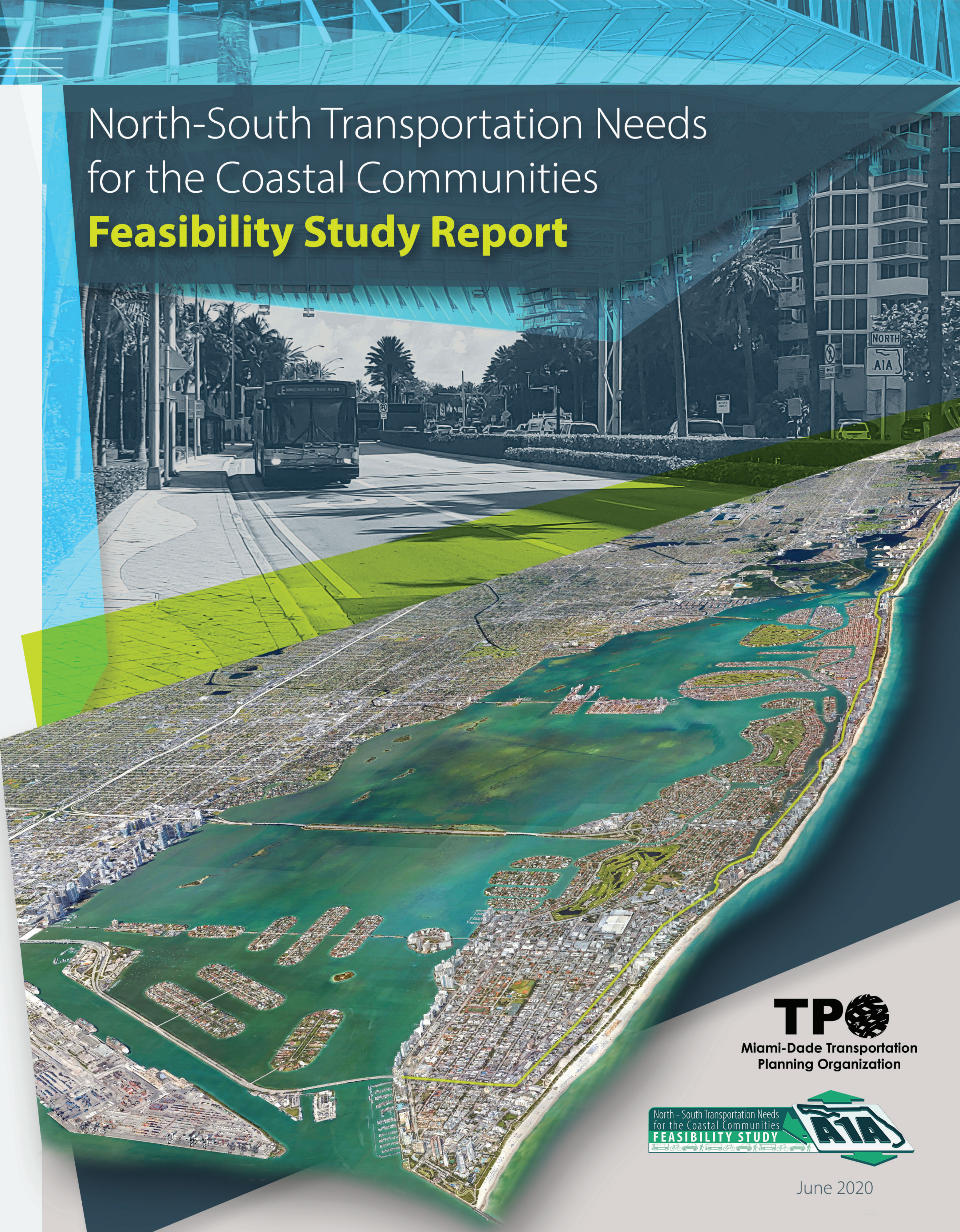
North-South Transportation Needs for the Coastal Communities

Feasibility Study Report



TPO
Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities
FEASIBILITY STUDY
A1A

June 2020

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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June 2020

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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.

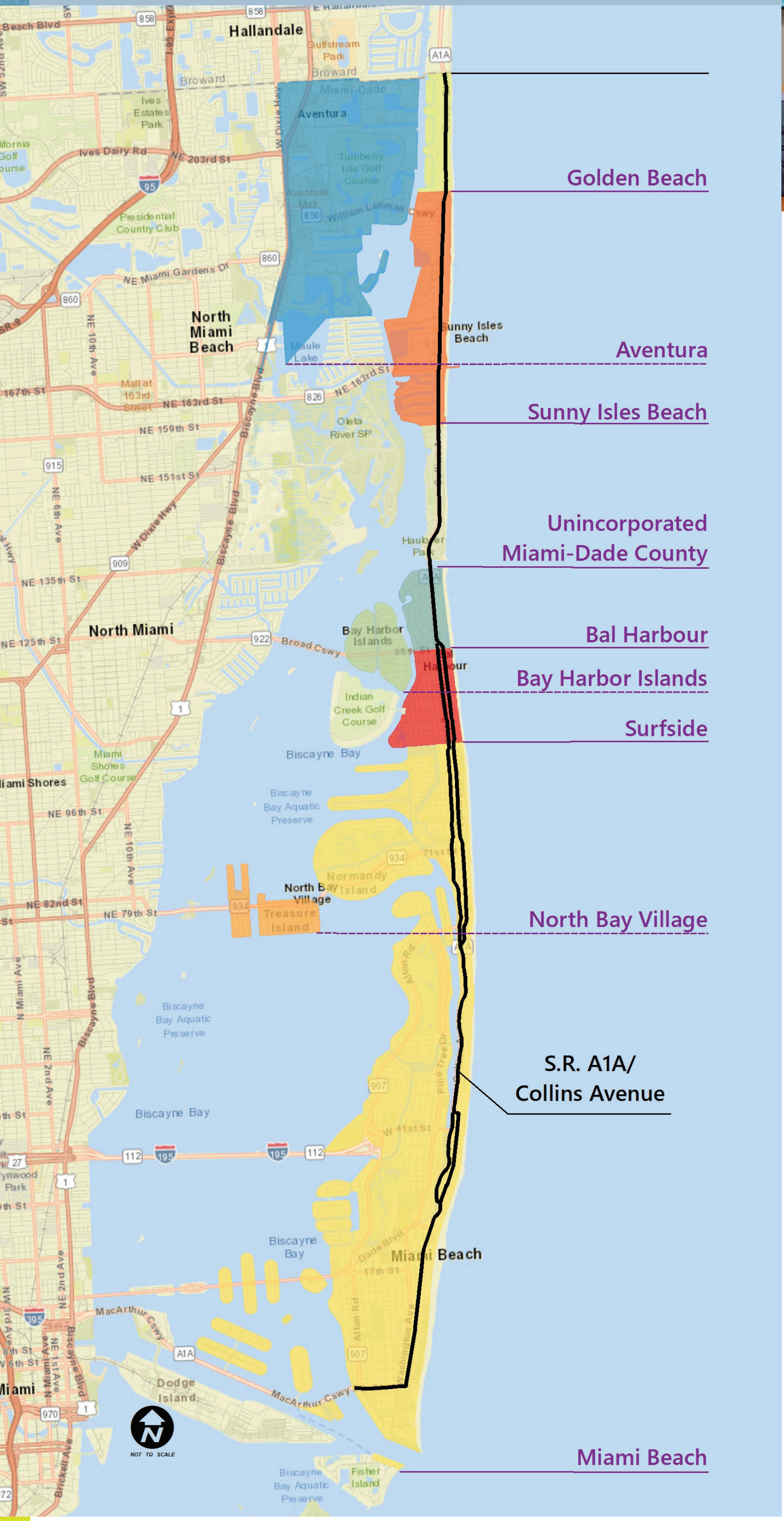


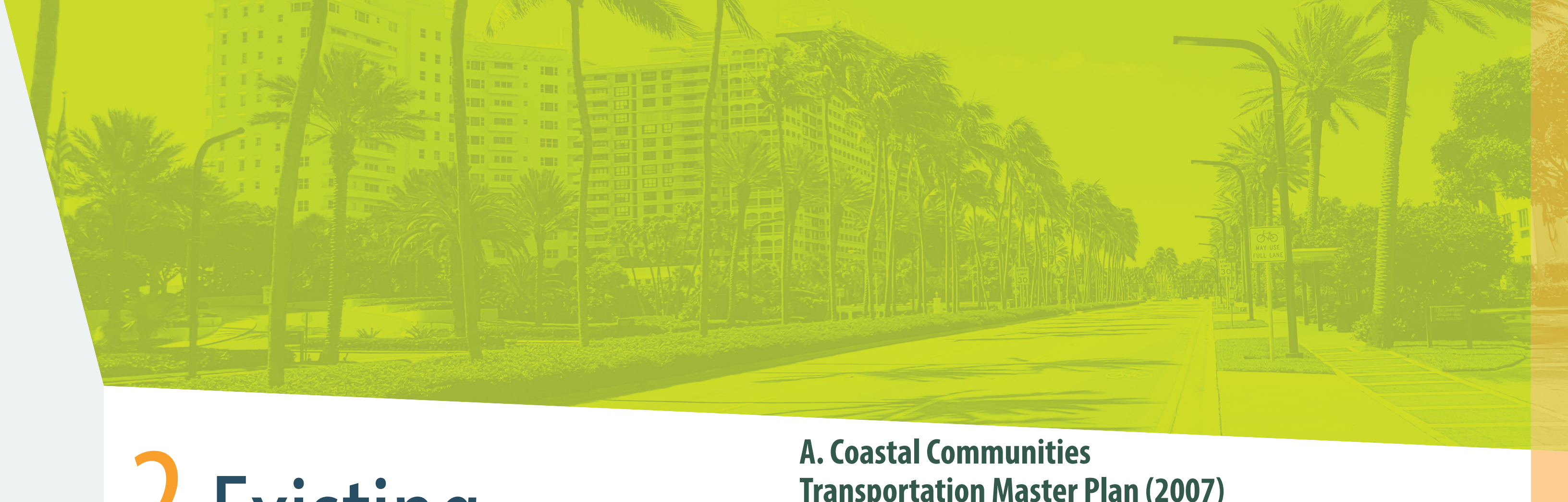
Figure 1-1 Coastal Communities Study Area

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 Transportation 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 northeastern 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.

- Agency Meeting presentations to the Transportation Planning Committee (TPC), Transportation Planning Technical Advisory Committee (TPTAC) and MPO Board.

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

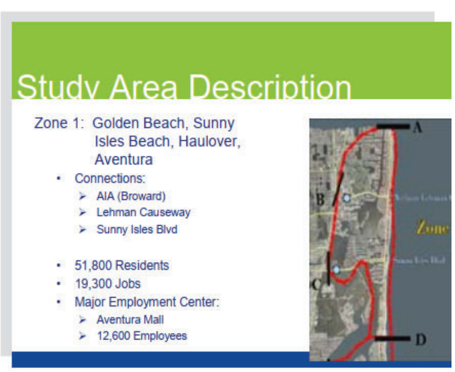
The study conclusions are summarized below:

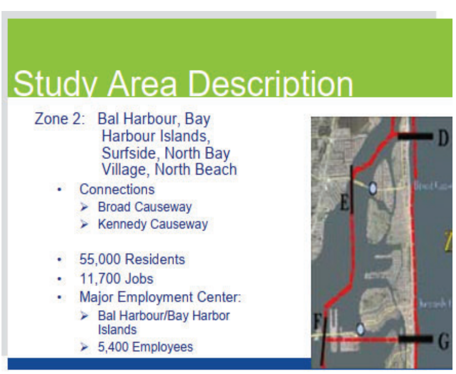
- Sub regional trip making in the study area is occurring but not the primary cause of congestion.
- Drivers tend to enter or exit the system on the causeway closest to their beach origin or destination.
- East/West movement is the most prevalent.
- Traffic is a product of the existing density, diverse 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.

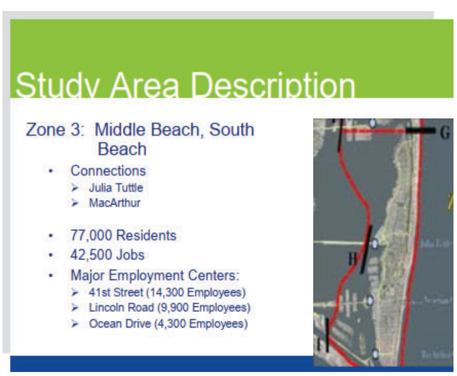
A total of 49 projects were developed for the project bank. Those projects were prioritized within four categories (alternative mode improvements, corridor enhancements, capacity projects, and policy projects). Following is a summary of key recommendations from the study.

- 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 circulatiors, 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.

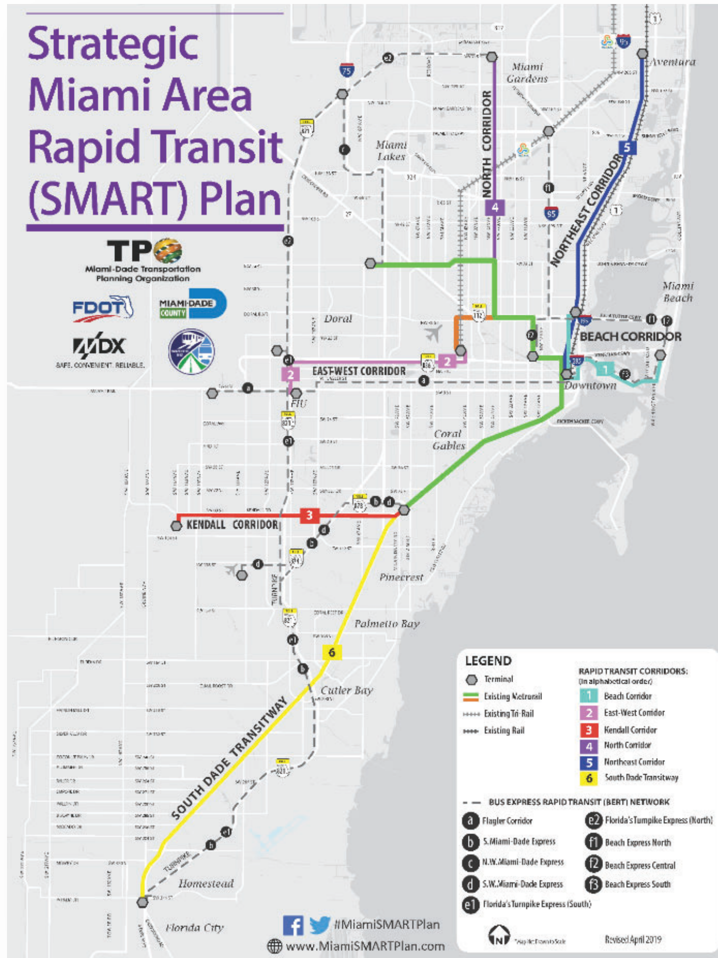
The SMART Plan intends to advance six of the PTP's rapid transit corridors, along with a network system of Bus Express Rapid Transit (BERT) service, in order to implement mass transit projects in Miami-Dade County. To ensure the SMART Plan moves forward, the TPO Governing Board directed the Miami-Dade 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, Metrobus 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 the 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.

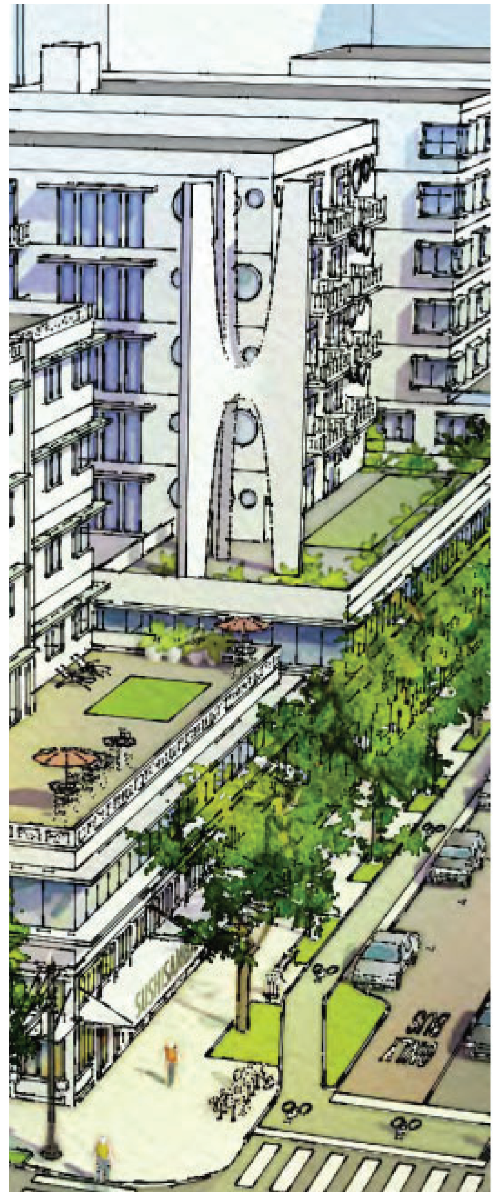
The North Beach study area is characterized by a mix of single-family, multi-family, low- and high-rise condominiums, as well as a mix of neighborhood parks, a golf course, the North Shore Open Space Park, hotels, access to Biscayne Bay, and two miles of beachfront. It includes the neighborhoods or sections 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.

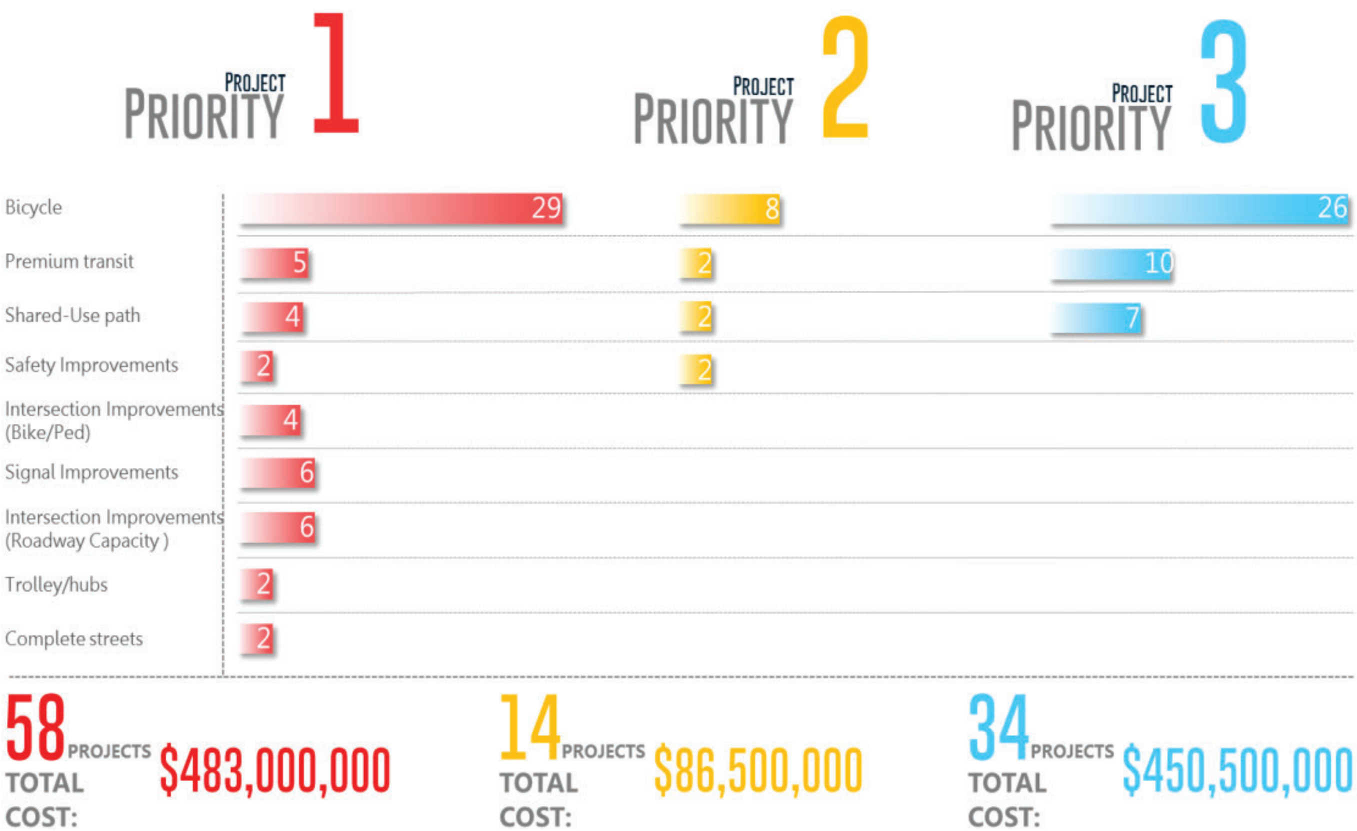


Table 1: Key Priority Projects from Miami Beach Transportation Master Plan

Project No.	Project Name	City Area	Project Type	From
Priority 1 Projects				
1	SR A1A / MacArthur Causeway Complete Streets Feasibility Study	South	Multimodal	Downtown
2	Miami Beach Light Rail/Modern Street Car	South	Multimodal	S. Pointe Drive & SR A1A/5th Street
18	SR A1A / 5th Street and SR 907 / Alton Road Intersection Improvements	South	Bike/Ped	N/A
20	SR A1A / MacArthur Causeway and SR A1A / 5th Street's Feasibility Study of Adaptive Signal Controls	South	Roadway	Fountain Street
23	SR A1A / Indian Creek Drive Bicycle/Pedestrian Safety Improvements	Middle	Roadway	26th Street
24	Intersection of SR A1A / Indian Creek Drive and 63rd Street and SR A1A / Abbott Avenue's Feasibility Study of Intersection Improvements	North	Roadway	N/A
27	SR 112 / Julia Tuttle Causeway s Feasibility Study	Middle	Multimodal	US-1 / Biscayne Blvd
29	SR 907 / Alton Road; SR 112 / 41st Street; SR A1A / Indian Creek Drive / Collins Avenue; Dade Boulevard Proposed Middle Beach	Middle	Transit	Sullivan Drive (Mt. Sinai Medical Center Entrance); SR 907 / Alton Road; SR 112 / 41st Street
30	SR A1A / Collins Avenue and Indian Creek Drive Signal Optimization Study	North	Roadway	SR 907 / 63rd Street
33	Middle Beach Intermodal Station	Middle	Multimodal	N/A
34	SR 112 / Julia Tuttle Cswy Westbound Ramp	Middle	Roadway	Mount Sinai Hospital
37	Middle Beach Recreational Corridor	Middle	Bike/Ped	SR A1A / Collins Avenue BLK 4700
38	SR A1A / Collins Avenue / Indian Creek Drive and SR 112 / 41st Street's Intersection Safety Study and Improvements	Middle	Roadway	N/A
50	South Beach Pedestrian Priority Zones	South	Bike/Ped	N/A

To	Project Length (Miles)	Project Description
Collins Avenue	3.8	Review of design alternatives for exclusive transit lanes and bicycle lanes long MacArthur Causeway (Phase I)
Washington Avenue & Dade Boulevard	4.55 (Rail Lane) and 4.70 (Protected Bike Lanes)	Exclusive transit and protected/buffered bicycle lanes (Lane repurposing and/or roadway widening)
N/A	N/A	Provide Enhanced Crosswalks and improved sidewalk crossings.
Washington Avenue	2	Feasibility Study of Adaptive Signal Controls
SR 112 / 41st Street	0.9	Safety Improvements
N/A	N/A	Feasibility Study of Intersection Improvements
SR 907 / Alton Road	3.18	Feasibility study for Shared Path, Protected Bike lanes, and Exclusive Bus lanes
SR 112 / 41st Street; SR A1A / Indian Creek Drive / Alton Road; Dade Boulevard; 17th Street	6.4 (Total Distance of One Loop)	Trolley Route from Mt. Sinai Medical Center servicing Mid and South Beach
SR 934 / 71st Street	0.79	Signal Optimization Feasibility Study on SR A1A
N/A	N/A	Develop an Intermodal Station to provide multi-modal transfers
SR 112 / Julia Tuttle Causeway	0.25	Westbound on ramp to SR 112 / Julia Tuttle from Mount Sinai Hospital
SR A1A / Collins Avenue BLK 5400	0.8	Connect the North and South existing Beachwalk segments
N/A	N/A	Intersection Safety Study and Improvements
N/A	N/A	Designation and formalization of Pedestrian Priority Zones (PPZ)

Table 1: Key Priority Projects from Miami Beach Transportation Master Plan (Continued)

Project No.	Project Name	City Area	Project Type	From
Priority 2 Projects				
2	SR A1A / Collins Avenue / Indian Creek Drive Exclusive transit and protected/buffered bicycle lanes	South Middle	Transit/Bike & Ped	17th Street
10	44th Street AND SR A1A / Collins Avenue Safety Feasibility Study	Middle	Bike/Ped	44th Street
Priority 3 Projects				
1	SR A1A / Collins Avenue Protected/buffered bicycle lanes	South	Bike/Ped	South Pointe Drive
3	SR A1A Collins Avenue Exclusive transit lanes	Middle	Transit	44th Street
4	SR A1A Collins Avenue / Indian Creek Drive Exclusive transit and protected/buffered bicycle lanes	Middle / North	Transit/Bike/Ped	SR A1A Collins Avenue / Indian Creek Drive Split
5	SR 934 / 79th Street Causeway Exclusive transit, Shared Uses Path, and protected/buffered bicycle lanes	North	Transit/Bike/Ped	US 1 / Biscayne Boulevard
12	Washington Avenue Exclusive transit and protected/buffered bicycle lanes	South	Transit	South Pointe Drive
13	Venetian Causeway Conventional Bike Lanes	South	Bike/Ped	US 1 / Biscayne Boulevard
21	SR A1A Collins Avenue / Indian Creek Drive / Harding Avenue Exclusive transit lanes and Protected Bicycle Lanes	Middle / North	Transit	SR A1A Collins Avenue / Indian Creek Drive Split
25	SR A1A / MacArthur Causeway Light Rail Connection/ Shared-Use Path	South	Transit/Bike&Ped	US 1 / Biscayne Boulevard
27	SR 112 / Julia Tuttle Causeway Exclusive Transit Lane/Shared-Use Path	Middle	Multimodal	US-1 / Biscayne Blvd
28	SR A1A/ Indian Creek Drive Protected Bicycle Lanes	North	Bike/Ped	Abbott Avenue

To	Project Length (Miles)	Project Description
44th Street	2.76	Exclusive transit and protected/buffered bicycle lanes (Lane repurposing and/or roadway widening), Enhanced crosswalks
SR A1A / Collins Avenue	N/A	Safety Feasibility Study
17th Street	1.68	Protected/buffered bicycle lanes (Lane repurposing and/or roadway widening) Enhanced crosswalks
SR A1A Collins Avenue / Indian Creek Drive Split	2	Exclusive transit lanes (Lane repurposing)
SR 934 / 71st Street	2.05	Exclusive transit and protected/buffered bicycle lanes (Lane repurposing and/or roadway widening),
Bay Drive	2.67	Exclusive transit, Shared Uses Path, and protected/buffered bicycle lanes (Lane repurposing and/or roadway widening),
SR A1A / 5th Street	0.44	Exclusive transit and protected/buffered bicycle lanes (Lane repurposing and/or roadway widening), Enhanced crosswalks
West Avenue	3.21	Conventional Bike Lanes(Lane repurposing and/or roadway widening) Enhanced crosswalks
88th Street	4.36	Exclusive transit lanes (Lane repurposing) and protected Bicycle Lanes along Harding Avenue
SR 907 / Alton Road	3.41	Light Rail Connection across the Bay/ Protected Bicycle Lanes (Lane repurposing and/or roadway widening), Enhanced crosswalks
SR 907 / Alton Road	3.18	Exclusive Transit Lane and Shared-Use Path. This project required extensive bridge work.
Dickens Avenue	0.33	Protected Bicycle Lanes (Lane repurposing and/or roadway widening)

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 2: FDOT District 6 Five-Year Work Program (Years 2019 – 2024)

ID	Name	From	To	Work Type	Phase	Year	Cost
430813-2	SR A1A/Collins Avenue and Indian Creek Drive	5800 Block	SR 907/63 Street	Resurfacing	PE	2020	$262,000
430949-1	SR A1A/Collins Avenue	Bayview Drive	SR 856/192 Street	Resurfacing	CST	2019	($491,287
					Contract Incentives	2019	($170,000
430949-2	SR A1A/Collins Avenue	North of Haulover Inlet	South of Bay-view Drive	Resurfacing	PE	2019	$778,436
					CST	2022	$5.56 million
434773-3	SR A1A/Collins Avenue	4700 Block	5800 Block	Planning	Planning	2020	$300,000
441886-1	SR A1A/Collins Avenue	at 36th, 83rd and 87th Streets		Pedestrian safety im-provements	PE	2019	$187,758
					ROW	2020	$82,450
					CST	2023	$691,909
422713-2	Venetian Causeway	North Bayshore Drive	Purdy Avenue	PD&E/EMO Study	PD&E/EMO	2019	$616,542
443432-1	SR A1A/Macarthur Causeway	SR-5/Biscayne Blvd	SR-997/Alton Road	Bike path/trail	PE	2019	$25,000
					CST	2020	$715,562
444622-1	SR 112/I-195/Julia Tuttle Causeway	E. of SR-5/ Biscayne Blvd	Alton Road	Miscellaneous construction	PE	2020	$460,000
					CST	2022	$4.26 million

Information on the tentative 2020-2025 FDOT District 6 Five-Year Work Program can be found here:
https://fdotewp1.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**:

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.

Table 3: Miami-Dade County TIP Fiscal Years 2019/2020 to 2023/2024

ID	Name	From	To	Work Type	Phase	Year	Cost
DT4408411	Northshore Boardwalk	79th Street	87th Terrace	Bike-Ped/ Trail	CST	2022	$3.0 million
TAMDT287	Beach Corridor (from SMART Plan)	Midtown Miami (at or near NE 41st Street and NE 2nd Avenue)	Transit Hub Connector (near 5th Street & Alton Road)	Transit	PD&E	2020	$3.0 million
DT4291931	SR 907/Alton Road	Michigan Avenue	S of Ed Sullivan Drive/43rd Street	Flexible pavement reconstruction	CST	2021	$25.5 million
					Alternative Contract Incentives	2022	$1.1 million
DT4304441	SR 907/Alton Road	S of 43rd Street	N of West 48th Street	Flexible pavement reconstruction	CST	2022	$17.9 million
					Right of Way	2020 thru 2021	$2.8 million
					Alternative Contracting Incentives	2022	$700,000
DT4304442	SR 907/Alton Road	N of West 48th Street	E of Allison Road	Flexible pavement reconstruction	Railroad and Utilities	2021	$5.0 million
					CST	2021	$30.0 million
DT4309492	SR A1A/Collins Avenue	Haulover Inlet	S of Bayview Drive	Resurfacing	CST	2022	$5.6 million
DT4416461	City of Sunny Isles Beach – Government Center/Beach Access Pedestrian Bridge				CST	2021	$4.5 million
DT4418861	SR A1A/Collins Avenue	at 36th, 63rd, and 87th Streets		Pedestrian safety improvements	CST	2023	$700,000

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

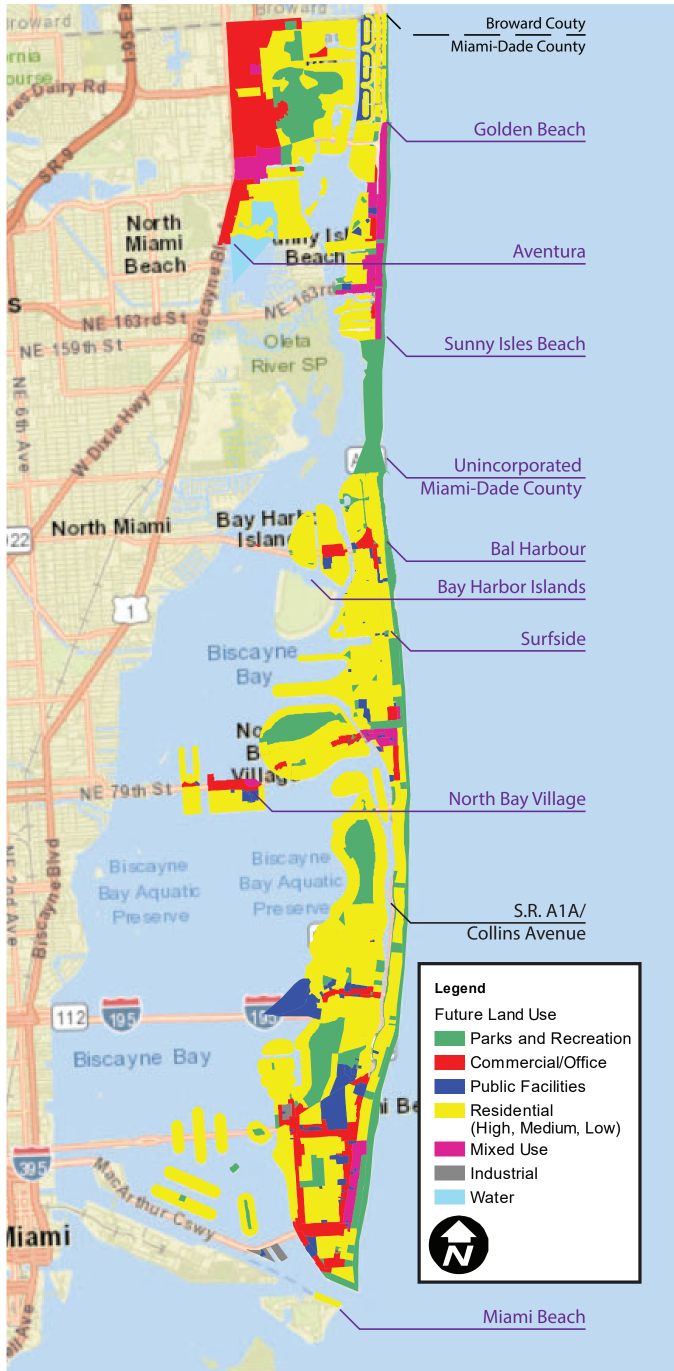
A. Existing and Future Land Uses

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

Existing Land Use	Cumulative Percentage
Residential	**54%**
- Low Density	29%
- Med Density	23%
- High Density	2%
Commercial	**24%**
Recreational	**20%**
Conservation	**1%**

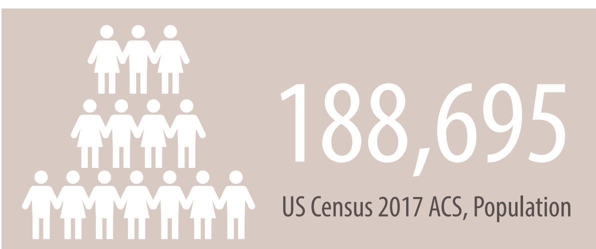
Figure 2 -1 Future Land Use

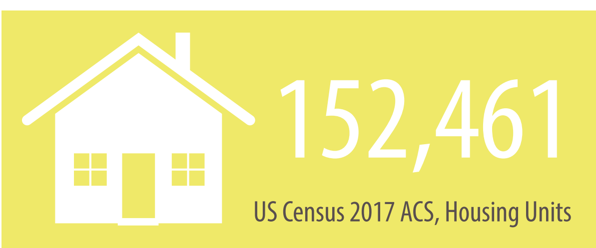


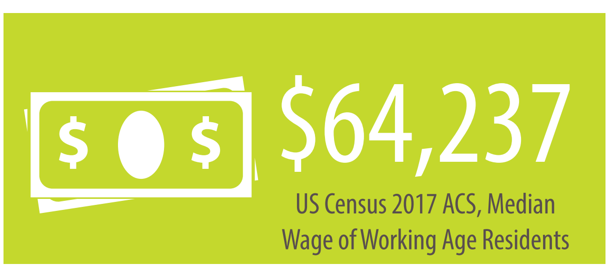
B. Population and Employment

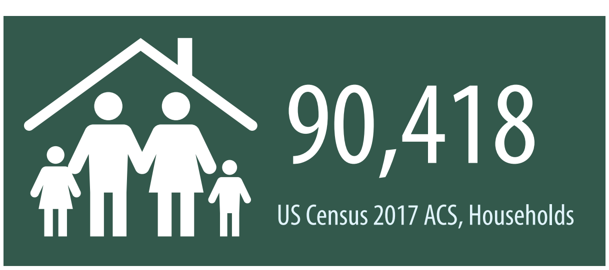
Population and employment data were compiled using the US Census American Community Survey (ACS) 2017 data sets. The results are summarized as follows and displayed in **Figures 2-2** through **2-18:**

- 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 earns 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.

