventura Mall transit hub
- Crosswalk at US 1 / Lehman Causeway
Proposed Improvements – Lehman Causeway Path

➢ Lehman Causeway from Biscayne Boulevard to SR A1A
  o 10-12 foot wide shared use path on south side (eastbound travel direction), with 2-foot barrier and 8-foot shoulder.
  o 2 Eastbound travel lanes maintained

➢ Path deviates from Causeway to the southern service road between Country Club Drive and the eastern U-turn loop.

➢ Maintains WB hurricane evacuation capacity
Proposed Improvements – Bus Lane Concept (Miami Beach)

- Dedicated Business Access + Transit (BAT) Lane – also shared w/ bikes
  - A1A from Lehman Causeway to 189th Street - Mixed Traffic
  - A1A from 189th Street to Bayview Drive - Dedicated Lane
    - small southbound segment just north of 163rd Street - Mixed Traffic
    - small northbound segment just south of 163rd Street - Mixed Traffic
  - A1A from Bayview Drive to Harbor Way - Mixed Traffic (Haulover Park section)
  - A1A from Harbor Way to 17th Street (Convention Center) - Dedicated Lane
  - Washington Avenue from 17th Street to 5th Street - Mixed Traffic
Rendering of Bus Lane concept in Bal Harbor
Rendering of Bus Lane concept in Miami Beach
Proposed Improvements – 79th Street Complete Street
North Bay Village

➢ 79th Street Causeway from Bayshore Court (Miami) to Bay Drive (Miami Beach)

➢ Could include the following:
  o Lane reduction from 6 lanes (3 in each direction) to 4 lanes (2 in each direction)
  o Wider sidewalks / bicycle paths
  o Wider median
  o Transit amenities
  o On-street parking
Proposed Improvements – 79th Street Complete Street
North Bay Village
Other Programmed & Proposed Improvements – Transit and Pedestrian

➢ Increased headways (10 to 15-minutes between buses; Better Bus Concepts)
➢ Transit stop amenities – shaded shelters
➢ The Miami Beach Walk – bike/ped path from South Pointe Park to 87th Street
➢ Protected bike lanes
  o Washington Ave from South Pointe Dr to Dade Blvd
  o Along Collins Ave from South Pointe to 63rd St
  o Along SR A1A one-way pairs north of 63rd St
  o Along Julia Tuttle Causeway
  o Along MacArthur Causeway

➢ Pedestrian Bridges (SIB)
  o Collins Ave @ 163rd St, @ 174th St, and @ 180th St (Priority 1)
  o Collins Ave @ Heritage Park (Priority 3)

➢ Signalized Crosswalks
  o Collins Ave and 36th St, RRFB (2020)
  o Collins Ave and 83rd St RRFB (2020)
  o Collins Ave and 87th St, RRFB (2020)
  o Collins Ave and 79th St, New Signal (2020)
  o 4300 Block of Collins Ave, RRFB (2024)
  o 41st St and Jefferson Ave, New Signal (2021)
Potential Projects from other Miami Beach Plans & Studies

➢ 71st Street / Normandy Drive
  o Continuous protected bike lanes
  o Exclusive transit lanes

➢ 41st Street / Julia Tuttle Causeway
  o 41st Street complete streets concept (City proposal)
  o I-195 Enhanced Bike/ped path (I-195 Master Plan)

➢ Venetian Causeway / Dade Blvd. / 17th St.
  o Dade Blvd. shared path (City study)
  o 17th Street – part of Beach connection BRT option (PD&E Study)

➢ MacCarthur Causeway / 5th Avenue
  o Beach connection premium transit options (PD&E Study)
  o Connection to Convention Center using Washington Avenue
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Project Manager  
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Appendix B
Lehman Causeway Traffic Analysis Memorandum
Traffic Analysis Memorandum
SR 856 Lehman Causeway

Miami-Dade TPO

SR 856 – William Lehman Causeway

West of SR 1 to East of SR A1A

Miami-Dade, Florida

June 2020
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1. Executive Summary

This traffic analysis has been prepared to supplement a mobility concept included in the North-South Transportation Needs for the Coastal Communities Study. The analysis included here is a conceptual level of a multimodal enhancement identified in the larger study to provide bicycle and pedestrian connectivity between Sunny Isles Beach and Aventura. The objective of this effort is to evaluate the operational impacts of reducing SR 856 from three lanes to two lanes in the eastbound direction in order to accommodate a separated multi-modal facility across the causeway bridge.

The results of the HCM analysis show that even with a single lane reduction and applying a volume growth rate exceeding the historical or projected growth, the eastbound Lehman Causeway roadway is estimated to operate at a LOS C or better for all the study sub-segments for the horizon year 2040. The FDOT target LOS for urban facilities is LOS D. Therefore, the studied alternatives are within LOS targets, and operations are not estimated to experience service capacity deficiencies.

The study of the historical crashes within the study area was completed to check for any existing crash trends. Based on the reported crash types, the safety implications were reviewed in accordance with industry trends for lane reduction and shoulder-width reductions. Due to the lower volumes in the eastbound direction, the impacts on crash frequency were estimated to be negligible. A detailed Highway Safety Manual predictive crash analysis is recommended to determine the precise changes in expected crash frequency resulting from a lane reduction or other changes in roadway geometrical features. Overall, the result of this study has determined that the lane reduction concept is a viable alternative regarding vehicular operational performance.

To expand upon the results of this study, a detailed analysis is recommended during the Preliminary Engineering Phase of the project, which may include additional alternatives to provide this needed connection in the area.

2. Introduction

2.1. Project Objective

This traffic analysis has been prepared to supplement one of the mobility concepts included in the North-South Transportation Needs for the Coastal Communities Study. This analysis is not a stand-alone effort, but part of the larger report. This concept identified in the larger study is intended to improve multi-modal operations and bicycle/pedestrian safety along the corridor by evaluating the impacts associated with converting one vehicular traffic lane to a separated multi-use path just east of US 1/Biscayne Boulevard and west of SR A1A. This memorandum summarizes the existing and future traffic conditions in a build and no-build alternative.

The traffic analysis process includes:

- Review of existing roadway characteristics
- Collection of most recently available (2019) traffic data
- Analysis of existing year traffic operations evaluation
- Development of future year (2040) traffic volumes
- Analysis of future year operational evaluation
2.2. Analysis Area Description

The SR 856 (William Lehman Causeway) corridor is located in northern Miami-Dade County near Aventura, FL. The Causeway operates as a limited-access expressway that connects US 1 (Biscayne Boulevard) to the west and SR A1A (Collins Avenue) on the east. In each direction, there is a pair of off-ramps and on-ramps providing access to a causeway frontage road and Country Club Drive. This memorandum includes an analysis to evaluate the traffic conditions along the Lehman Causeway, and the evaluation does not consider altering the number of lanes approaching or departing the intersections. Therefore, the study limits do not include these unaltered intersections in the analysis. Additionally, there are no signalized intersections within the study limits.

Figure 2-1 below provides a map of the study area with the specific study portions of SR 856 highlighted.

Figure 2-1 – Study Area Map
3. Traffic Analysis Methodology

3.1. Study Area
The study area comprises of SR 856 (William Lehman Causeway) from just east of the US 1 (Biscayne Boulevard) intersection influence area to just west of the SR A1A (Collins Avenue) intersection influence area. Because the proposed lane reconfiguration alternative only impacts the design of eastbound lanes, only the eastbound side of SR 856 is analyzed in this study. At times westbound information is provided only as a reference for reasonableness checks.

3.2. Analysis Years and Design Period
The following study years are established for this report:
- Existing Year – 2019
- Design Year – 2040

3.3. Technical Guidance and Standards
Analysis of the corridor operations is based on criteria and guidance detailed in the following documents:
- FDOT Project Traffic Forecasting Handbook (2019)
- FDOT Quality/LOS Handbook (2020)

3.4. Performance Metrics
The study focuses on SR 856 between the two intersections on the eastern and western terminus. This link operates without any controls, therefore the appropriate performance metric to evaluate its performance is total volume, volume to capacity ratio, density, and Level of Service (LOS). The prevailing measure of effectiveness will be the design year LOS using Generalized Service volumes for pre-screening and HCM methods for alternative analysis.

It is the FDOT’s intent to plan, design, and operate the State Highway System at an acceptable LOS for the traveling public. The LOS is defined as the system of six designated ranges from “A” (best) to “F” (worst) used to evaluate roadway facility performance. The automobile mode level of service targets for the State Highway System during peak travel hours are “D” in urbanized areas and “C” outside urbanized areas.

LOS Criteria
In the FDOT Quality/Level of Service Handbook, the LOS target and corresponding hourly service volumes for Freeways/Expressways in urbanized areas are identified below.
- Three Lane Hourly LOS D Service Volume – 5,620 vehicles per hour
- Two-Lane Hourly LOS D Service Volume - 3,740 vehicles per hour

In the Highway Capacity Manual freeway, LOS is categorized based on density. The LOS D threshold is listed below.
- Per Lane Hourly LOS D Density Range – 26 to 35 passenger cars per mile, per lane
3.5. Analysis Approach and Traffic Analysis Tools

The study area includes an urban uninterrupted freeway link along SR 856. Due to the study area not including any traffic control elements, it will be analyzed as a freeway link. To analyze the performance metrics of this link, the FDOT Quality/Level of Service Handbook Generalized Service Volume Tables (2012) were used to pre-screen alternatives from a generalized service level perspective. If the alternative passed the pre-screening (LOS D or better) than methodologies of the HCM are used to analyze the facility with more detail. To perform the HCM analysis the HCS Freeway Facilities is used. This method analyzes freeway facilities and the relationship that merging, diverging, and weaving sections have on the adjacent section.

Summary of Analysis Tools Used:

- Prescreening of AADT and LOS: FDOT Generalized Volume Service Tables (LOS)
- Freeway Operational Analysis (Density and LOS): HCM (HCS)

3.6. Data Needs and Sources

The primary source of traffic data collection for this study is from the FDOT Florida Traffic Online (FTO) web-based application. This traffic data included in this database include the historical annual average daily traffic (AADT), K factor, directional D-factors, truck percentages, seasonal factors, and vehicle classification percentages.
4. Existing Conditions Analysis

An analysis of the existing conditions was conducted for the study area link of SR 856. Data collection included AADT and directional hourly volumes along the mainline and AADT at the ramps within the study area.


The existing geometry and traffic signage required for the analysis herein was collected through review of available aerial imagery and verified through FDOT straight-line diagrams.

Study Area Typical Section
SR 856, from US 1 to SR A1A, exists as a six-lane roadway, divided by a barrier wall. The study area is classified as an urban principal arterial “Freeway and Expressway” that runs primarily in an east-west direction. The existing typical section for SR 856 is six 12-foot lanes with an 8-foot inside shoulder and 10-foot outside shoulder. The posted speed limit is 55 mph for the entirety of the study area.

Traffic Control
There are no traffic controls within the study area. Just beyond the study area on either end are signalized intersections providing access north and south of SR 856.

Multi-Modal Accommodations
There are designated bicycle lane markings located across the causeway bridge but there are no markings or signage provided elsewhere outside of the bridge area. There are no pedestrian facilities and no transit stops on the corridor.

4.2. Traffic Data Collection

Existing AADT Volumes
Existing AADT volumes for the year 2019 were obtained from the FDOT Florida Traffic Online (2019) web application.

Within the study area, there was a Portable Traffic Monitoring Site (Site # 870152) count performed along SR 856 just east of the US 1 intersection that includes historical AADT, directional hourly volumes, vehicle classification, and truck factors. This is the only mainline data collection location in the study area.

In addition to mainline data collection, there are Portable Traffic Monitoring Sites located at each of the four ramps leading to and from the causeway frontage roads. At the ramp counts, only historical AADT is available.

The AADT of the eastern portion of the corridor was determined based on the volume balancing of the limited access facilities versus the mainline counts. A summary of the existing AADT is provided in Table 4-1.

Existing Hourly Volumes
The directional hourly counts were performed by FDOT between June 25 to 27, 2019. The directional data were applied a seasonal factor of 1.02 based on the dates of data collection and the 2019 North Miami Dade County Peak Season Factor Report from FDOT’s Florida Traffic Online. A summary of the peak hour volumes is provided in Table 4-2.

A combined summary of the AADT and hourly counts is provided in Figure 4-1.

Due to the PM volumes exceeding the AM volumes for each sub-segment, only PM volumes are used in further analysis.

Data collection files are provided in Sub-Appendix B1.
Table 4-1 - Existing Segment Volumes and Traffic Factors

<table>
<thead>
<tr>
<th>Count Location</th>
<th>FDOT Site # - Location Proximity</th>
<th>2019 AADT</th>
<th>K Factor</th>
<th>D Factor</th>
<th>T Factor</th>
</tr>
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<tbody>
<tr>
<td># 870152 – SR 856 East of US 1</td>
<td>40,000</td>
<td>8.00</td>
<td>54.60</td>
<td>2.80</td>
<td></td>
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<tr>
<td># 876175 – SR 856 EB Off Ramp</td>
<td>4,100</td>
<td>8.00</td>
<td>One way</td>
<td>1.90</td>
<td></td>
</tr>
<tr>
<td># 876177 – SR 856 EB On Ramp</td>
<td>11,500</td>
<td>8.00</td>
<td>One way</td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td># 876176 – SR 856 WB On Ramp</td>
<td>5,500</td>
<td>8.00</td>
<td>One way</td>
<td>2.80</td>
<td></td>
</tr>
<tr>
<td># 876178 – SR 856 WB Off Ramp</td>
<td>10,500</td>
<td>8.00</td>
<td>One way</td>
<td>2.70</td>
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</table>

Table 4-2 - Summary of Hourly Directional Traffic Data Collection (SR 856 just east of US 1)

<table>
<thead>
<tr>
<th>Direction</th>
<th>Peak Hour</th>
<th>Collected Volume (veh/hr)</th>
<th>Adjusted Volume (veh/hr)</th>
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<tbody>
<tr>
<td>Eastbound</td>
<td>7:30-8:30 AM</td>
<td>1,200</td>
<td>1,225</td>
</tr>
<tr>
<td></td>
<td>4:45-5:45 PM</td>
<td>1,255</td>
<td>1,280</td>
</tr>
<tr>
<td>Westbound</td>
<td>9:15-10:15 AM</td>
<td>1,655</td>
<td>1,690</td>
</tr>
<tr>
<td></td>
<td>4:30-5:30 PM</td>
<td>1,565</td>
<td>1,600</td>
</tr>
</tbody>
</table>

Figure 4-1 – 2019 Segment Traffic Volumes
4.3. Existing Traffic Operations

Development of Existing Design Hour Volumes

Based on the available traffic data a design hour volume profile was developed for eastbound SR 856. The process and assumptions for this development are as follows.

The AADT and peak hourly volumes at the portable traffic monitoring site were used a base point for which all other volumes were developed from. An example of eastbound traffic development is listed below:

- Eastbound demand hourly volume determined based on seasonally adjusted hourly approach volume from count site (Eastbound PM volume of 1,280 vehicles per hour).
- The ramp volume to the causeway frontage roads was assumed to follow the same hourly trend as observed at the count site 870152. (For example, the peak hour percentage of traffic when compared to the AADT here was calculated as 1,281/18,800=7%)
- The design hour volumes for the ramps were calculated by multiplying the AADT by the local peak volume percentage from the previous step (For example, the EB off Ramps Hourly Volume = (4,100 AADT) x 7% = 284 vehicles per hour)
  - This process was followed for all ramps.
- The hourly volume estimates between the ramps and east of the ramps were determined based on volume balancing of known volumes.

Segment Analysis Assumptions

The following factors were assumed for analysis of the existing design hour volumes. To facilitate the ease of analysis, where various values were available a conservative value was globally applied to different segments within the study area.

- Peak Hour Factor = 0.94
- Peak Hour Truck Factor “T” Factor = 2.8 (for all mainline and ramps)
- Analysis Period = PM Peak
- Mainline Speed Limit = 55 mph
- Mainline Free Flow speed = 60 mph

Segment/Corridor Analysis

The segment of SR 856 within the study area was analyzed using the methodologies of HCM6 and performed using the HCS7 software. For freeways analysis, the HCM requires the corridor be categorized into segments of either basic, merge, diverge, or weaving. The study area was segmented using these options and analyzed as a system using the HCS7 Freeways module. The results of the existing eastbound LOS analysis are provided in Table 4-3. The segment analysis results indicate that the corridor is currently operating at LOS A or B, which meets local LOS targets.

Table 4-3 - Existing Segment Analysis (Eastbound PM)

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<tr>
<th>Segment</th>
<th>Segment Type</th>
<th>Number of Lanes</th>
<th>Density (pc/mi/ln)</th>
<th>d/c Ratio</th>
<th>LOS</th>
<th>LOS Targets</th>
</tr>
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<tbody>
<tr>
<td>SR 856 west of Country Club Dr Off Ramp</td>
<td>Basic</td>
<td>3</td>
<td>8.0</td>
<td>0.20</td>
<td>A</td>
<td>D</td>
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<td>Country Club Dr Off Ramp</td>
<td>Diverge</td>
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<td>8.6</td>
<td>0.20</td>
<td>A</td>
<td>D</td>
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<td>Basic</td>
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<td>11.1</td>
<td>0.29</td>
<td>B</td>
<td>D</td>
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</table>
4.4. Historical Crash Summary

The crash records were obtained for Lehman Causeway using Florida’s Signal4 Analytics crash reporting system. The crash study limits were identified as from 700 east of US-1/Biscayne Boulevard to 500 feet west of SR A1A/Collins Avenue. At first, the past five years of data (2015-2019) was queried, but a gap in available data between 2015 through 2017 was found. The crash records search was then expanded to range from 2014-2019 to include additional crash data trends before the gap in data. Additionally, FDOT’s Crash Analysis Reporting System (CARS) was used to identify if additional crash records were available to fill in the 2015 through 2017 gap. The CARS search resulted in no additional records found.

The crash record narratives were reviewed to verify each corresponding crash data included properly marked fields such as crash severity, crash type, manner of collision, crash date and time, and crash location. Over the 2014 through 2019 period, a total of 15 crashes were reported. All of the crashes reported were either single-vehicle or multi-vehicle crashes. No pedestrian or biking related crashes were reported.

In terms of crash severity, all 15 (100%) crashes resulted in a Property Damage Only (PDO) condition. The crash data sorted by crash type is provided in Figure 4-2. The highest crash type reported were rear end crashes, which accounted for 40% of the total crashes, with the remaining records classified as sideswipe (33%) and off road (27%) crash types.