Travel Mode						
Total	68,840	9,196	6,899	6,300	2,517	3,407
Percent	71%	9%	7%	6%	3%	4%

US Census 2017 ACS, Mode of Travel to Work

Coastal Communities Generations Defined

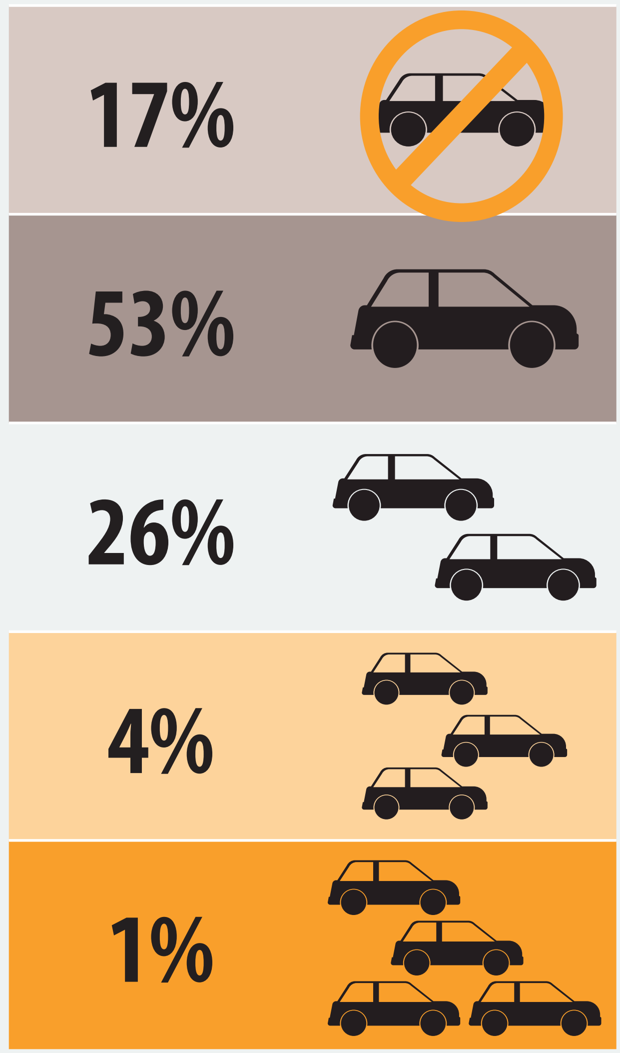
The Millennial Generation
Born: After 1980
Age in 2017: 20 to 36
Share of adult population: 33%

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

The Baby 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%



US Census 2017 ACS, Zero Car Households

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

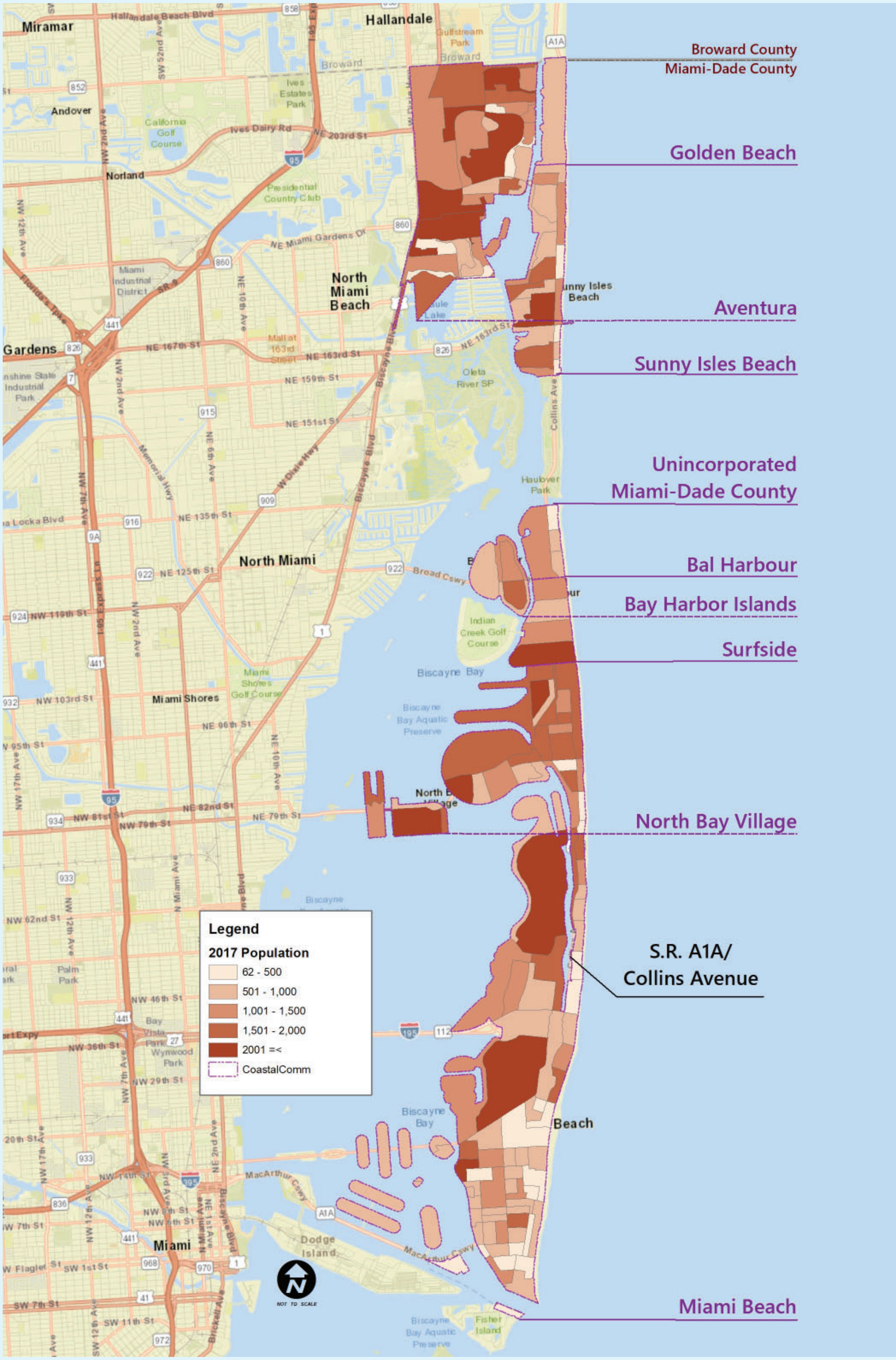


Figure 2-3 Median Age, 2017

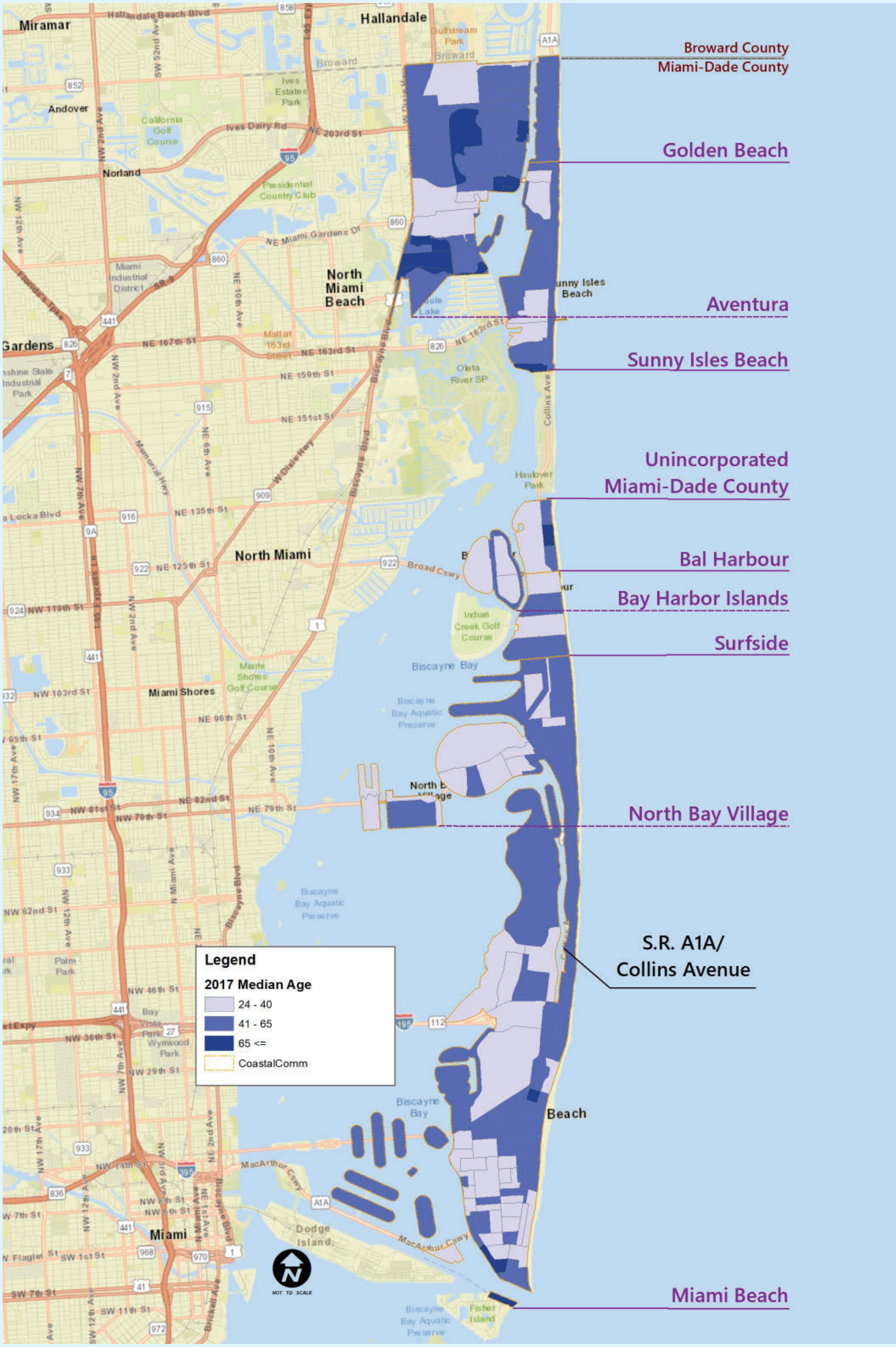


Figure 2-4 Population 65 and Over, 2017

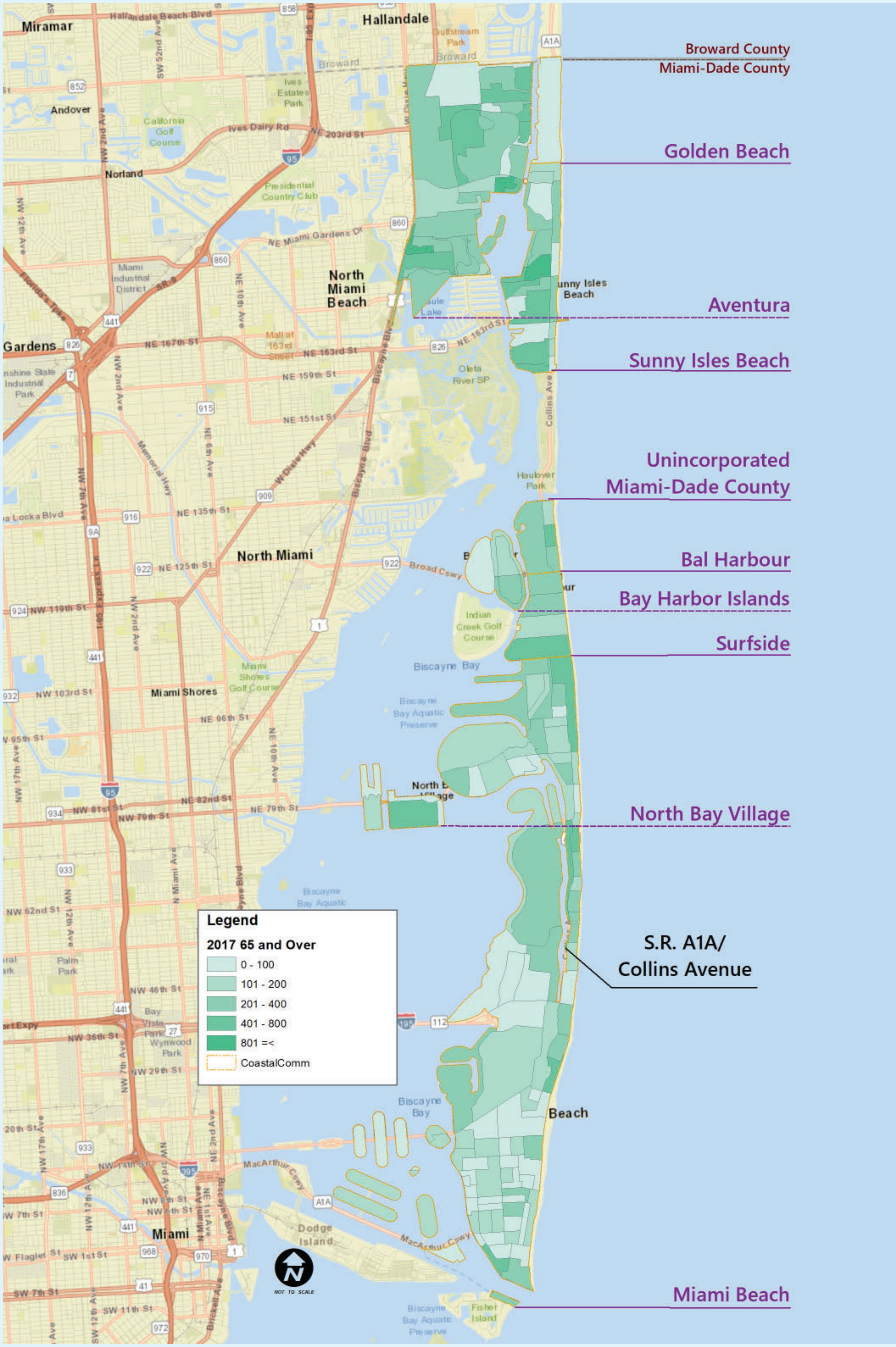


Figure 2-5 Median Household Income, 2017

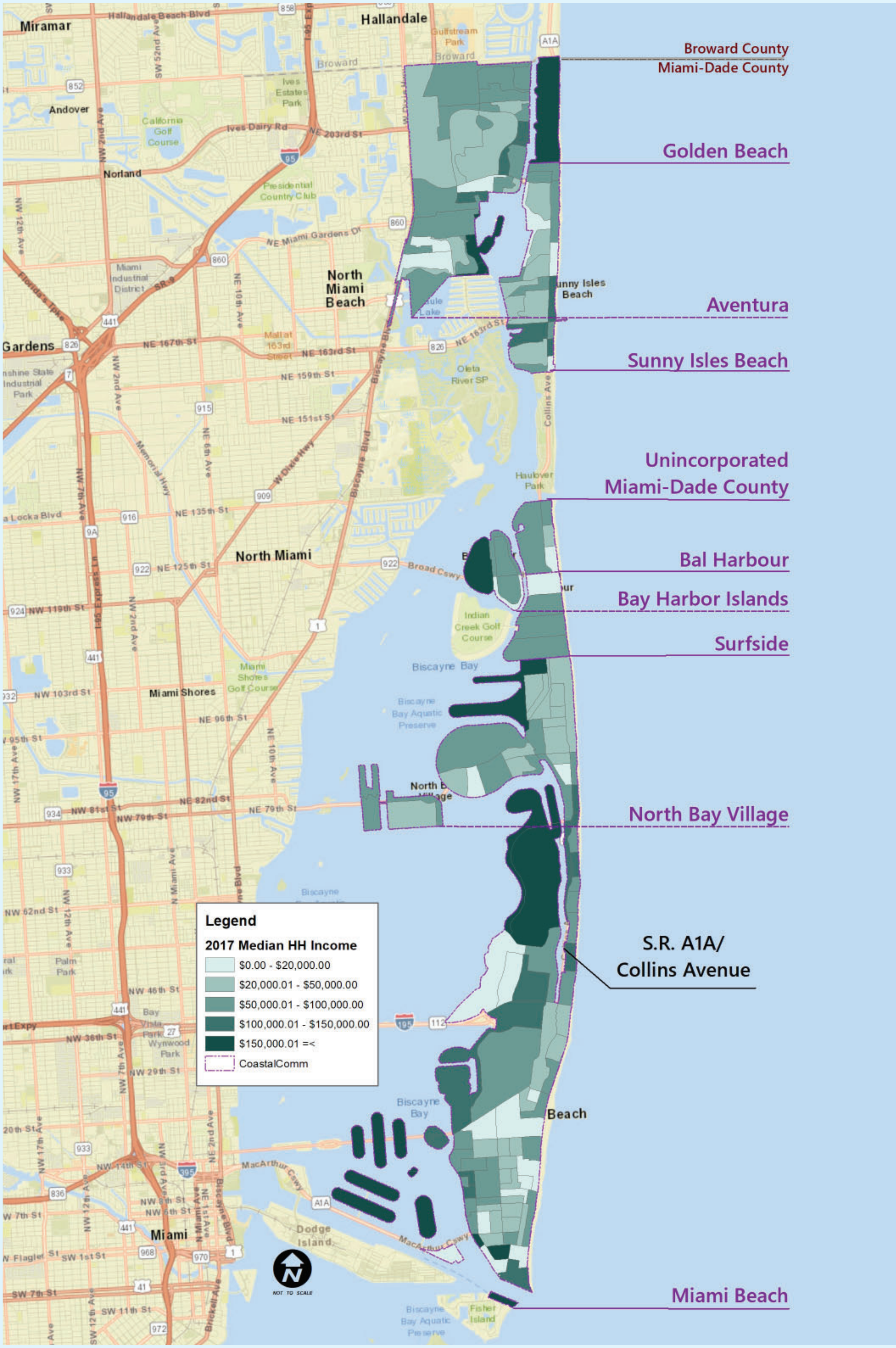


Figure 2-6 Poverty, 2017

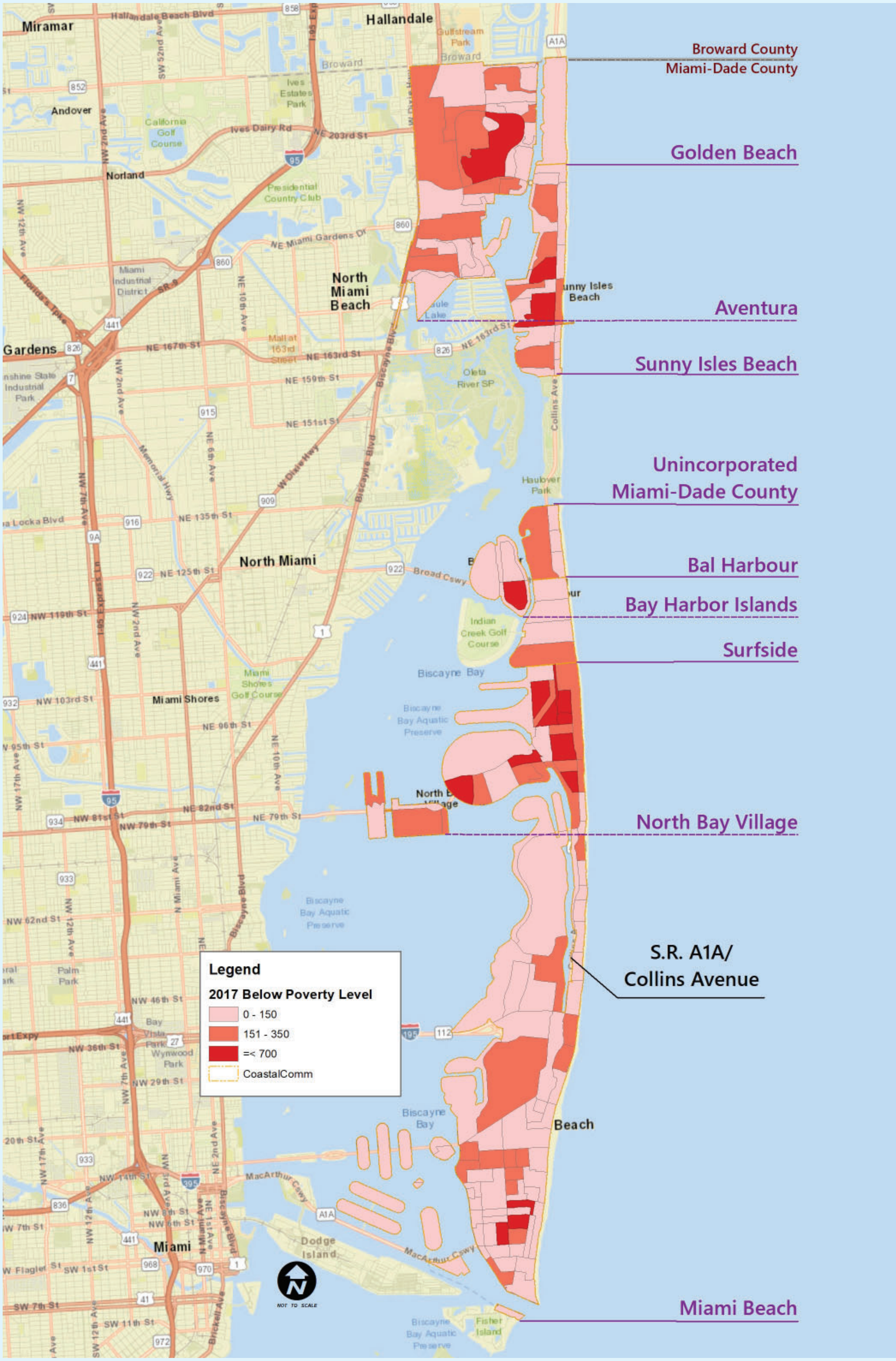


Figure 2-7 No High School Degree, 2017

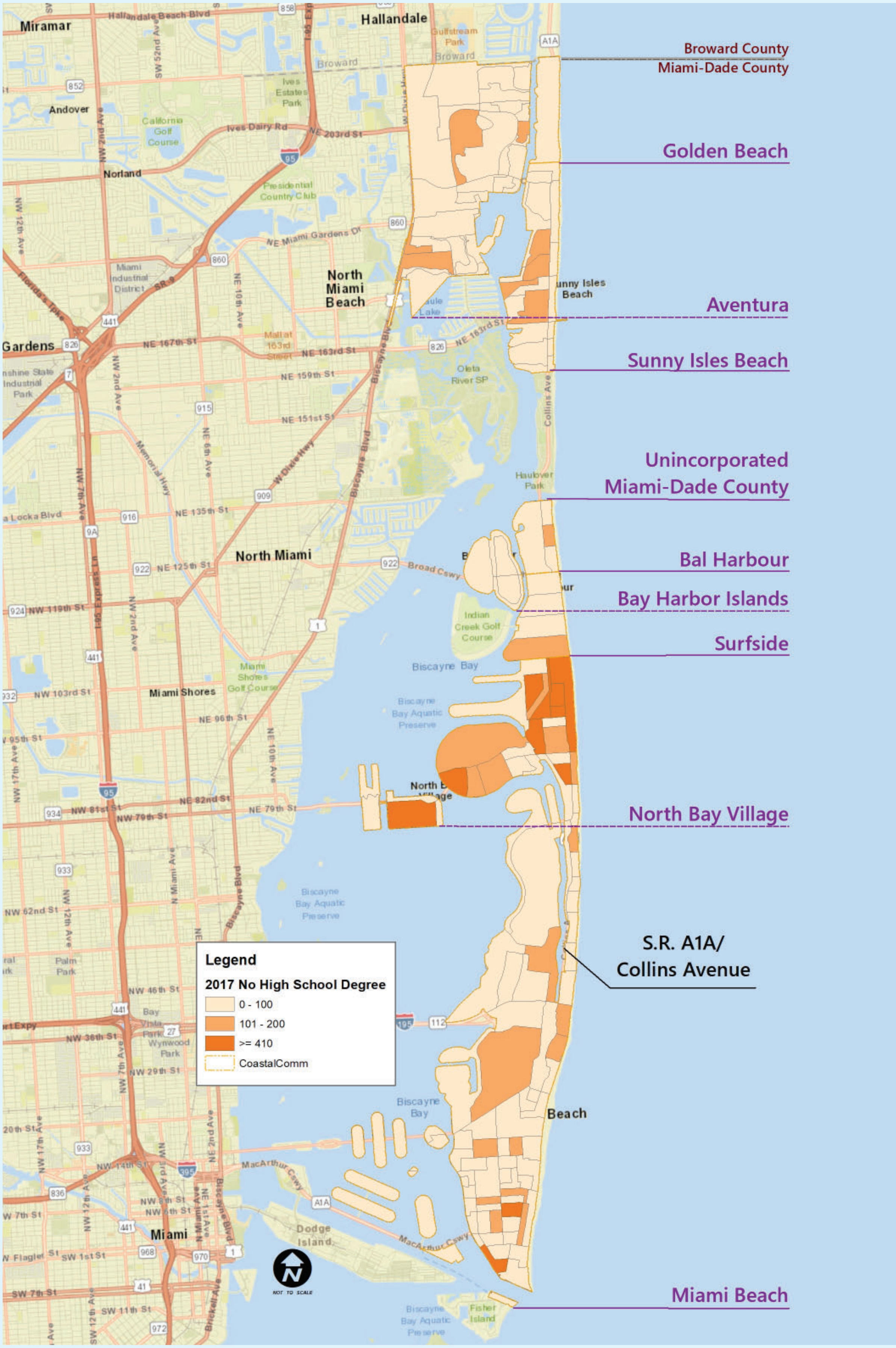


Figure 2-8 Minority Population, 2017

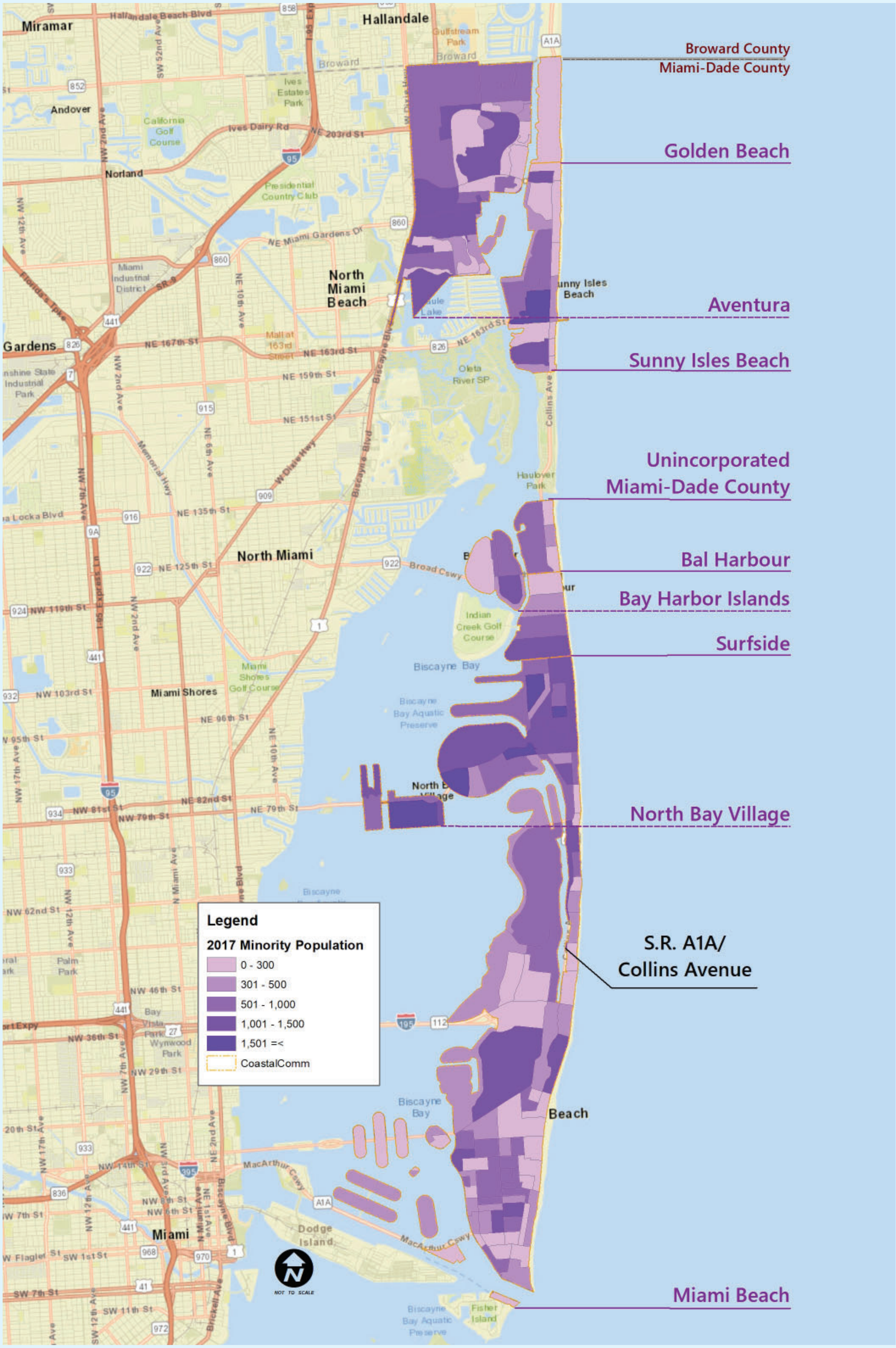


Figure 2- 9 English Speaking Households, 2017

Figure 2-10 Speaks English Very Well, 2017

Figure 2-11 Spanish Speaking Households, 2017

Figure 2-12 Zero Car Households, 2017

Figure 2-13 Mode of Travel to Work, 2017

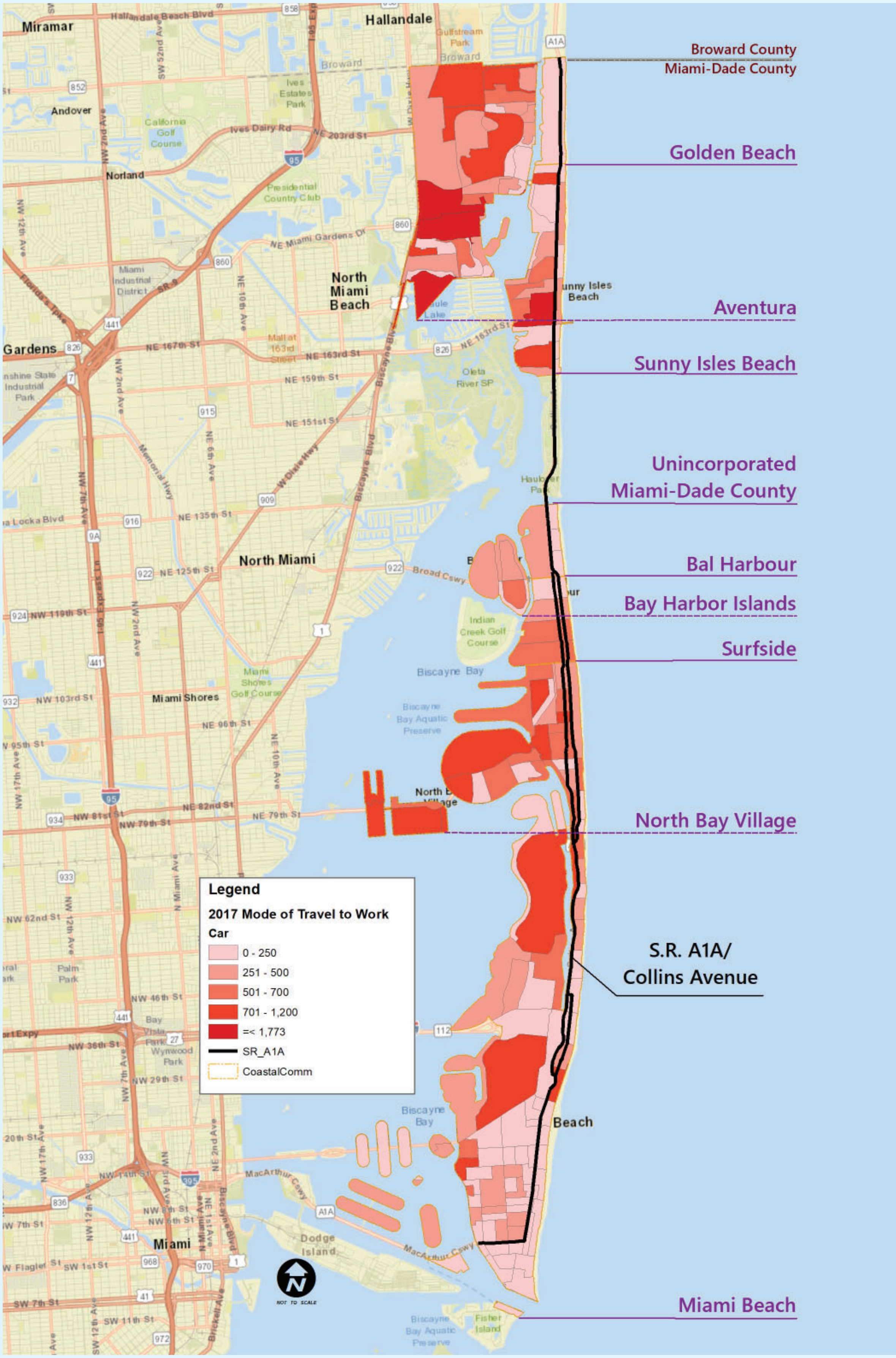


Figure 2-14 Drive to Work, 2017

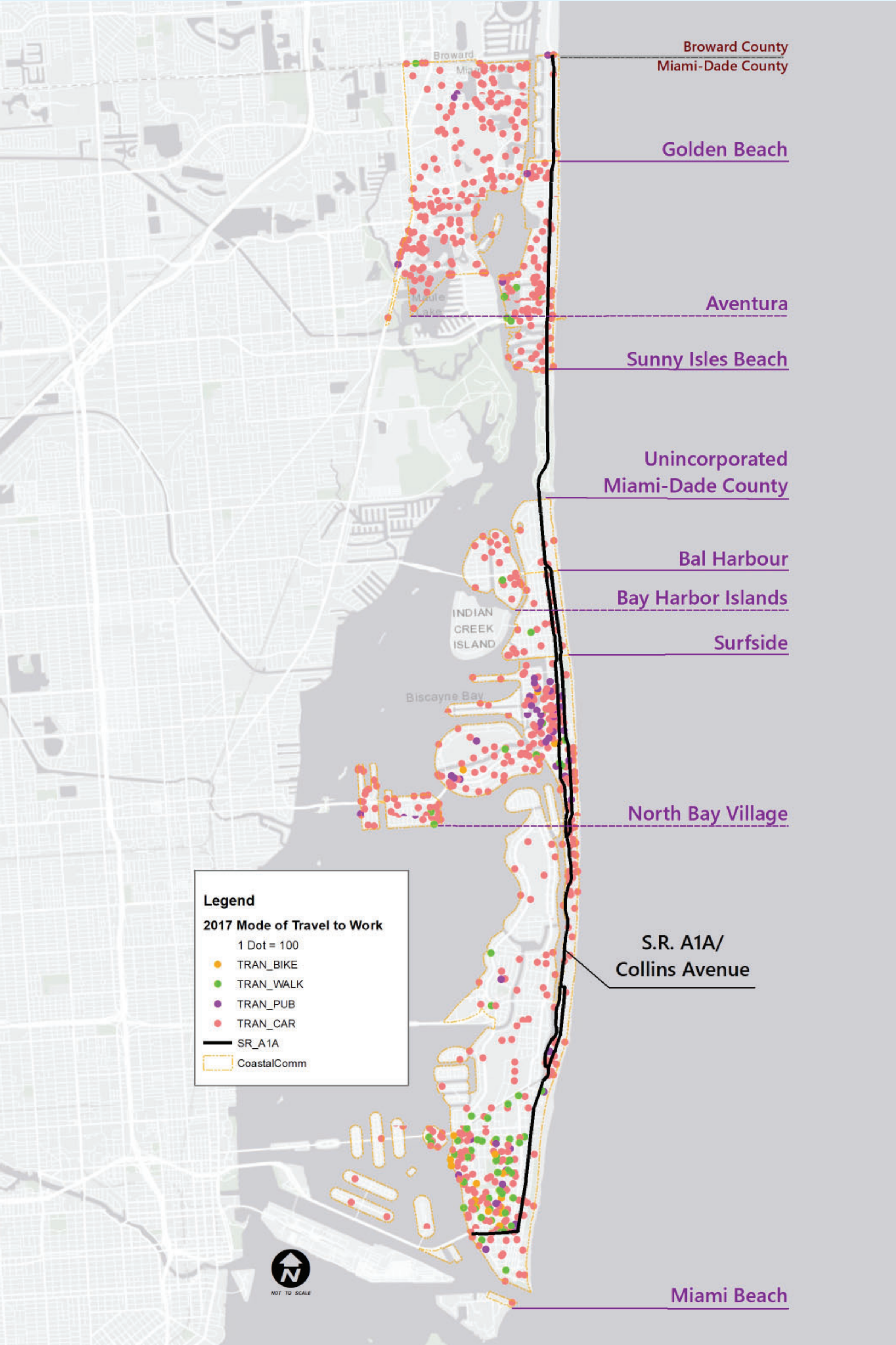


Figure 2-15 Transit to Work, 2017

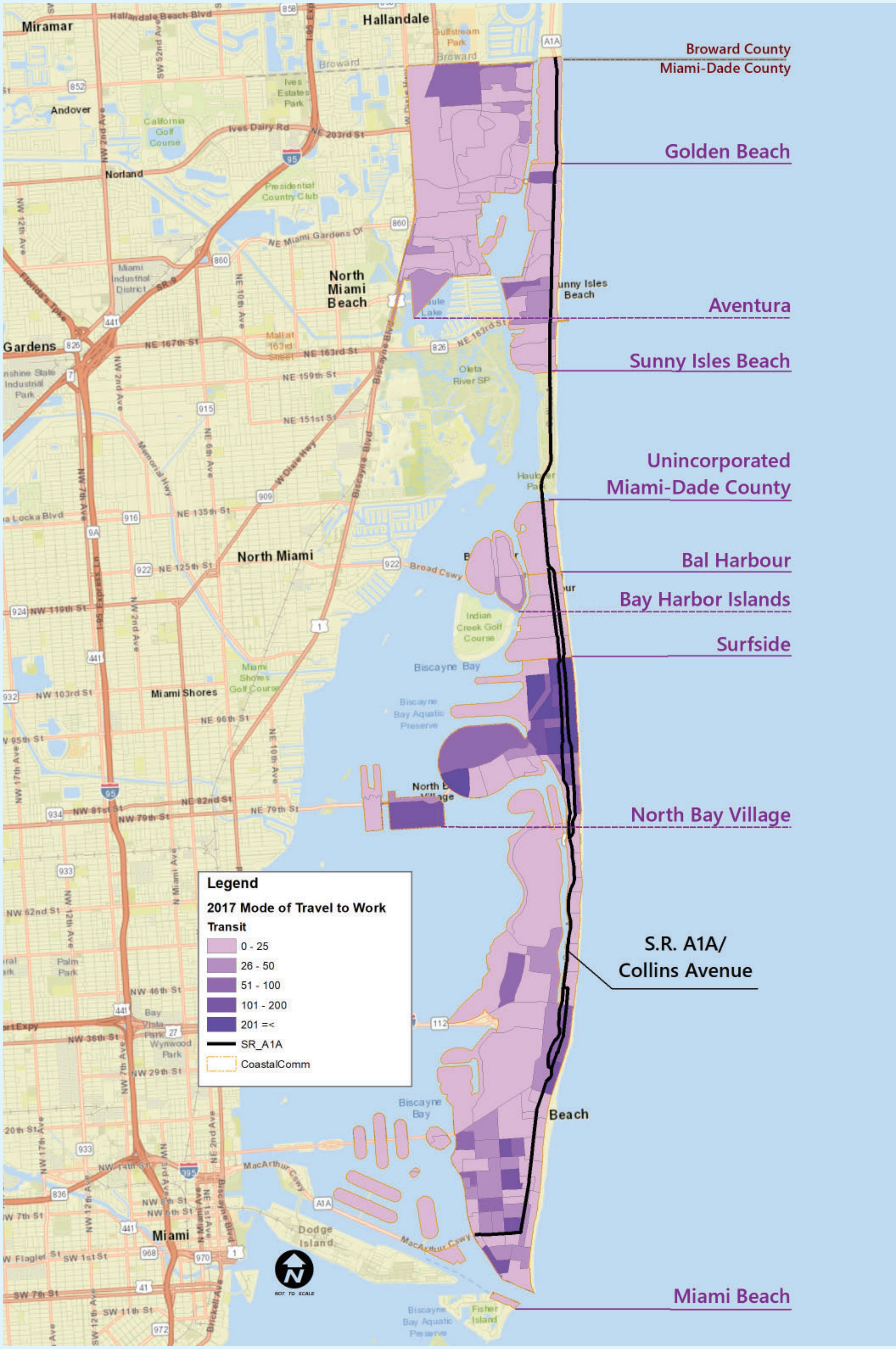


Figure 2-16 Bike to Work, 2017

Figure 2-17 Walk to Work, 2017

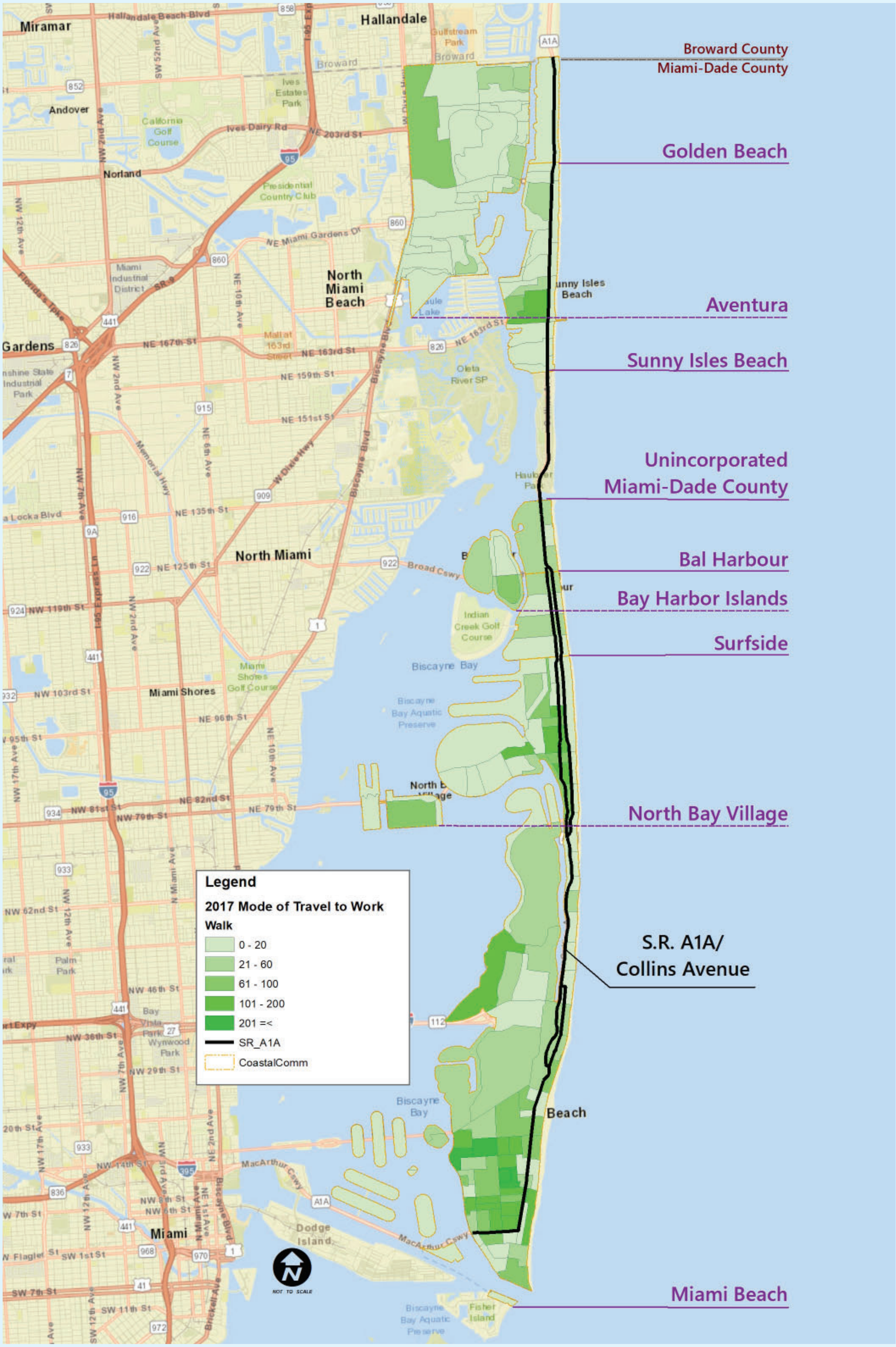
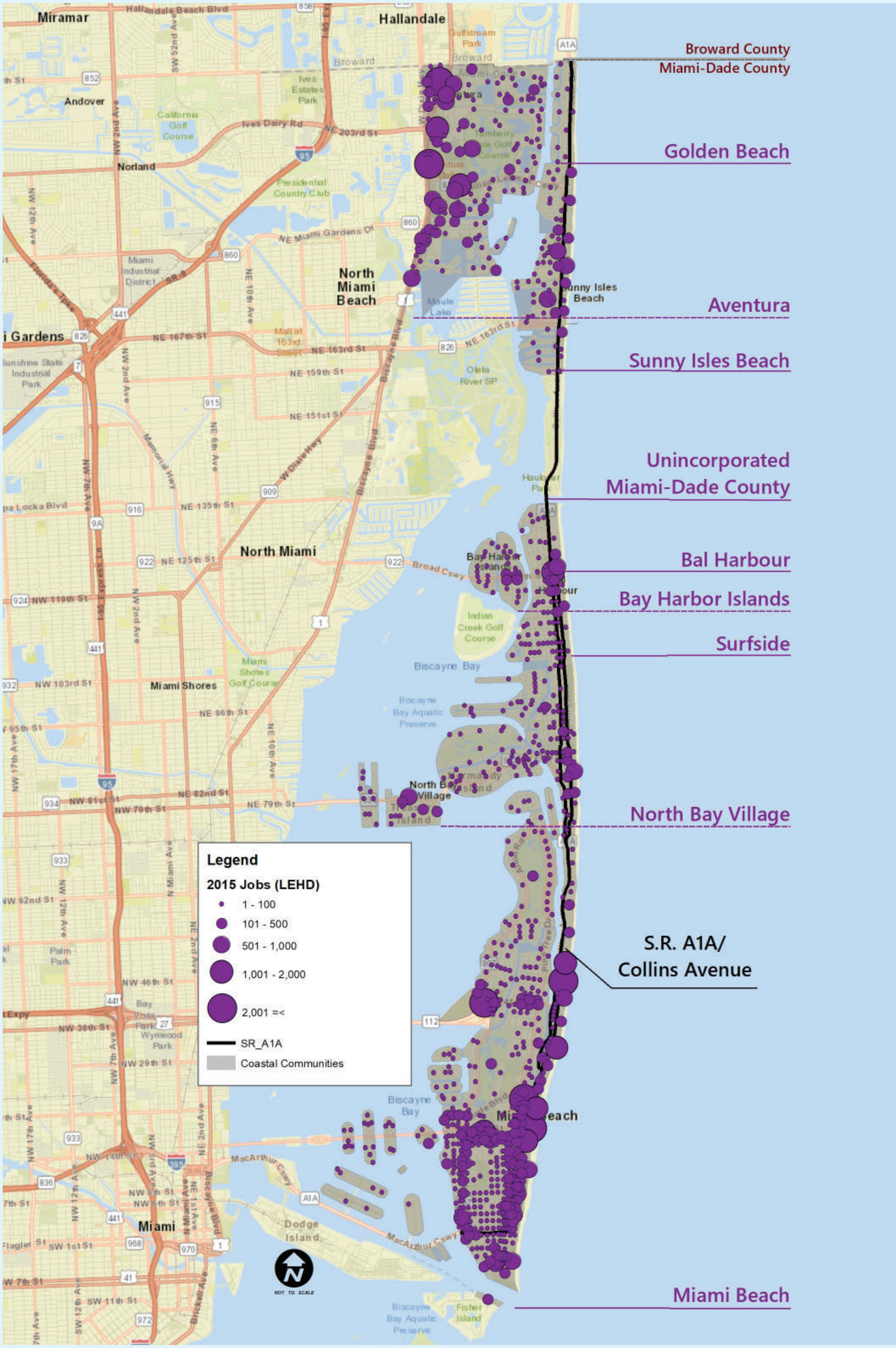


Figure 2-18 Jobs, 2015



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 2-19 Number of Lanes

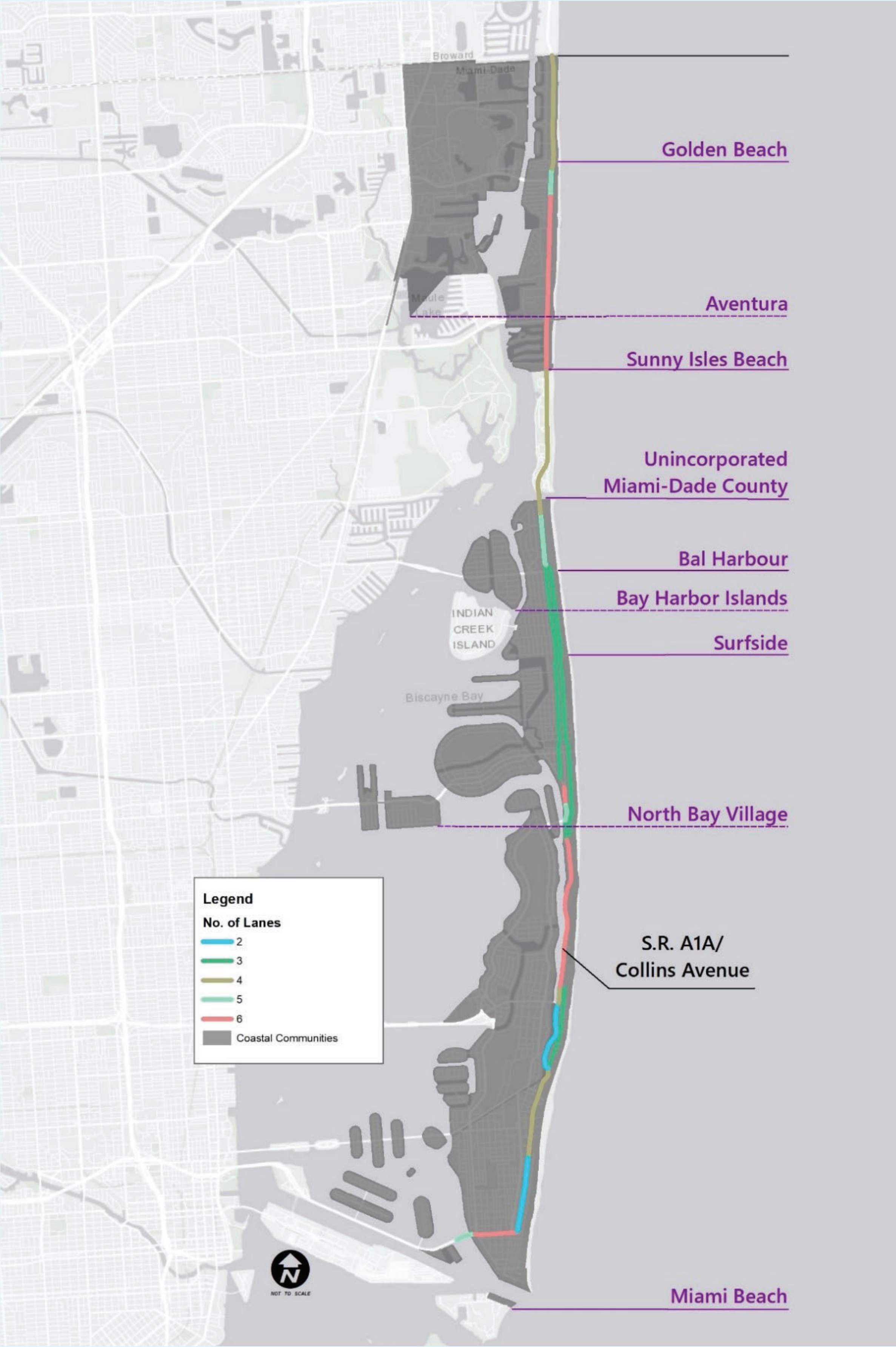


Figure 2-20 Right-of-Way (ROW)

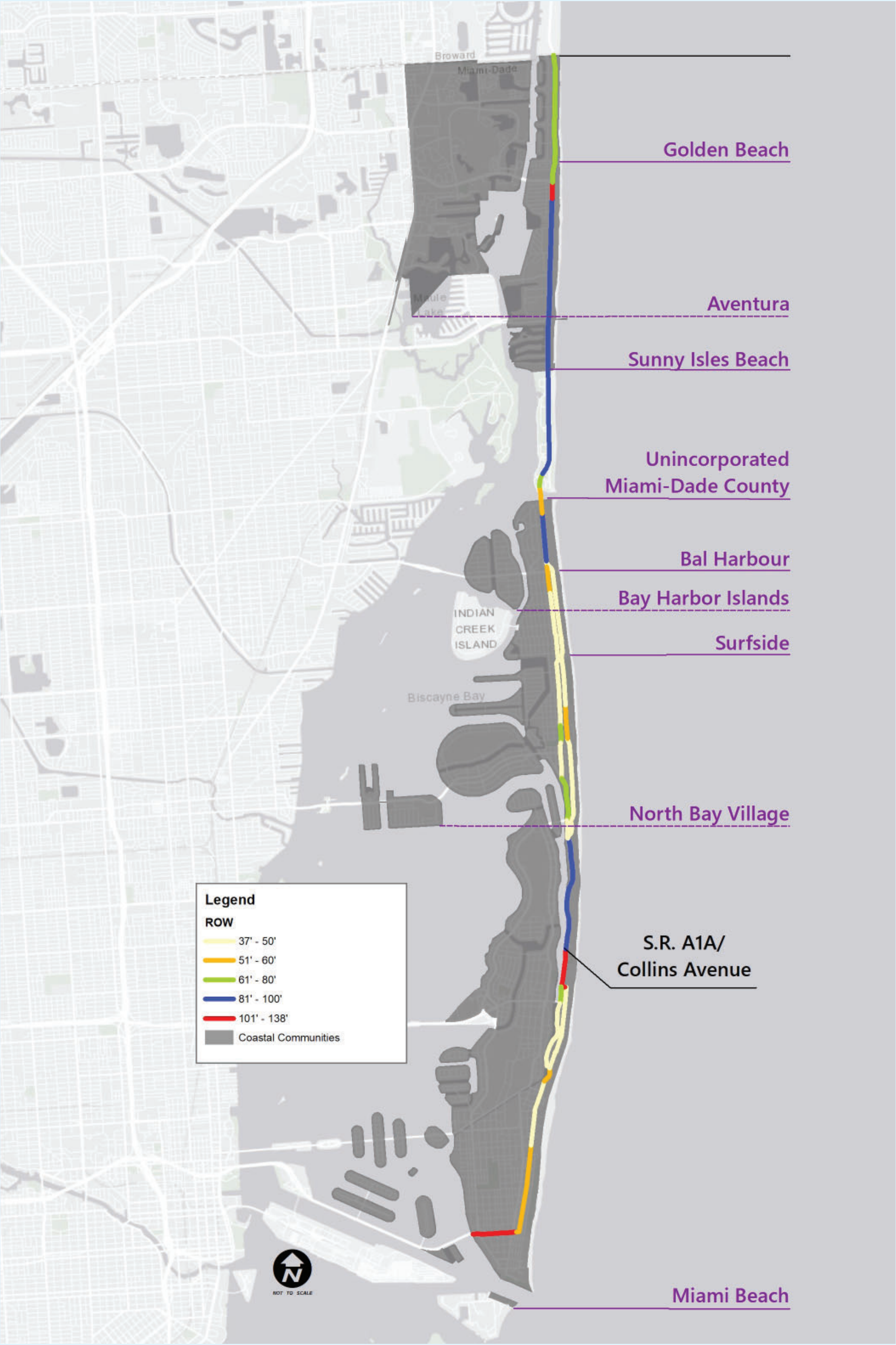


Figure 2-21 Speed Limits

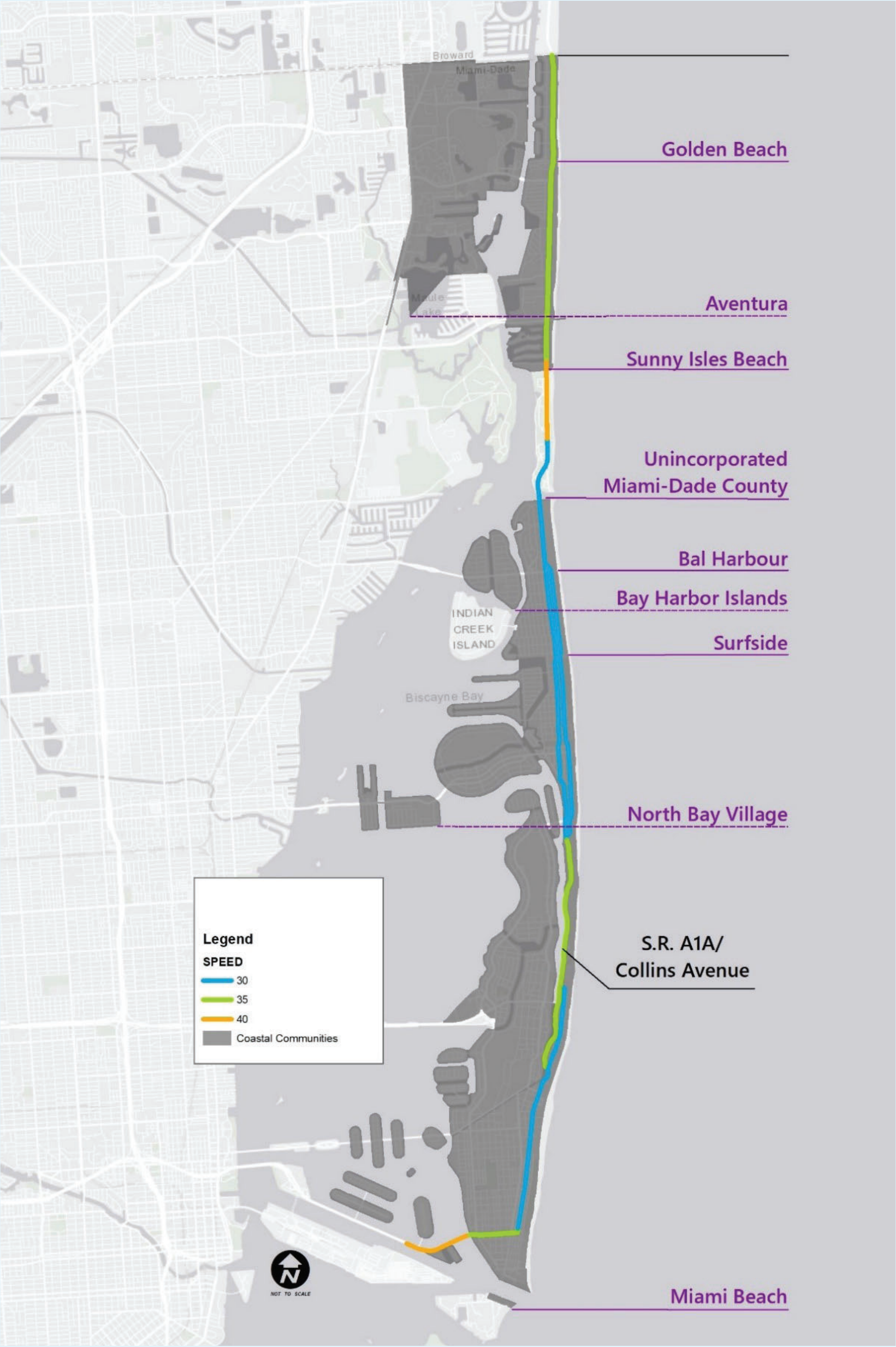


Figure 2-22 Signals and Crossings

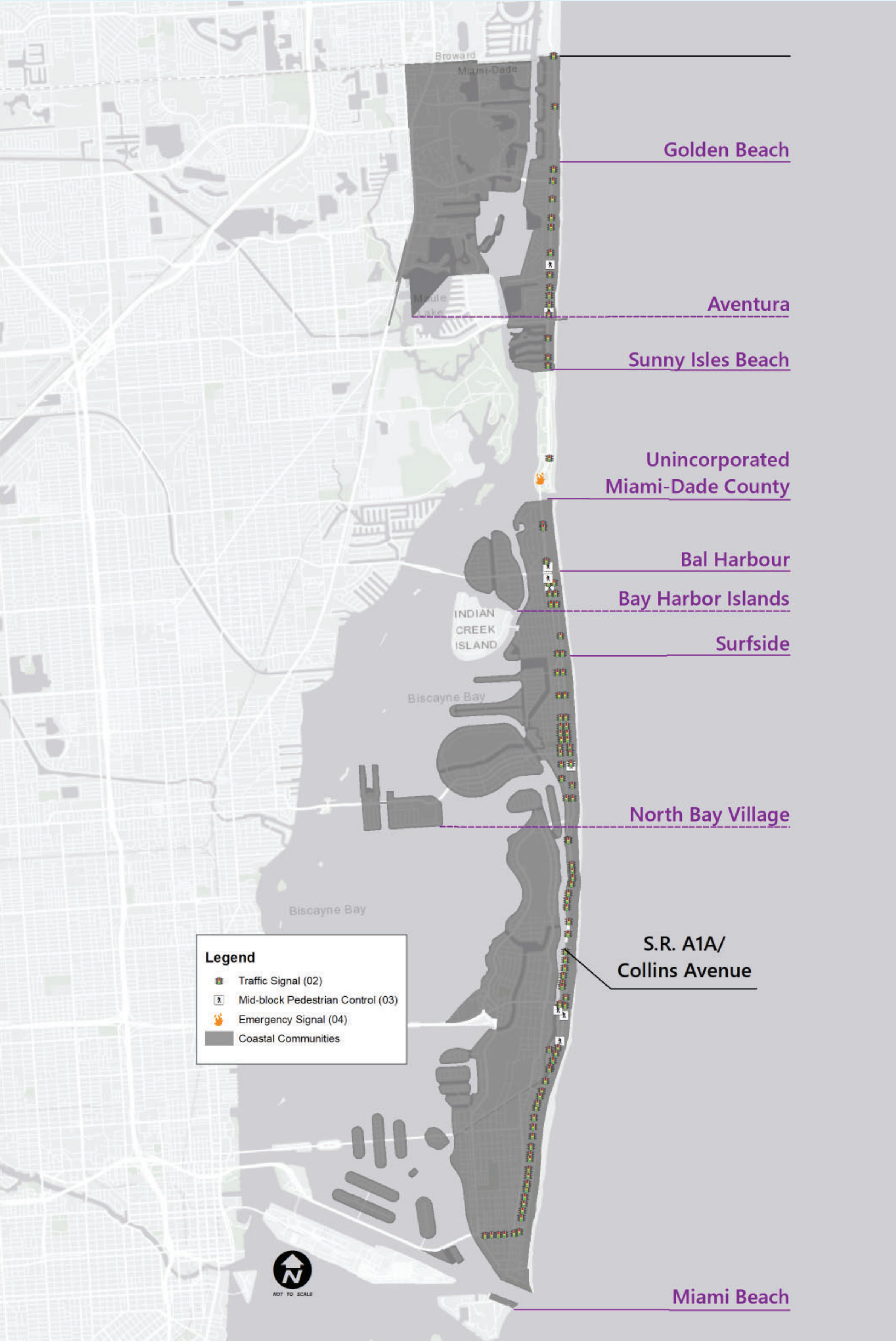


Figure 2-23 Annual Average Daily Traffic (AADT)

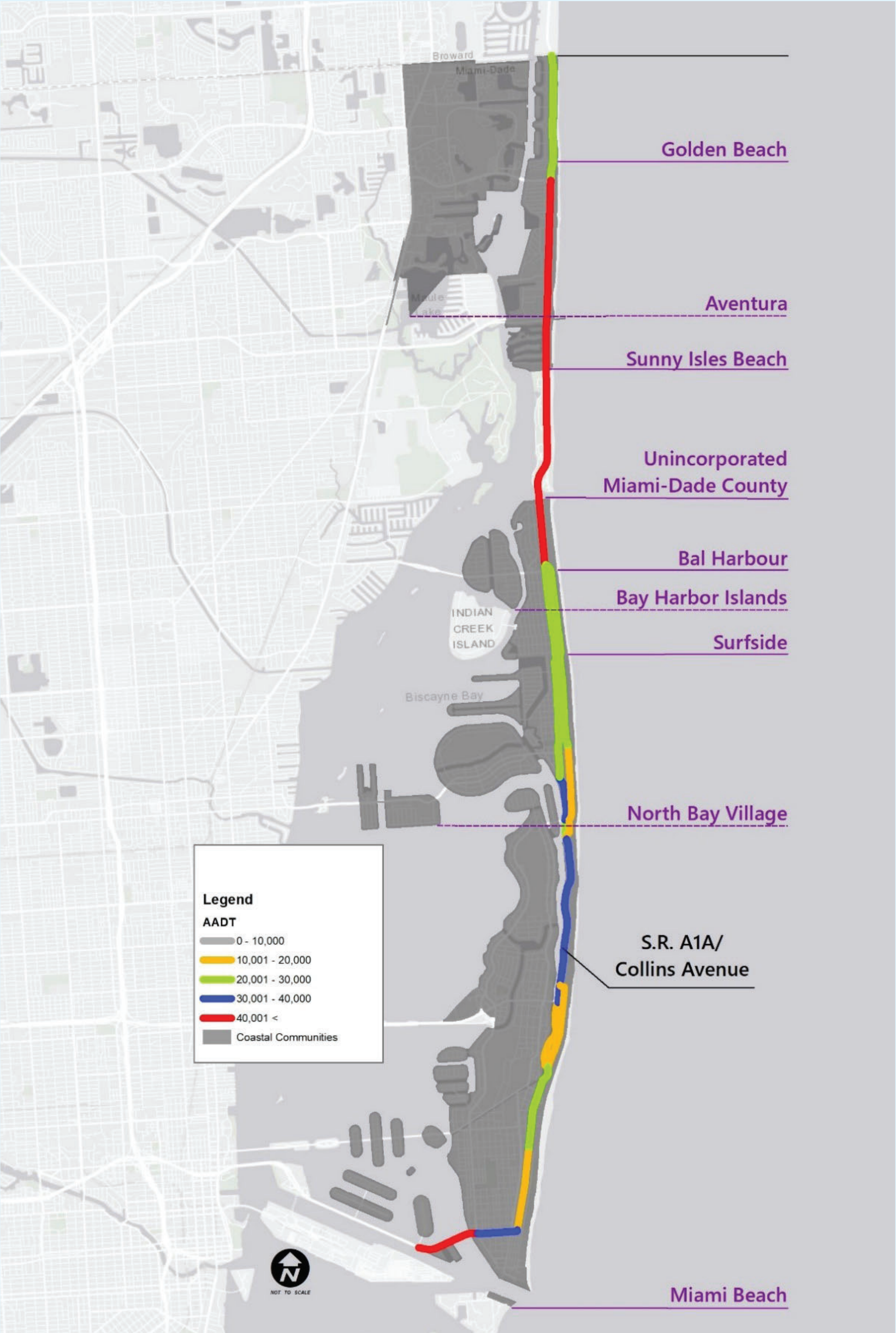


Figure 2-24 Bicycle Facilities

Figure 2-25 Sidewalks

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 2-26 Community Transit Services

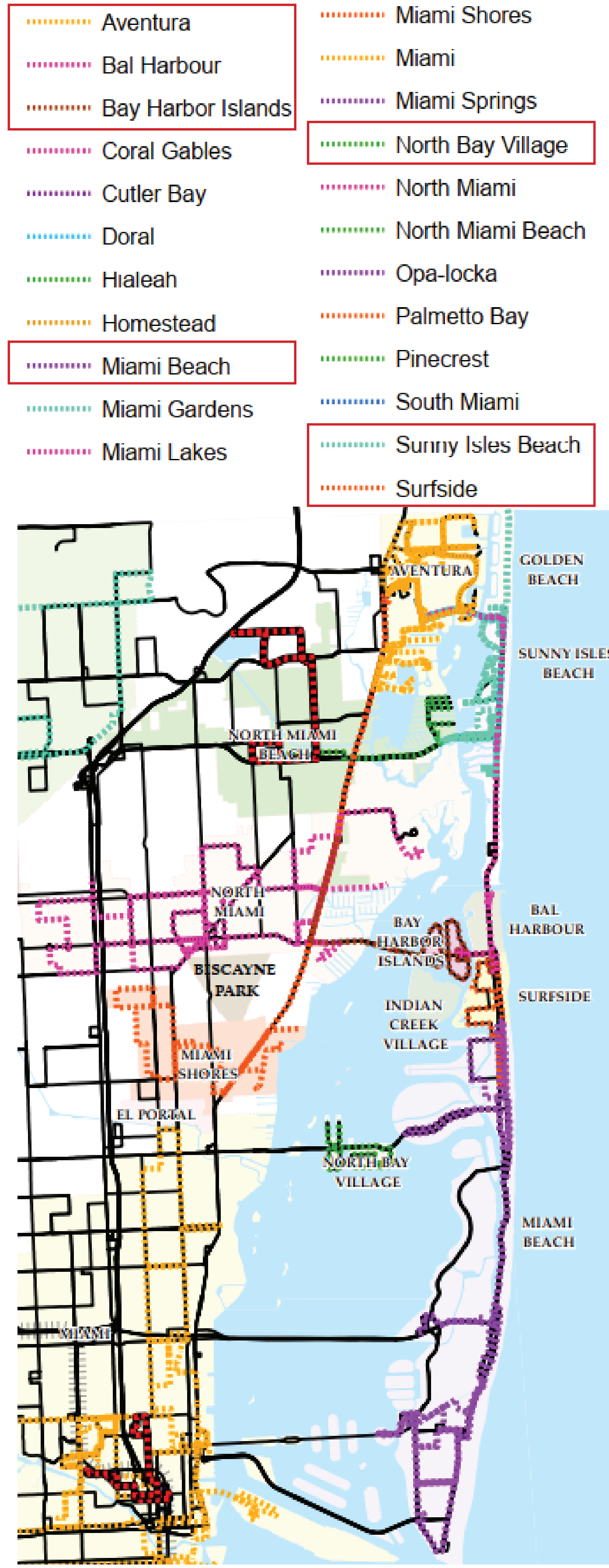


Figure 2-27 Metrobus Routes

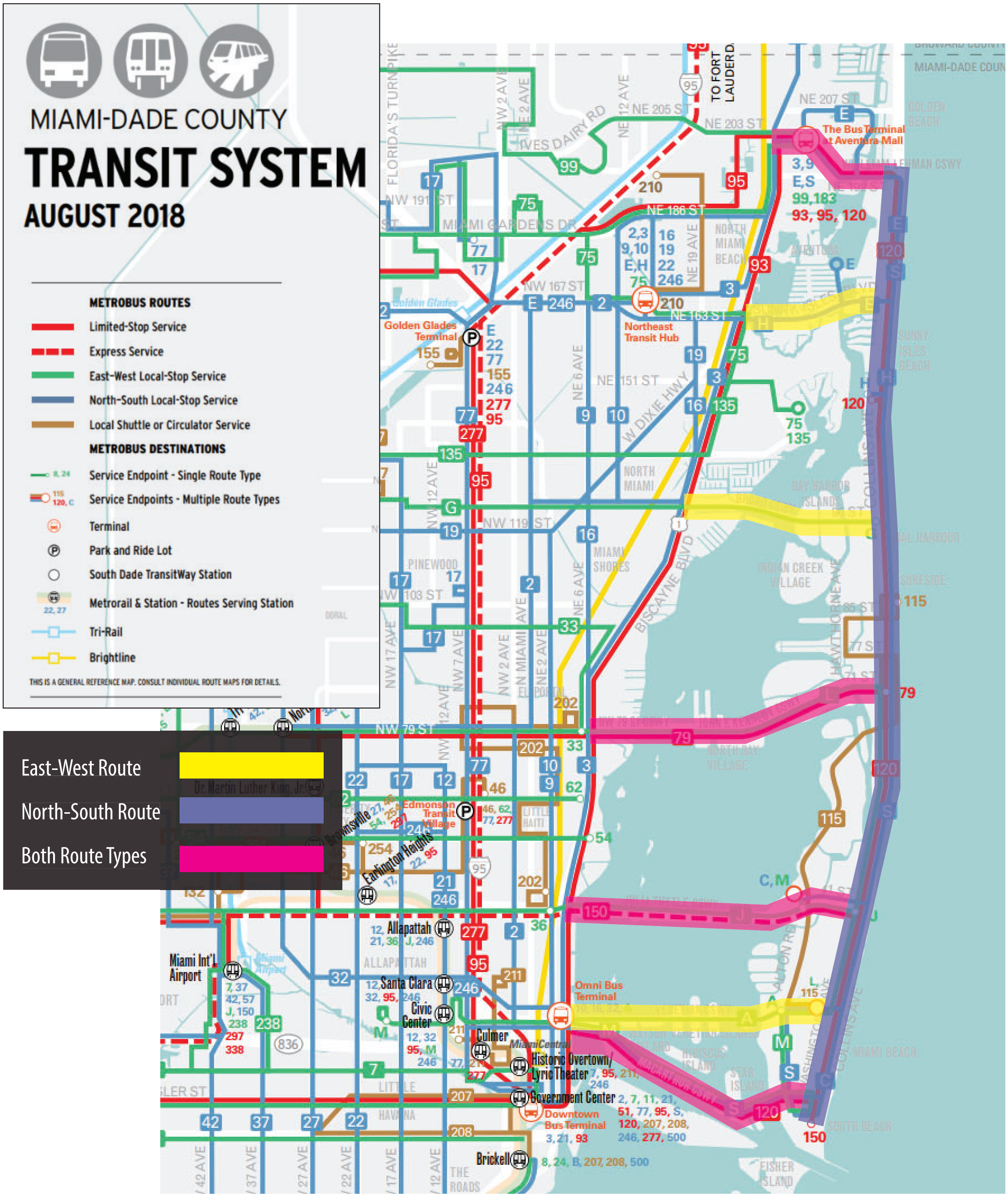


Table 5 Metrobus Ridership Data

Metrobus Route Ridership Data							
Route		Mar-19	Mar-18	Diff	Mar-19	Mar-18	Diff
ID	Desc	Ave Weekday			Month		
79	Limited	381	181	200	8,010	3,984	4,026
115	MB Shuttle	131	122	9	3,388	3,409	(21)
101-A	E/W	150	134	16	3,785	3,334	451
103-C	N/S	432	429	3	11,760	11,674	86
105-E	N/S	1,181	1,238	(57)	31,279	33,104	(1,825)
107-G	E/W	1,590	1,673	(83)	43,265	46,742	(3,477)
108-H	N/S	499	459	40	14,452	13,556	896
110-J	E/W	2,576	2,409	167	71,223	67,535	3,688
112-L	E/W	7,164	7,353	(189)	203,563	210,756	(7,193)
113-M	E/W	736	773	(37)	19,814	20,954	(1,140)
119-S	N/S	8,970	8,863	107	259,064	260,908	(1,844)
120-Beach Max	Limited	5,969	6,256	(287)	164,057	175,188	(11,131)
150-MB Airport Flyer	Express	1,806	1,810	(4)	53,836	54,082	(246)

Source: Miami-Dade County Transportation and Public Works, Ridership Technical Reports, Division of Performance and Materials Management; October 2018 through March 2019.

Metrobus Route Ridership Data							
Route		Feb-19	Feb-18	Diff	Feb-19	Feb-18	Diff
ID	Desc	Ave Weekday			Month		
79	Limited	393	210	183	7,850	4,209	3,641
115	MB Shuttle	142	250	(108)	3,238	6,157	(2,919)
101-A	E/W	163	130	33	3,732	2,993	739
103-C	N/S	457	441	16	11,023	10,880	143
105-E	N/S	1,224	1,269	(45)	30,084	30,516	(432)
107-G	E/W	1,580	1,685	(105)	39,594	41,731	(2,137)
108-H	N/S	501	485	16	12,965	12,653	312
110-J	E/W	2,545	2,463	82	63,928	61,031	2,897
112-L	E/W	7,088	7,364	(276)	182,847	189,202	(6,355)
113-M	E/W	776	773	3	18,947	19,417	(470)
119-S	N/S	8,710	8,742	(32)	230,274	203,883	26,391
120-Beach Max	Limited	3,101	6,248	(3,147)	152,989	156,855	(3,866)
150-MB Airport Flyer	Express	1,794	1,735	59	48,490	46,958	1,532

Source: Miami-Dade County Transportation and Public Works, Ridership Technical Reports, Division of Performance and Materials Management; October 2018 through March 2019.

Table 5 Metrobus Ridership Data, continued

Metrobus Route Ridership Data							
Route		Jan-19	Jan-18	Diff	Jan-19	Jan-18	Diff
ID	Desc	Ave Weekday			Month		
79	Limited	298	175	123	6,551	3,850	2,701
115	MB Shuttle	122	215	(93)	3,225	5,783	(2,558)
101-A	E/W	153	130	23	4,140	3,236	904
103-C	N/S	398	341	57	10,841	9,425	1,416
105-E	N/S	1,132	1,163	(31)	30,510	30,884	(374)
107-G	E/W	1,525	1,479	46	41,299	39,991	1,308
108-H	N/S	491	417	74	13,940	12,076	1,864
110-J	E/W	2,305	2,385	(80)	61,916	65,547	(3,631)
112-L	E/W	6,913	7,089	(176)	195,044	198,621	(3,577)
113-M	E/W	711	720	(9)	19,164	19,458	(294)
119-S	N/S	8,596	8,249	347	248,420	239,679	8,741
120-Beach Max	Limited	5,782	5,870	(88)	160,842	161,058	(216)
150-MB Airport Flyer	Express	1,685	1,635	50	49,942	48,873	1,069

Source: Miami-Dade County Transportation and Public Works, Ridership Technical Reports, Division of Performance and Materials Management; October 2018 through March 2019.

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.

Figure 2-28 Bus Stops

Table 6 Better Bus Service Comparison

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

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.

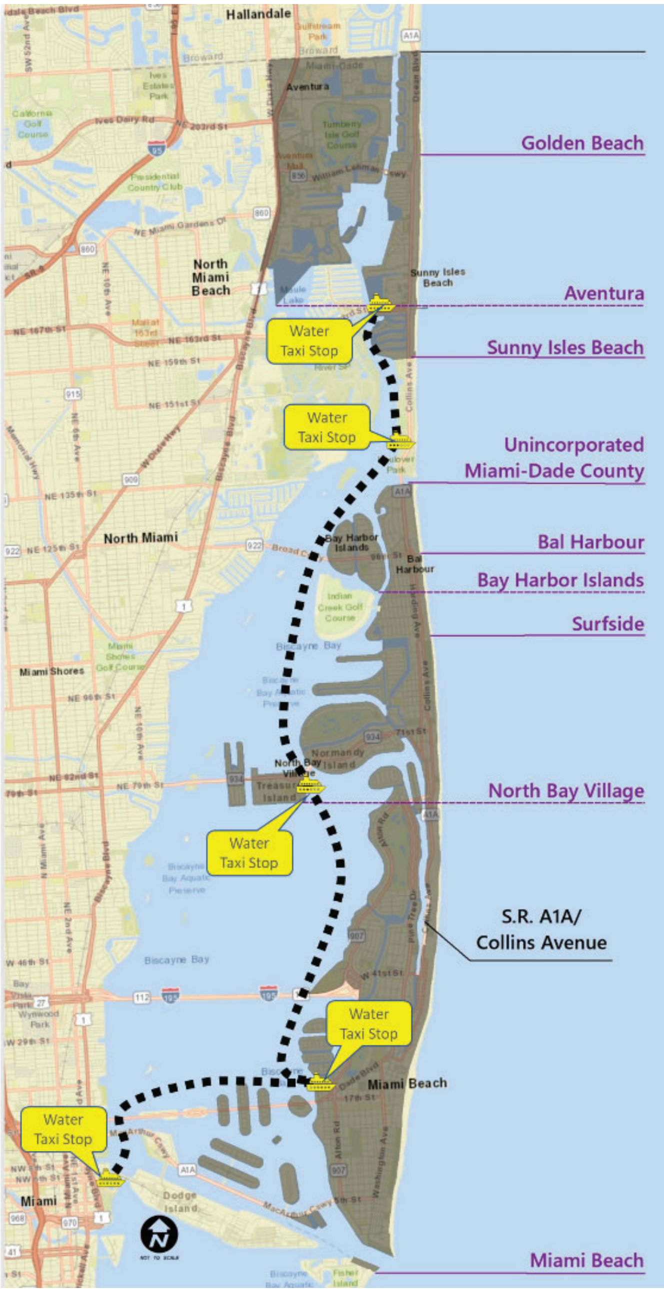
In early 2019, Miami-Dade County issued a Request for Information (RFI) for this potential Waterborne Express route. The goal of the RFI is to obtain information from the industry to better determine the most effective service for the area. The RFI envisioned the following:

- 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:

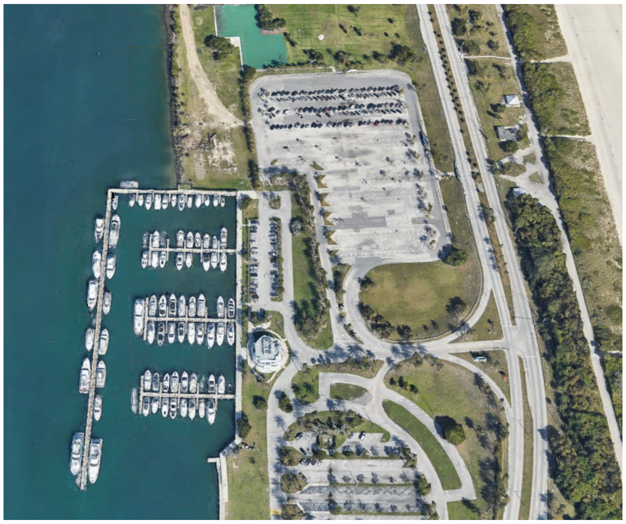
- Bayfront Park (Miami)
- Maurice Gibb Memorial Park (Miami Beach)
- Grandview Palace Marine (North Bay Village)
- Haulover Park (Miami-Dade County)
- Bella Vista Park (Sunny Isles Beach)

Figure 3-1 Waterborne Transit Service Map



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.

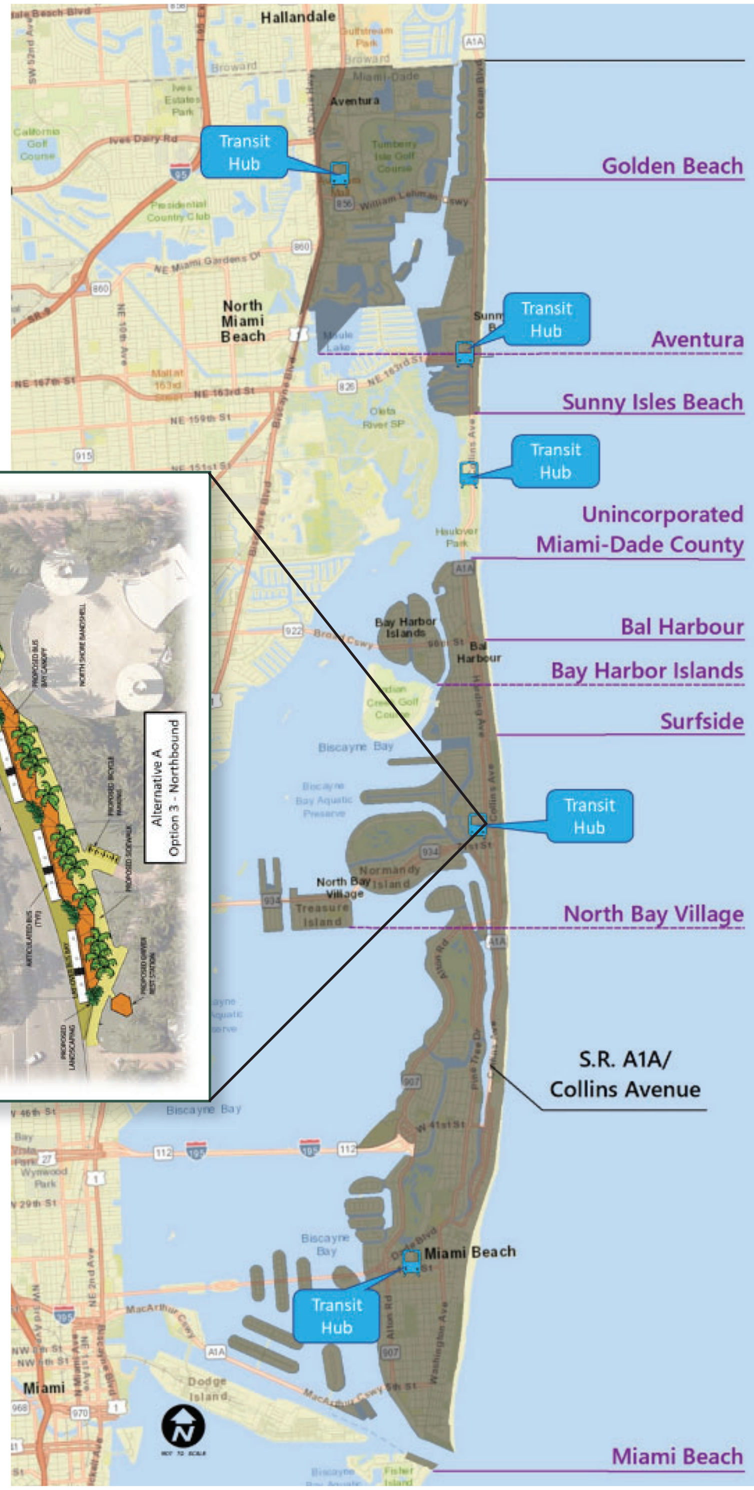
Figure 3-2 Example Watertaxi from Washington DC



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.

Figure 3-3 Transit Hub Map



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).

Figure 3-4 Lehman Causeway Path Rendering

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

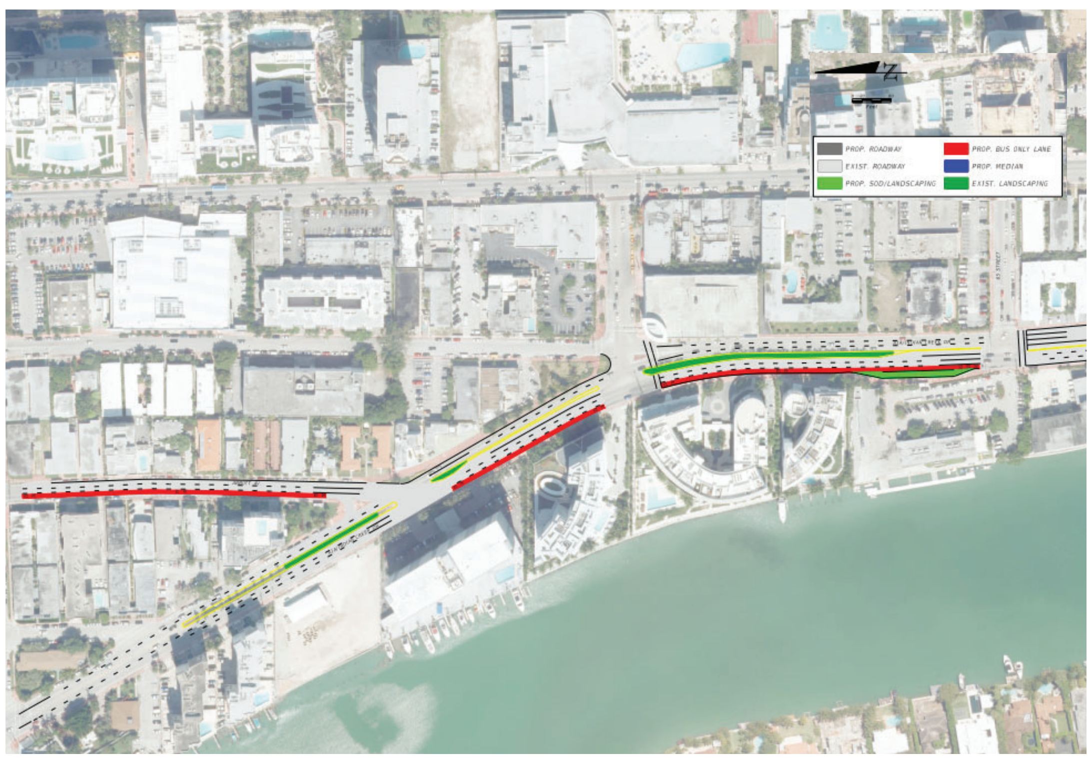


Figure 3-5 Shared Bike-Bus Lanes Map in North Beach Area of Miami Beach

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 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

Figure 3-8 Existing Miami Beach Boardwalk

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 boarwalk (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 4 **ACT Bus and HOV Facility Warrants** (AECOM 2012)

Project Type	Warrants
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. *HOV lane* if the following exist: • Buses carry 40% - 65% of passenger volumes carried in adjacent general traffic lanes. • > 10 buses per hour. • Without bus lanes, bus travel times increase < 40% under congested conditions.
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 7 Multimodal Facilities on East-West Causeways

Causeway	Route	Jurisdiction	Existing Bicycle Facilities	Proposed Bicycle Facilities	Existing Pedestrian Facilities	Proposed Pedestrian Facilities	Existing County Transit Routes	SMART Plan Connectivity
Lehman Causeway	SR 856	FDOT	Bicycles permitted to use expressway shoulders under special pilot program.	Study proposes 12-foot shared use trail along eastbound roadway, with connections to surface paths.	None. However, some pedestrians use the shoulder improperly (local residents, tourists, religious members).	Study proposes 12-foot shared use trail along eastbound roadway, with connections to surface paths.	E/105, S/119, 120	NE 197th Ave. (Aventura)
NE 163rd St.	SR 826	FDOT	There are no designated bicycle facilities in this corridor, neither bicycle lanes nor sharrows.	Better accommodation of bicycles through designated bicycle lanes, desirably with buffers, would be preferred, but is a high cost solution.	There is sidewalk continuity along this corridor from Miami Beach to the mainland.	No actions needed.	E/105	NE 163rd St.
Broad Causeway	SR 922	FDOT	There is continous accommodation of bicycles in both travel directions with marked sharrows in the right lanes.	Better accommodation of bicycles through designated bicycle lanes, desirably with buffers, would be preferred, but is a high cost solution.	There is sidewalk continuity along this corridor from Miami Beach to the mainland.	No actions needed.	G/107	NE 125th St.
NE 79st St.	SR 934	FDOT	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.	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&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.	There is sidewalk continuity along this corridor from Miami Beach to the mainland.	No actions needed.	79, L/112	NE 79th St.