The crashes were also reviewed for patterns relating to weather, pavement, and lighting conditions. Most of the crashes (80%) occurred during clear weather and dry pavement conditions. 60% of the crashes occurred during daylight conditions with 20% of crashes occurring during dark, lighted conditions. Raw crash records are provided in Sub-Appendix B3.

![Figure 4-2 – Crash Type Summary](image-url)
5. Development of Traffic Forecast

5.1. Traffic Forecasting Methodology
A comparative analysis of all different sources of traffic volumes and other parameters, such as population growth trends, was performed to assess the reasonableness of the available traffic data for the existing year, which in turn will serve as the basis for the future year projections. The future traffic forecast for the study area was developed by comparing model growth, historical growth, and population projections. The subsequent sections describe the forecasting process and methods used in determining a recommended growth rate.

5.2. Development of Design Traffic Factors
Design traffic characteristics were developed per the FDOT Project Traffic Forecasting Handbook, January 2014. The primary design traffic characteristics are the Peak Hour Factor, K-factor, Design Hour Directional Demand (D) factor, and percentage of trucks. These characteristics are used in developing future traffic volumes and conducting future operational analyses.

5.3. Demand Model
The South East Regional Planning Model (SERPM) was run for the study area and surrounding facilities for a 2040 forecast year. Based on the 2040 estimate, and adjusted by the peak season correction factor (0.97), the 2040 forecasted volume for SR 856 (just east of US 1) is 42,100 AADT. When compared to the 2019 collected AADT at the same location this reflects a 0.3% annual growth rate. A summary of the planning model output is provided in Sub-Appendix B4.

5.4. Historical Growth Rates
Historical AADT counts published on FDOT’s Florida Traffic online were referenced to determine a growth rate that reflects how traffic has historically grown. Based on a trend of the most recent ten years of historical data the annual linear projection of traffic growth is estimated to be 1.6 percent. Table 5-1 illustrates the historical AADT and projection chart. FDOT’s Trends Analysis Tool worksheets showing the historical and future trend estimates are provided in Sub-Appendix B2.
5.5. Population Projections

The FDOT Forecasting and Trends Office publishes an annual memorandum that estimates future county populations titled the *Projections of Florida Population by County, 2020-2070*. For Miami-Dade County, the 2040 projection reflects a 1.0% annual increase in population between the years 2020 and 2040. A summary of population statistics is provided in Sub-Appendix B5.

5.6. Recommended Design Volume Growth Rates

After reviewing the regional demand model, historical growth trends, and population projections in the study area, it was determined a 2.0% annual growth rate be used to develop 2040 design volumes. This will yield higher traffic forecasts in 2040 than the other methods, and thereby a more conservative analysis. A summary of the growth rates is listed in Table 5-2.

### Table 5-2 - Growth Rate Summary and Recommendation

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<td>Historical Volume Trends</td>
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<tr>
<td>Population Projections</td>
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<tr>
<td><strong>Recommended Annual Growth Rate</strong></td>
<td><strong>2.0%</strong></td>
</tr>
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</table>
5.7. Future Volumes
Future year AADT and design hour volumes were developed for the horizon year 2040 based on existing traffic volumes and the annual growth rate identified in this study. It is assumed that the 2040 design year traffic volumes will be the same in the no-build and build alternatives.

The future traffic analysis is evaluated for the no-build scenario and the build alternative. The no-build scenario is performed with the existing roadway facility, which serves as a baseline comparison for the build alternative. The same traffic factors developed for the existing year will be used in all future years.

Figure 5-1 – 2040 Segment Traffic Volumes

6. Alternatives Conceptual Analysis
The segment of SR 856 within the study area was analyzed using the methodologies of HCM6 and performed using the HCS7 software. The study area was segmented using predefined segments used for existing conditions analysis. These options and analyzed as a system using the HCS7 Freeways module. The HCS7 reports for all scenarios are provided in Sub-Appendix B6. The analysis included here is a conceptual level of one recommended alternative as per the results of the study to provide bicycle and pedestrian connectivity between Sunny Isles Beach and Aventura. However, a detailed analysis is recommended during the Preliminary Engineering Phase of the project, which includes additional alternatives to provide this needed connection in the area.
6.1. 2040 No-Build Alternative

No-Build Geometry
The no-build scenario was performed with the existing roadway facility, which serves as a baseline comparison for the build alternative.

No-Build Segment/Corridor Analysis
The results of the 2040 no-build eastbound LOS analysis are provided in Table 6-1. The segment analysis results indicate that the corridor is estimated to operate at LOS A, B, or C, which meets local LOS targets.

Table 6-1 – 2040 No-Build Segment Analysis (Eastbound PM)

<table>
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<tr>
<th>Segment</th>
<th>Segment Type</th>
<th>Number of Lanes</th>
<th>Density (pc/mi/ln)</th>
<th>d/c Ratio</th>
<th>LOS</th>
<th>LOS Targets</th>
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<td>SR 856 west of Country Club Dr Off Ramp</td>
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<td>SR 856 between Country Club Dr Ramps</td>
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6.2. 2040 Build Alternative

Build Alternative Geometry
The 2040 Build alternative scenario was performed with a reduction of one travel lane in the eastbound direction.

Build Alternative Segment/Corridor Analysis
The results of the 2040 build eastbound LOS analysis are provided in Table 6-2. The segment analysis results indicate that the corridor is estimated to operate at LOS B or C, which meets local LOS targets.

Table 6-2 – 2040 No-Build Segment Analysis (Eastbound PM)

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6.3. Future Build Safety Analysis

With very few crashes reported in the project area over the latest available 6-year period, there were no high crash locations or segments identified. Additionally, the study area does not appear on the FDOT high crash list for Miami-Dade County. Rather than completing a full, quantitative and data-driven, safety analysis at this time, this section provides a summary of what affects changing certain roadway design elements that are estimated to have on the safety performance of SR 856. The following paragraphs list each design element and the safety performances referenced from the Highway Safety Manual (HSM).

Lane Reductions

Removing a travel lane will decrease overall roadway capacity with effects to operations that are only most apparent during heavy traffic demand periods nearing the roadway capacity levels. A freeway lane reduction is not expected to have a large impact on the safety performance of a freeway unless it is operating near capacity. The HSM established Safety Performance Factor (SPF) coefficients relating the number of travel lanes to crash frequency.

For example, a six-lane freeway segment with an AADT of 50,000 vehicles per day, is predicted to operate with a lower PDO crash frequency (< 1 crashes/year) and higher fatal-and-injury crash frequency (< 1 crashes/year) when compared to a four-lane segment.

Clear Zone Reductions

With the reduction of travel lanes and the installation of a barrier-separated shared-use path, there may be portions of the roadway where the clear zone is restricted. Specifically, there may be sections where a reduction in the outside shoulder or outside clearance is required. The HSM establishes a crash modification factor (CMF) for the outside shoulder and outside clearance widths. For shoulder widths less than 10 feet, the safety performance becomes negatively impacted. The relationship for outside clearance is similar as the safety performance becomes negatively impacted for roadways with less than 20 feet of outside clearance.

7. Summary of Analysis Results

The objective of this analysis was to evaluate the operational impacts of reducing SR 856 from three lanes to two lanes in the eastbound direction in order to accommodate a separated multi-modal facility across the causeway. The results of the HCM analysis show that even with a single lane reduction and applying a volume growth rate exceeding the historical or projected growth, the eastbound Lehman Causeway roadway is estimated to operate at a LOS C or better for all the study sub-segments for the horizon year 2040. The FDOT target LOS for urban facilities is LOS D. Therefore, the studied alternatives are within LOS targets, and operations are not estimated to experience service capacity deficiencies.

The study of the historical crashes within the study area was completed to check for any existing crash trends. Based on the reported crash types, the safety implications were reviewed in accordance with industry trends for lane reduction and shoulder-width reductions. Due to the lower volumes in the eastbound direction, the impacts on crash frequency were estimated to be negligible. A detailed Highway Safety Manual predictive crash analysis is recommended to determine the precise changes in expected crash frequency resulting from a lane reduction or other changes in roadway geometrical features. Overall, the result of this study has determined that the lane reduction concept is a viable alternative regarding vehicular operational performance.
Appendices
Appendix B1. Traffic Data Collection
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<th>YEAR</th>
<th>AADT</th>
<th>DIRECTION 1</th>
<th>DIRECTION 2</th>
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AADT FLAGS:  C = COMPUTED;  E = MANUAL ESTIMATE;  F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE;  T = THIRD YEAR ESTIMATE;  R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE;  6 = SIXTH YEAR ESTIMATE;  X = UNKNOWN

*K FACTOR:  STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES
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AADT FLAGS:  C = COMPUTED;  E = MANUAL ESTIMATE;  F = FIRST YEAR ESTIMATE
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*K FACTOR:  STARTING WITH YEAR 2011 IS STANDARDS, PRIOR YEARS ARE K30 VALUES
## FLORIDA DEPARTMENT OF TRANSPORTATION
### TRANSPORTATION STATISTICS OFFICE
#### 2019 HISTORICAL AADT REPORT

**COUNTY:** 87 - MIAMI-DADE  
**SITE:** 6176 - RAMP 87210002 FROM WB FRONTAGE RD TO WB SR856, 30' W OF FRONTAGE RD

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**K FACTOR:**  
- STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES
### 2019 HISTORICAL AADT REPORT

#### COUNTY: 87 - MIAMI-DADE

#### SITE: 6177 - RAMP 87210003 FROM EB NE 192 ST TO EB SR856, 15' E OF NE 192 ST

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### Notes:

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*K FACTOR: STARTING WITH YEAR 2011 IS STANDARD K, PRIOR YEARS ARE K30 VALUES
### FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2019 HISTORICAL AADT REPORT

COUNTY: 87 - MIAMI-DADE

SITE: 6178 - RAMP 87210004 FROM WB SR856 TO WB FRONTAGE RD, 50' W OF SR 856

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*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES
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Appendix B2. Traffic Trends Worksheets
### Traffic Trends - V03.a

**SR 856 -- SR 856**

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**Traffic (ADT/AADT)**

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**2025 Opening Year Trend**

- 2025: N/A, 41900

**2035 Mid-Year Trend**

- 2035: N/A, 47900

**2045 Design Year Trend**

- 2045: N/A, 53900

**TRANPLAN Forecasts/Trends**

**Annual Trend Increase**: 597

**Trend R-squared**: 46.28%

**Trend Annual Historic Growth Rate**: 1.78%

**Trend Growth Rate (2019 to Design Year)**: 1.57%

**Printed**: 2-Jul-20

**Straight Line Growth Option**

*Axle-Adjusted
Appendix B3. Crash Data
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</tbody>
</table>
Appendix B4. Regional Planning Model Data
Appendix B5. FDOT Population Projection by County
Introduction

The Multi-use Corridors of Regional Economic Significance (M-CORES) program is created by the Florida Department of Transportation (FDOT) to revitalize rural communities, encourage job creation and provide regional connectivity along the following three corridors:

- The Suncoast Connector, extending from Citrus County to Jefferson County
- The Northern Turnpike Connector, extending from the northern terminus of Florida's Turnpike northwest to the Suncoast Parkway
- The Southwest-Central Florida Connector, extending from Collier County to Polk County

One of the main objectives of the M-CORES program is to evaluate the future demand along the corridors and properly address the need for the corridors and their potential economic and environmental impacts. In order to support the objective, future population projections for the next 50 years from 2020 to 2070 in five-year increment were developed for all 67 counties in Florida. This Technical Memorandum describes the methodology used for the development of population projections and presents the results based on the methodology.

The Bureau of Economic and Business Research (BEBR) at the University of Florida has been making population projections for Florida and its counties since the 1970s. The latest report was published in April 2019 and it contains the most recent set of projections from 2020 to 2045. To account for uncertainty regarding future population growth, BEBR publishes three series of projections: low, medium, and high. The medium series is typically considered more accurate, while the low and high series provide an indication of the uncertainty surrounding the medium series. It should be noted that these projections include only permanent residents, and tourists or seasonal residents are not included.

The methodology used by the BEBR to develop 2020-2045 population projections has been used for many years and has proven to be both practical and reliable. In consultation with the FDOT Forecasting and Trends Office (FTO), it was determined that for the purpose of the M-CORES program, the medium series of BEBR projections for 2020 to 2045 would be used for years up to to 2045. For years after 2045, i.e., from 2050 to 2070, the BEBR methodology used to generate 2020-2045 population projections in the medium range was deployed. However, to ensure the BEBR methodology was properly applied, a two-step process was followed. The first step involved in replicating the BEBR 2020-2045 population projections with the same methodology and data sources. The second step involved in extending the population projections to the next 20 years from 2050 to 2070 with necessary adjustments and reasonableness checks. The following sections provide more details about the two-step process.
BEBR Methodology and Replicating 2020-2045 Population Projections

State projections

Based on BEBR’s methodology, the starting point for the state-level projections was the April 1, 2010 census population count by age, sex, race, and Hispanic origin, as adjusted by the National Center for Health Statistics (NCHS) in the Vintage 2014 bridged race population estimates. Projections were made in one-year intervals using a cohort-component methodology in which births, deaths, and migration are projected separately for each age-sex cohort in Florida for non-Hispanic whites, non-Hispanic nonwhites, and Hispanics.

Three different sets of assumptions are applied to provide low, medium, and high series of projections, although the low and high series do not provide absolute bounds on future population change, they provide a reasonable range in which Florida’s future population is likely to fall. The medium projections of total population for 2019-2023 were adjusted to be consistent with the state population forecasts for those years produced by the State of Florida’s Demographic Estimating Conference (DEC) held February 6, 2019. None of the projections after 2023 had any further adjustments.

BEBR recommended that medium series is the most likely to provide accurate forecasts in most circumstances. Therefore, the medium projections of state total population for 2020-2045 were directly used when replicating projections of county population for 2020-2045.

County projections

The cohort-component method is a good way to make population projections at the state level but is not necessarily the best way to make projections at the county level. Many counties in Florida are so small that the number of persons in each age-sex category is inadequate for making reliable cohort-component projections, giving the lack of detailed small-area data. Even with more importation, county growth patterns are so volatile that a single technique based on data from single time period may produce misleading results. As a result, BEBR recommended use of several different techniques and historical base periods to project the total population at the county level.

BEBR started with the population estimate constructed for April 1, 2018, and made projections for each county using the following five different techniques:

- **Linear** – the population will change by the same number of persons in each future year as the average annual change during the base period.
- **Exponential** – the population will change at the same percentage rate in each future year as the average annual rate during the base period.
- **Share-of-growth** – each county’s share of state population growth in the future will be the same as its share during the base period.
- **Shift-share** – each county's share of the state population will change by the same annual amount in the future as the average annual change during the base period.
- **Constant-share** – each county’s share of the state population will remain constant at its 2018 level.

For the linear and share-of-growth techniques BEBR used base periods of two, ten, and twenty years (2016–2018, 2008–2018, and 1998–2018), yielding three sets of projections for each technique. For the
exponential and shift-share techniques, BEBR used base periods of five and fifteen years (2013–2018 and 2003–2018), yielding two sets of projections for each technique. The constant-share method was based on data for a single year (2018). Table 1 shows a summary of the techniques used, the corresponding base period(s), and the number of population projection sets created based on the techniques.

### Table 1 Population Projection Techniques and Base Periods

<table>
<thead>
<tr>
<th>Technique</th>
<th>Base Period</th>
<th>Number of Projection Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear</td>
<td>2016–2018 (two-year period)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2008–2018 (ten-year period)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1998–2018 (twenty-year period)</td>
<td></td>
</tr>
<tr>
<td>Exponential</td>
<td>2013–2018 (five-year period period)</td>
<td>2</td>
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<tr>
<td></td>
<td>2003–2018 (fifteen-year period)</td>
<td></td>
</tr>
<tr>
<td>Share-of-growth</td>
<td>2016–2018 (two-year period)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2008–2018 (ten-year period)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1998–2018 (twenty-year)</td>
<td></td>
</tr>
<tr>
<td>Shift-share</td>
<td>2013–2018 (five-year period)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2003–2018 (fifteen-year period)</td>
<td></td>
</tr>
<tr>
<td>Constant share</td>
<td>2018 (one-year period)</td>
<td>1</td>
</tr>
</tbody>
</table>

BEBR’s methodology produced eleven projections for each county for each projection year (2020, 2025, 2030, 2035, 2040 and 2045). From these, five averages were calculated: one using all eleven projections (AVE – 11), one that excluded the highest and lowest projections (AVE - 9), one that excluded the two highest and two lowest projections (AVE - 7), one that excluded the three highest and three lowest projections (AVE – 5), and one that excluded the four highest and four lowest projections (AVE – 3).

BEBR selected AVE-5 for 65 counties, the average in which the three highest and three lowest projections were excluded. For Monroe County, an average of projections, made with the exponential technique with a base period of five years and the linear technique with a base period of ten years, was selected. And for Putnam County, AVE-3 was selected.

In addition, BEBR made manual adjustments to the projections in seven counties in the Florida Panhandle to account for estimated population losses or slowdowns in growth due to the impacts of Hurricane Michael (Bay, Calhoun, Franklin, Gulf, Jackson, Liberty, and Wakulla counties). Besides, some other manual adjustments were made in several counties to account for changes in institutional populations such as university students and prison inmates.

The county population projections for 2020-2045 were generated using the BEBR methods described above. However, since no information about the BEBR manual adjustments was available, no manual adjustments were made to the initial projections.