Table 7 Multimodal Facilities on East-West Causeways (continued)

Causeway	Route	Jurisdiction	Existing Bicycle Facilities	Proposed Bicycle Facilities	Existing Pedestrian Facilities	Proposed Pedestrian Facilities	Existing County Transit Routes	SMART Plan Connectivity
I-195	SR 112	FDOT	Bicycles permitted to use expressway shoulders under special pilot program.	The I-195 Master Plan is examining future improvement strategies for this corridor. Planning options are considering bicycle and pedestrian accommodation options.	None. However, some pedestrians use the shoulder improperly.	The I-195 Master Plan is examining future improvement strategies for this corridor. Planning options are considering bicycle and pedestrian accommodation options.	J/110, 150	Wynwood/ Design District/NE 36th St.
Venetian Causeway	---	Miami-Dade County	There are continous green-painted un buffered 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.	No actions needed.	There is sidewalk continuity along this corridor from Miami Beach to the mainland.	No actions needed.	A/101	---
MacArthur Causeway	SR A1A	FDOT	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 segmets; no connection from Watson Island to mainland.	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.	Current Beach Link transit alternatives PD&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.	Current Beach Link transit alternatives PD&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.	M/112, /S/119, 120	MIamiCentral Station (Downtown)

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

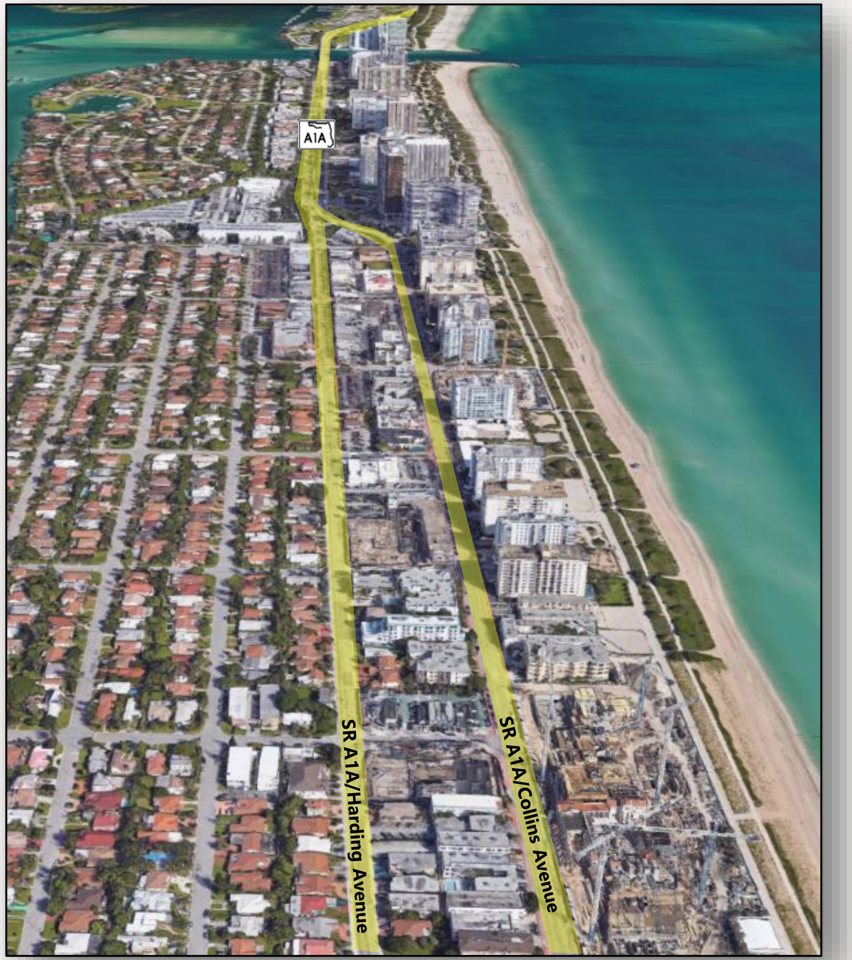
Source: tripadvisor, Miami Photo: Collins Avenue & 42nd Street

TPO Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Purpose

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.



TPO Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

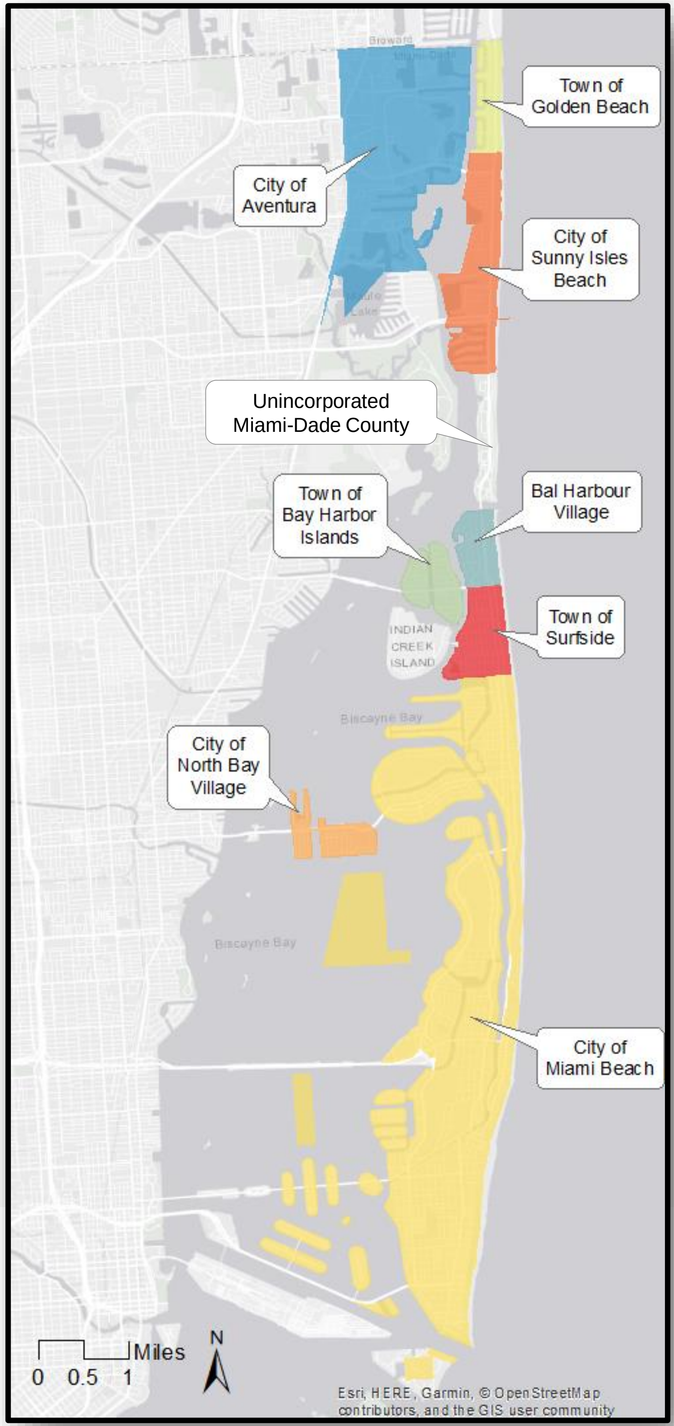
Background and Goals

- Resolution #38-18 (September 27, 2018)
  - Authorized by the Miami-Dade TPO Governing Board
  - 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



TPO Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Key Scope Items

- PROJECT COORDINATION AND MANAGEMENT
- LITERATURE REVIEW
- DATA COLLECTION
- CORRIDOR ANALYSIS AND EVALUATION
- PROPOSED IMPROVEMENTS
- ACTION PLAN
- RECOMMENDATIONS
- FINAL REPORT

Key Stakeholder Groups

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

Schedule*

SCHEDULE

2019

March	April	May	June	July	August	September	October	November	December
Literature Review	Literature Review	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation		Draft Report	Final Report	
Data Collection	Data Collection	Data Collection		Proposed Actions	Proposed Actions	Proposed Actions		TPO Present-ations	TPO Present-ations
Identify Stakeholders	SAC Meeting #1		SAC Meeting #2		SAC Meeting #3	Action Plan	Action Plan	SAC Meeting #4	
						Recommend-ations	Recommend-ations		

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

* Schedule is subject to change.

Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

SAC Responsibilities

- Four meetings during key project milestones
  - Meeting #1 – April 11, 2019 (today)
  - Meeting #2 – June 2019
  - Meeting #3 – August 2019
  - 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

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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

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

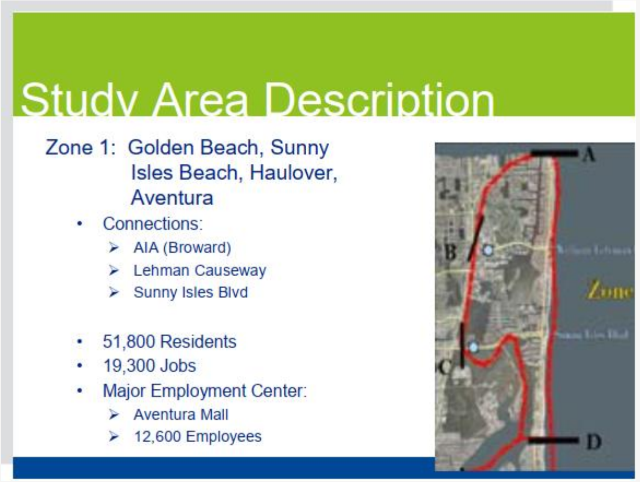
Miami-Dade Transportation Planning Organization

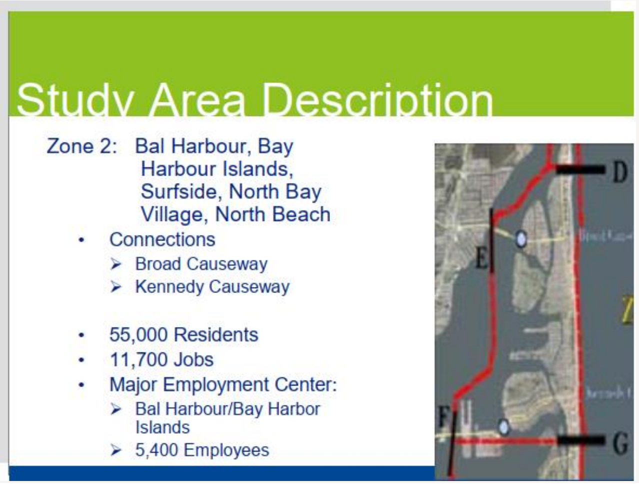
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

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





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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Overview of Key Recommendations from Previous and Related Studies

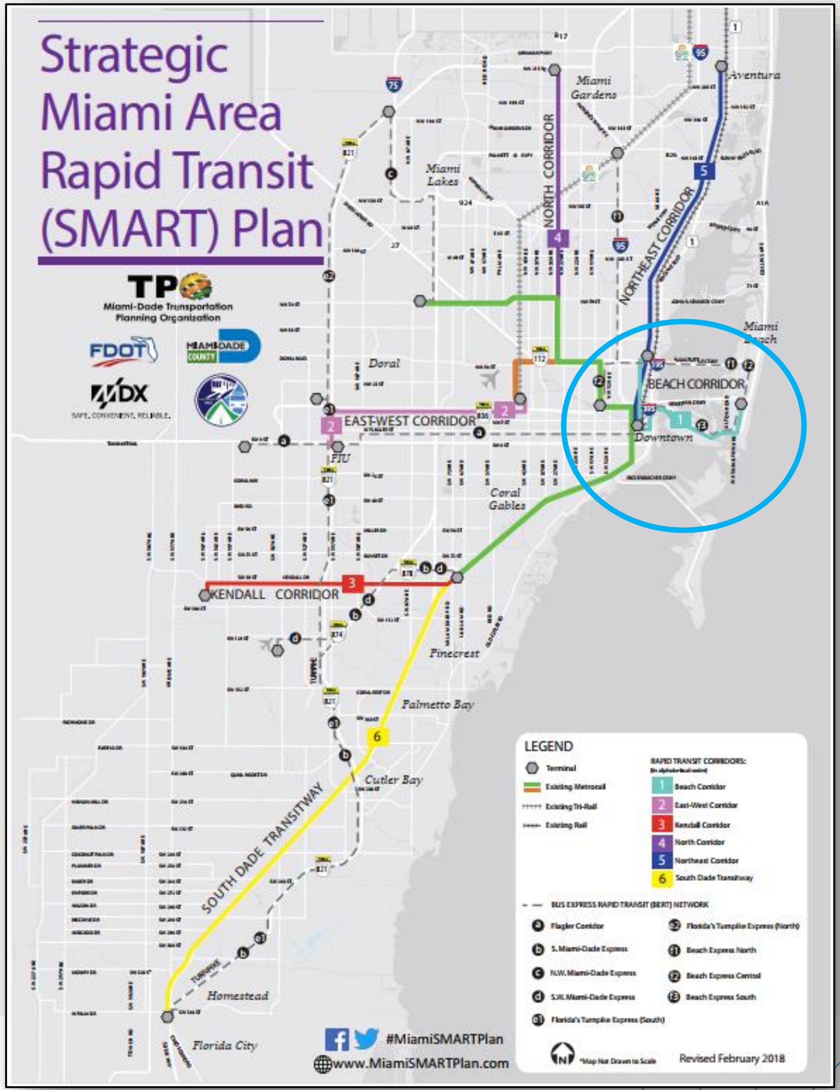
Coastal Communities Transportation Master Plan (2007)

- 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

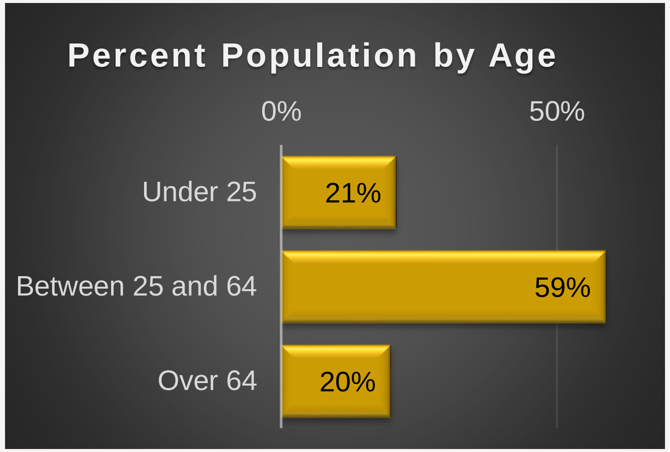
Miami-Dade Transportation Planning Organization

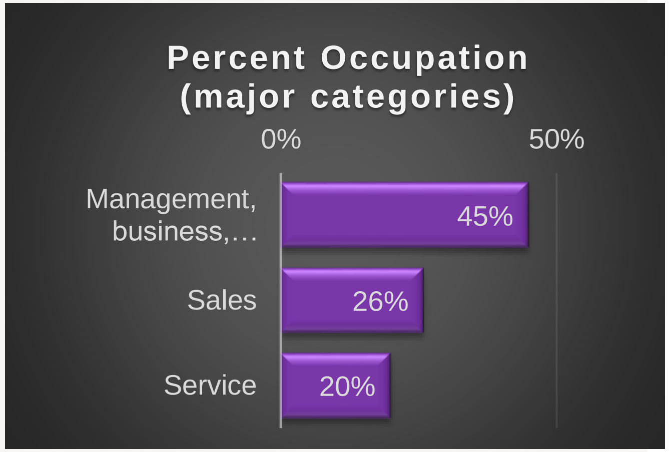
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

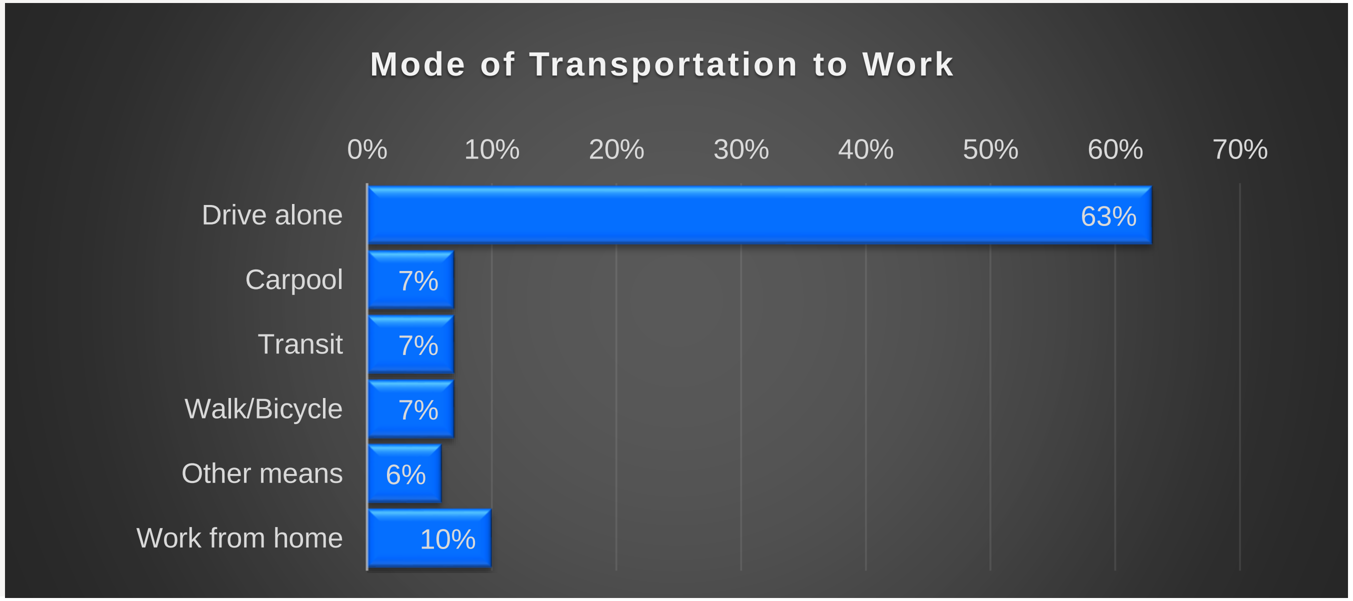
Demographics (for entire study area)

- 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

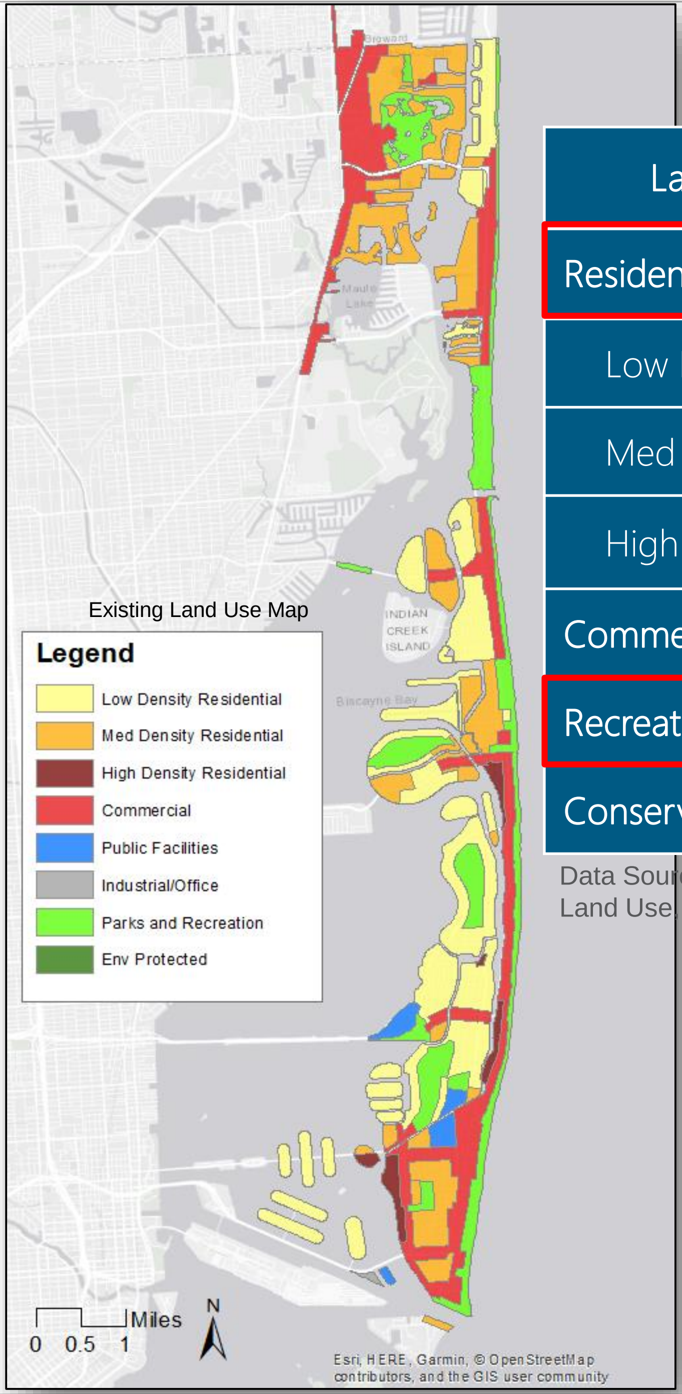
*Poverty level and means of transportation data based on 2017 US Census data at the Census Tract level.







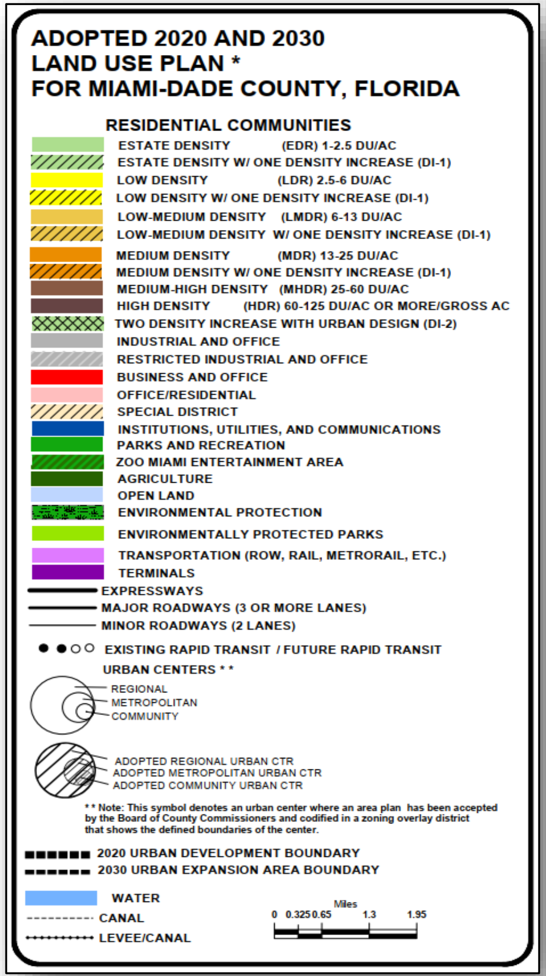
Existing Land Use

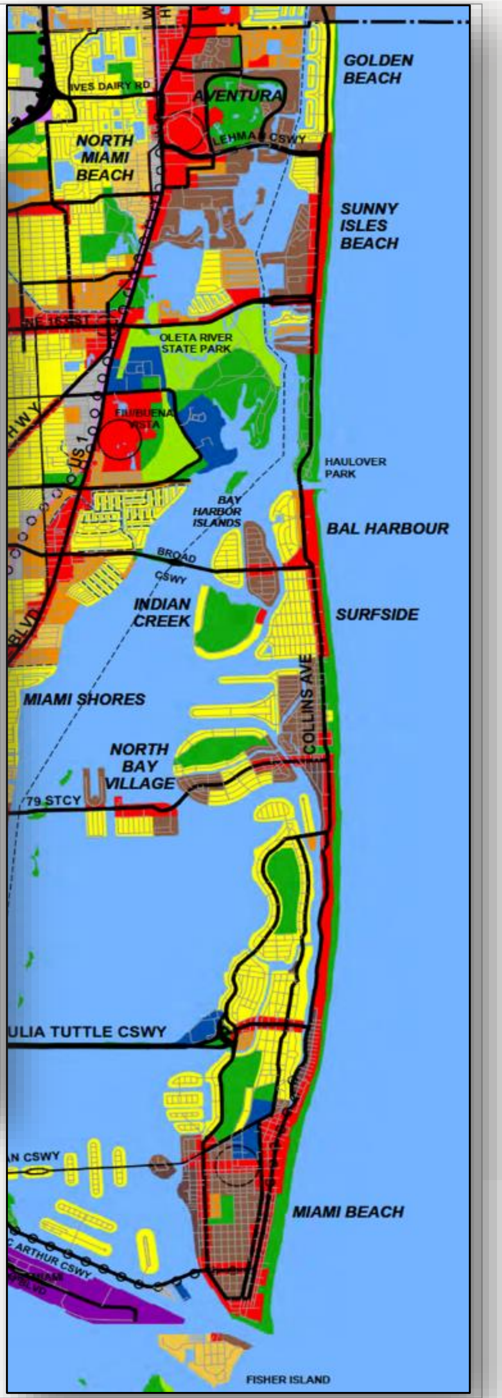


Land Use	Cumulative Percentage
Residential	54%
Low Density	29%
Med Density	23%
High Density	2%
Commercial	24%
Recreational	18%
Conservation	1%

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

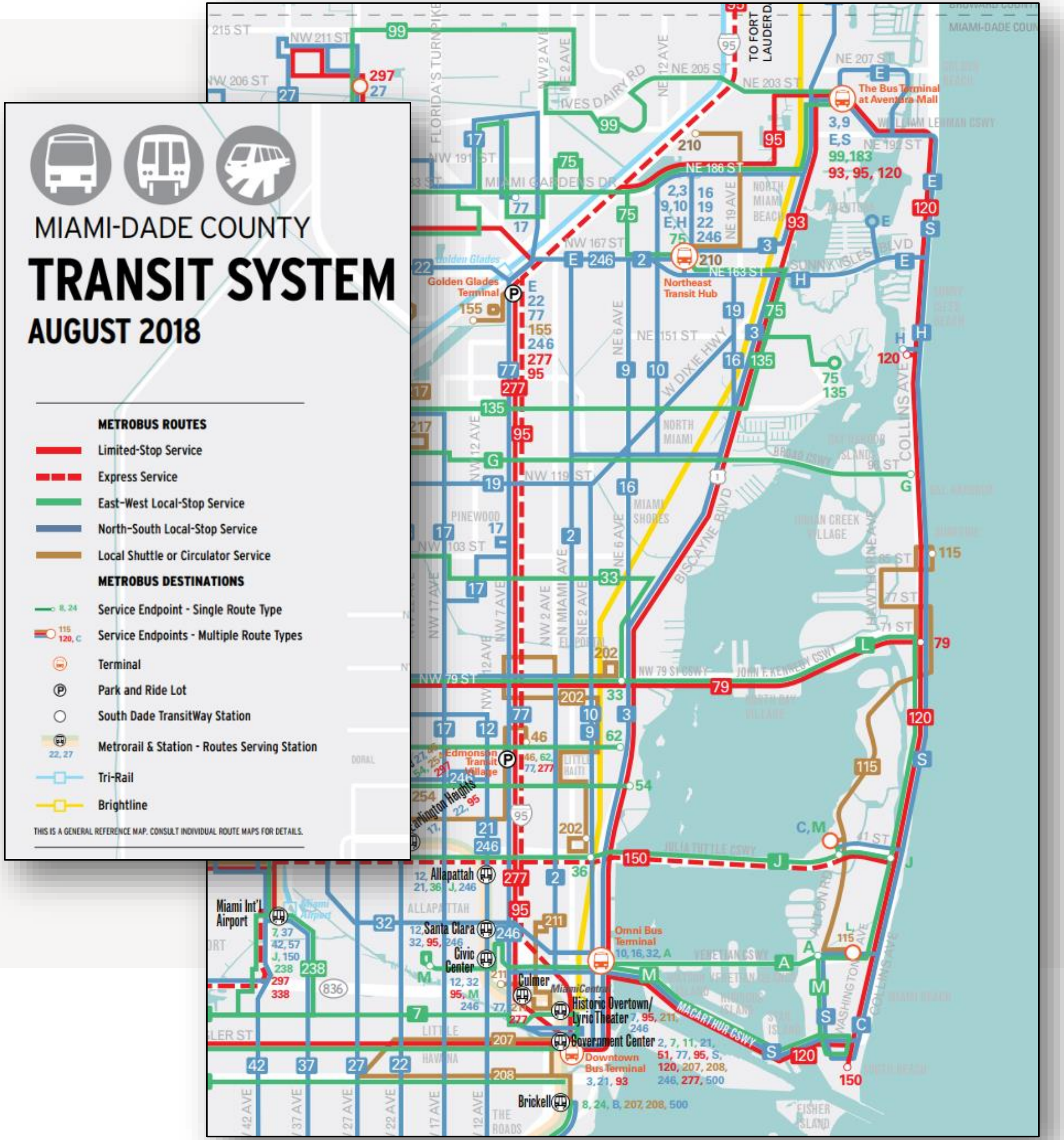
Future Land Use





Study Area Transit Services

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

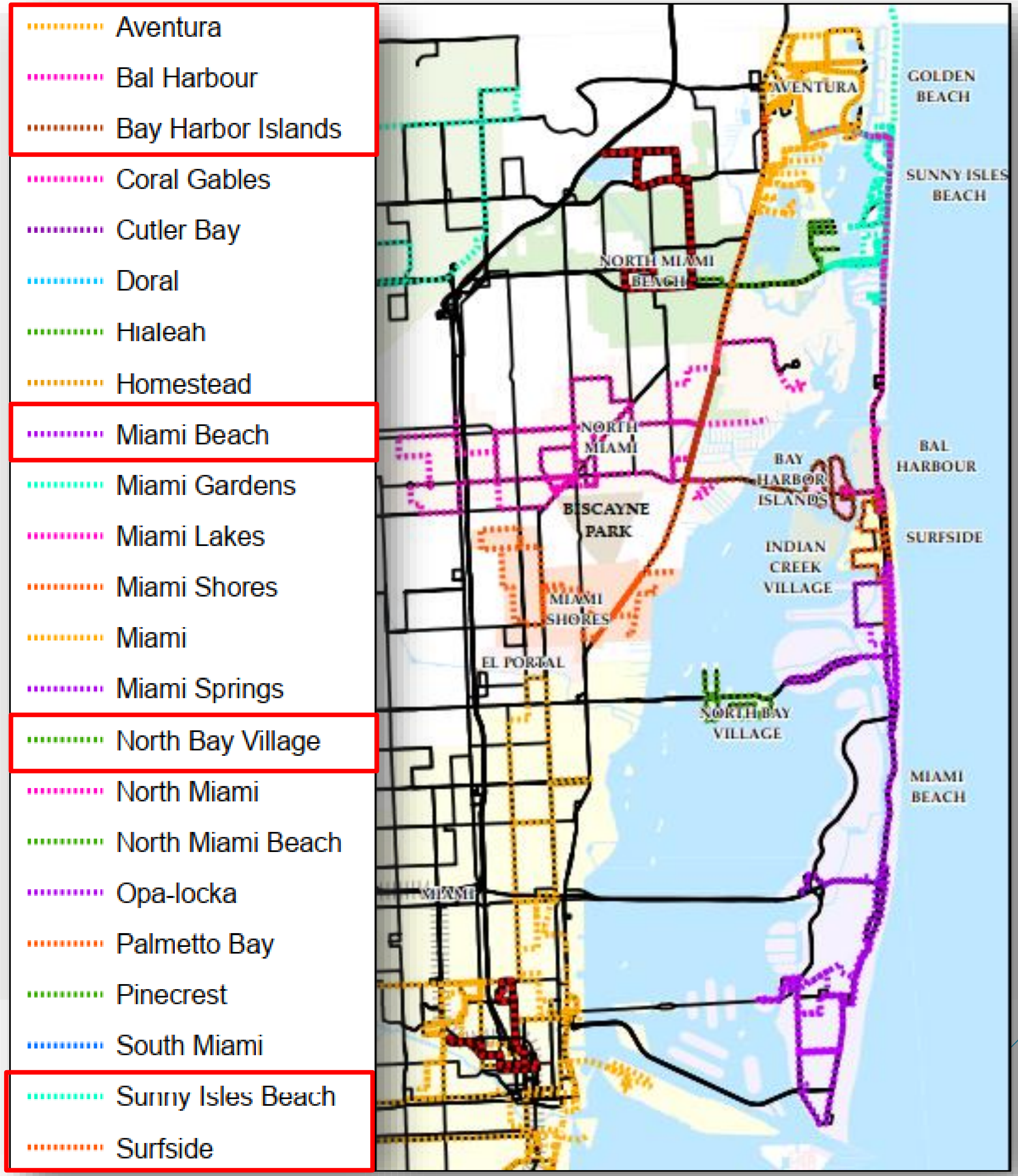


TPO
Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities
FEASIBILITY STUDY
A1A

Study Area Transit Services

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

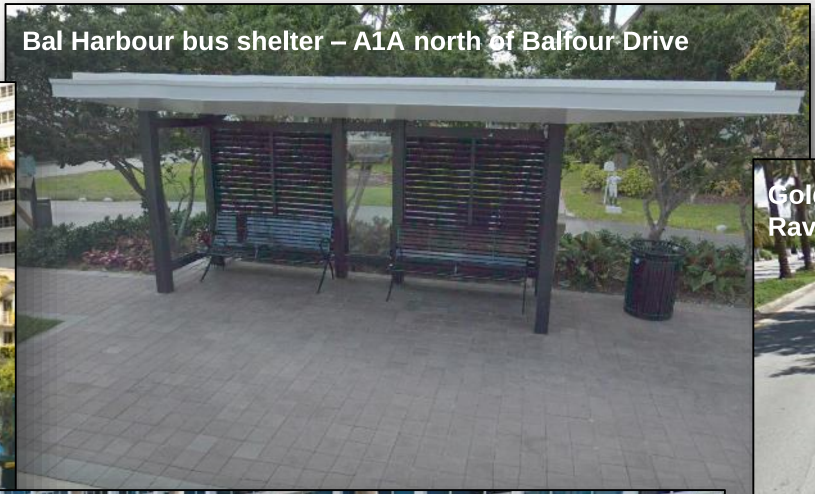


Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

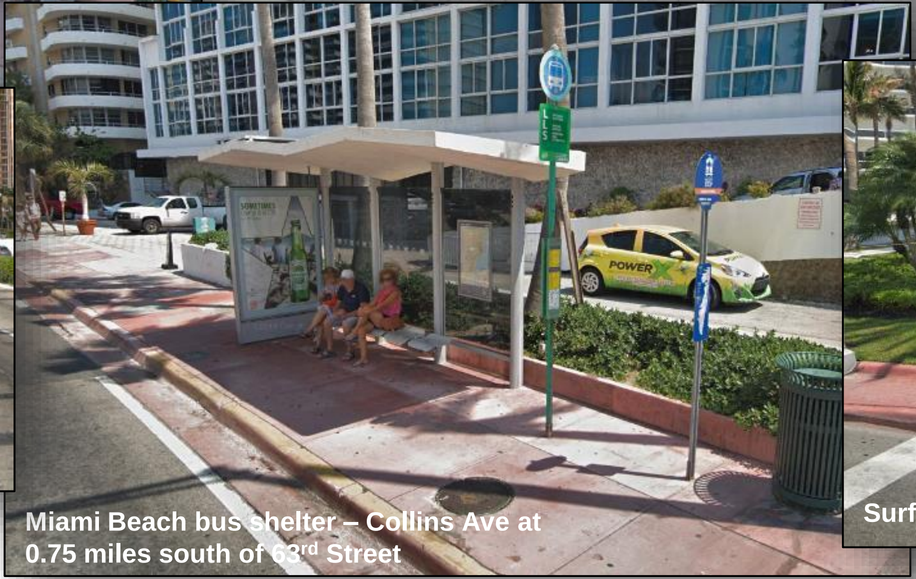
Transit Conditions


Miami Beach bus stop – Collins Ave at 18th Street


Bal Harbour bus shelter – A1A north of Balfour Drive

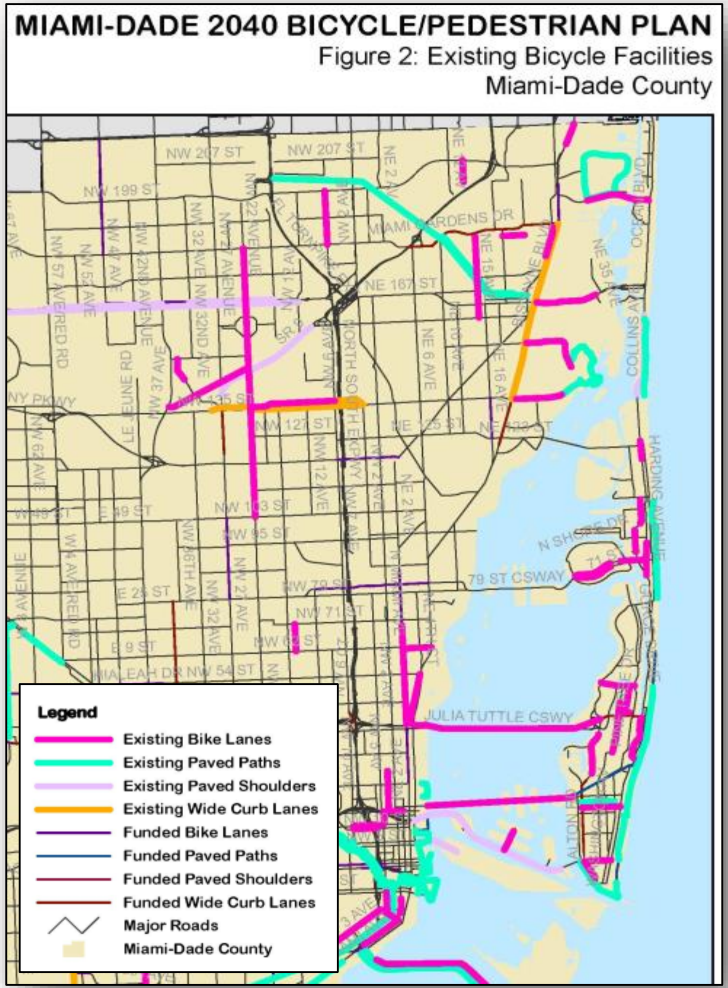

Golden Beach bus stop – A1A north of Ravena Avenue


Sunny Isles Beach bus shelter – A1A @ 174th Street


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


Surfside bus stop – Collins Ave at 96th Street

Pedestrian/Bicycle Conditions



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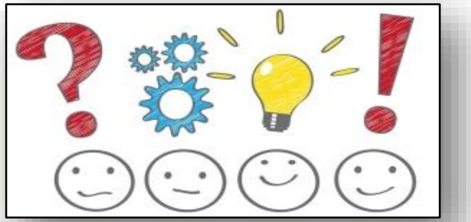
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A



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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

SCHEDULE

2019

March	April	May	June	July	August	September	October	November	December
Literature Review	Literature Review	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation		Draft Report	Final Report	
Data Collection	Data Collection	Data Collection		Proposed Actions	Proposed Actions	Proposed Actions		TPO Present-ations	TPO Present-ations
Identify Stakeholders	SAC Meeting #1		SAC Meeting #2		SAC Meeting #3	Action Plan	Action Plan	SAC Meeting #4	
						Recommend-ations	Recommend-ations		

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

* Schedule subject to change.

Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

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Miami-Dade Transportation Planning Organization

Meeting Notes

Project:	Miami-Dade TPO, North-South Transportation Needs for the Coastal Communities Feasibility Study		
Subject:	Study Advisory Committee (SAC) Meeting #1		
Meeting place:	Miami Beach City Hall Bldg.	Meeting no:	1
Date and time:	April 11, 2019 from 10:00 a.m. to 11:30 a.m.	Summary by:	Rohan Sadhai - Atkins
Present:	Lisa Colmenares Mary Tery Vilches Kiranmai Chirumamilla Joseph Kroll Ralph Rosado, PhD Claudia Hasbun Guillermo Olmedillo Jose Gonzalez Lynda Westin Jack Schnettler Wiatt Bowers Rohan Sadhai	Representing:	Miami-Dade TPO Project Manager Miami-Dade TPO Miami-Dade DTPW Aventura North Bay Village Sunny Isles Beach Surfside Miami Beach Miami Beach Atkins Atkins Atkins

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

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

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

TPO Miami-Dade Transportation Planning Organization

ATKINS Member of the SNC-Lavalin Group

CITY OF SUNNY ISLES BEACH

TOWN OF BAY HARBOR Islands

The City of AVENTURA Florida

90 YEARS GOLDEN BEACH 1929 2019

North Bay Village FLORIDA

BAL HARBOUR - VILLAGE -

MIAMIBEACH

Surfside FLORIDA

Meeting Agenda

I. Schedule

II. Overview of Data Collection

   A. Literature Review

   B. Area and Corridor Conditions

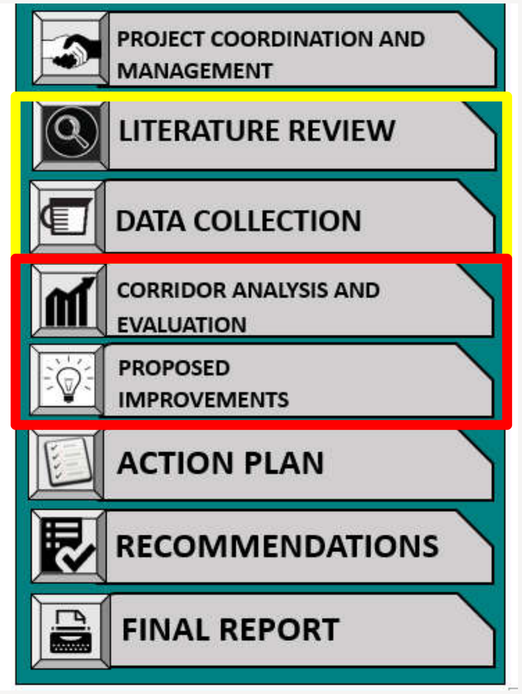
      a. Data Collected

      b. Field Review

III. Needs/Deficiencies

IV. Working Session

V. Next Steps



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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

Schedule*

SCHEDULE

2019

March	April	May	June	July	August	September	October	November	December
Literature Review	Literature Review	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation		Draft Report	Final Report	
Data Collection	Data Collection	Data Collection		Proposed Actions	Proposed Actions	Proposed Actions		TPO Present-ations	TPO Present-ations
Identify Stakeholders	SAC Meeting #1			SAC Meeting #2		SAC ** Meeting #3	Action Plan	SAC Meeting #4	
						Recommend-ations	Recommend-ations		

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

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

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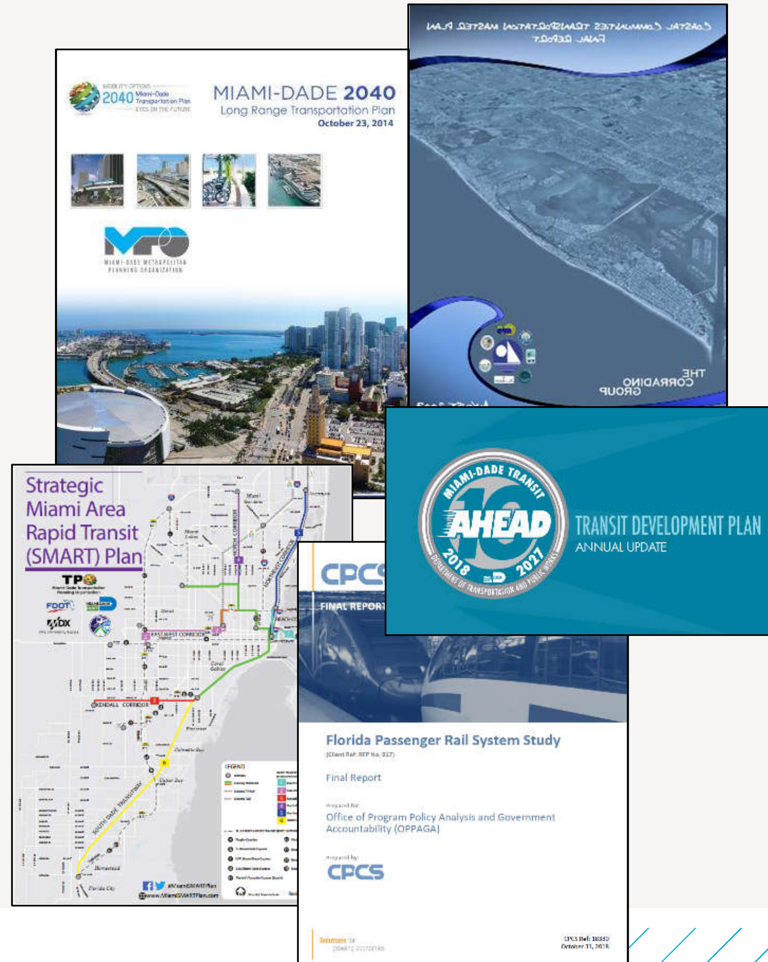
North - South Transportation Needs for the Coastal Communities
FEASIBILITY STUDY
A1A

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
  - Beach 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



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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

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

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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

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

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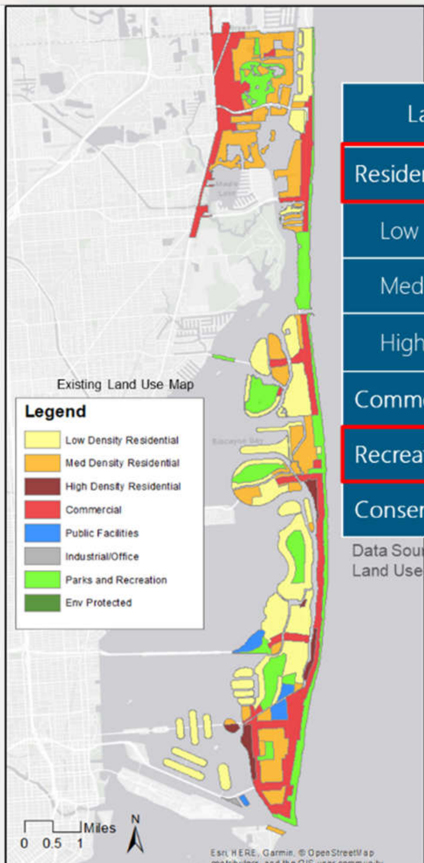
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

Overview of Data Collection
Corridor Characteristics

➤ Existing and Future Land Uses



Existing Land Use

Land Use	Cumulative Percentage
Residential	54%
Low Density	29%
Med Density	23%
High Density	2%
Commercial	24%
Recreational	20%
Conservation	1%

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

Future Land Use

Overview of Data Collection
Corridor Characteristics

- Demographics

188,695

US Census 2017 ACS, Population

152,461

US Census 2017 ACS, Housing Units

$64,237

US Census 2017 ACS, Median Household Income

90,418

US Census 2017 ACS, Households

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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Overview of Data Collection
Corridor Characteristics

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%

➢ 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

Travel Mode						
Total	68,840	9,196	6,899	6,300	2,517	3,407
Percent	71%	9%	7%	6%	3%	4%

US Census 2017 ACS, Mode of Travel to Work

17%
53%
26%
4%
1%

US Census 2017 ACS, Zero Car Households

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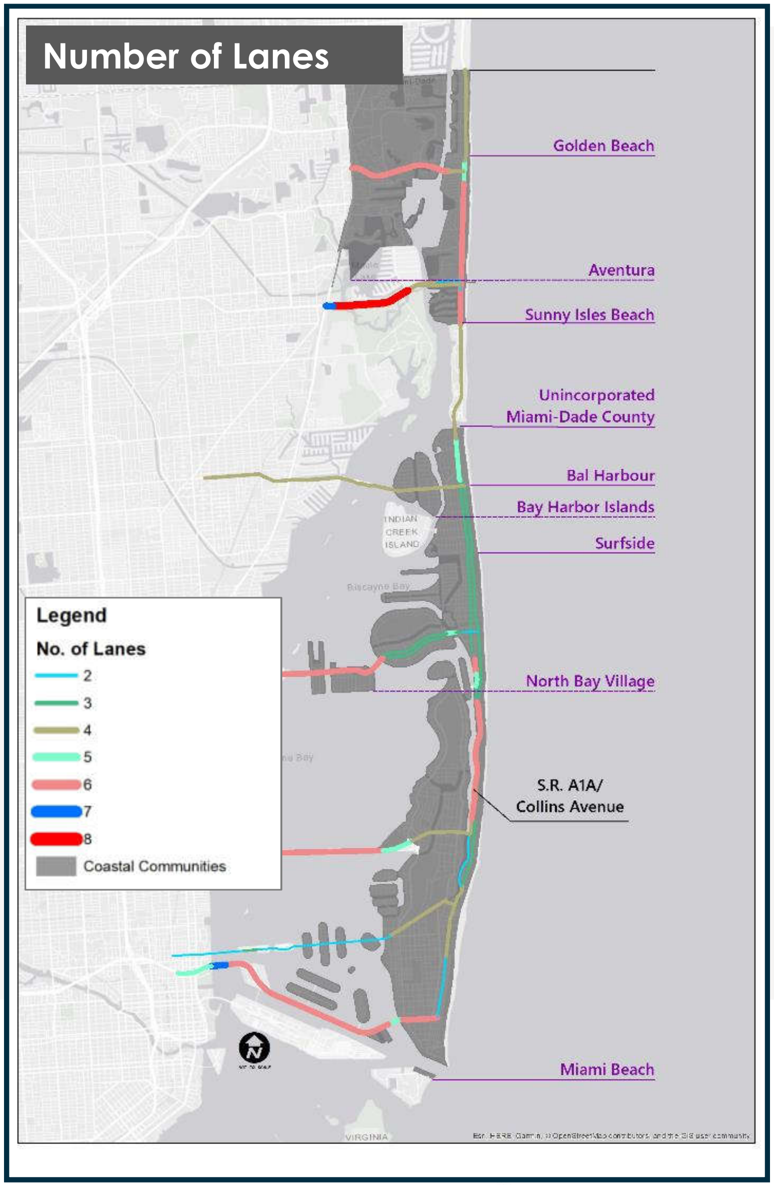
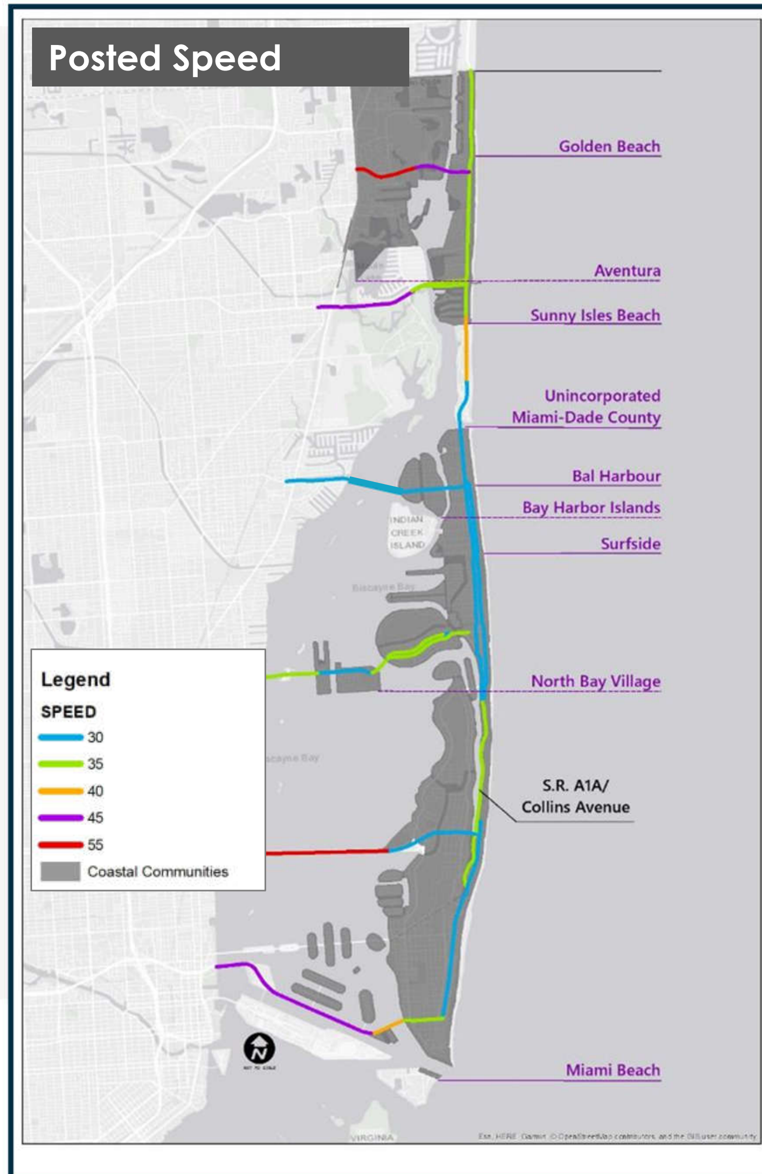
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY





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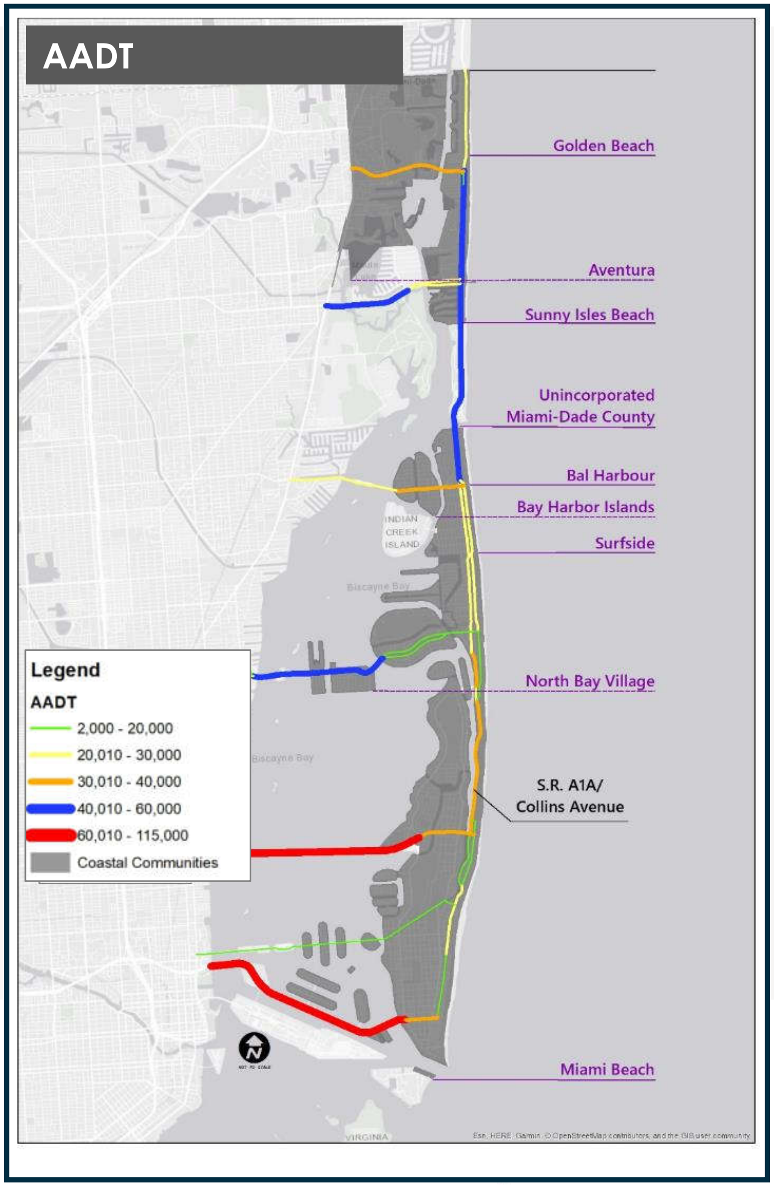

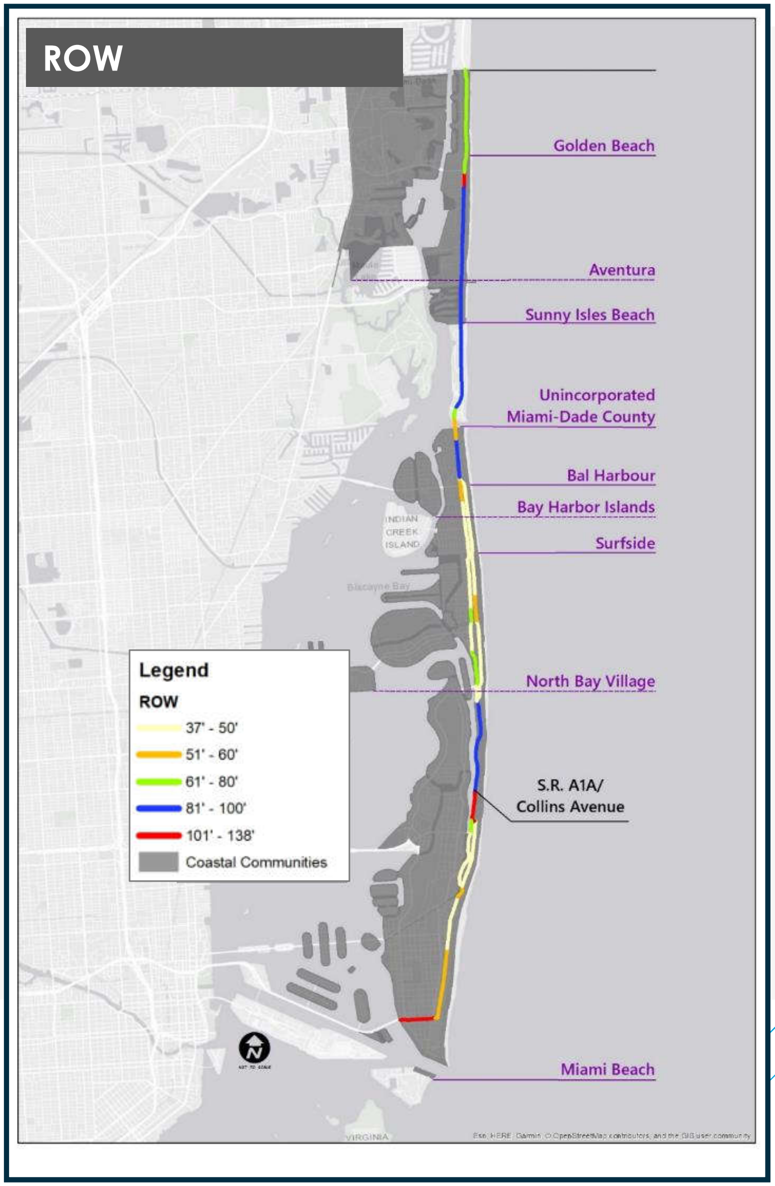

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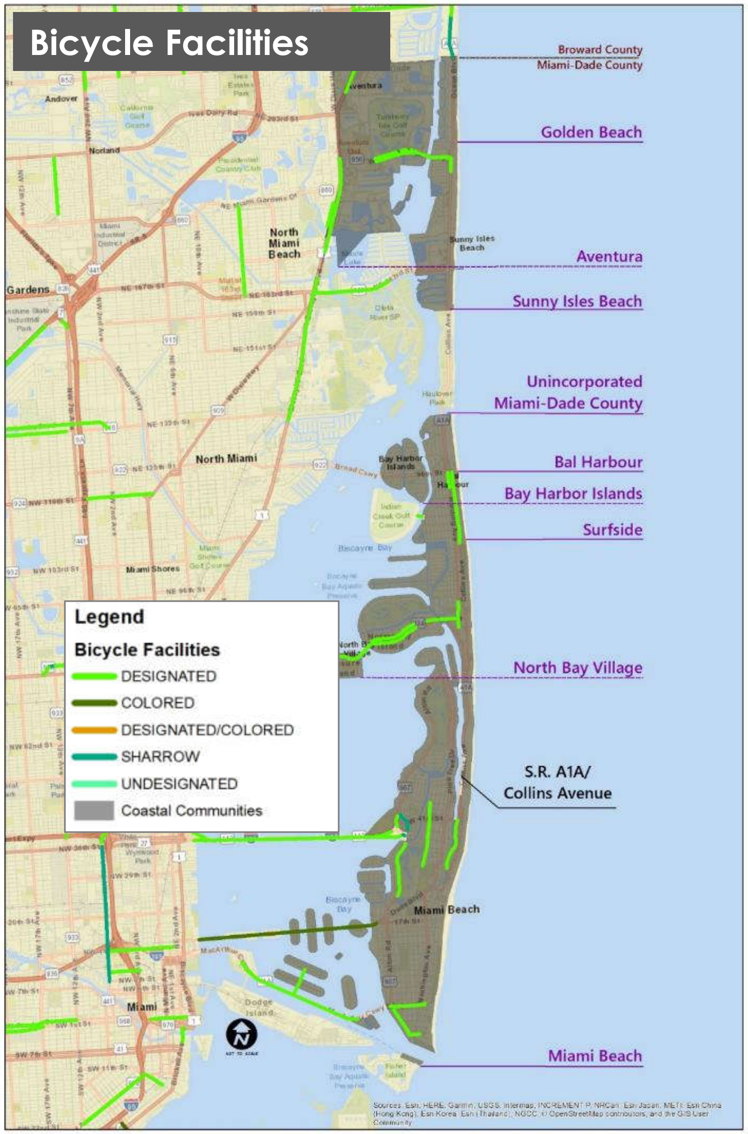

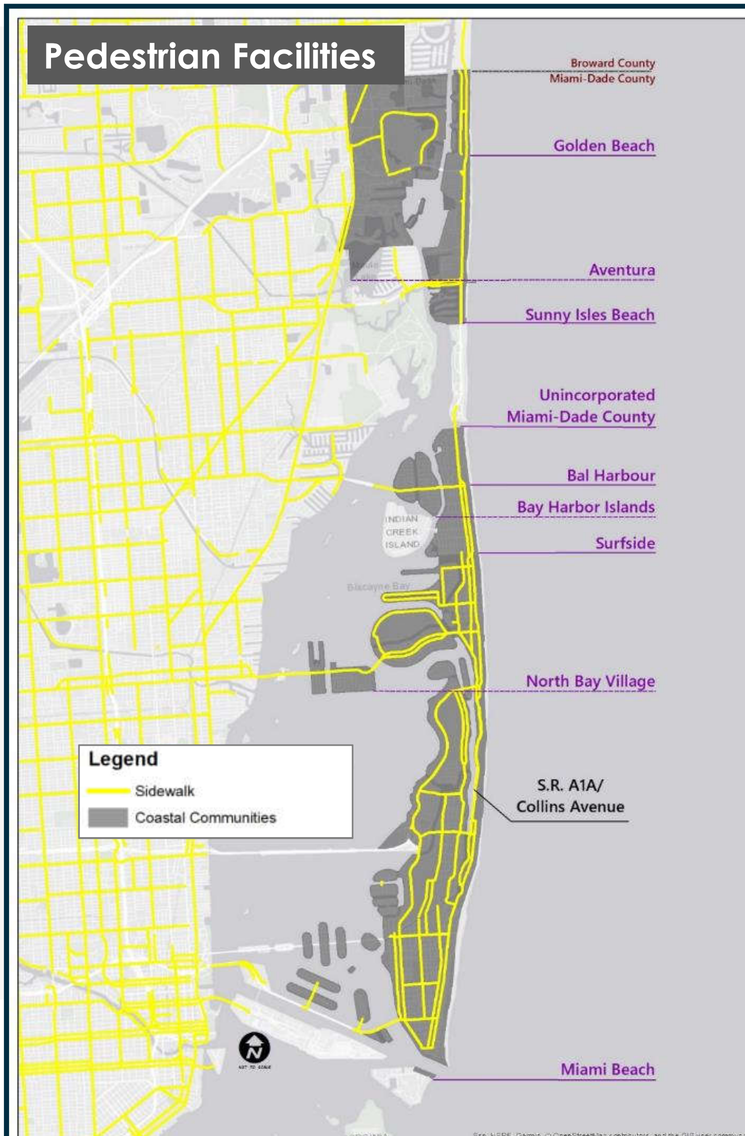

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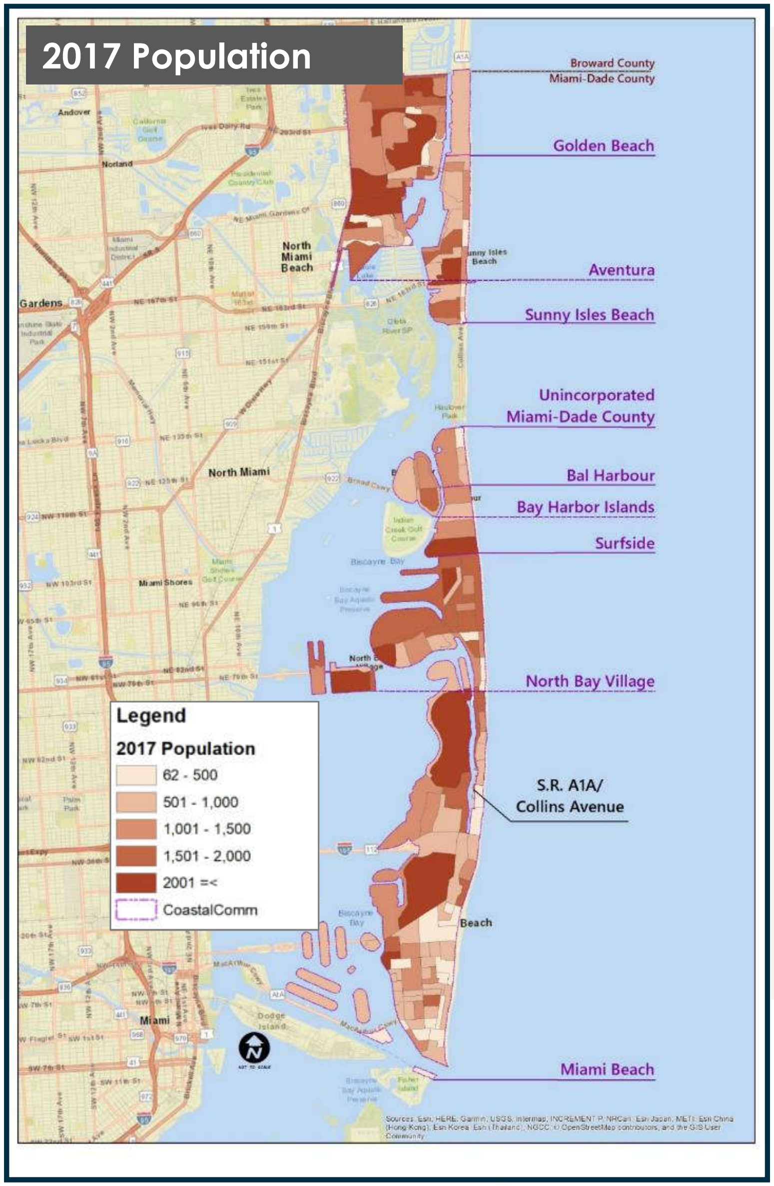

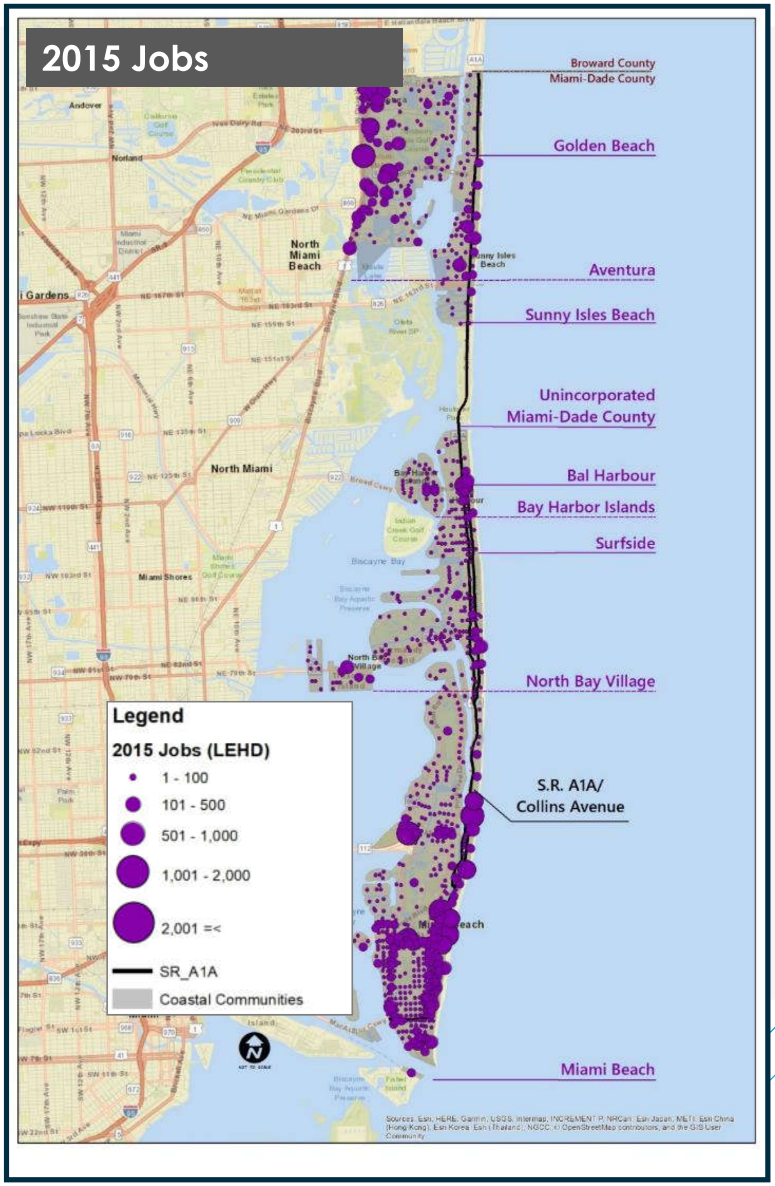

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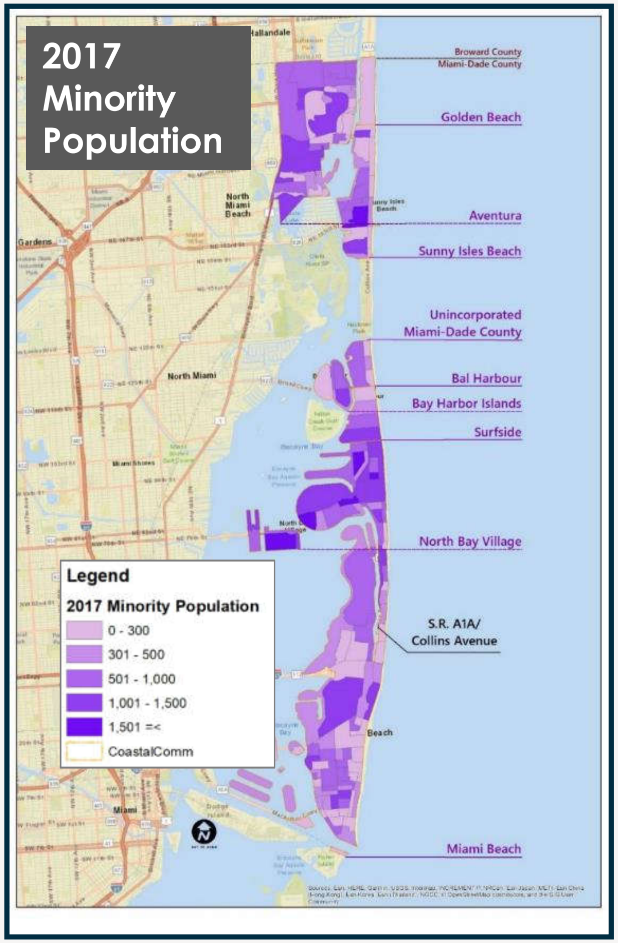
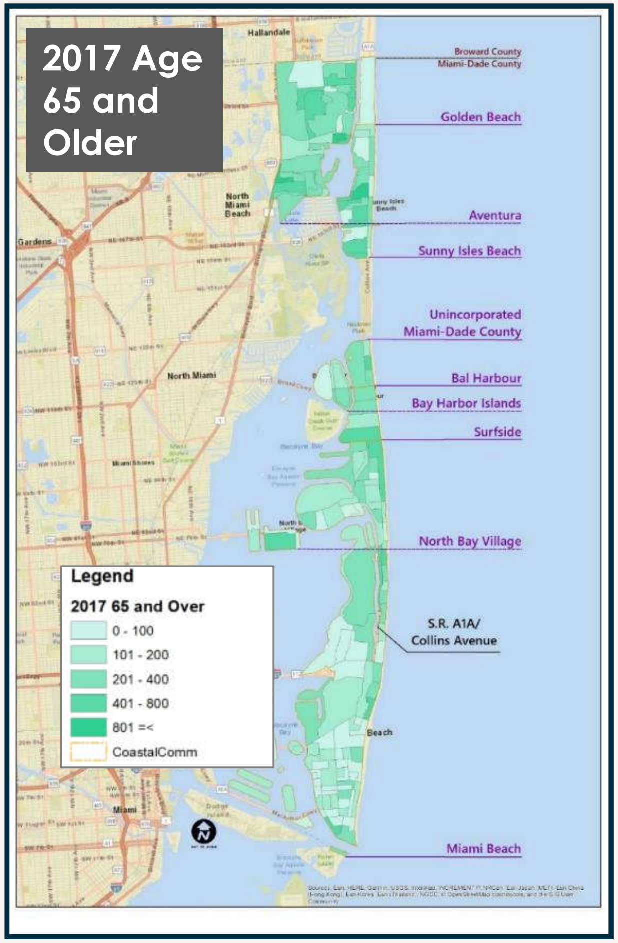
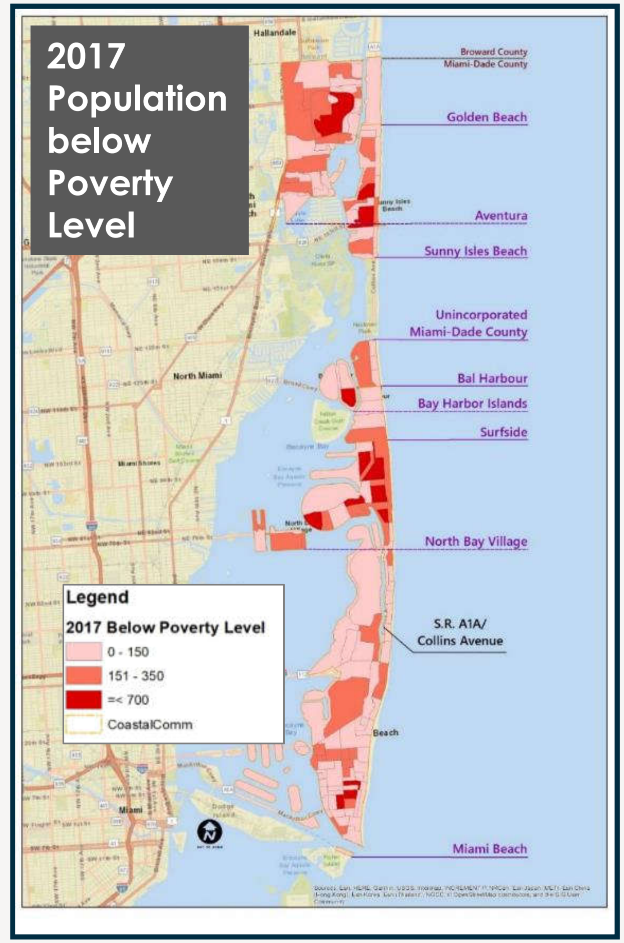
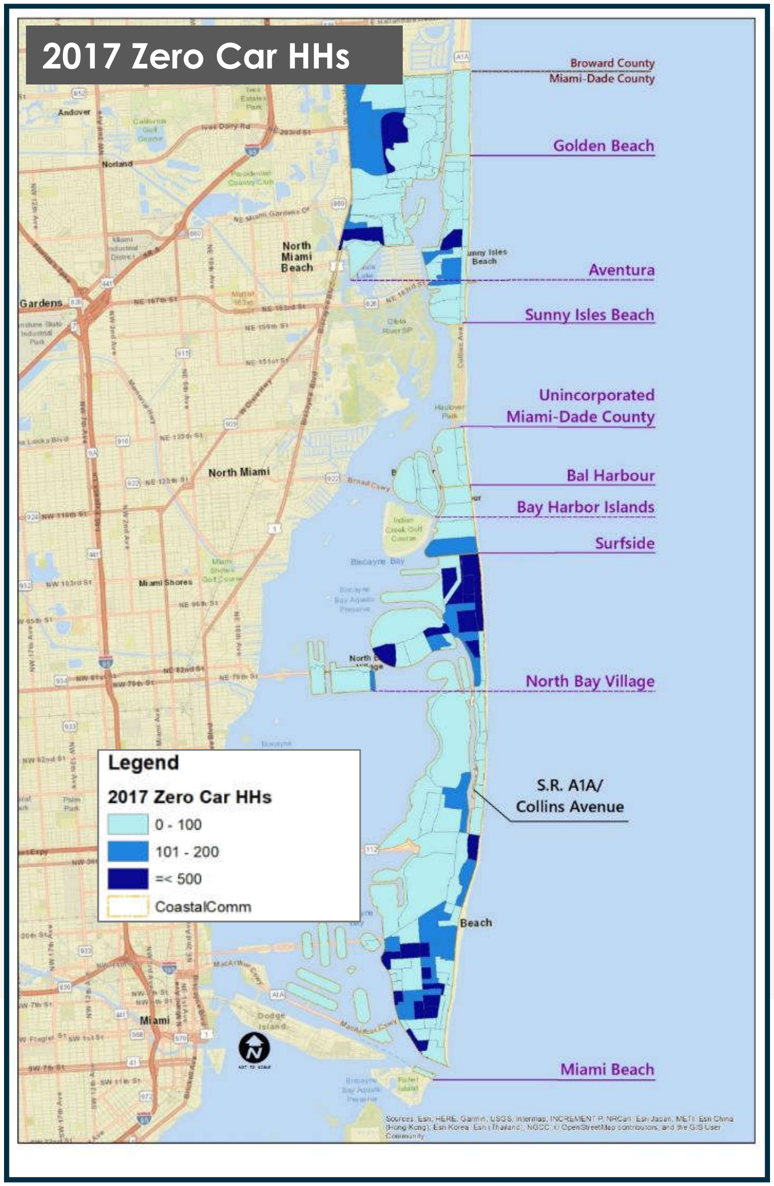
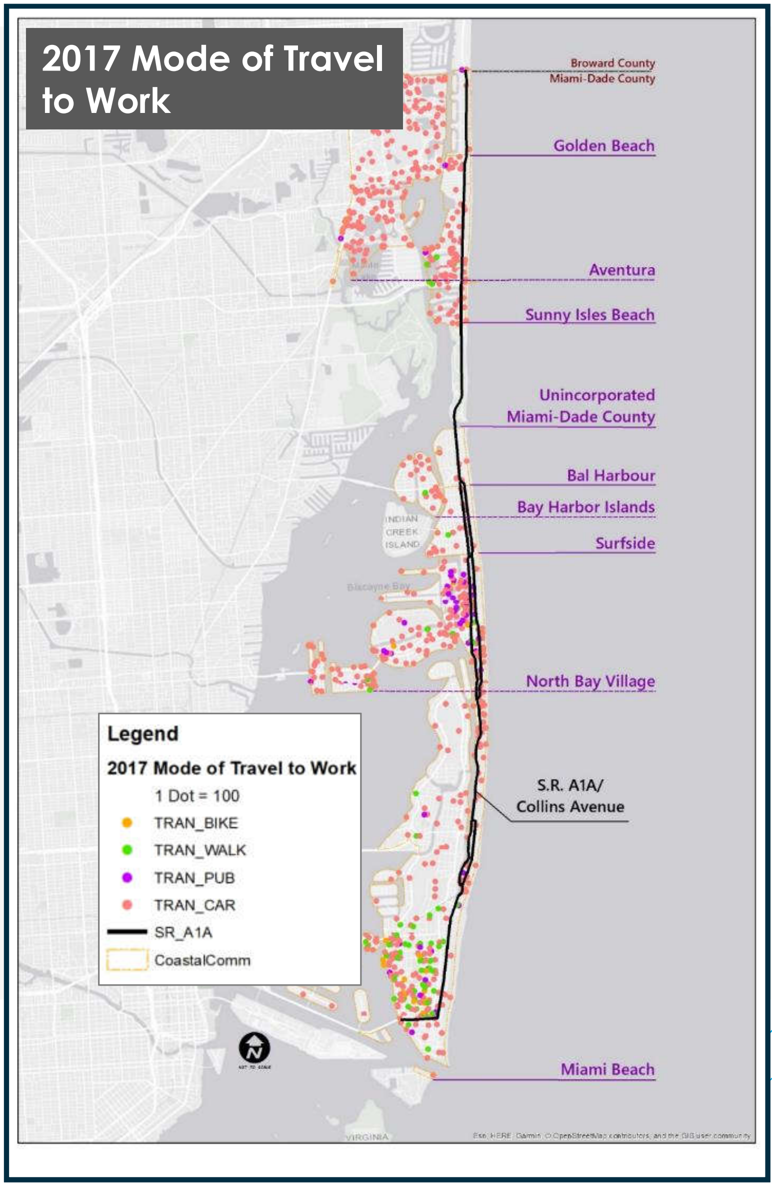

2017 Minority Population
Hallandale
Broward County
Miami-Dade County
Golden Beach
North Miami Beach
Aventura
Sunny Isles Beach
Unincorporated Miami-Dade County
North Miami
Bal Harbour
Bay Harbor Islands
Surfside
North Bay Village
S.R. A1A/
Collins Avenue
Miami
Miami Beach
Legend
2017 Minority Population
0 - 300
301 - 500
501 - 1,000
1,001 - 1,500
1,501 =<
CoastalComm


2017 Age 65 and Older
Hallandale
Broward County
Miami-Dade County
Golden Beach
North Miami Beach
Aventura
Sunny Isles Beach
Unincorporated Miami-Dade County
North Miami
Bal Harbour
Bay Harbor Islands
Surfside
North Bay Village
S.R. A1A/
Collins Avenue
Miami
Miami Beach
Legend
2017 65 and Over
0 - 100
101 - 200
201 - 400
401 - 800
801 =<
CoastalComm


2017 Population below Poverty Level
Hallandale
Broward County
Miami-Dade County
Golden Beach
Aventura
Sunny Isles Beach
Unincorporated Miami-Dade County
North Miami
Bal Harbour
Bay Harbor Islands
Surfside
North Bay Village
S.R. A1A/
Collins Avenue
Miami
Miami Beach
Legend
2017 Below Poverty Level
0 - 150
151 - 350
=< 700
CoastalComm





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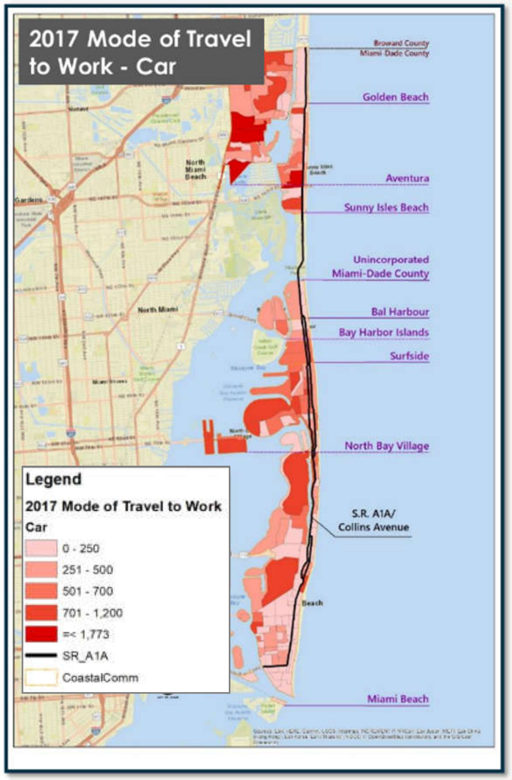