Table 2 presents population projections without manual adjustments for all counties for 2020-2045. Table 3 shows the percent differences between BEBR’s projections and unadjusted projections based on the BEBR methodology. In most cases, the differences between the two sets are below 3.0%, which indicates that direct application of the BEBR methodology were able to replicate the original BEBR population projections reasonably well, and the BEBR methodology can be extended to develop future projections from 2050 to 2070 that are consistent with the 2020-2045 projections.
# Table 2 Projections of Florida Population by County, 2020-2045

<table>
<thead>
<tr>
<th>County</th>
<th>Population Projections (without Manual Adjustments)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2020</td>
</tr>
<tr>
<td>Alachua</td>
<td>269,500</td>
</tr>
<tr>
<td>Baker</td>
<td>28,300</td>
</tr>
<tr>
<td>Bay</td>
<td>185,800</td>
</tr>
<tr>
<td>Bradford</td>
<td>28,400</td>
</tr>
<tr>
<td>Brevard</td>
<td>597,600</td>
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<tr>
<td>Broward</td>
<td>1,940,300</td>
</tr>
<tr>
<td>Calhoun</td>
<td>15,400</td>
</tr>
<tr>
<td>Charlotte</td>
<td>183,100</td>
</tr>
<tr>
<td>Citrus</td>
<td>148,500</td>
</tr>
<tr>
<td>Clay</td>
<td>220,200</td>
</tr>
<tr>
<td>Collier</td>
<td>381,500</td>
</tr>
<tr>
<td>Columbia</td>
<td>71,100</td>
</tr>
<tr>
<td>DeSoto</td>
<td>36,000</td>
</tr>
<tr>
<td>Dixie</td>
<td>16,800</td>
</tr>
<tr>
<td>Duval</td>
<td>980,200</td>
</tr>
<tr>
<td>Escambia</td>
<td>323,900</td>
</tr>
<tr>
<td>Flagler</td>
<td>112,500</td>
</tr>
<tr>
<td>Franklin</td>
<td>12,200</td>
</tr>
<tr>
<td>Gadsden</td>
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<tr>
<td>Gilchrist</td>
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<tr>
<td>Glades</td>
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<tr>
<td>Gulf</td>
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</tr>
<tr>
<td>Hamilton</td>
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<td>Hardee</td>
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<tr>
<td>Hendry</td>
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<td>Hernando</td>
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<td>Highlands</td>
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<td>Hillsborough</td>
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<tr>
<td>Holmes</td>
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</tr>
<tr>
<td>Indian River</td>
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</tr>
<tr>
<td>Jackson</td>
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<tr>
<td>Jefferson</td>
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<tr>
<td>Lafayette</td>
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<tr>
<td>Lake</td>
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<tr>
<td>Lee</td>
<td>747,000</td>
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<tr>
<td>Leon</td>
<td>298,000</td>
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### Projections of Florida Population by County, 2020-2070

<table>
<thead>
<tr>
<th>County</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>2040</th>
<th>2045</th>
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<td>44,000</td>
<td>44,900</td>
<td>45,800</td>
<td>46,600</td>
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<td>Liberty</td>
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<td>10,100</td>
<td>10,500</td>
<td>10,800</td>
<td>11,200</td>
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<td>19,700</td>
<td>19,900</td>
<td>20,000</td>
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<td>20,300</td>
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<td>551,400</td>
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<td>385,800</td>
<td>407,000</td>
<td>426,900</td>
<td>445,000</td>
<td>462,500</td>
</tr>
<tr>
<td>Martin</td>
<td>159,200</td>
<td>166,900</td>
<td>173,900</td>
<td>180,200</td>
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<td>193,000</td>
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<td>77,500</td>
<td>79,000</td>
<td>80,500</td>
<td>82,000</td>
<td>83,600</td>
</tr>
<tr>
<td>Nassau</td>
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<td>101,600</td>
<td>108,500</td>
<td>115,200</td>
<td>121,800</td>
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<tr>
<td>Okaloosa</td>
<td>202,200</td>
<td>211,500</td>
<td>219,900</td>
<td>227,600</td>
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<td>241,700</td>
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<tr>
<td>Okeechobee</td>
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<td>42,800</td>
<td>43,600</td>
<td>44,300</td>
<td>45,000</td>
<td>45,700</td>
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<td>622,500</td>
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<td>732,800</td>
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<td>Polk</td>
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<td>807,400</td>
<td>856,700</td>
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<td>72,900</td>
<td>72,800</td>
<td>72,800</td>
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<td>330,900</td>
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<td>395,600</td>
<td>427,100</td>
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<td>215,600</td>
<td>230,200</td>
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<td>504,900</td>
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<td>540,400</td>
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<td>594,500</td>
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<td>232,200</td>
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<td>Suwannee</td>
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<td>54,600</td>
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<td>Taylor</td>
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<td>22,800</td>
<td>22,800</td>
<td>22,800</td>
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<td>Union</td>
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<td>17,000</td>
<td>17,400</td>
<td>17,700</td>
<td>18,000</td>
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<td>591,800</td>
<td>610,500</td>
<td>627,200</td>
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<td>Wakulla</td>
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<td>36,500</td>
<td>38,000</td>
<td>39,500</td>
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</table>
## Table 3 Percent Errors of Florida Population by County, 2020-2045

<table>
<thead>
<tr>
<th>County</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>2040</th>
<th>2045</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alachua</td>
<td>0.4%</td>
<td>1.5%</td>
<td>2.2%</td>
<td>3.1%</td>
<td>4.2%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Baker</td>
<td>0.0%</td>
<td>0.7%</td>
<td>1.0%</td>
<td>1.9%</td>
<td>2.2%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Bay</td>
<td>1.0%</td>
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<td>3.3%</td>
<td>3.1%</td>
<td>3.6%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Bradford</td>
<td>0.7%</td>
<td>0.3%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.4%</td>
<td>1.4%</td>
</tr>
<tr>
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<td>0.2%</td>
<td>0.3%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Broward</td>
<td>0.1%</td>
<td>0.3%</td>
<td>0.1%</td>
<td>0.3%</td>
<td>0.5%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Calhoun</td>
<td>1.9%</td>
<td>3.2%</td>
<td>3.8%</td>
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<td>4.8%</td>
<td>5.9%</td>
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<tr>
<td>Charlotte</td>
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<td>0.2%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.0%</td>
<td>0.3%</td>
</tr>
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<td>0.5%</td>
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<td>0.3%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Clay</td>
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<td>0.0%</td>
<td>0.5%</td>
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<td>0.9%</td>
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<tr>
<td>Columbia</td>
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<td>0.3%</td>
<td>0.4%</td>
<td>1.0%</td>
<td>1.9%</td>
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</tr>
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<td>0.3%</td>
<td>0.3%</td>
<td>0.0%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Dixie</td>
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<td>8.1%</td>
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<td>0.0%</td>
<td>0.1%</td>
<td>0.4%</td>
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<td>0.5%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Flagler</td>
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<td>0.2%</td>
<td>0.5%</td>
<td>1.3%</td>
<td>2.5%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Franklin</td>
<td>0.8%</td>
<td>0.0%</td>
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## Technical Memorandum

**Projections of Florida Population by County, 2020-2070**

### Percent Errors

(Projections of Florida Population by County, 2020-2070)

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Projections of Florida 2050-2070 Population by County

State projections

Although the cohort-component method is a better way to make population projections at the state level, the information needed to apply the method such as birth rates, death rates, and migration rates for the distant future years from 2050 to 2070 is limited. A simplified method was used to develop state projections. Three different techniques were explored:

- **Linear** – the population will change by the same number of persons in each future year as the average annual change during the base period.
- **Exponential** – the population will change at the same percentage rate in each future year as the average annual rate during the base period.
- **Logarithmic** – the population will rapidly increase in size until it reaches a certain point, called the carrying capacity. At this point, the resources are not enough to support the population.

For all three techniques, the base periods of forty-seven years (1998-2045) were used to develop the state-level projections. The population data for 1998 - 2018 in one-year increment were obtained from the annual release of Florida Estimates of Population Report by BEBR, while the population data for 2020 - 2045 in five-year increment were obtained from the BEBR Projections of Florida Population by County published in April 2019. As mentioned earlier, the medium projections were used as recommended by BEBR.

This method produced three projections for each projection year (2050, 2055, 2060, 2065, 2070). After a careful review of the three projections, it was determined that the linear method produced the most reasonable state-level projections and, therefore, were used as the basis for county level population projections.

County projections

The county level population projections for 2050-2070 followed the same methodology as described in the previous section. Five (5) techniques (Linear, Exponential, Share-of-growth, shift-share, and Constant-Share) were used to produce eleven projections. Five (5) averages (AVE-11, AVE-9, AVE-7, AVE-5, and AVE-3) were calculated and different averages were used for different counties. The resulting projections were evaluated by comparing them with historical population trends for each county. Adjustments were made when the initial projections were deemed to be inconsistent with historical growth pattern prior to 2018 or BEBR projected growth trends between 2020 and 2045. Figure 1 graphically illustrates the process to develop the county-level population projections for 2050-2070.
Figure 1 2050-2070 County-Level Projection Process
The initial projections provided best fit for most of the 67 counties based on historical data. However, adjustments were needed for 25 counties (Baker, Bradford, Charlotte, Collier, Dixie, Franklin, Gadsden, Glades, Hardee, Jackson, Jefferson, Lafayette, Lake, Manatee, Marion, Monroe, Okaloosa, Osceola, Palm Beach, Pinellas, Putnam, Seminole, Suwannee, Taylor and Union) as the initial projections showed inconsistent growth patterns. The adjustments were made by conducting regression analysis using the 2018 population estimate and population projections for 2020 to 2045. Linear, Exponential, and Logarithmic techniques were used to produce additional three sets of population projections for each of the 25 counties. The average of the three projections was used for the 25 counties. A further review indicated that the resulting projections for Dixie and Union counties still showed illogical growth patterns. Therefore, further adjustment were made for the two counties based on their historical growth trends. The final projected populations by county for 2050-2070 are presented in Table 4 together with the BEBR projected populations for 2020-2045.
Technical Memorandum
Projections of Florida Population by County, 2020-2070