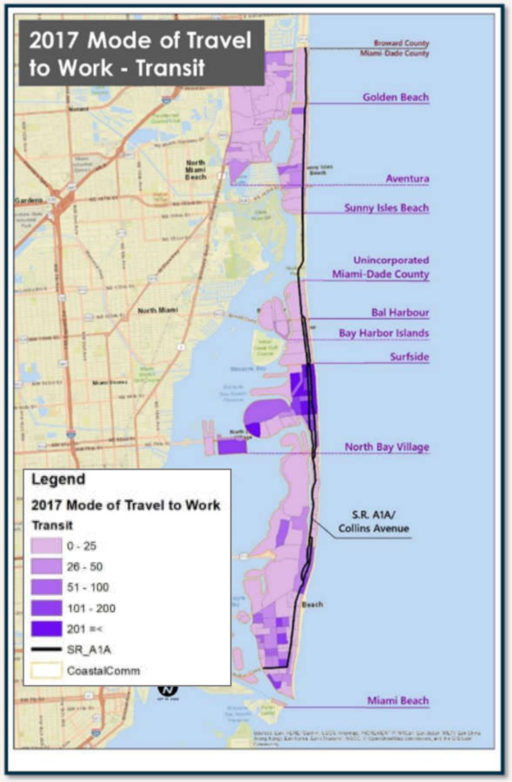

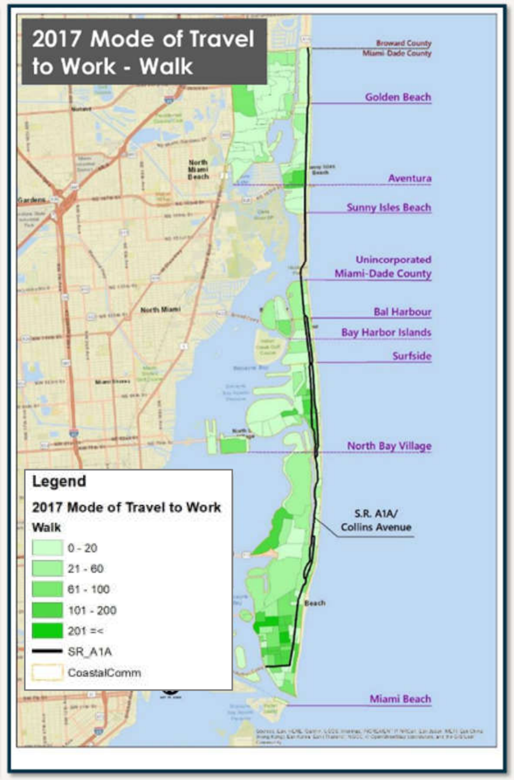

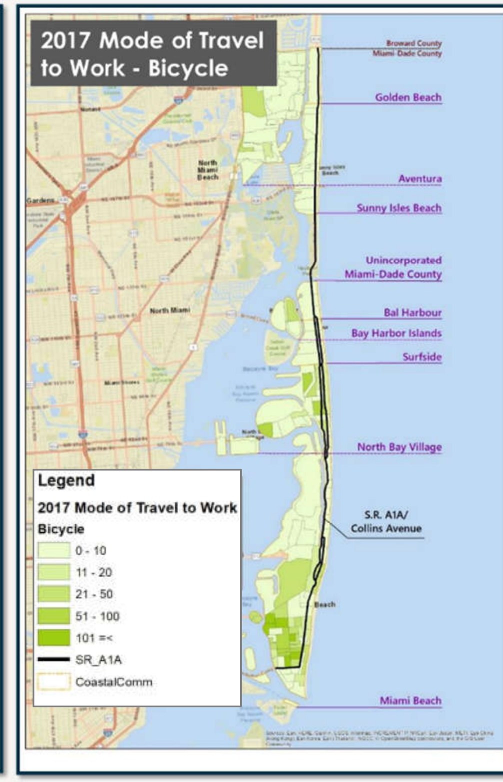

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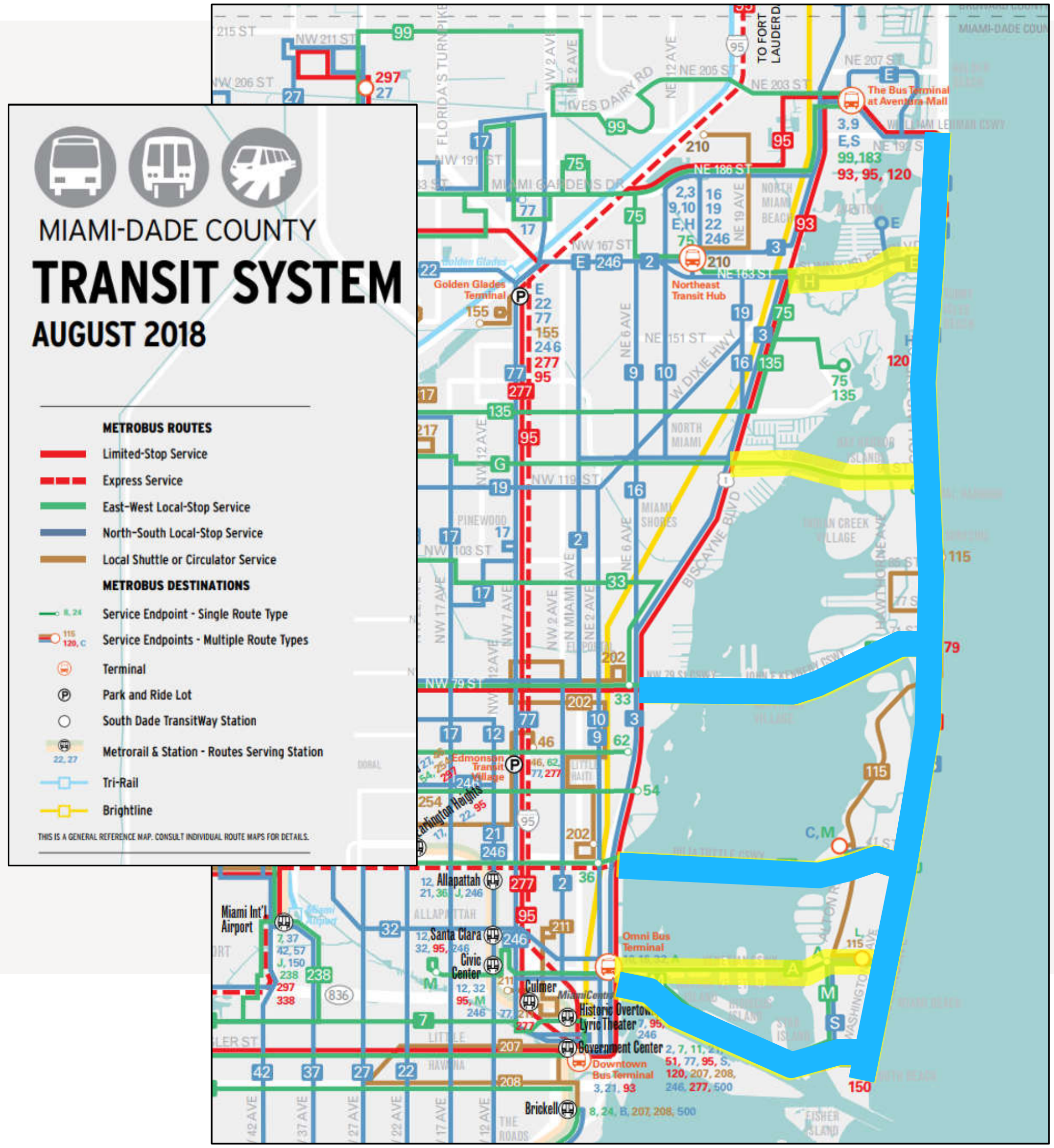
North - South Transportation Needs for the Coastal Communities
FEASIBILITY STUDY
A1A

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



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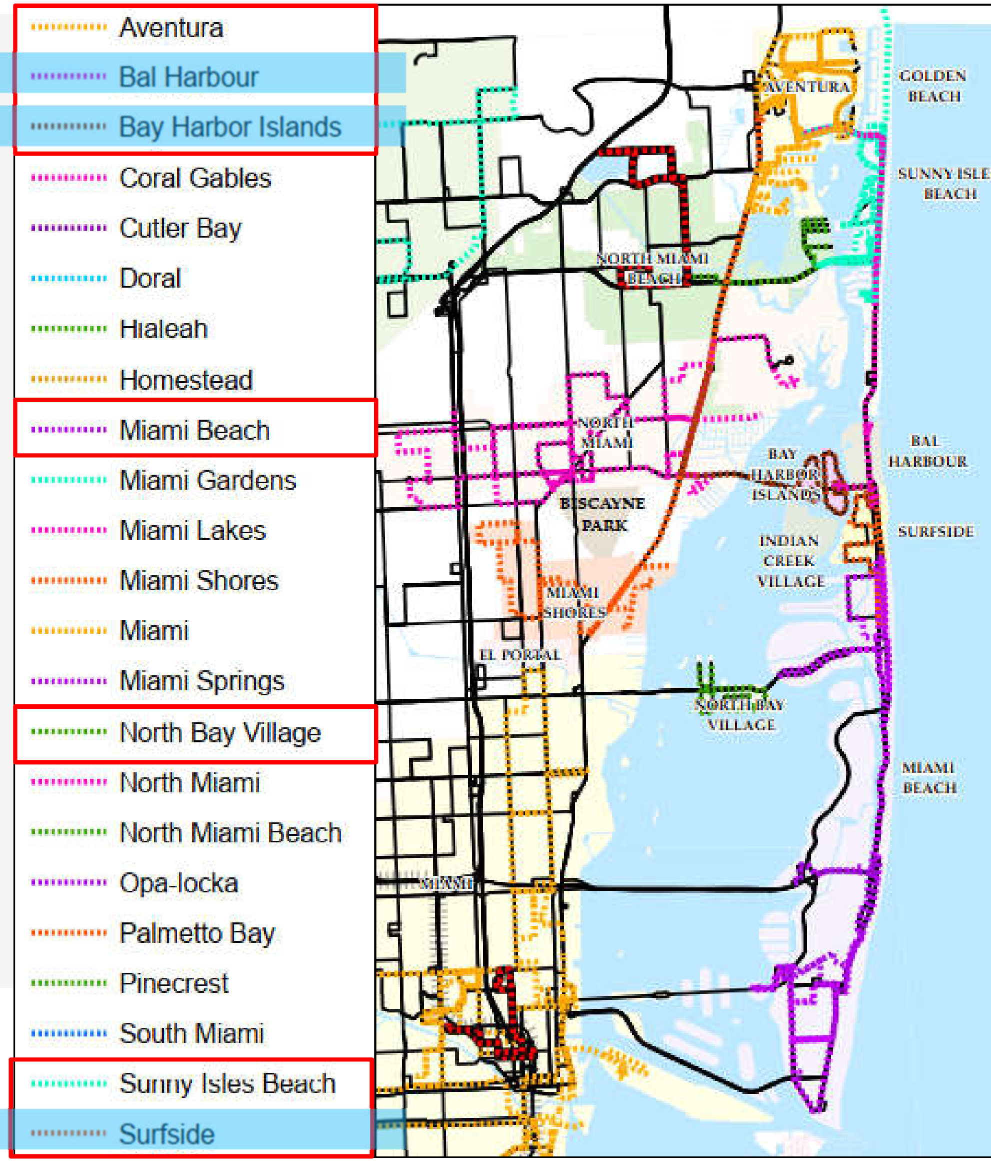
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

A1A

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



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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Transit Ridership

Metrobus Routes Ridership Data

Route ID	Route Desc	Ave Weekday Mar-19	Ave Weekday Mar-18	Ave Weekday Diff	Month Mar-19	Month Mar-18	Month Diff
79	Limited	381	181	200	8,010	3,984	4,026
115	MB Shuttle	131	122	9	3,388	3,409	(21)
101-A	E/W	150	134	16	3,785	3,334	451
103-C	N/S	432	429	3	11,760	11,674	86
105-E	N/S	1,181	1,238	(57)	31,279	33,104	(1,825)
107-G	E/W	1,590	1,673	(83)	43,265	46,742	(3,477)
108-H	N/S	499	459	40	14,452	13,556	896
110-J	E/W	**2,576**	2,409	167	**71,223**	67,535	3,688
112-L	E/W	**7,164**	7,353	(189)	**203,563**	210,756	(7,193)
113-M	E/W	736	773	(37)	19,814	20,954	(1,140)
119-S	N/S	**8,970**	8,863	107	**259,064**	260,908	(1,844)
120-Beach Max	Limited	**5,969**	6,256	(287)	**164,057**	175,188	(11,131)
150-MB Airport Flyer	Express	1,806	1,810	(4)	53,836	54,082	(246)

Source: Miami-Dade County Transportation and Public Works, Ridership Technical Reports, Division of Performance and Materials Management; October 2018 through March 2019.

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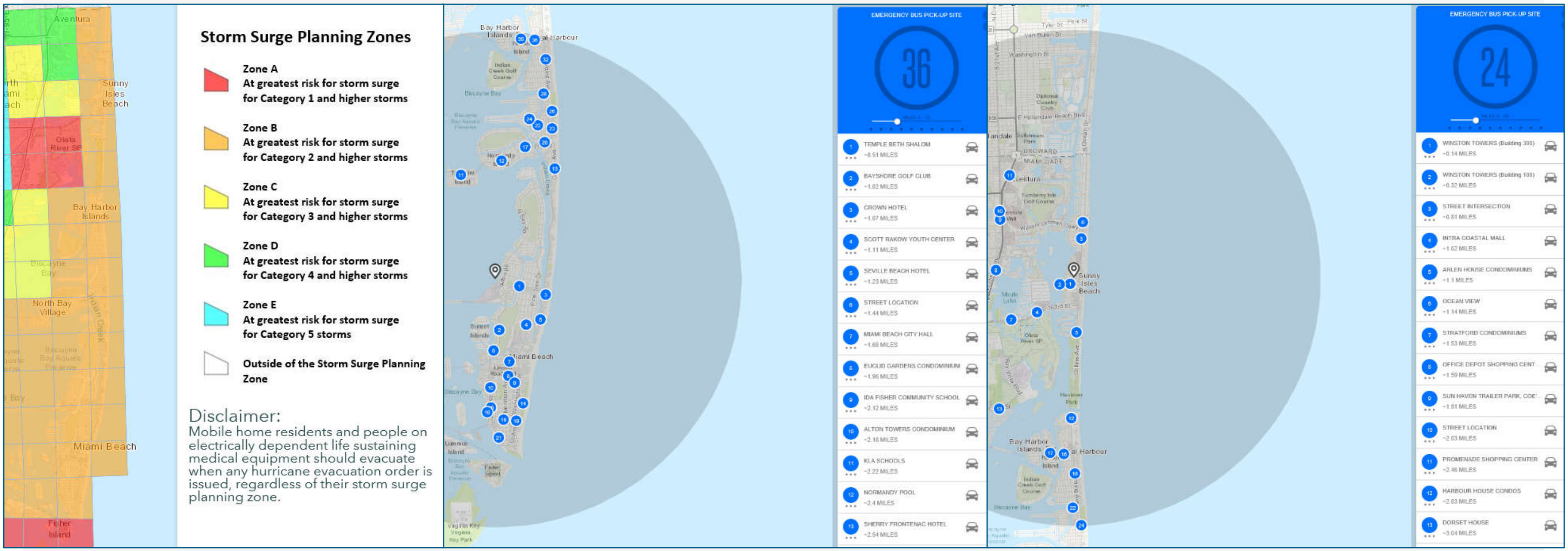
Emergency Evacuation Zones and Bus Pick-up Sites



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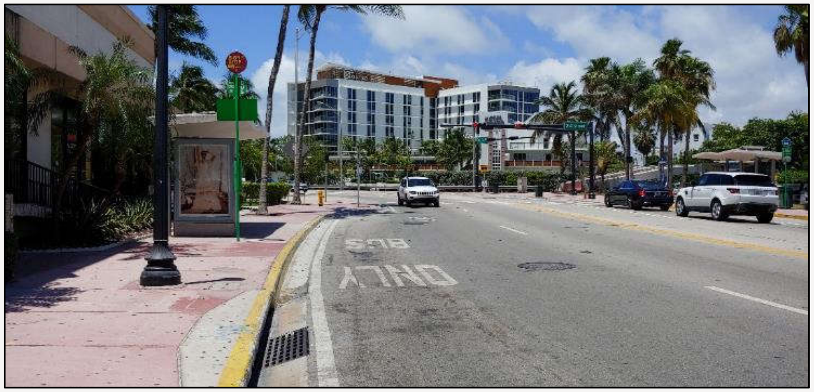
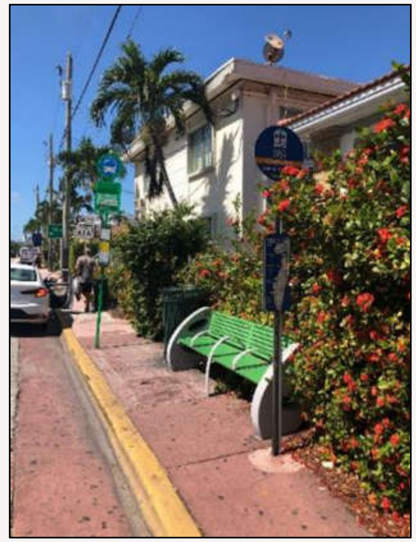
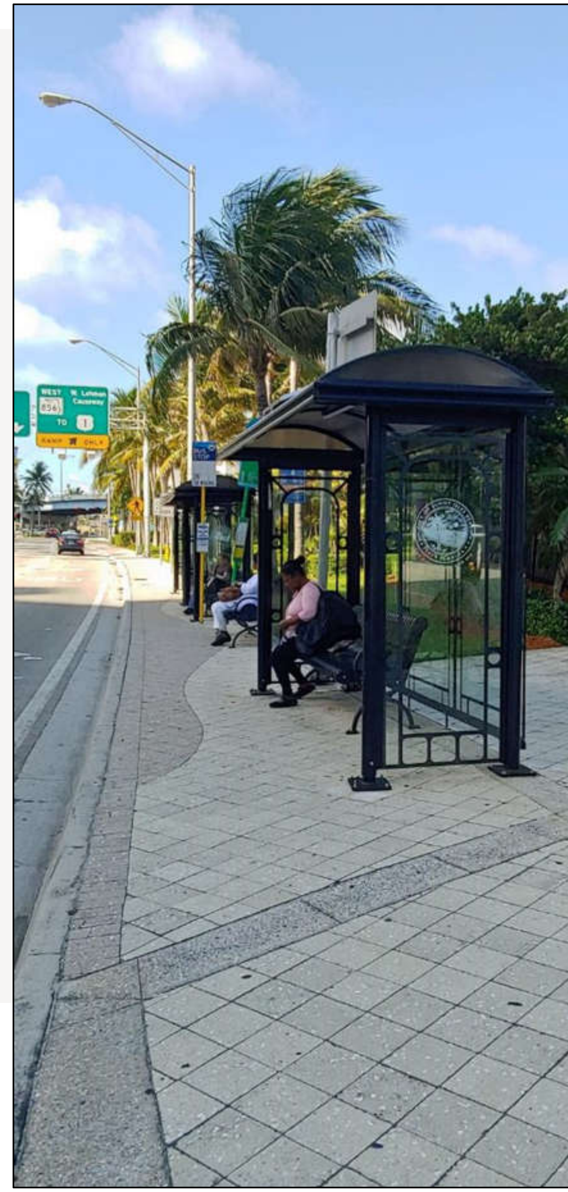
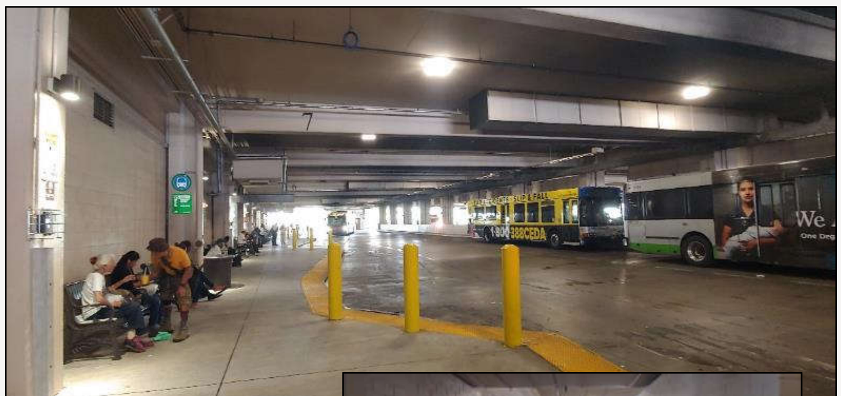
Field Review

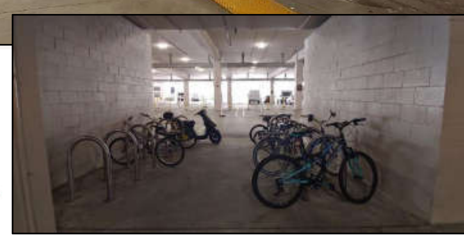


Field Review: Transit









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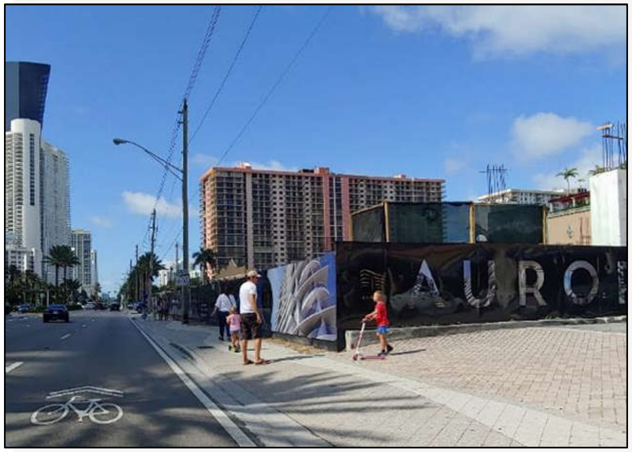
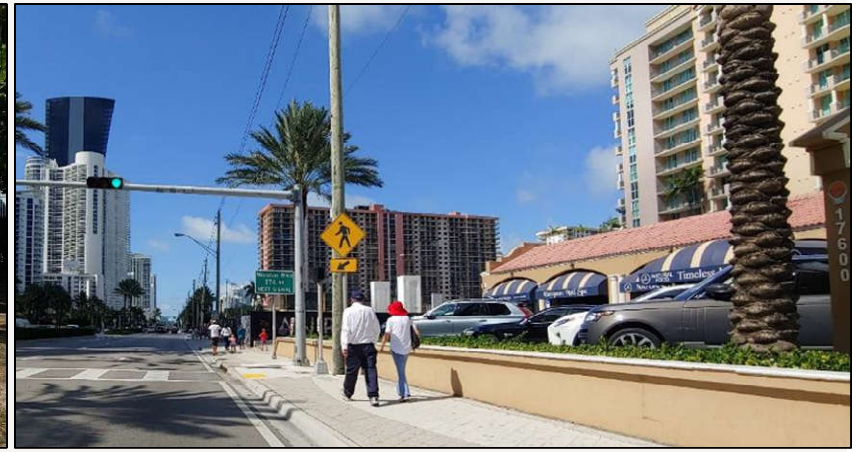
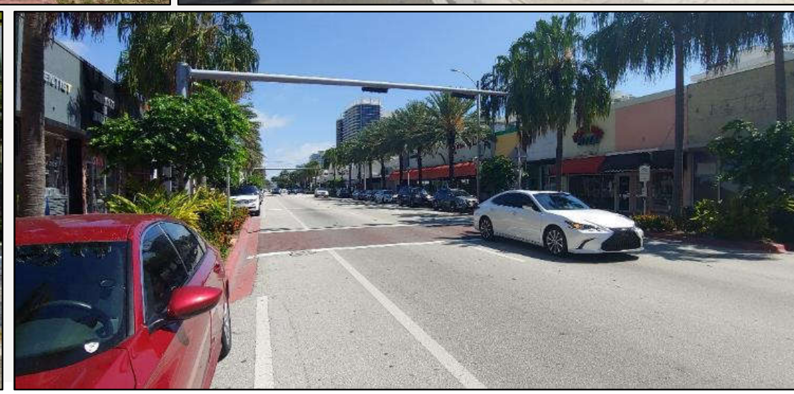
FEASIBILITY STUDY
A1A

Field Review: Pedestrian







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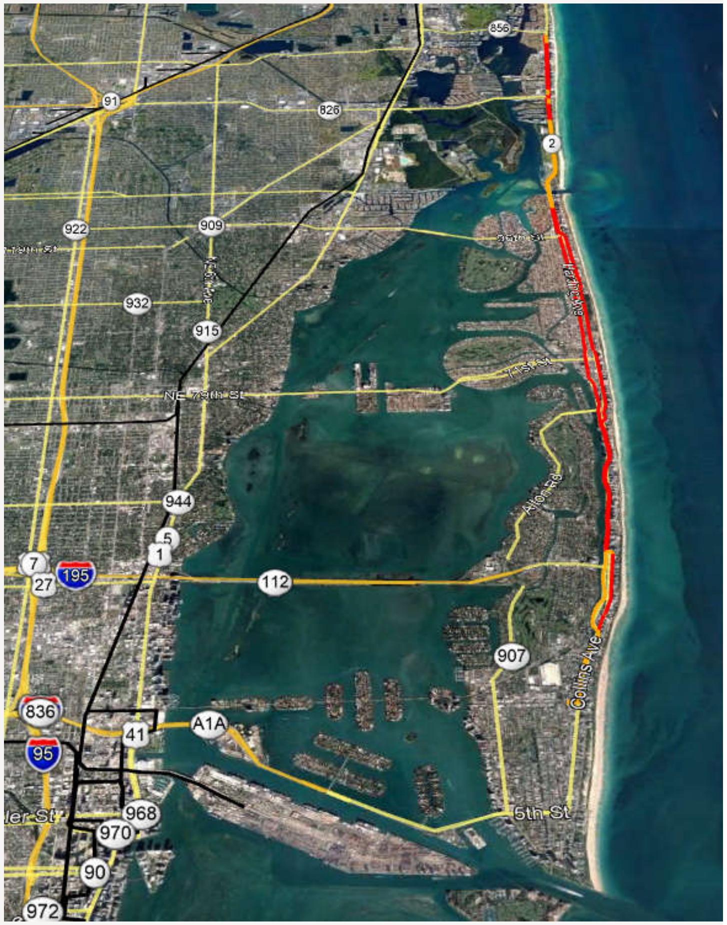
North - South Transportation Needs for the Coastal Communities
FEASIBILITY STUDY
A1A

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)



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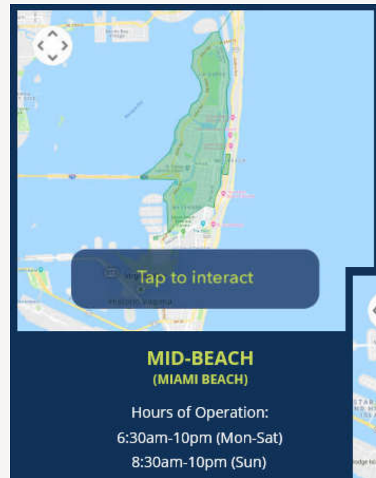
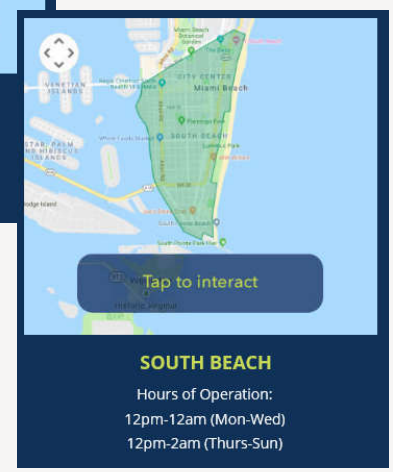
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

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/



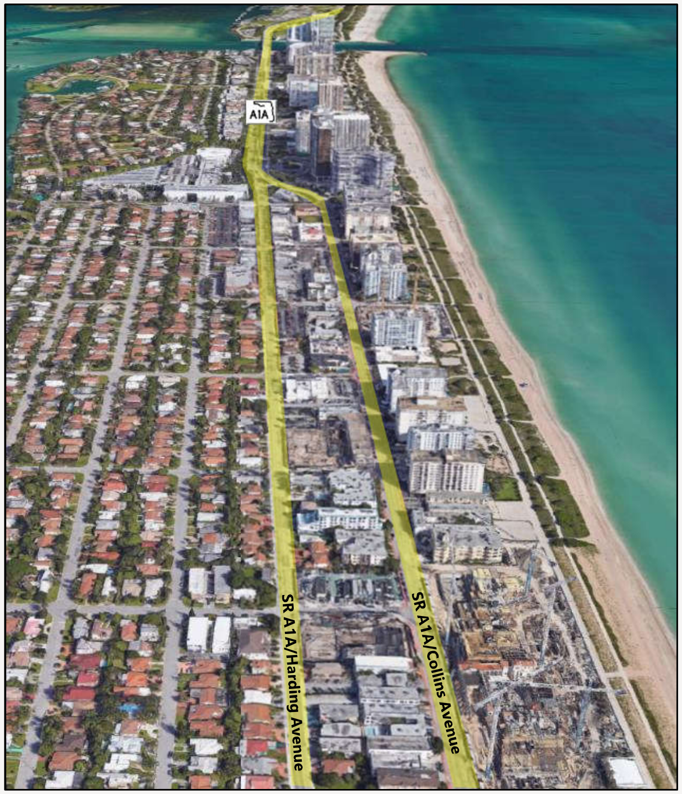
Freebee service areas.
Source: https://ridefreebee.com/

Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

Next Steps

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



North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

TPO Miami-Dade Transportation Planning Organization

Contact Information

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305-375-1738

Jack S. Schnettler, P.E.

Project Manager

Jack.Schnettler@atkinsglobal.com

305-514-3369

Miami-Dade Transportation Planning Organization

Meeting Notes

Project:	Miami-Dade TPO North-South Transportation Needs for the Coastal Communities Feasibility Study		
Subject:	Study Advisory Committee (SAC) Meeting #2		
Meeting place:	Sunny Isles Beach Government Center	Meeting no:	2
Date and time:	July 23, 2019 from 10:00 a.m. to 11:30 a.m.	Summary by:	Jack Schnettler - Atkins
Present:	Lisa Colmenares Joann Carr Susan Simpson Kathryn Matos Claudia Hasbun Guillermo Olmedillo Jose Olivo Lynda Westin Jack Schnettler Wiatt Bowers Rohan Sadhai	Representing:	Miami-Dade TPO Project Manager Aventura Sunny Isles Beach Sunny Isles Beach Sunny Isles Beach Surfside North Bay Village Miami Beach Atkins Project Manager Atkins Atkins

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 on-going 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 sideways 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.
    - Traffic volume/LOS for existing and future conditions
    - 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:
    - 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

Miami-Dade TPO

North-South Transportation Needs for the Coastal Communities Feasibility Study

Study Advisory Committee (SAC)–Meeting #3

Date: Friday, September 27, 2019 at 10:00 AM

Location: 1st Floor Conference Room
1666 Kennedy Causeway
North Bay Village, FL 33141

Meeting Agenda

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

Schedule*

SCHEDULE

2019

March	April	May	June	July	August	September	October	November	December
Literature Review	Literature Review	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation		Draft Report	Final Report	
Data Collection	Data Collection	Data Collection		Proposed Actions	Proposed Actions	Proposed Actions		TPO Present-ations	TPO Present-ations
Identify Stakeholders	SAC Meeting #1			SAC Meeting #2		SAC ** Meeting #3	Action Plan	SAC Meeting #4	
						Recommend-ations	Recommend-ations		

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

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

TPO Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Overview of Existing Conditions

- **Literature Review**
  - Various transportation plans and programs
  - Previous and related studies
- **Data Collection**
  - 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 Existing Conditions

Existing Land Use

Land Use	Cumulative Percentage
Residential	54%
Low Density	29%
Med Density	23%
High Density	2%
Commercial	24%
Recreational	20%
Conservation	1%

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

Travel Mode	Car	Bus	Bicycle	Walk	Motorcycle	Other
Total	68,840	9,196	6,899	6,300	2,517	3,407
Percent	71%	9%	7%	6%	3%	4%

US Census 2017 ACS, Mode of Travel to Work

188,695

US Census 2017 ACS, Population

152,461

US Census 2017 ACS, Housing Units

2040

$64,237

US Census 2017 ACS, Median Household Income

90,418

US Census 2017 ACS, Households

No car	17%
1 car	53%
2 cars	26%
3 cars	4%
4 cars	1%

US Census 2017 ACS, Zero Car Households

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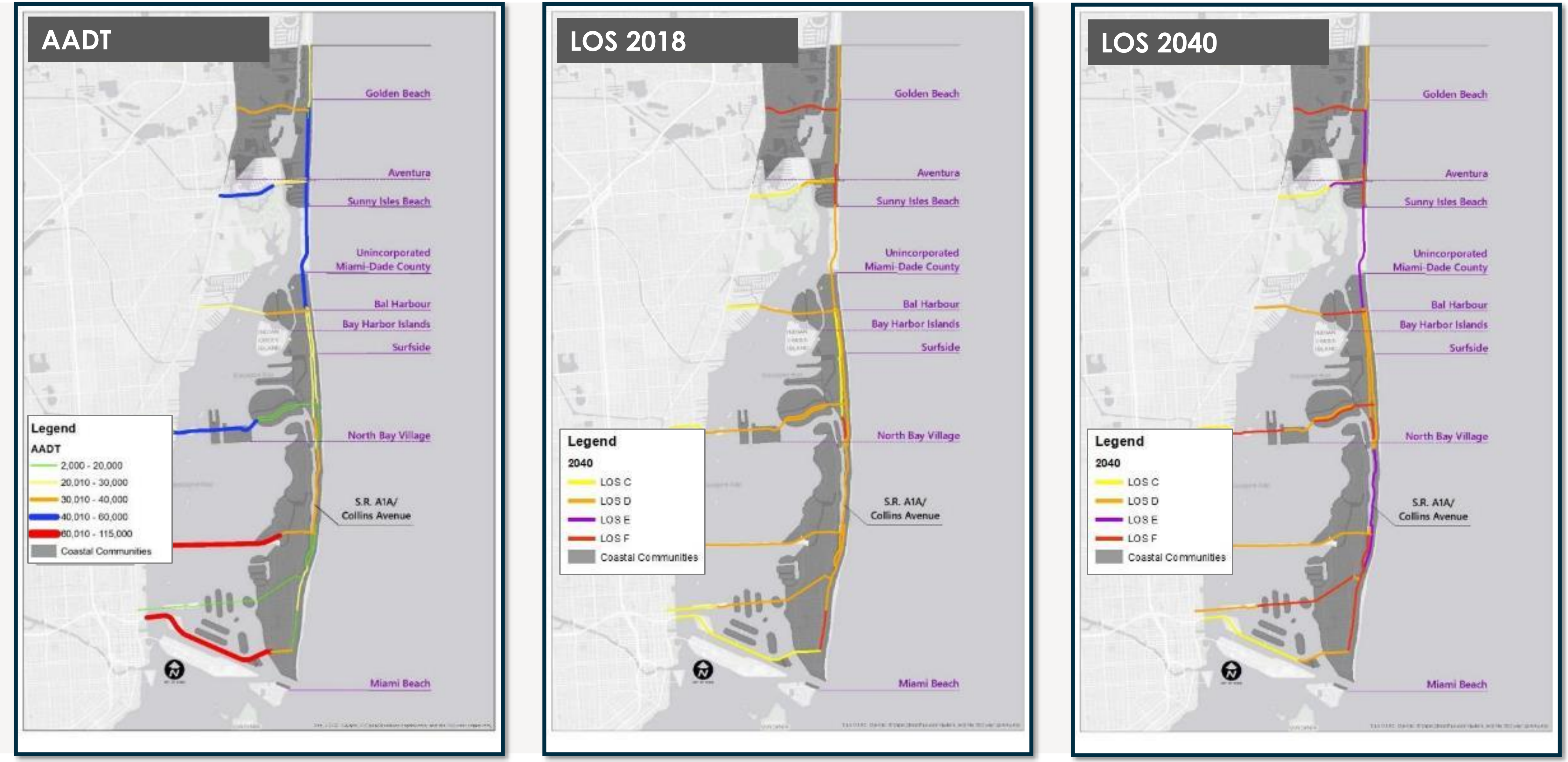
The Silent Generation
Born: 1928 to 1945
Age in 2017: 72 to 89
Share of adult population: 8%

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

TPO Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A



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North - South Transportation Needs for the Coastal Communities
FEASIBILITY STUDY
A1A

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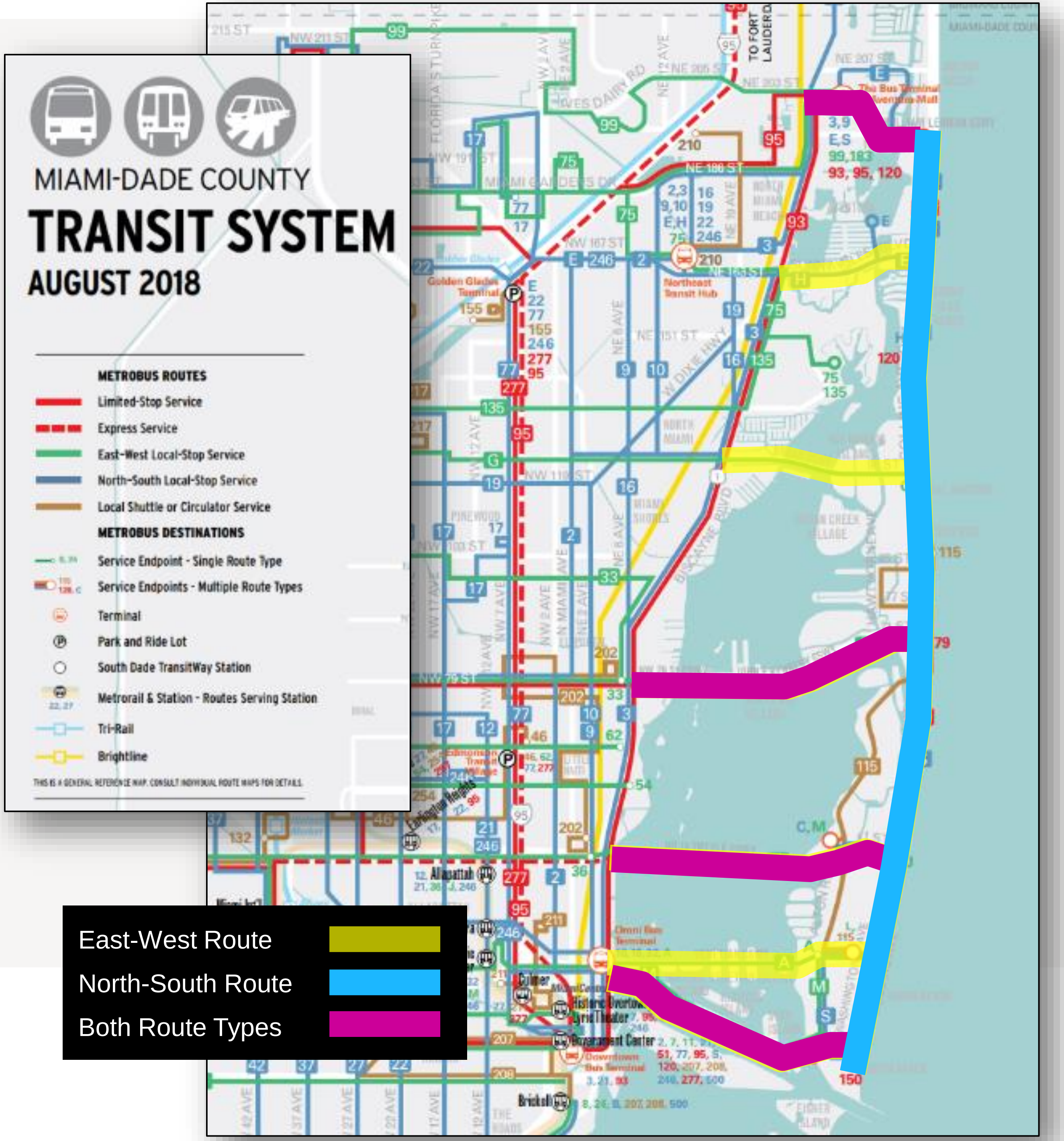
Planning Organization

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



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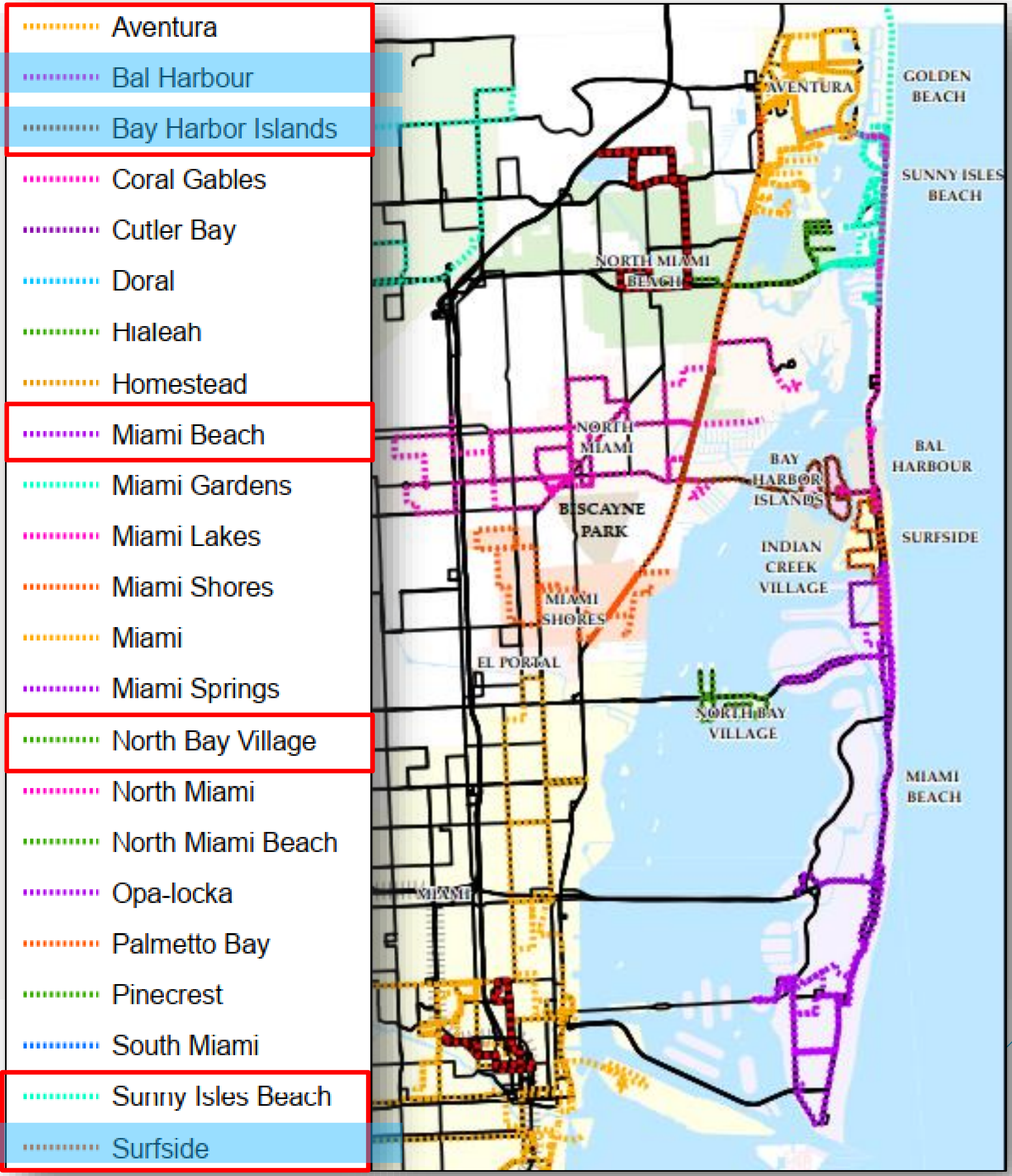
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

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



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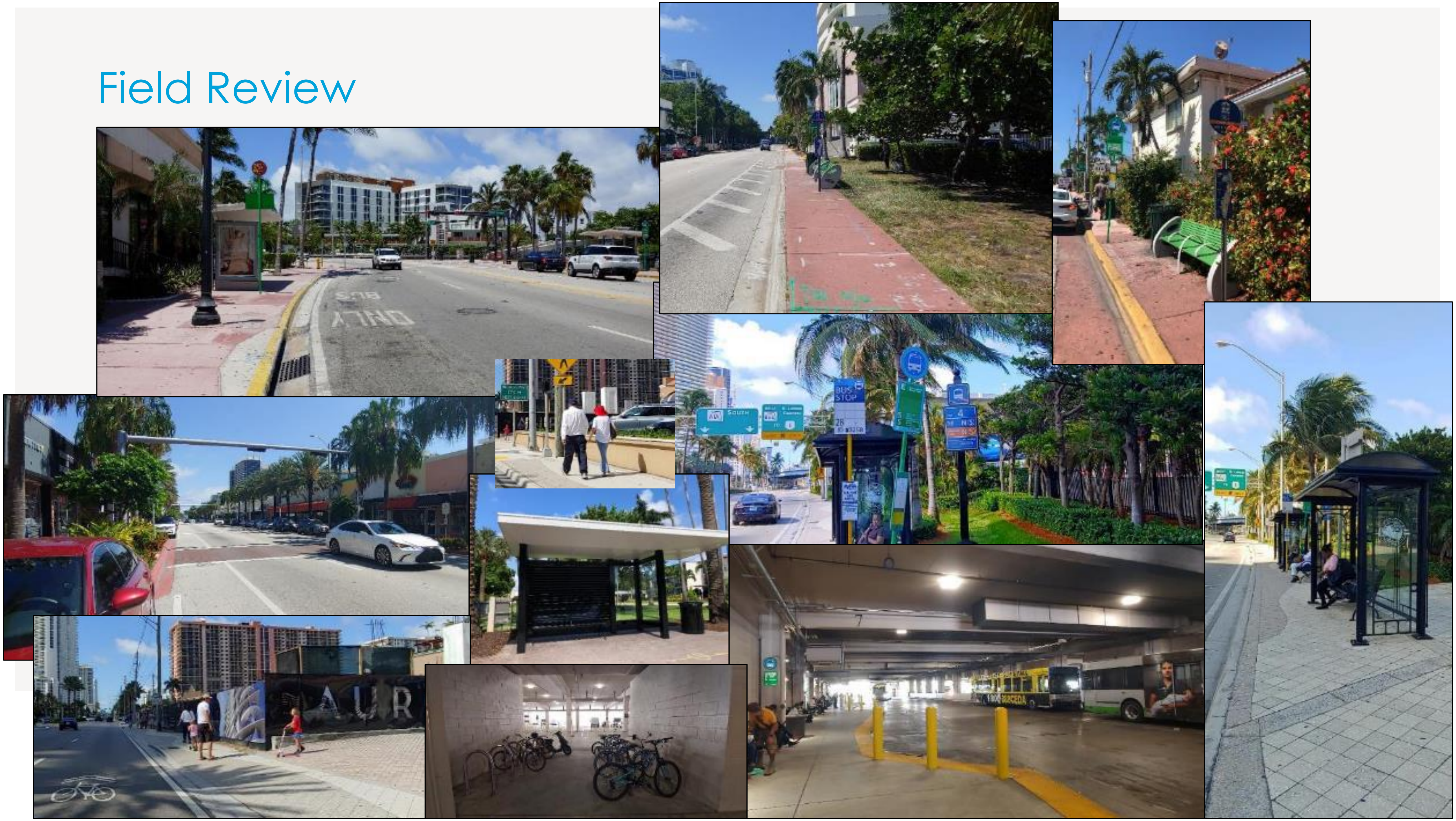
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Field Review

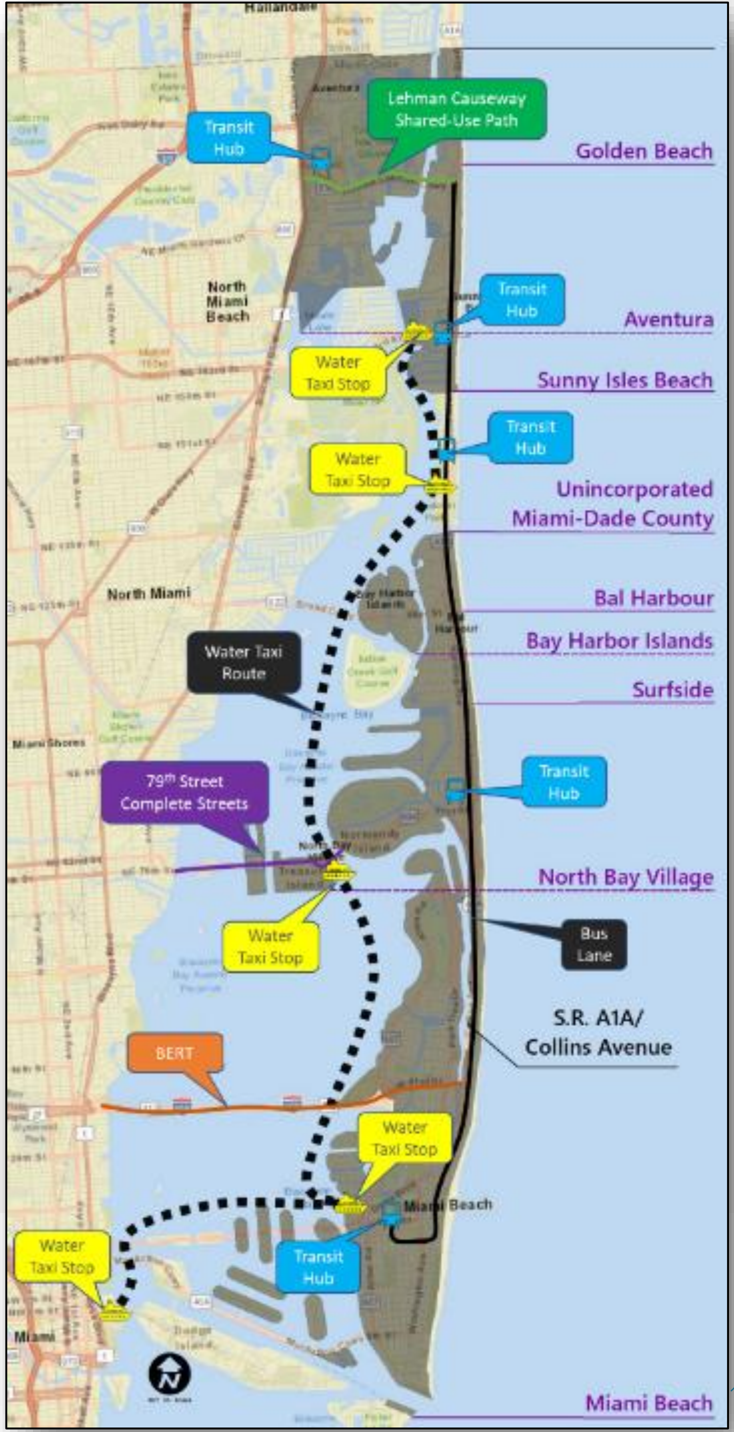


Deficiencies and Needs

- Dedicated transit along SR A1A that links all communities
- Lack of walkable pockets of development – transit hubs
- Bicycle facilities
  - East/west bicycle facilities linking the mainland
  - North-south gaps
- Pedestrian facilities
  - Improve shade along corridor
  - Enhanced crosswalks at intersections
  - 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



Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Waterborne Transit Services

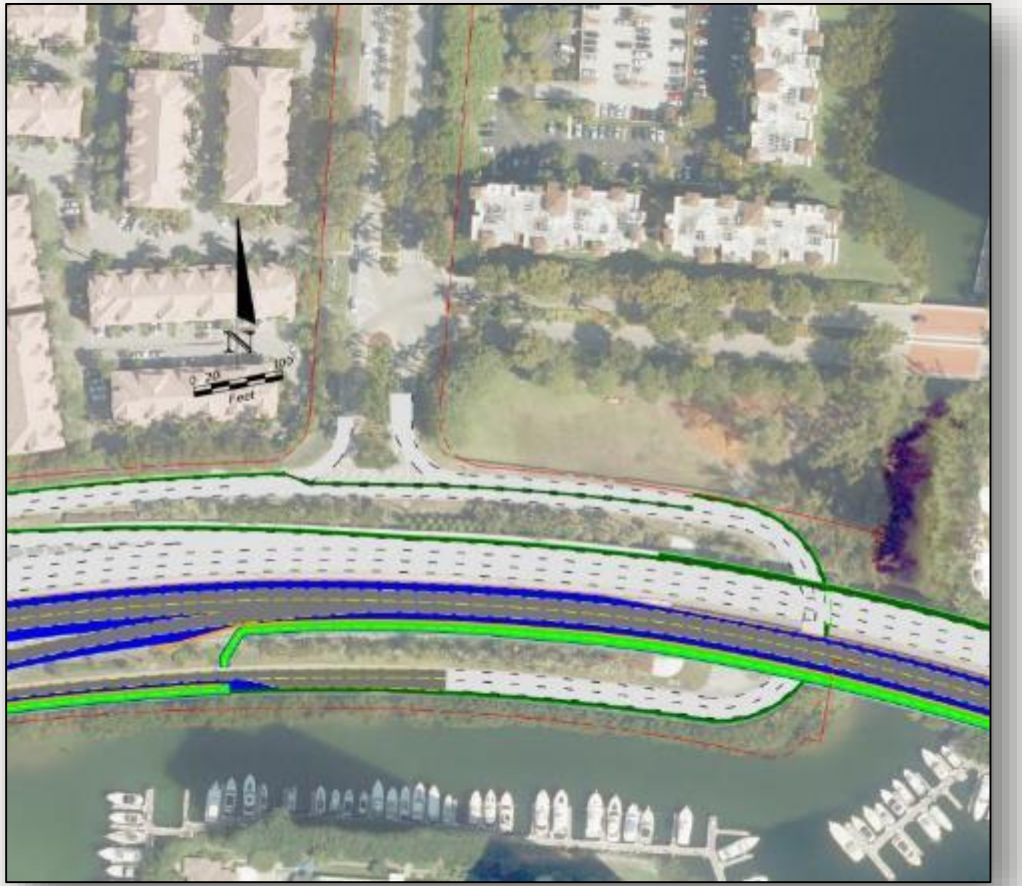
- 4 Stops in Coastal Area and 1 stop along Mainland
  - Bayfront Park (Miami)
  - Maurice Gibb Memorial Park (Miami Beach)
  - Grandview Palace Marine (North Bay Village)
  - Haulover Park (M-D County)
  - West end of Bella Vista Island (Sunny Isles Beach)

TPO Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Proposed Improvements – Lehman Causeway Path

- Lehman Causeway from Biscayne Boulevard to SR A1A
  - 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.
  - 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



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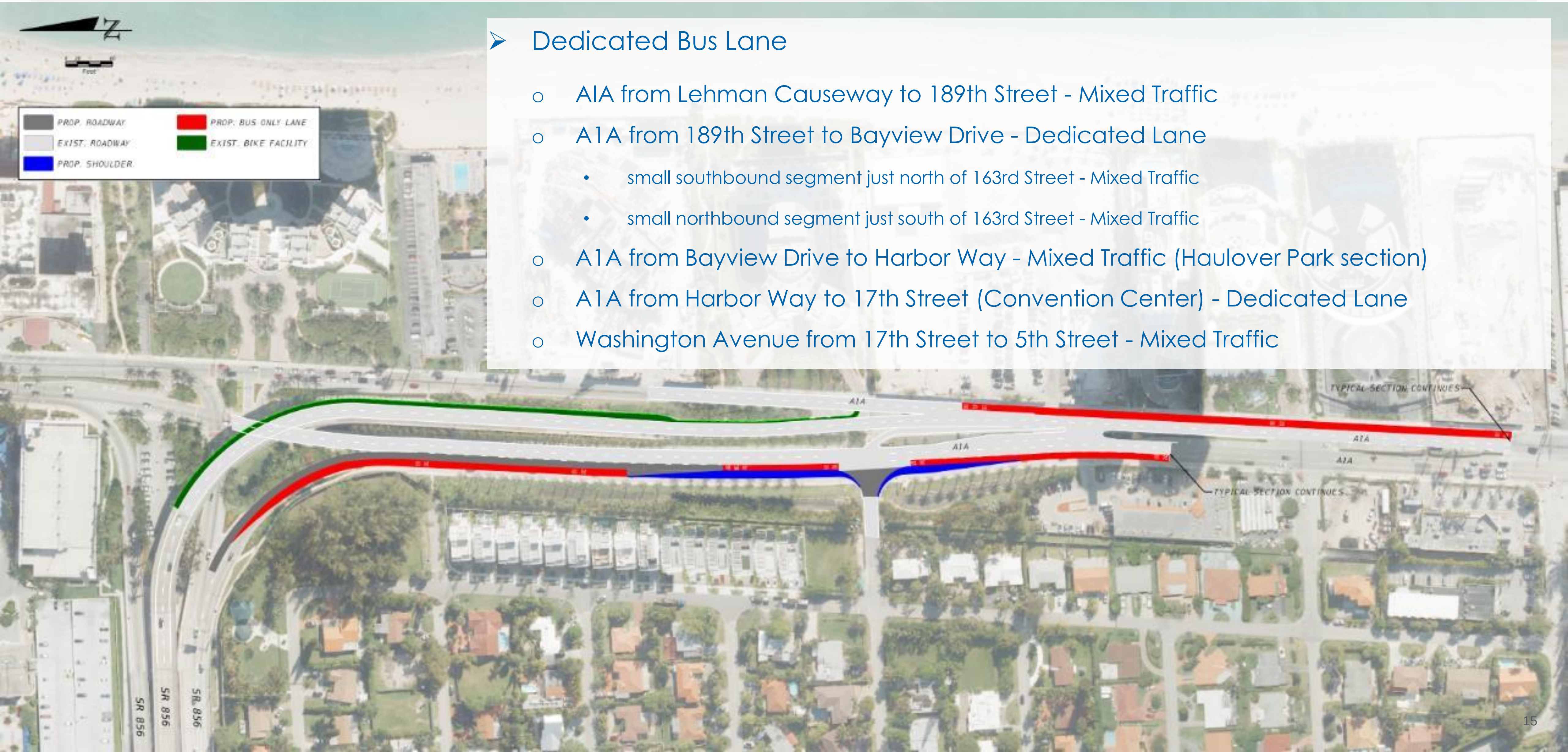
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

Proposed Improvements – Bus Lane Concept

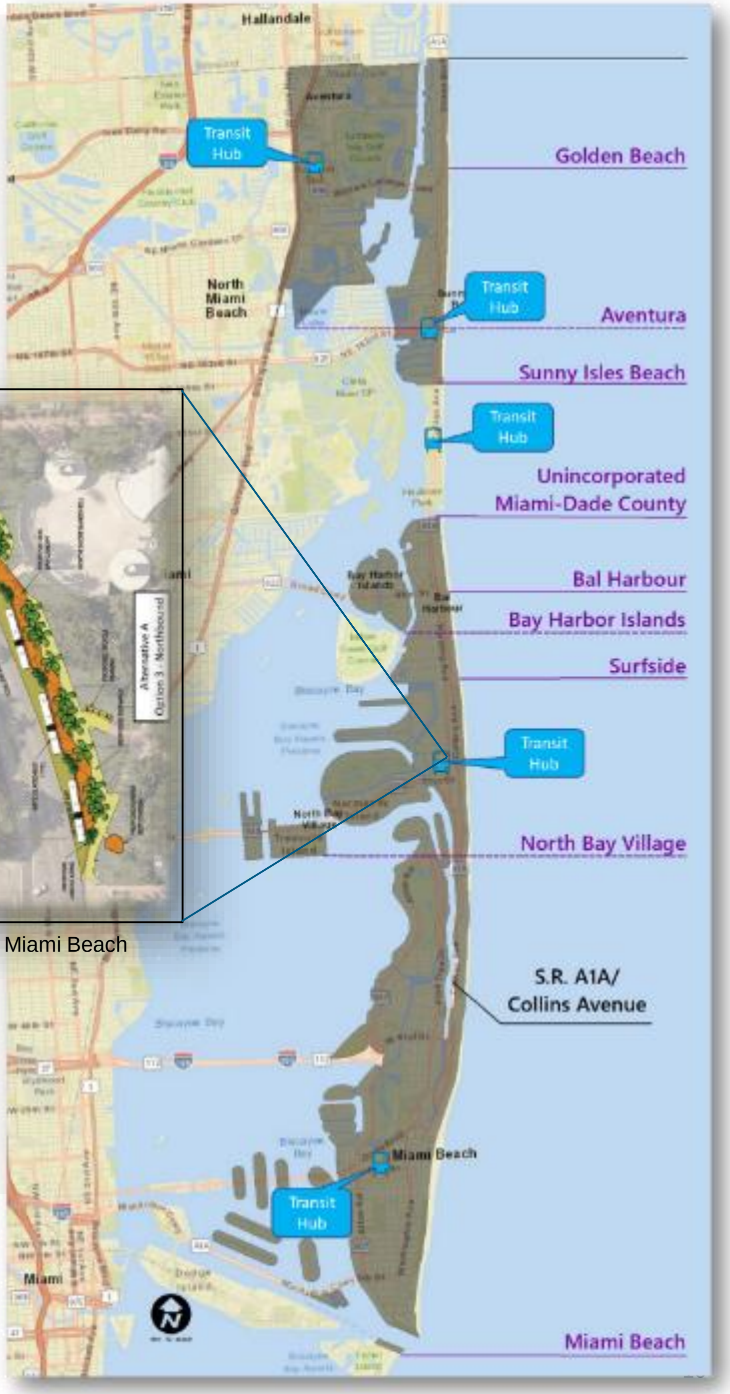
- Dedicated Bus Lane
  - AIA from Lehman Causeway to 189th Street - Mixed Traffic
  - A1A from 189th Street to Bayview Drive - Dedicated Lane
    - small southbound segment just north of 163rd Street - Mixed Traffic
    - small northbound segment just south of 163rd Street - Mixed Traffic
  - A1A from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



Proposed Improvements – Transit Hubs

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

Between 72nd and 73rd Streets (Miami Beach); Miami Beach Intermodal Hubs Feasibility Study, 2018.



TPO
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North - South Transportation Needs for the Coastal Communities
FEASIBILITY STUDY
A1A

Proposed Improvements – 79th Street Complete Streets

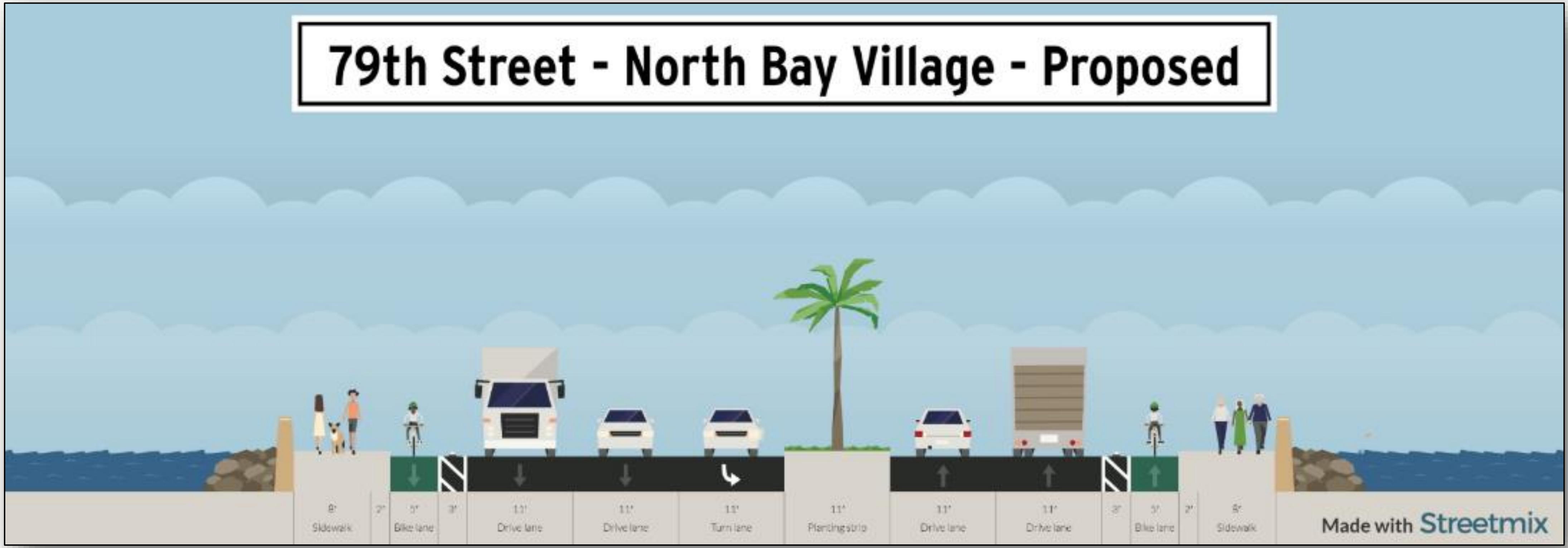
- 79th Street Causeway from Bayshore Court (Miami) to Bay Drive (Miami Beach)
- Could include the following:
  - Lane reduction from 6 lanes (3 in each direction) to 4 lanes (2 in each direction)
  - Wider pedestrian/bicycle paths
  - Wider median
  - Transit amenities

TPO Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Proposed Improvements – 79th Street Complete Streets

Proposed Improvements – 79th Street Complete Streets



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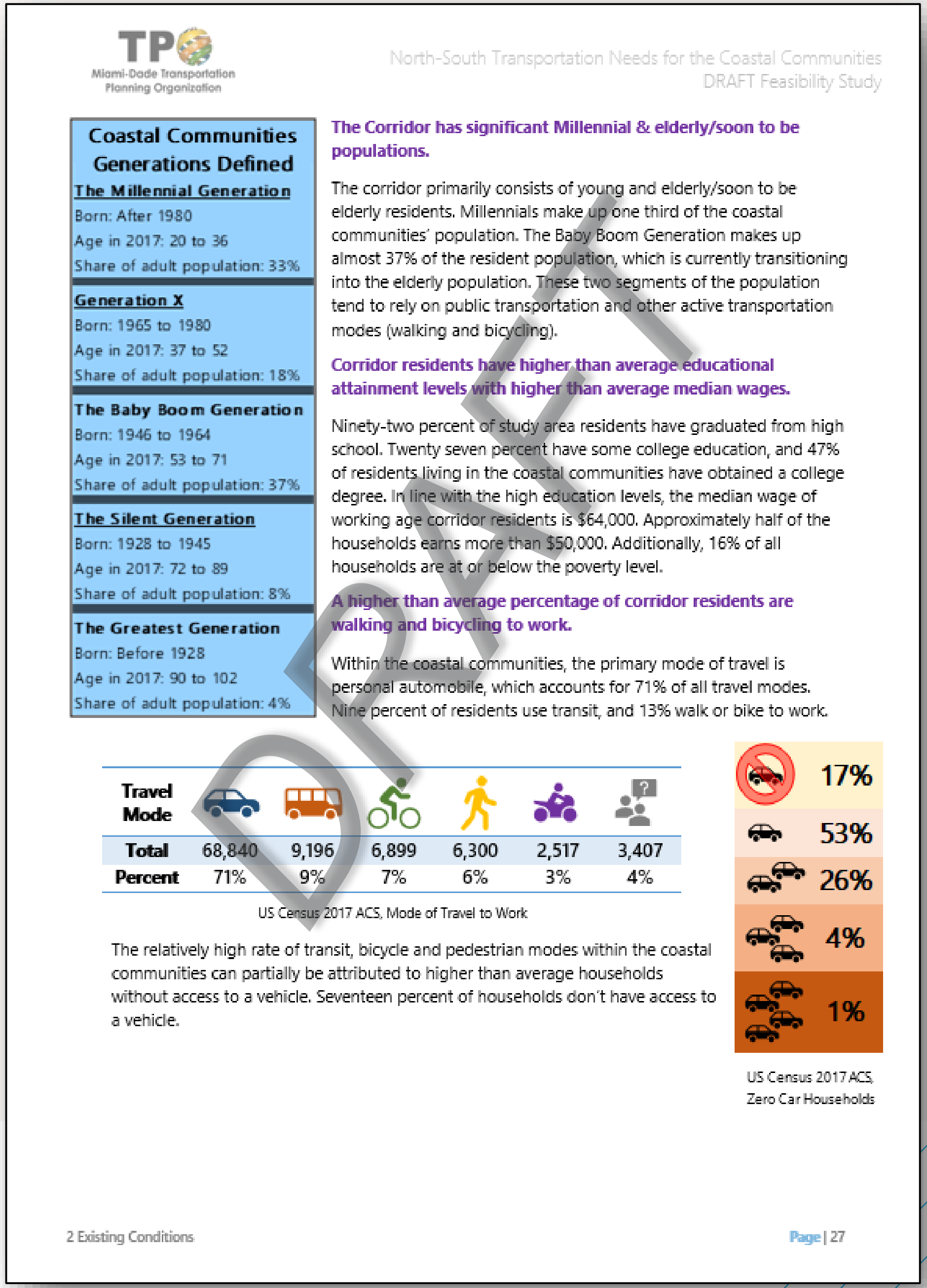
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

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



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

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
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The Silent Generation
Born: 1928 to 1945
Age in 2017: 72 to 89
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The Greatest Generation
Born: Before 1928
Age in 2017: 90 to 102
Share of adult population: 4%

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

Ninety-two percent of study area 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 line with the high education levels, the median wage of working age corridor residents is $64,000. Approximately half of the households earns 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. Nine percent of residents use transit, and 13% walk or bike to work.

Travel Mode	Car	Bus	Bicycle	Walk	Motorcycle	Other
Total	68,840	9,196	6,899	6,300	2,517	3,407
Percent	71%	9%	7%	6%	3%	4%

US Census 2017 ACS, 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 households without access to a vehicle. Seventeen percent of households don't have access to a vehicle.

No car	17%
1 car	53%
2 cars	26%
3 cars	4%
4 cars	1%

US Census 2017 ACS, Zero Car Households

DRAFT

2 Existing Conditions   Page | 27

Contact Information

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Miami-Dade Transportation Planning Organization

Meeting Notes

Project:	Miami-Dade TPO North-South Transportation Needs for the Coastal Communities Feasibility Study		
Subject:	Study Advisory Committee (SAC) Meeting #3		
Meeting place:	North Bay Village City Hall	Meeting no:	3
Date and time:	Sept. 27, 2019 from 10:00 a.m. to 12:00 p.m.	Summary by:	Jack Schnettler - Atkins
Present:	Lisa Colmenares Claudia Hasbun Jose Olivo Ralph Rosado Lynda Westin Jack Schnettler Rohan Sadhai	Representing:	Miami-Dade TPO Project Manager Sunny Isles Beach North Bay Village North Bay Village Miami Beach Atkins Project Manager Atkins

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 Aliiance'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

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

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

TPO Miami-Dade Transportation Planning Organization

ATKINS Member of the SNC-Lavalin Group

CITY OF SUNNY ISLES BEACH

TOWN OF BAY HARBOR Islands

The City of AVENTURA Florida

North Bay Village FLORIDA

BAL HARBOUR - VILLAGE -

90 YEARS GOLDEN BEACH 1929 2019

MIAMIBEACH

Surfside FLORIDA

Meeting Agenda

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

Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

Schedule*

SCHEDULE

2019

March	April	May	June	July	August	September	October	November	December
Literature Review	Literature Review	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation		Draft Report	Final Report	
Data Collection	Data Collection	Data Collection		Proposed Actions	Proposed Actions	Proposed Actions		TPO Present-ations	TPO Present-ations
Identify Stakeholders	SAC Meeting #1			SAC Meeting #2		SAC Meeting #3	Action Plan	SAC Meeting #4	
						Recommend-ations	Recommend-ations		

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

* Schedule is subject to change

Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Overview of Existing Conditions

- Literature Review
  - Various transportation plans and programs
  - Previous and related studies
- Data Collection
  - 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 Existing Conditions

Existing Land Use

Land Use	Cumulative Percentage
Residential	54%
Low Density	29%
Med Density	23%
High Density	2%
Commercial	24%
Recreational	20%
Conservation	1%

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

Travel Mode	Car	Bus	Bicycle	Walk	Motorcycle	Other
Total	68,840	9,196	6,899	6,300	2,517	3,407
Percent	71%	9%	7%	6%	3%	4%

US Census 2017 ACS, Mode of Travel to Work

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US Census 2017 ACS, Population

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US Census 2017 ACS, Housing Units

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

90,418
US Census 2017 ACS, Households

0	17%
1	53%
2	26%
3	4%
4+	1%

US Census 2017 ACS, Zero Car Households

Coastal Communities Generations Defined

The Millennial Generation
Born: After 1980
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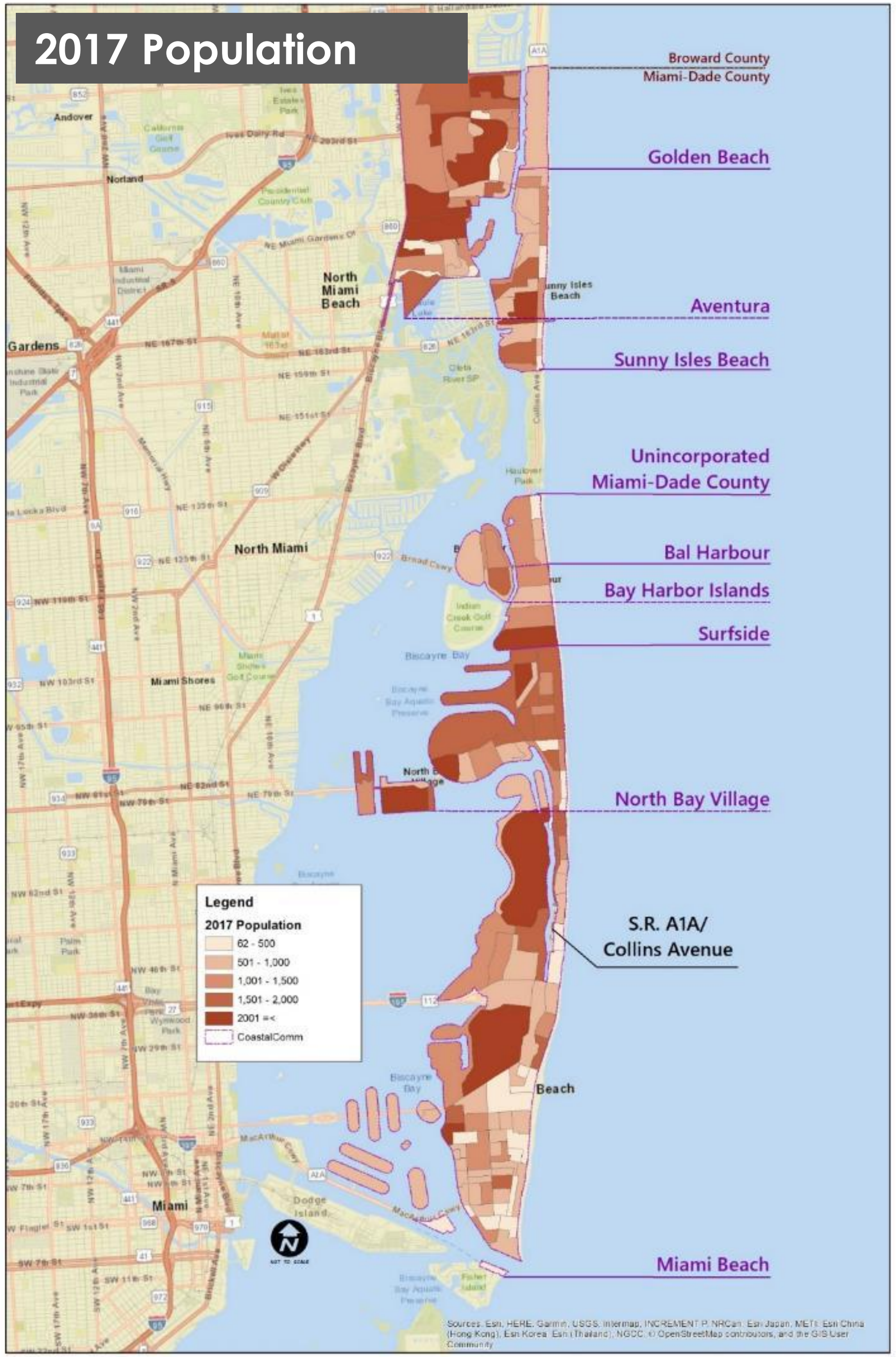
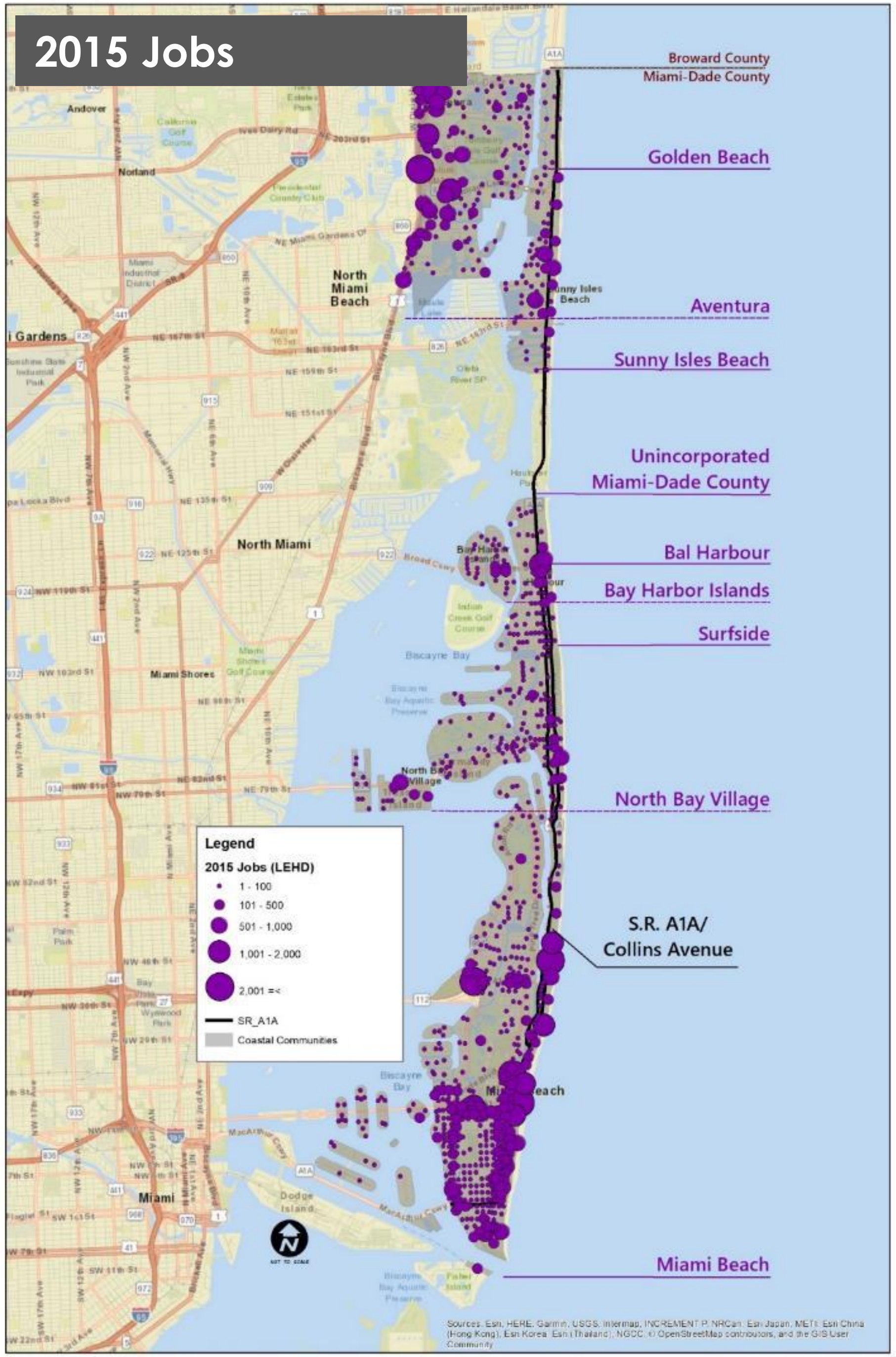
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A





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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
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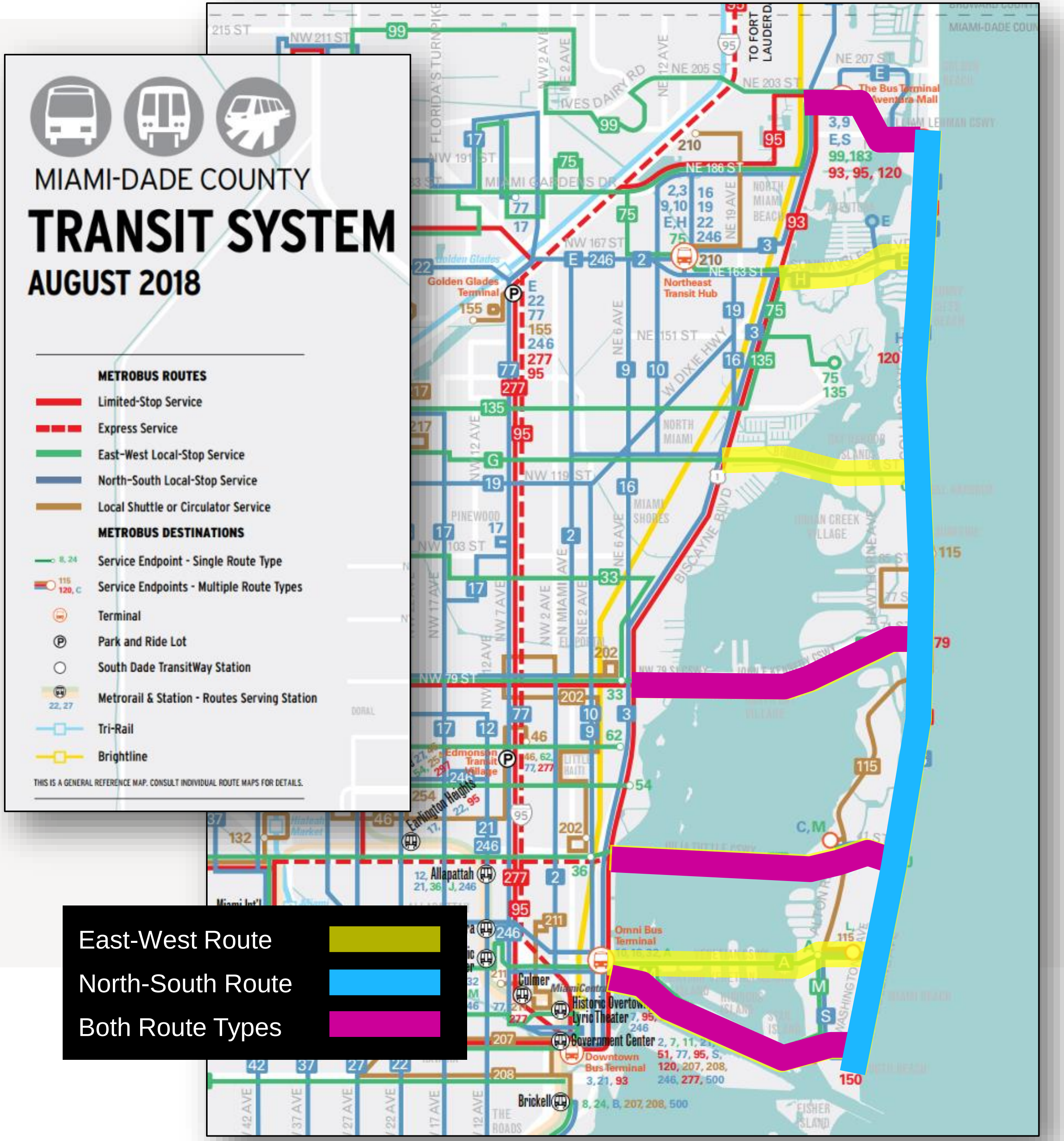
- ➢ Metrorail and Metromover
  - o Via Metrobus routes 120, A, M, and S



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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Study Area Transit Services

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

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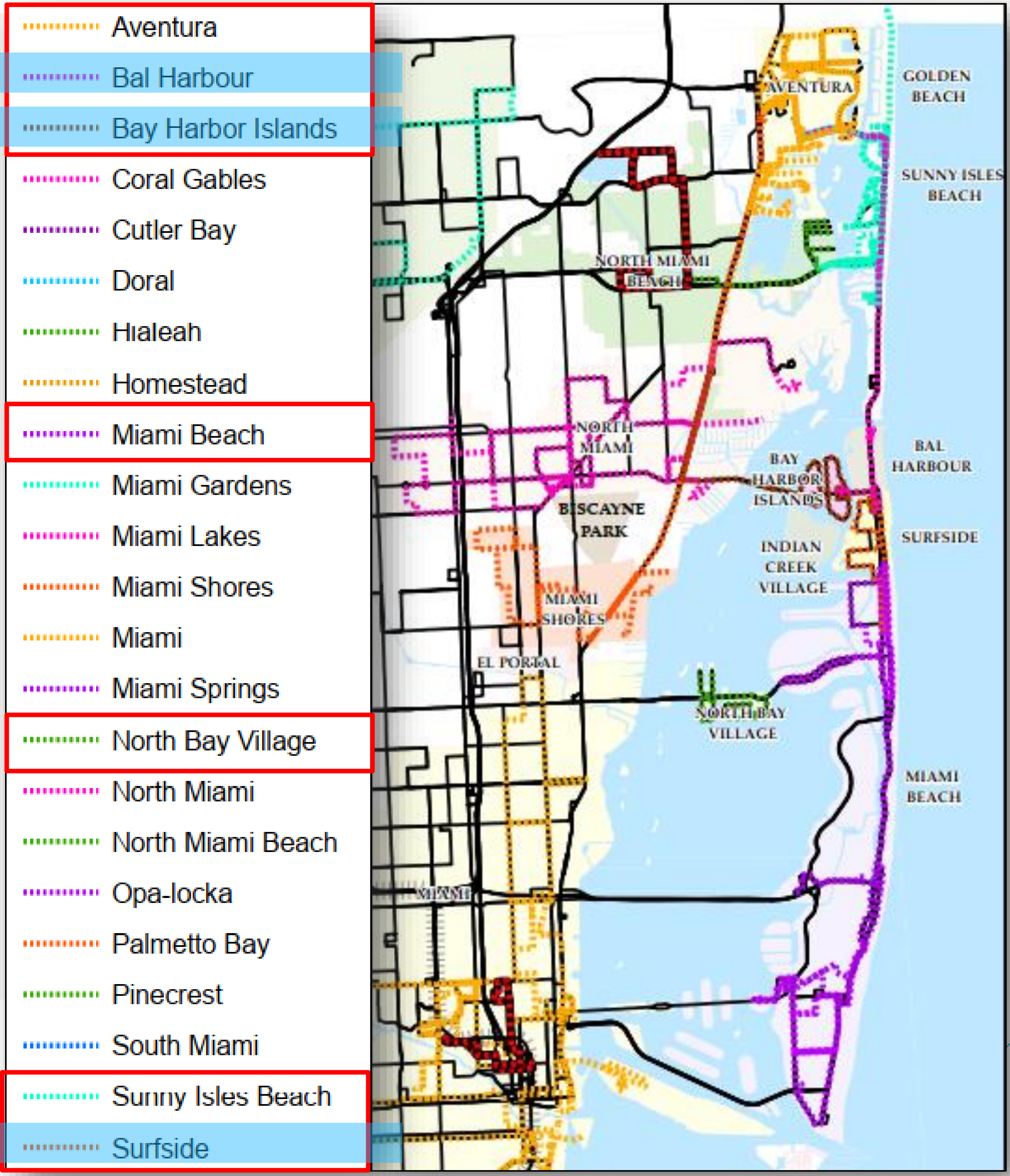