Table 4 Projections of Florida Population by County (2020–2070 with Estimates for 2018)
Census
County
Alachua
Baker
Bay
Bradford
Brevard
Broward
Calhoun
Charlotte
Citrus
Clay
Collier
Columbia
DeSoto
Dixie
Duval
Escambia
Flagler
Franklin
Gadsden
Gilchrist
Glades
Gulf
Hamilton
Hardee
Hendry
Hernando
Highlands
Hillsborough
Holmes
Indian River
Jackson
Jefferson
Lafayette
Lake
Lee
Leon

2010
247,336
27,115
168,852
28,520
543,376
1,748,066
14,625
159,978
141,236
190,865
321,520
67,531
34,862
16,422
864,263
297,619
95,696
11,549
46,389
16,939
12,884
15,863
14,799
27,731
39,140
172,778
98,786
1,229,226
19,927
138,028
49,746
14,761
8,870
297,052
618,754
275,487

Estimate
(BEBR)
2018
263,291
27,652
181,199
28,057
583,563
1,897,976
15,093
177,987
145,721
212,034
367,347
69,721
35,520
16,489
952,861
318,560
107,511
12,009
47,828
17,424
13,002
16,499
14,621
27,296
39,586
185,604
102,525
1,408,864
20,133
151,825
50,435
14,733
8,501
342,917
713,903
292,332

Projections (BEBR)
2020
268,300
28,300
178,500
28,600
598,500
1,942,700
14,900
183,700
148,600
220,200
382,800
71,000
36,000
16,600
981,900
324,400
112,500
12,100
48,100
17,800
13,200
16,400
14,900
27,300
40,300
191,700
104,100
1,466,800
20,300
157,200
50,200
14,900
8,700
360,700
747,400
298,300

2025
279,300
29,500
189,600
28,800
630,300
2,041,100
15,500
196,000
155,300
239,100
418,400
73,900
36,900
16,800
1,044,700
337,300
123,900
12,700
48,400
18,700
13,600
16,900
15,200
27,300
41,900
205,800
107,500
1,598,400
20,600
169,300
50,700
15,200
8,900
402,100
824,400
311,900

2030
288,600
30,600
198,200
28,900
656,300
2,120,300
15,900
206,100
161,100
255,700
449,500
76,500
37,700
16,900
1,095,200
347,600
134,400
13,100
48,500
19,400
13,900
17,300
15,300
27,400
43,200
218,300
110,300
1,708,600
20,900
179,400
51,200
15,400
9,200
437,200
892,100
322,800

2035
296,500
31,400
205,600
29,000
678,700
2,183,000
16,300
214,600
166,200
269,700
475,200
78,600
38,400
17,000
1,139,100
355,500
143,600
13,500
48,600
20,000
14,100
17,700
15,400
27,400
44,400
229,200
112,700
1,800,200
21,000
187,700
51,500
15,500
9,400
467,400
949,800
331,500
11

Projections (FDOT)
2040
303,500
32,200
211,800
29,100
698,700
2,238,300
16,700
222,100
170,200
281,700
496,800
80,300
39,000
17,100
1,177,600
362,100
151,600
13,800
48,700
20,600
14,300
18,100
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238,400
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2045
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81,800
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52,300
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Technical Memorandum
Projections of Florida Population by County, 2020-2070

12
Appendix B6. HCM Analysis Reports
### Project Information

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<th>6/19/2020</th>
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### Facility Global Input

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<tr>
<td>Density at Capacity, pc/mi/ln</td>
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</tr>
<tr>
<td>Queue Discharge Capacity Drop, %</td>
<td>7</td>
</tr>
<tr>
<td>Total Segments</td>
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<td>Time Period Duration, min</td>
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### Facility Segment Data

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<td>Basic</td>
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<td>3</td>
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<tr>
<td>2</td>
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<td>Diverge</td>
<td>1000</td>
<td>3</td>
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</tr>
<tr>
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### Facility Segment Data

#### Segment 1: Basic

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<th>Flow Rate (pc/h)</th>
<th>Capacity (pc/h)</th>
<th>d/c Ratio</th>
<th>Speed (mi/h)</th>
<th>Density (pc/mi/ln)</th>
<th>LOS</th>
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<th>Flow Rate (pc/h)</th>
<th>Capacity (pc/h)</th>
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<th>Speed (mi/h)</th>
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<td></td>
<td>F</td>
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<td>R</td>
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<td>0.973</td>
<td>0.973</td>
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<td>2000</td>
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### Facility Time Period Results

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<th>Density, veh/mi/ln</th>
<th>Travel Time, min</th>
<th>LOS</th>
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<td>8.6</td>
<td>1.60</td>
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### Facility Overall Results

- **Space Mean Speed, mi/h**: 57.6
- **Density, veh/mi/ln**: 8.6
- **Average Travel Time, min**: 1.60
- **Density, pc/mi/ln**: 8.8

### Messages

**INFORMATION 1**

Density for segment 5 in time period 1 is within 0.5 pc/mi/ln of LOS boundary. Be cautious when comparing LOS results.

### Comments
**Volume Distribution**

Volume (pc/h)

Segment

1 2 3 4 5

**Speed Distribution**

Speed Distribution

Speed (mi/h)

Segment

1 2 3 4 5

**Density Distribution**

Density Distribution

Density (pc/m/ln)

Segment

1 2 3 4 5
## Project Information

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<td>Diverge</td>
<td>Diverge</td>
<td></td>
<td>1000</td>
<td>3</td>
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<td>3</td>
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<td>1900</td>
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### Facility Segment Data

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<th>Density (pc/mi/ln)</th>
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<td>Freeway Ramp</td>
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<td></td>
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<tr>
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<td>R</td>
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#### Segment 5: Basic

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<th>Capacity (pc/h)</th>
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<th>Speed (mi/h)</th>
<th>Density (pc/mi/ln)</th>
<th>LOS</th>
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</thead>
<tbody>
<tr>
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<td>Speed, mi/h</td>
<td>Density, pc/mi/ln</td>
<td>Density, veh/mi/ln</td>
<td>Travel Time, min</td>
<td>LOS</td>
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<td></td>
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<td>12.2</td>
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**Facility Overall Results**

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**Messages**

**INFORMATION 1**
Density for segment 1 in time period 1 is within 0.5 pc/mi/ln of LOS boundary. Be cautious when comparing LOS results.

**INFORMATION 2**
Density for segment 4 in time period 1 is within 0.5 pc/mi/ln of LOS boundary. Be cautious when comparing LOS results.

**Comments**
Volume Distribution

Speed Distribution

Density Distribution

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Generated: 07/02/2020 15:34:01
EB 3 Lane_Facilities 2040.xlsx
### Facility Global Input

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jam Density, pc/mi/ln</td>
<td>190.0</td>
</tr>
<tr>
<td>Density at Capacity, pc/mi/ln</td>
<td>45.0</td>
</tr>
<tr>
<td>Queue Discharge Capacity Drop, %</td>
<td>7</td>
</tr>
<tr>
<td>Total Segments</td>
<td>6</td>
</tr>
<tr>
<td>Time Period Duration, min</td>
<td>15</td>
</tr>
</tbody>
</table>

### Facility Segment Data

<table>
<thead>
<tr>
<th>No.</th>
<th>Coded</th>
<th>Analyzed</th>
<th>Name</th>
<th>Length, ft</th>
<th>Lanes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic</td>
<td>Basic</td>
<td>EB: 3-Lane Segment before lane drop</td>
<td>1000</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Basic</td>
<td>Basic</td>
<td>EB: Begin of 2-lane segment EB</td>
<td>1500</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Diverge</td>
<td>Diverge</td>
<td>EB: Ramp to frontage road</td>
<td>1000</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Basic</td>
<td>Basic</td>
<td>EB: Between ramps</td>
<td>1900</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Merge</td>
<td>Merge</td>
<td>EB: Ramp from frontage road</td>
<td>700</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Basic</td>
<td>Basic</td>
<td>EB: Eastern most segment before A1A intersection</td>
<td>2200</td>
<td>2</td>
</tr>
</tbody>
</table>

### Facility Segment Data

#### Segment 1: Basic

<table>
<thead>
<tr>
<th>Time Period</th>
<th>PHF</th>
<th>fHV</th>
<th>Flow Rate (pc/h)</th>
<th>Capacity (pc/h)</th>
<th>d/c Ratio</th>
<th>Speed (mi/h)</th>
<th>Density (pc/mi/ln)</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.94</td>
<td>0.973</td>
<td>1990</td>
<td>6861</td>
<td>0.29</td>
<td>58.7</td>
<td>11.3</td>
<td>B</td>
</tr>
</tbody>
</table>

#### Segment 2: Basic

<table>
<thead>
<tr>
<th>Time Period</th>
<th>PHF</th>
<th>fHV</th>
<th>Flow Rate (pc/h)</th>
<th>Capacity (pc/h)</th>
<th>d/c Ratio</th>
<th>Speed (mi/h)</th>
<th>Density (pc/mi/ln)</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.94</td>
<td>0.973</td>
<td>1990</td>
<td>4800</td>
<td>0.41</td>
<td>72.1</td>
<td>13.4</td>
<td>B</td>
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</tbody>
</table>

#### Segment 3: Diverge

<table>
<thead>
<tr>
<th>Time Period</th>
<th>PHF</th>
<th>fHV</th>
<th>Flow Rate (pc/h)</th>
<th>Capacity (pc/h)</th>
<th>d/c Ratio</th>
<th>Speed (mi/h)</th>
<th>Density (pc/mi/ln)</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.94</td>
<td>0.973</td>
<td>1990</td>
<td>441</td>
<td>0.45</td>
<td>51.6</td>
<td>19.3</td>
<td>15.1</td>
</tr>
</tbody>
</table>

#### Segment 4: Basic

<table>
<thead>
<tr>
<th>Time Period</th>
<th>PHF</th>
<th>fHV</th>
<th>Flow Rate (pc/h)</th>
<th>Capacity (pc/h)</th>
<th>d/c Ratio</th>
<th>Speed (mi/h)</th>
<th>Density (pc/mi/ln)</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.94</td>
<td>0.973</td>
<td>1549</td>
<td>4574</td>
<td>0.34</td>
<td>58.0</td>
<td>13.2</td>
<td>B</td>
</tr>
</tbody>
</table>

#### Segment 5: Merge

<table>
<thead>
<tr>
<th>Time Period</th>
<th>PHF</th>
<th>fHV</th>
<th>Flow Rate (pc/h)</th>
<th>Capacity (pc/h)</th>
<th>d/c Ratio</th>
<th>Speed (mi/h)</th>
<th>Density (pc/mi/ln)</th>
<th>LOS</th>
</tr>
</thead>
</table>
### Segment 6: Basic

<table>
<thead>
<tr>
<th>Time Period</th>
<th>PHF</th>
<th>fHV</th>
<th>Flow Rate (pc/h)</th>
<th>Capacity (pc/h)</th>
<th>d/c Ratio</th>
<th>Speed (mi/h)</th>
<th>Density (pc/mi/ln)</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.94</td>
<td>0.973</td>
<td>2786</td>
<td>4574</td>
<td>0.61</td>
<td>58.2</td>
<td>23.7</td>
<td>C</td>
</tr>
</tbody>
</table>

#### Facility Time Period Results

<table>
<thead>
<tr>
<th>T</th>
<th>Speed, mi/h</th>
<th>Density, pc/mi/ln</th>
<th>Density, veh/mi/ln</th>
<th>Travel Time, min</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>58.7</td>
<td>17.3</td>
<td>16.8</td>
<td>1.60</td>
<td>B</td>
</tr>
</tbody>
</table>

#### Facility Overall Results

- **Space Mean Speed, mi/h**: 58.7
- **Average Travel Time, min**: 1.60

#### Messages

**INFORMATION 1**: Density for segment 1 in time period 1 is within 0.5 pc/mi/ln of LOS boundary. Be cautious when comparing LOS results.

#### Comments
Appendix C
Lehman Causeway Concept Plans
ROAD NO.

DATE

DESCRIPTION

REVISIONS

DATE

DESCRIPTION

MIAMI-DADE MPO

PROJECT NUMBER

WILLIAM LEHMAN CSWY

ROAD NO.

MULTI USE PATH

PROP. ROADWAY

PROP. SHOULDER

PROP. MULTIUSE PATH

EXIST. ROADWAY

PROP. BARRIER WALL

EXIST. BIKE FACILITY

MATCH LINE SHEET 7
Appendix D
Lehman Causeway Cost Estimate
Date: 12/11/2019 1:30:35 PM

FDOT Long Range Estimating System - Production
R3: Project Details by Sequence Report

Project: WILLAY-1-52-01
Letting Date: 01/2099
Description: Proposed 12' protected multi use path along the south side of the William Lehman Causeway from Biscayne Blvd. to Collins Ave.

District: 06  County: 87 MIAMI-DADE  Market Area: 13  Units: English
Contract Class: Lump Sum Project: N  Design/Build: N  Project Length: 1.670 MI
Project Manager: N/A

Version 1-P Project Grand Total $3,715,231.77
Description: Proposed 12' protected multi use path along the south side of the William Lehman Causeway from Biscayne Blvd. to Collins Ave. Mill and resurface William Lehman Causeway eastbound and eastbound perimeter road.

Sequence: 1 WDU - Widen/Resurface, Divided, Urban  Net Length: 1.670 MI  8,818 LF
Description: Restripe William Lehman Causeway from Biscayne Blvd to Collins Ave. and add 12' protected multi use path.
Special Conditions: Proposed 12' protected multi use path will be constructed on the existing shoulder for the majority of the project and one lane will be reduced in the eastbound direction. In other areas the multi use path will be constructed using new base and pavement.

EARTHWORK COMPONENT

User Input Data

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>Standard Clearing and Grubbing Limits L/R</td>
<td>0.00 / 0.00</td>
</tr>
<tr>
<td>Incidental Clearing and Grubbing Area</td>
<td>1.11</td>
</tr>
</tbody>
</table>

Alignment Number 1
Distance 1.670
Top of Structural Course For Begin Section 102.00
Top of Structural Course For End Section 102.00
Horizontal Elevation For Begin Section 100.00
Horizontal Elevation For End Section 100.00
Existing Front Slope L/R 6 to 1 / 6 to 1
Existing Median Shoulder Cross Slope L/R 4.00 % / 4.00 %
Existing Outside Shoulder Cross Slope L/R 2.00 % / 2.00 %
Front Slope L/R 6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R 4.00 % / 4.00 %
Outside Shoulder Cross Slope L/R 2.00 % / 2.00 %
Roadway Cross Slope L/R 2.00 % / 2.00 %

Pay Items

<table>
<thead>
<tr>
<th>Pay item</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Extended Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>110-1-1</td>
<td>CLEARING &amp; GRUBBING</td>
<td>1.11 AC</td>
<td>$88,705.52</td>
<td>$98,463.13</td>
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Earthwork Component Total $98,463.13

ROADWAY COMPONENT
### User Input Data

<table>
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<tr>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>Number of Lanes</td>
<td>3</td>
</tr>
<tr>
<td>Existing Roadway Pavement Width L/R</td>
<td>0.00 / 36.00</td>
</tr>
<tr>
<td>Structural Spread Rate</td>
<td>110</td>
</tr>
<tr>
<td>Friction Course Spread Rate</td>
<td>110</td>
</tr>
<tr>
<td>Widened Outside Pavement Width L/R</td>
<td>0.00 / 0.00</td>
</tr>
<tr>
<td>Widened Inside Pavement Width L/R</td>
<td>0.00 / 0.00</td>
</tr>
<tr>
<td>Widened Structural Spread Rate</td>
<td>0</td>
</tr>
<tr>
<td>Widened Friction Course Spread Rate</td>
<td>165</td>
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</table>

### Pay Items

<table>
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<tr>
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<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Extended Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>327-70-5</td>
<td>MILLING EXIST ASPH PAVT, 2&quot; AVG DEPTH</td>
<td>35,270.40</td>
<td>SY</td>
<td>$3.73</td>
<td>$131,558.59</td>
</tr>
<tr>
<td>334-1-13</td>
<td>SUPERPAVE ASPHALTIC CONC, TRAFFIC C</td>
<td>1,939.87</td>
<td>TN</td>
<td>$140.48</td>
<td>$272,512.94</td>
</tr>
<tr>
<td>337-7-83</td>
<td>ASPH CONC FC, TRAFFIC C, FC-12.5, PG 76-22</td>
<td>1,939.87</td>
<td>TN</td>
<td>$157.02</td>
<td>$304,598.39</td>
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</tbody>
</table>

### X-Items

<table>
<thead>
<tr>
<th>Pay item</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Extended Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>160-4</td>
<td>TYPE B STABILIZATION</td>
<td>4,600.00</td>
<td>SY</td>
<td>$5.90</td>
<td>$27,140.00</td>
</tr>
<tr>
<td>Comment:</td>
<td>Type &quot;B&quot; Stabilization 14' in width X the length of multi use path not available on the existing shoulder (0.56 miles)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>285-701</td>
<td>OPTIONAL BASE, BASE GROUP 01</td>
<td>3,942.00</td>
<td>SY</td>
<td>$19.32</td>
<td>$76,159.44</td>
</tr>
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<td>Comment:</td>
<td>Optional base group one, 12' in width X multi use path not available on the existing shoulder (0.56 miles)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>327-70-5</td>
<td>MILLING EXIST ASPH PAVT, 2&quot; AVG DEPTH</td>
<td>8,682.00</td>
<td>SY</td>
<td>$3.73</td>
<td>$32,383.86</td>
</tr>
<tr>
<td>Comment:</td>
<td>Mill existing southern William Lehman perimeter road from W Country Club Dr to 500' east of on ramp. On/exit ramp(eastbound) included. (20' avg pmvmt width x 0.74 miles)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>334-1-13</td>
<td>SUPERPAVE ASPHALTIC CONC, TRAFFIC C</td>
<td>478.00</td>
<td>TN</td>
<td>$140.48</td>
<td>$67,149.44</td>
</tr>
<tr>
<td>Comment:</td>
<td>Proposed superpave asphalt for southern Will-Leh perimeter road from W Country Club Dr to 500' east of on ramp. On/exit ramps(eastbound) included. (20' avg pmvmt x 0.74 miles)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>337-7-83</td>
<td>ASPH CONC FC, TRAFFIC C, FC-12.5, PG 76-22</td>
<td>478.00</td>
<td>TN</td>
<td>$157.02</td>
<td>$75,055.56</td>
</tr>
<tr>
<td>Comment:</td>
<td>Proposed Friction course asphalt for southern Will-Leh perimeter road from W Country Club Dr to 500' east of on ramp. On/exit ramps(eastbound) included. (20' avg pmvmt x 0.74 miles)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>339-1</td>
<td>MISCELLANEOUS ASPHALT PAVEMENT</td>
<td>395.00</td>
<td>TN</td>
<td>$270.06</td>
<td>$106,673.70</td>
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<tr>
<td>Comment:</td>
<td>2&quot; of 100 lb/cy per inch asphalt for 12' multiuse path X multi use path not available on existing shoulder (0.56)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>521-72-40</td>
<td>SHLDR CONC BARRIER, 38&quot; OR 44&quot; HEIGHT</td>
<td>8,518.00</td>
<td>LF</td>
<td>$209.23</td>
<td>$1,782,221.14</td>
</tr>
<tr>
<td>Comment:</td>
<td>Concrete barrier to separate traffic lanes from 12' multi use path</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pavement Marking Subcomponent

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include Thermo/Tape/Other</td>
<td>N</td>
</tr>
<tr>
<td>Pavement Type</td>
<td>Asphalt</td>
</tr>
<tr>
<td>Solid Stripe No. of Paint Applications</td>
<td>2</td>
</tr>
<tr>
<td>Solid Stripe No. of Stripes</td>
<td>4</td>
</tr>
<tr>
<td>Skip Stripe No. of Paint Applications</td>
<td>2</td>
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<tr>
<td>Skip Stripe No. of Stripes</td>
<td>1</td>
</tr>
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Pay Items

<table>
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<tr>
<th>Pay item</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Extended Amount</th>
</tr>
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<tbody>
<tr>
<td>706-1-1</td>
<td>RAISED PAVMT MARK, TYPE B W/O FINAL SURF</td>
<td>451.00</td>
<td>EA</td>
<td>$25.14</td>
<td>$11,338.14</td>
</tr>
<tr>
<td>710-11-101</td>
<td>PAINTED PAVT MARK,STD,WHITE,SOLID,6&quot;</td>
<td>13.36</td>
<td>GM</td>
<td>$784.13</td>
<td>$10,475.98</td>
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<tr>
<td>710-11-131</td>
<td>PAINTED PAVT MARK,STD,WHITE,SKIP, 6&quot;</td>
<td>3.34</td>
<td>GM</td>
<td>$374.29</td>
<td>$1,250.13</td>
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</table>

Roadway Component Total

$2,902,050.71

SHOULDER COMPONENT

User Input Data

<table>
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<tr>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Existing Total Outside Shoulder Width L/R</td>
<td>0.00 / 10.00</td>
</tr>
<tr>
<td>New Total Outside Shoulder Width L/R</td>
<td>0.00 / 7.25</td>
</tr>
<tr>
<td>Total Outside Shoulder Perf. Turf Width L/R</td>
<td>0.00 / 5.00</td>
</tr>
<tr>
<td>Sidewalk Width L/R</td>
<td>0.00 / 0.00</td>
</tr>
</tbody>
</table>

Pay Items

<table>
<thead>
<tr>
<th>Pay item</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Extended Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>570-1-1</td>
<td>PERFORMANCE TURF</td>
<td>4,898.67</td>
<td>SY</td>
<td>$1.57</td>
<td>$7,690.91</td>
</tr>
</tbody>
</table>

X-Items

<table>
<thead>
<tr>
<th>Pay item</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Extended Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>104-10-3</td>
<td>SEDIMENT BARRIER</td>
<td>8,817.00</td>
<td>LF</td>
<td>$2.25</td>
<td>$19,838.25</td>
</tr>
</tbody>
</table>

Comment: For constructible length (1.67 miles)

Erosion Control

Pay Items

<table>
<thead>
<tr>
<th>Pay item</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Extended Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>104-11</td>
<td>FLOATING TURBIDITY BARRIER</td>
<td>1,750.00</td>
<td>LF</td>
<td>$13.93</td>
<td>$24,377.50</td>
</tr>
<tr>
<td>104-18</td>
<td>INLET PROTECTION SYSTEM</td>
<td>30.00</td>
<td>EA</td>
<td>$109.43</td>
<td>$3,282.90</td>
</tr>
<tr>
<td>Pay Items</td>
<td>Description</td>
<td>Quantity</td>
<td>Unit</td>
<td>Unit Price</td>
<td>Extended Amount</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------------------------</td>
<td>----------</td>
<td>------</td>
<td>------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>700-1-11</td>
<td>SINGLE POST SIGN, F&amp;I GM, &lt;12 SF</td>
<td>37.00</td>
<td>AS</td>
<td>$339.70</td>
<td>$12,568.90</td>
</tr>
<tr>
<td>700-1-12</td>
<td>SINGLE POST SIGN, F&amp;I GM, 12-20 SF</td>
<td>4.00</td>
<td>AS</td>
<td>$1,080.97</td>
<td>$4,323.88</td>
</tr>
<tr>
<td>700-1-50</td>
<td>SINGLE POST SIGN, RELOCATE</td>
<td>4.00</td>
<td>AS</td>
<td>$287.52</td>
<td>$1,150.08</td>
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<tr>
<td>700-1-60</td>
<td>SINGLE POST SIGN, REMOVE</td>
<td>37.00</td>
<td>AS</td>
<td>$22.95</td>
<td>$849.15</td>
</tr>
<tr>
<td>700-2-14</td>
<td>MULTI- POST SIGN, F&amp;I GM, 31-50 SF</td>
<td>2.00</td>
<td>AS</td>
<td>$4,738.95</td>
<td>$9,477.90</td>
</tr>
<tr>
<td>700-2-60</td>
<td>MULTI- POST SIGN, REMOVE</td>
<td>2.00</td>
<td>AS</td>
<td>$569.31</td>
<td>$1,138.62</td>
</tr>
</tbody>
</table>

**Sequence 1 Total**  
$3,085,211.93
Date: 12/11/2019  1:30:36 PM

FDOT Long Range Estimating System - Production
R3: Project Details by Sequence Report

Project: WILLAY-1-52-01  Letting Date: 01/2099

Description: Proposed 12' protected multi use path along the south side of the William Lehman Causeway from Biscayne Blvd. to Collins Ave.

District: 06  County: 87 MIAMI-DADE  Market Area: 13  Units: English
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Project Manager: N/A

Version 1-P Project Grand Total  $3,715,231.77

Description: Proposed 12' protected multi use path along the south side of the William Lehman Causeway from Biscayne Blvd. to Collins Ave. Mill and resurface William Lehman Causeway eastbound and eastbound perimeter road.

Project Sequences Subtotal  $3,085,211.93

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Project Sequences Total  $3,665,231.77

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Non-Bid Components:

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Project Non-Bid Subtotal  $50,000.00

Version 1-P Project Grand Total  $3,715,231.77
Appendix E
SR A1A Shared Bike-Bus Lane Concept Plans
PROPOSED DEDICATED BUSWAY

ROAD NO.  A1A DEDICATED BUSWAY

PROJECT NUMBER

MIAMI-DADE MPO

5

DATE  DESCRIPTION  DATE  DESCRIPTION

03/03/19  2/18/19  0/3/01  3/03/00

3500

4500

5000

Foot

10  20  30  40  50

EXIST. ROADWAY

PROP. BUS ONLY RAMP

TYPICAL SECTION CONTINUES

SR-826 ON RAMP

SR-826 ON RAMP

SR-826 ON RAMP

SR-826 ON RAMP

SR-826 ON RAMP

SR-826 ON RAMP

SR-826 ON RAMP
PROPOSED DEDICATED BUSWAY

ROAD NO.: A1A DEDICATED BUSWAY
PROJECT NUMBER: A1A DEDICATED BUSWAY

MELAY-DADE MPO

EXIST. ROADWAY
PROP. BUS ONLY LANE

MALLORI INLET

ROAD NO.
A1A

11

SHEET

DATE DESCRIPTION

DATE DESCRIPTION

12/16/2019
JENS6760

3:05:10 PM

O:\Projects\A1A Dedicated Busway\CADD\roadway\PLANRD01.dgn
PROPOSED DEDICATED BUSWAY

ROAD NO.: A1A DEDICATED BUSWAY
PROJECT NUMBER: MIAMI-DADE MPO

PROPOSED DEDICATED BUSWAY

REVISIONS

Sheets: 21
ROAD NO. D A T E

REVISIONS

PROJECT NUMBER

MIAMI-DADE MPO

ROAD NO.

A1A DEDICATED BUSWAY

PROP. ROADWAY

PROP. BUS ONLY LANE

PROP. MEDIAN

PROP. SOD/LANDSCAPING

EXIST. ROADWAY

EXIST. LANDSCAPING

PROPOSED DEDICATED BUSWAY

50

0 10

Feet

12/16/2019

3:05:14 PM
PROPOSED DEDICATED BUSWAY

MIAMI-DADE MPO

ROAD NO. PROJECT NUMBER
A1A DEDICATED BUSWAY

DATE DESCRIPTION DATE DESCRIPTION

50 Feet

PROPOSED DEDICATED BUSWAY

EXIST ROADWAY
PROP MEDIAN
PROP BUS ONLY LANE
PROP. ROADWAY
PROP. SOD/LANDSCAPING
EXIST LANDSCAPING