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North - South Transportation Needs for the Coastal Communities
FEASIBILITY STUDY
A1A

Field Review – Pedestrian Environment along A1A

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FEASIBILITY STUDY
A1A

Field Review – Bus Stops along A1A

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FEASIBILITY STUDY
A1A

Field Review – Linking A1A to Aventura

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FEASIBILITY STUDY
A1A

Deficiencies and Needs

- Dedicated transit along SR A1A that links all communities
- Lack of walkable pockets of development – transit hubs
- Bicycle facilities
  - East/west bicycle facilities linking the mainland
  - North-south gaps
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  - Improve shade along corridor
  - Enhanced crosswalks at intersections
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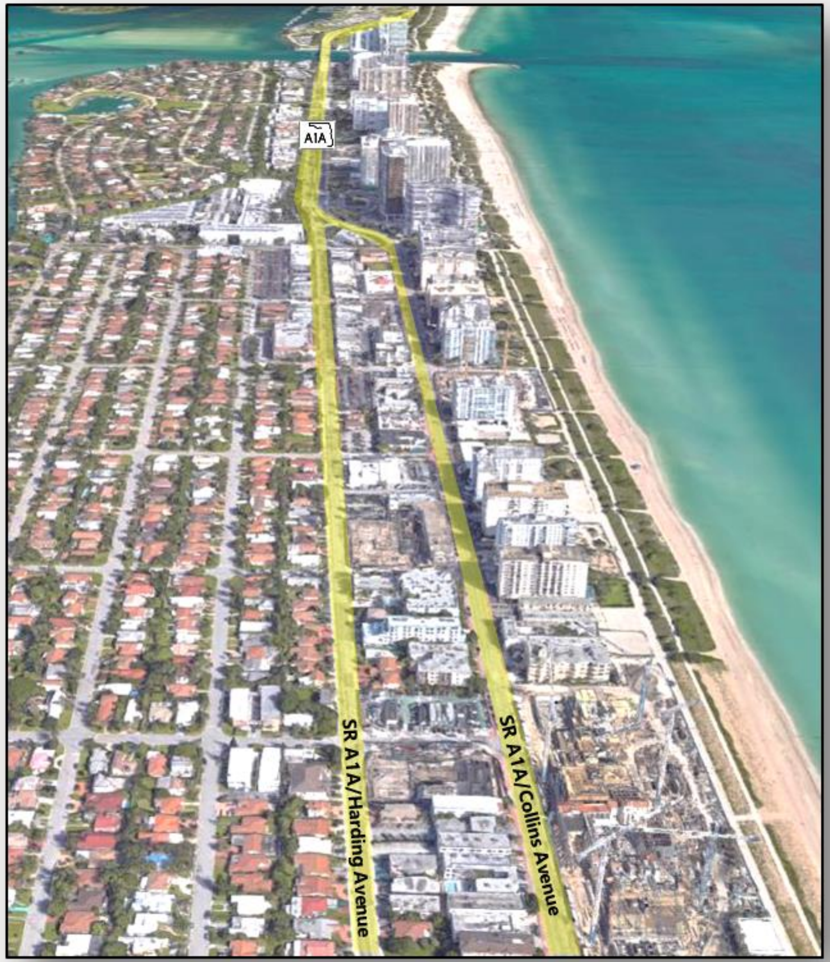

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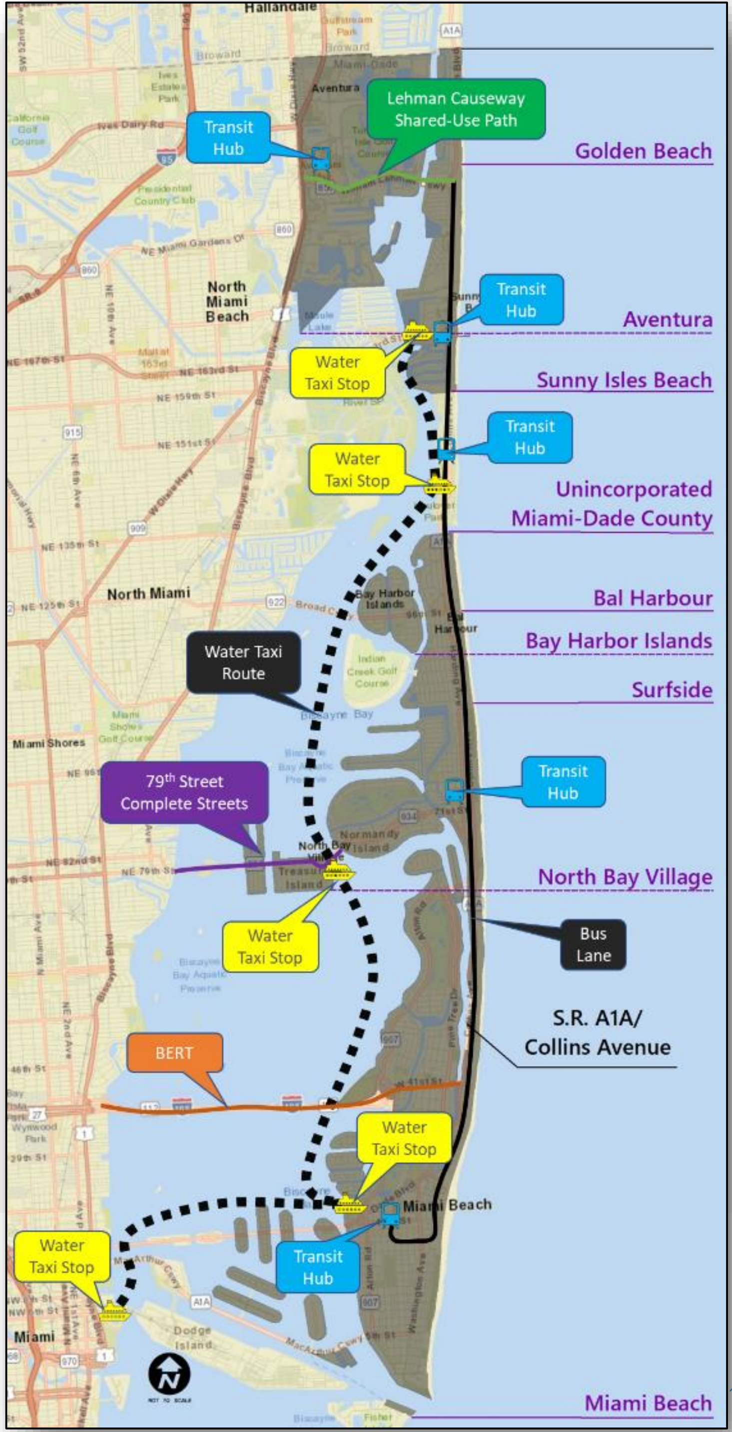
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

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
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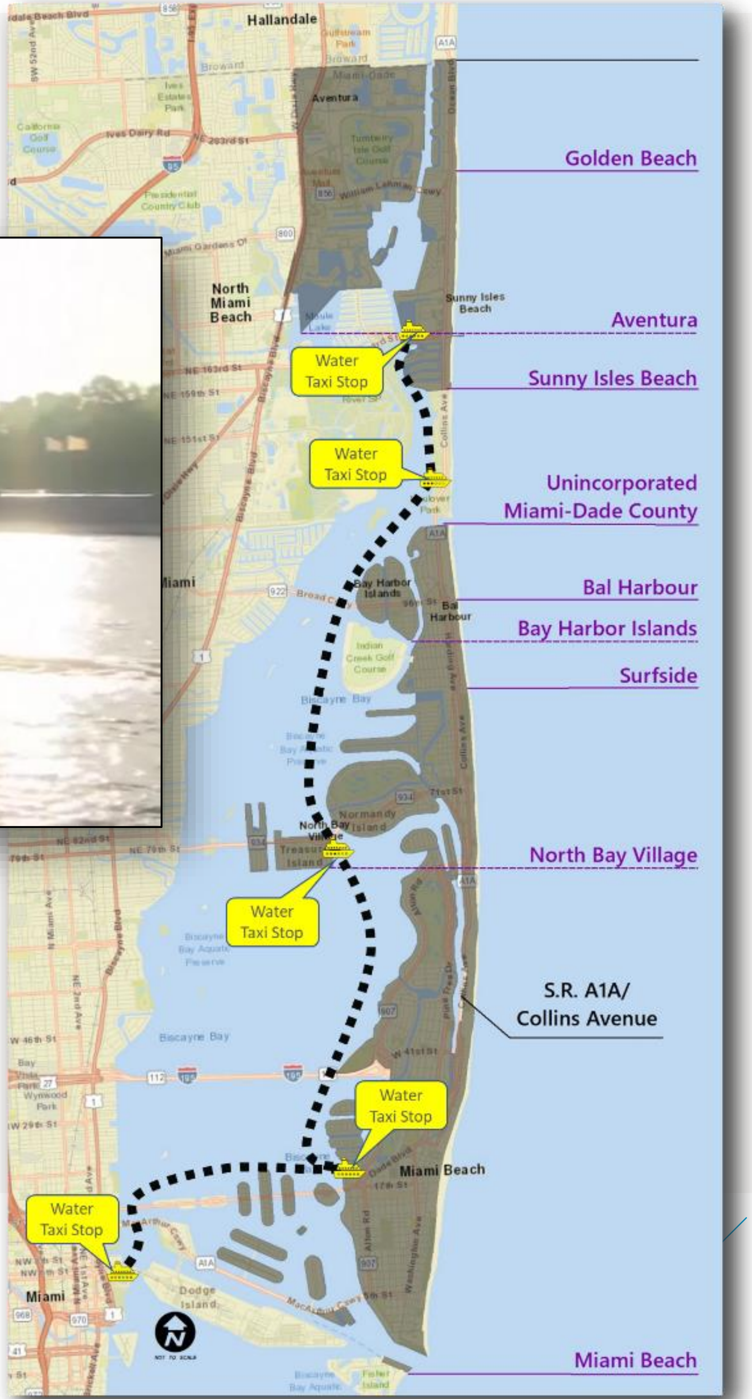

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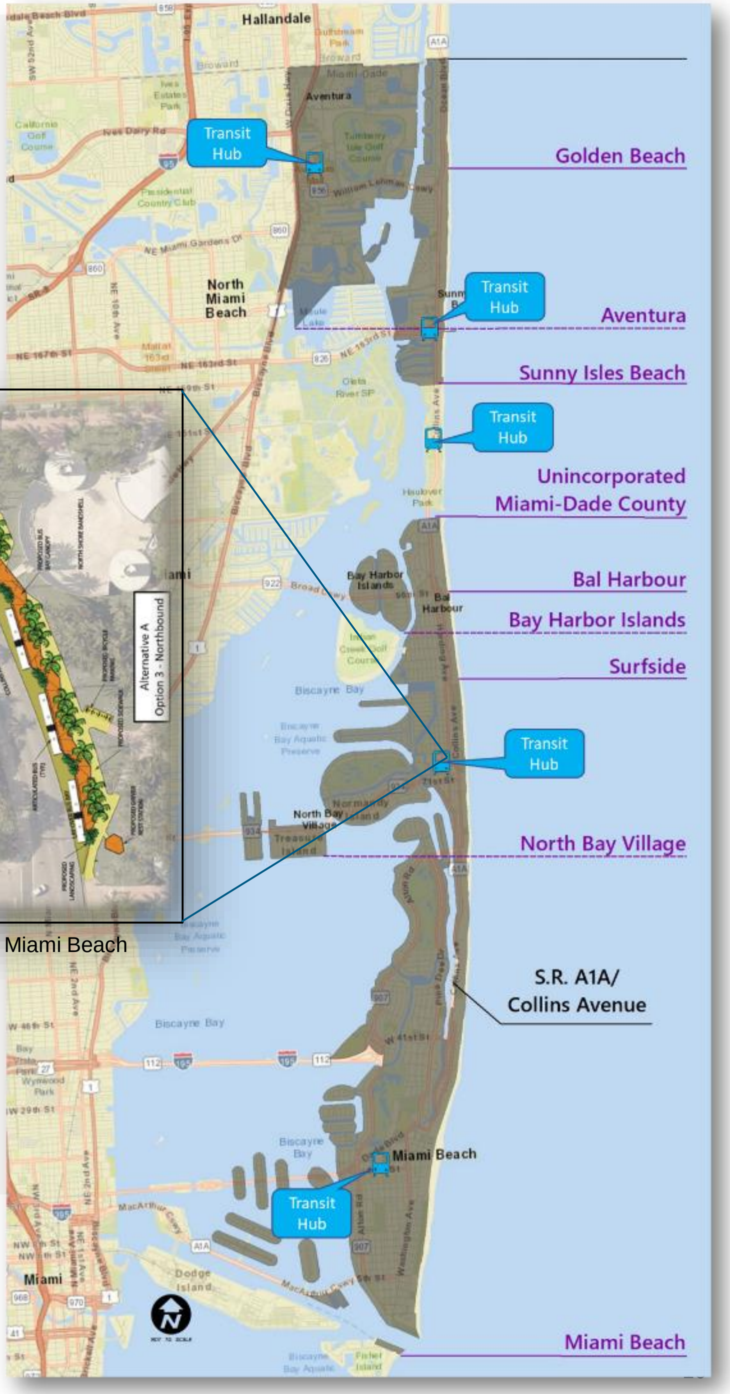
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Proposed Improvements – Transit Hubs

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

Between 72nd and 73rd Streets (Miami Beach); Miami Beach Intermodal Hubs Feasibility Study, 2018.



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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Proposed Improvements – Lehman Causeway Path

- Lehman Causeway from Biscayne Boulevard to SR A1A
  - 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.
  - 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

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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

A1A

Proposed Improvements – Bus Lane Concept (MB)

- Dedicated Bus Lane
  - 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
  - Washington Avenue from 17th Street to 5th Street - Mixed Traffic


BUS
BUS
BUS
BUS
BUS
30 MPH
30 MPH

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:
    - 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

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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

A1A

Proposed Improvements – 79th Street Complete Street North Bay Village

SHORT-TERM CATALYTIC PROJECTS – KENNEDY CAUSEWAY – EXISTING CONDITIONS
C4 – Urban General FDOT Context-Sensitive Designation

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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Proposed Improvements – 79th Street Complete Street North Bay Village

MID-TERM CATALYTIC PROJECTS – KENNEDY CAUSEWAY – PROPOSED
C4 – Urban General FDOT Context-Sensitive Designation

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North - South Transportation Needs for the Coastal Communities
FEASIBILITY STUDY
A1A

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
  - 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)

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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Potential Projects from other Miami Beach Plans & Studies

- Overall Corridor
  - Enhanced sidewalks and crossings
- North Beach (Plan NoBe)
  - Bicycle – Protected lanes on Harding-Abbot
  - Transit – Exclusive curb transit lanes on Collins
  - Roadway – Collins/Harding-Abbott converted to 2-way
- Collins and/or Washington
  - Bicycle – Bike lanes and neighborhood greenway (Bike/ped Master Plan)
  - Transit – Exclusive curb transit lane (Transportation Master Plan)

Image: Dover Kohl & Partners

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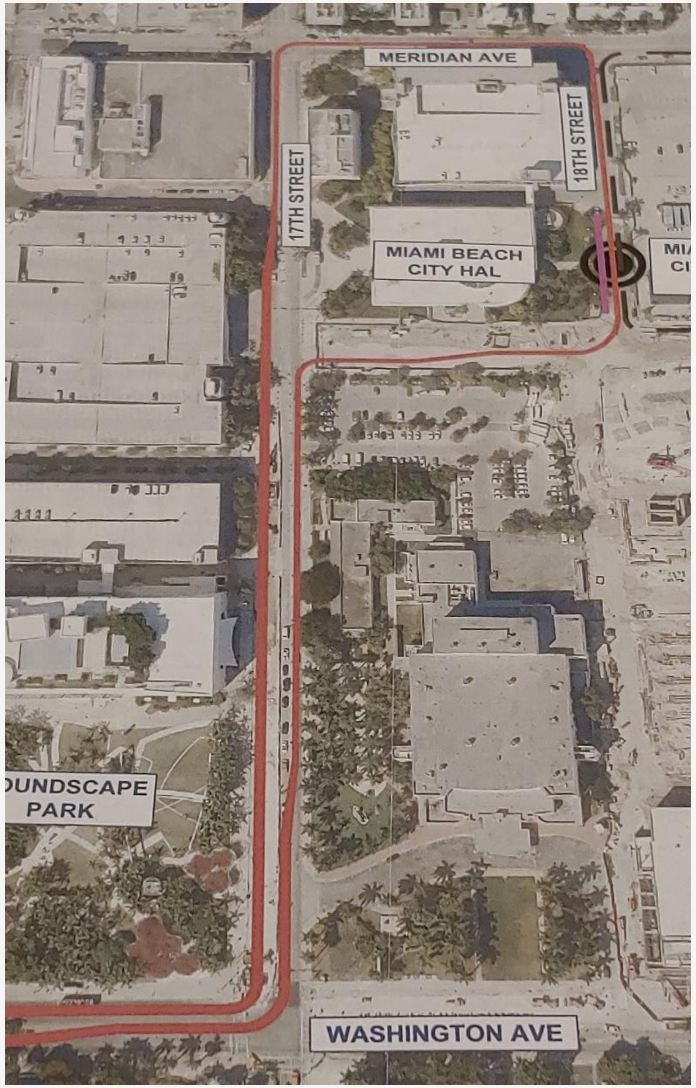
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Potential Projects from other Miami Beach Plans & Studies

- 71st Street / Normandy Drive
  - Continuous protected bike lanes
  - Exclusive transit lanes
- 41st Street / Julia Tuttle Causeway
  - 41st Street complete streets concept (City proposal)
  - I-195 Enhanced Bike/ped path (I-195 Master Plan)
- Venetian Causeway / Dade Blvd. / 17th St.
  - Dade Blvd. shared path (City study)
  - 17th Street – part of Beach connection BRT option (PD&E Study)
- MacCarthur Causeway / 5th Avenue
  - Beach connection premium transit options (PD&E Study)



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North - South Transportation Needs for the Coastal Communities FEASIBILITY 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: 33%

Generation X
Born: 1965 to 1980
Age in 2017: 37 to 52
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Born: Before 1928
Age in 2017: 90 to 102
Share of adult population: 4%

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

Ninety-two percent of study area 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 line with the high education levels, the median wage of working age corridor residents is $64,000. Approximately half of the households earns 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. Nine percent of residents use transit, and 13% walk or bike to work.

DRAFT

Travel Mode	Car	Bus	Bicycle	Walk	Motorcycle	Other
Total	68,840	9,196	6,899	6,300	2,517	3,407
Percent	71%	9%	7%	6%	3%	4%

US Census 2017 ACS, Mode of Travel to Work

No car	17%
1 car	53%
2 cars	26%
3 cars	4%
4 cars	1%

US Census 2017 ACS, Zero Car Households

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.

Miami-Dade Transportation Planning Organization

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Contact Information

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Project Manager

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Miami-Dade TPO

North-South Transportation Needs for the Coastal Communities Feasibility Study

TPTAC & CTAC Meetings
December 4, 2019

North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

TPO Miami-Dade Transportation Planning Organization

ATKINS Member of the SNC-Lavalin Group

CITY OF SUNNY ISLES BEACH

TOWN OF BAY HARBOR Islands

The City of AVENTURA Florida

North Bay Village FLORIDA

BAL HARBOUR - VILLAGE -

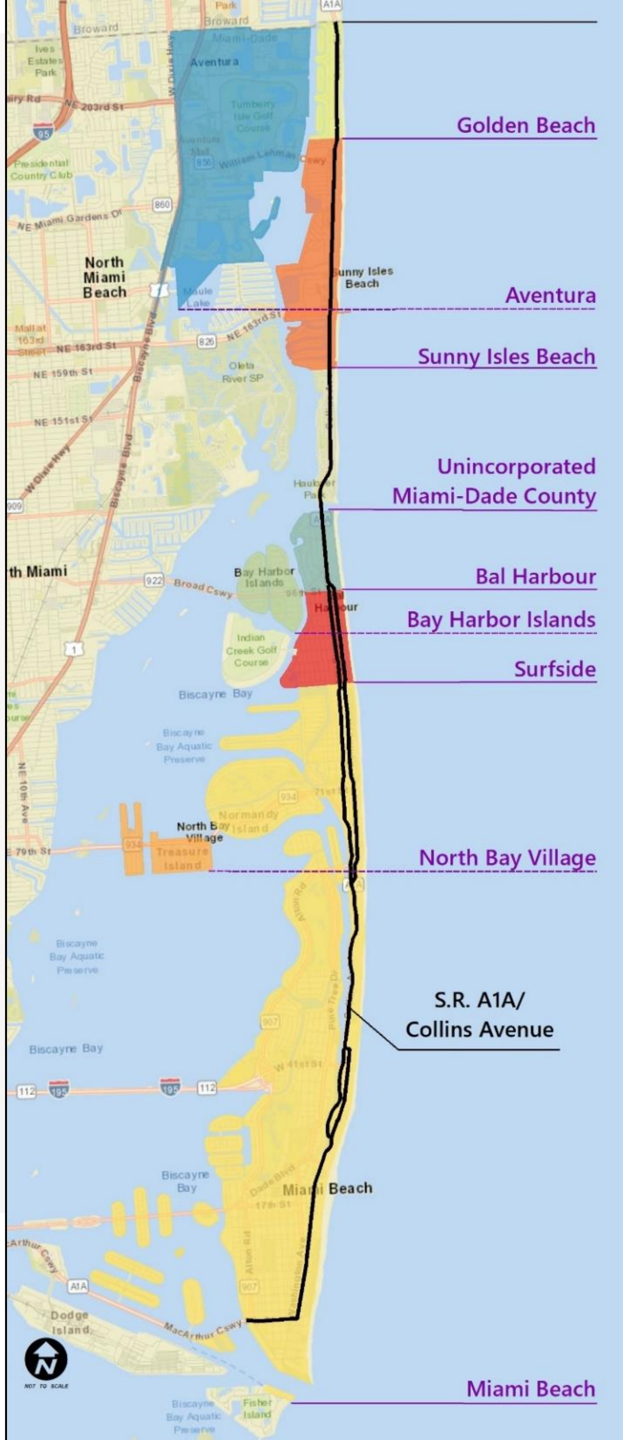
90 YEARS GOLDEN BEACH 1929 2019

MIAMIBEACH

Surfside FLORIDA

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



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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Schedule and Process

SCHEDULE

2019

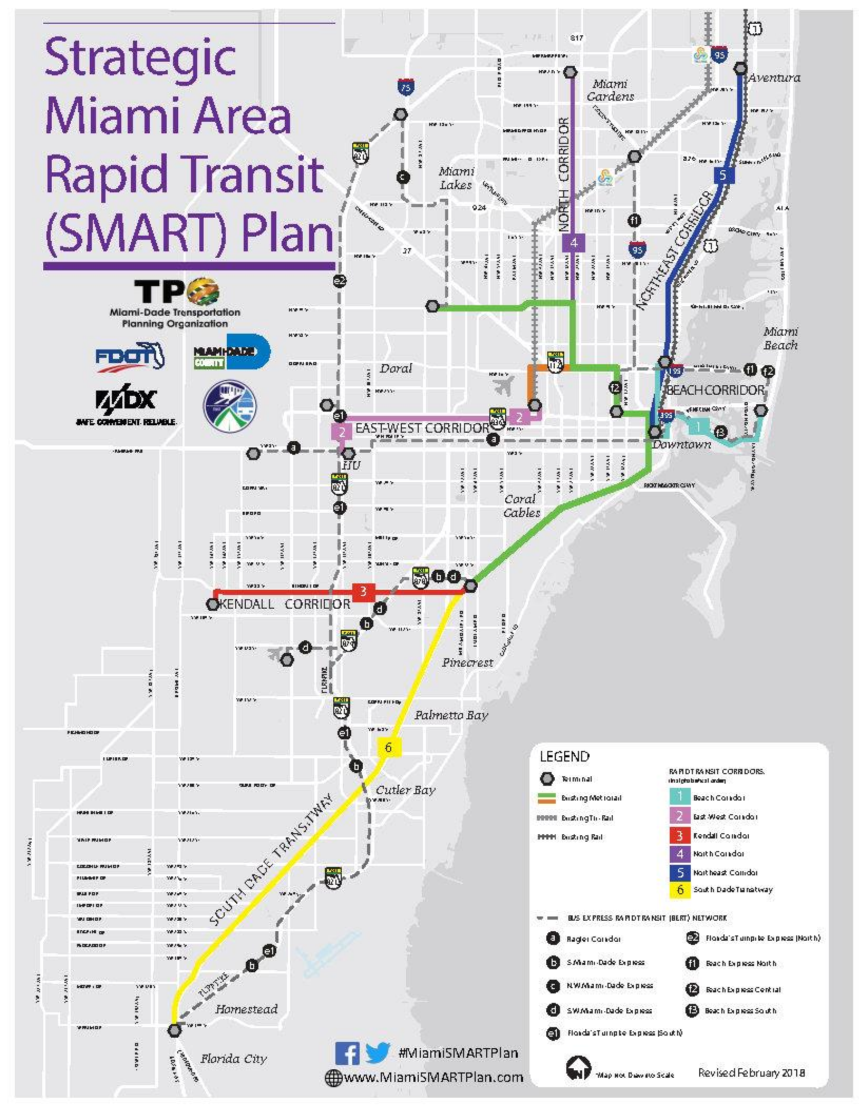
March	April	May	June	July	August	September	October	November	December
Literature Review	Literature Review	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation	Corridor Analysis & Evaluation		Draft Report	Final Report	
Data Collection	Data Collection	Data Collection		Proposed Actions	Proposed Actions	Proposed Actions		TPO Present-ations	TPO Present-ations
Identify Stakeholders	SAC Meeting #1			SAC Meeting #2		SAC Meeting #3	Action Plan	SAC Meeting #4	
						Recommend-ations	Recommend-ations		

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

- PROJECT COORDINATION AND MANAGEMENT
- LITERATURE REVIEW
- DATA COLLECTION
- CORRIDOR ANALYSIS AND EVALUATION
- PROPOSED IMPROVEMENTS
- ACTION PLAN
- RECOMMENDATIONS
- FINAL REPORT

SMART Plan Connections

- Study connects at either end with ongoing transit initiatives
- Potential for connections to mainland and transit stations on Northeast Corridor



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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

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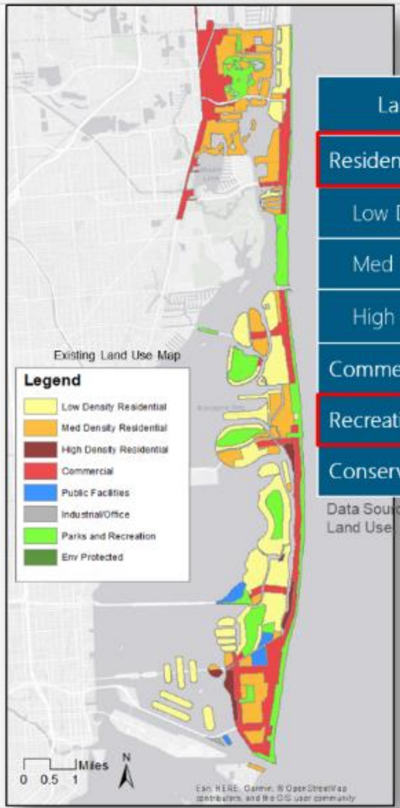

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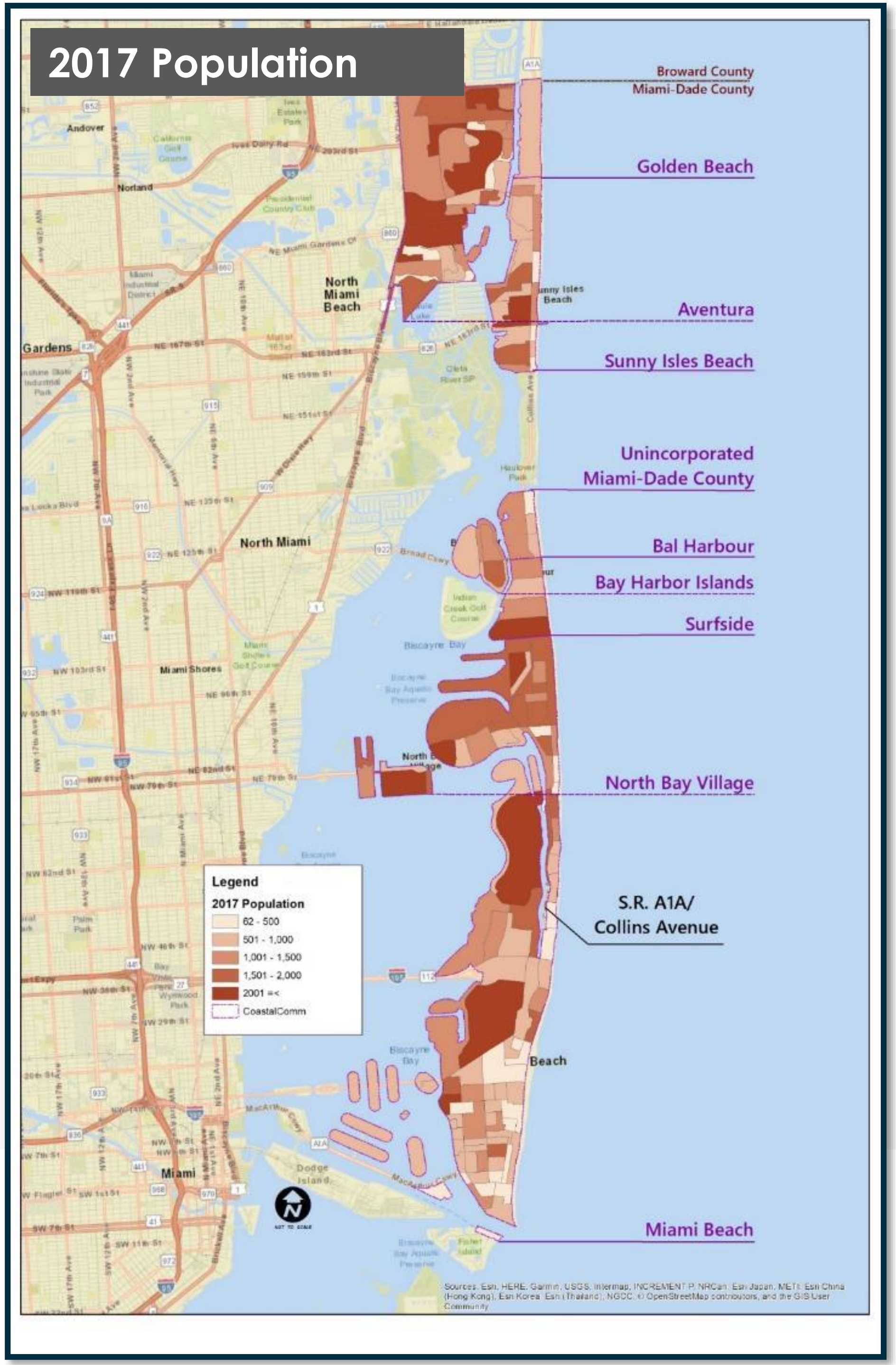

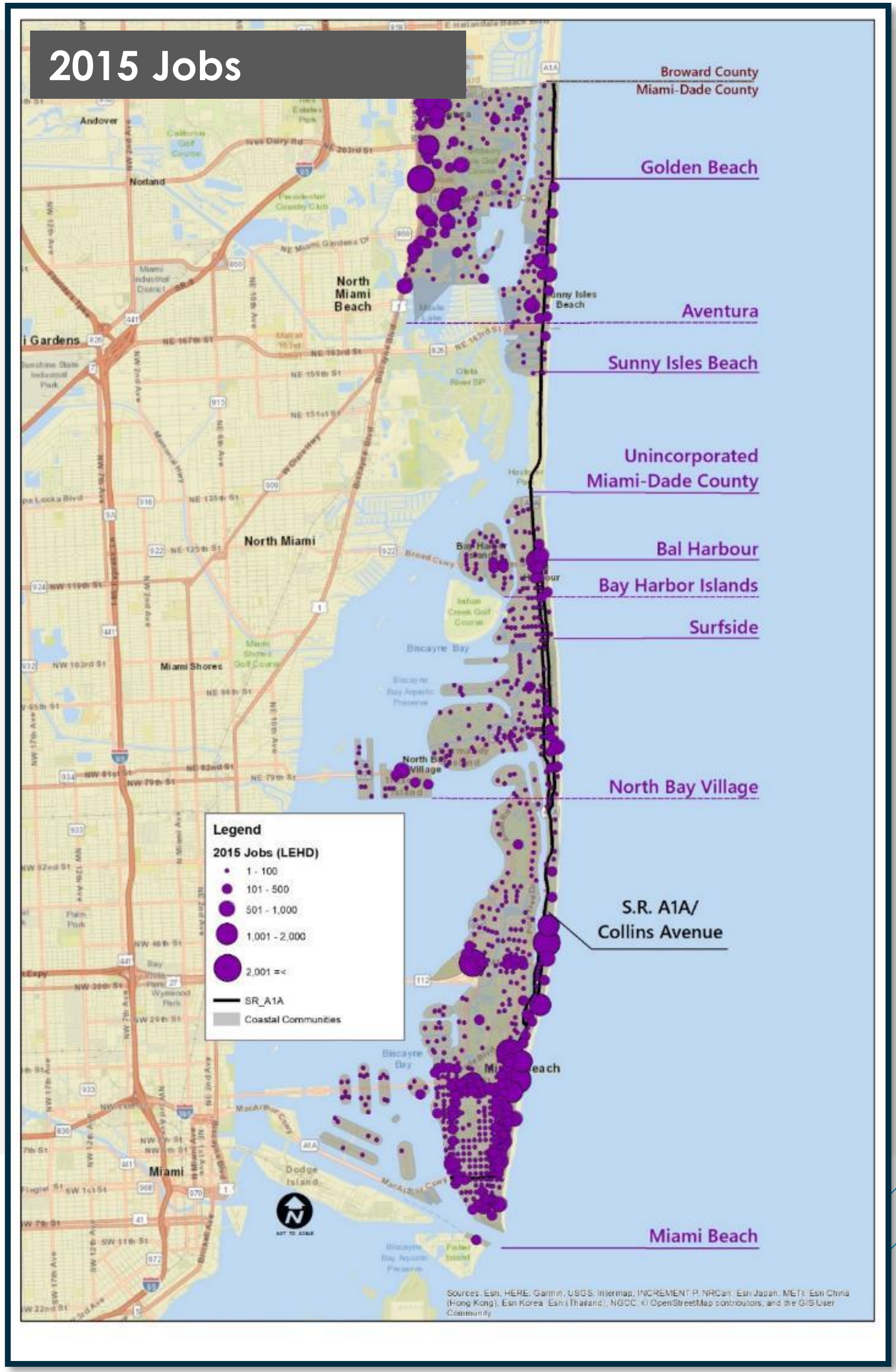

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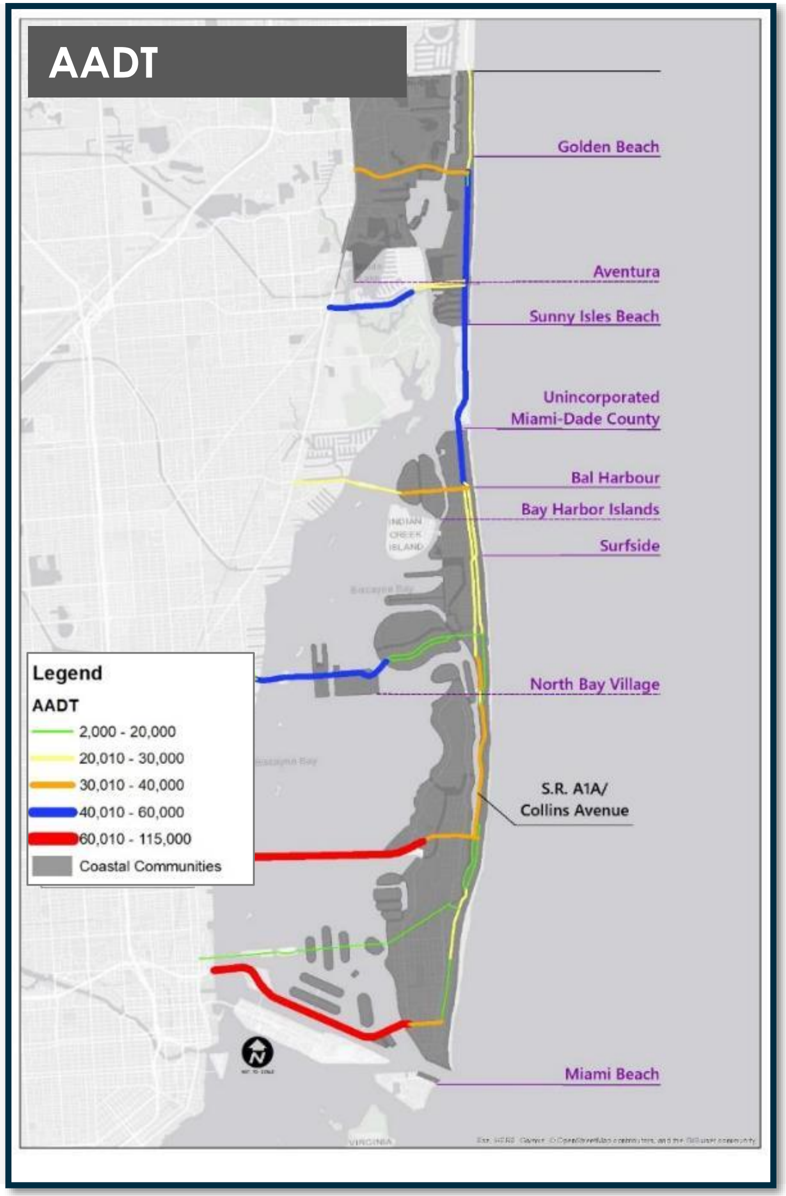

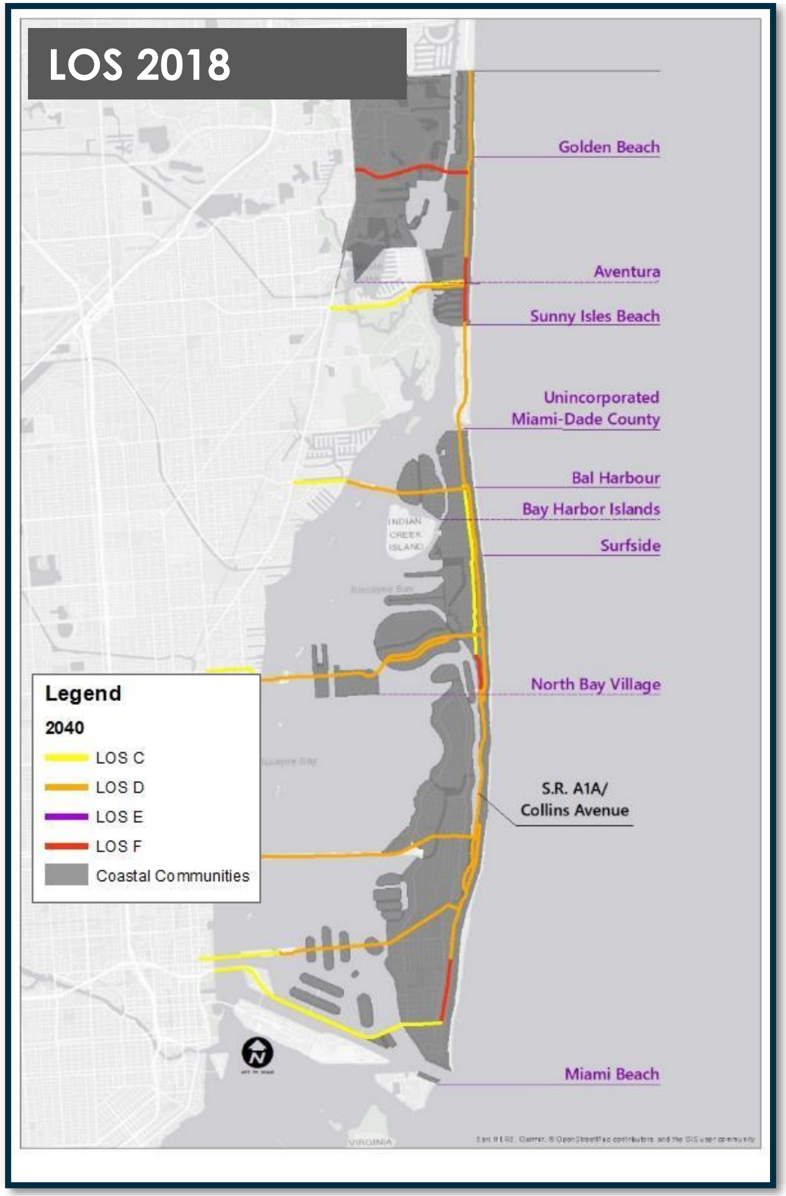

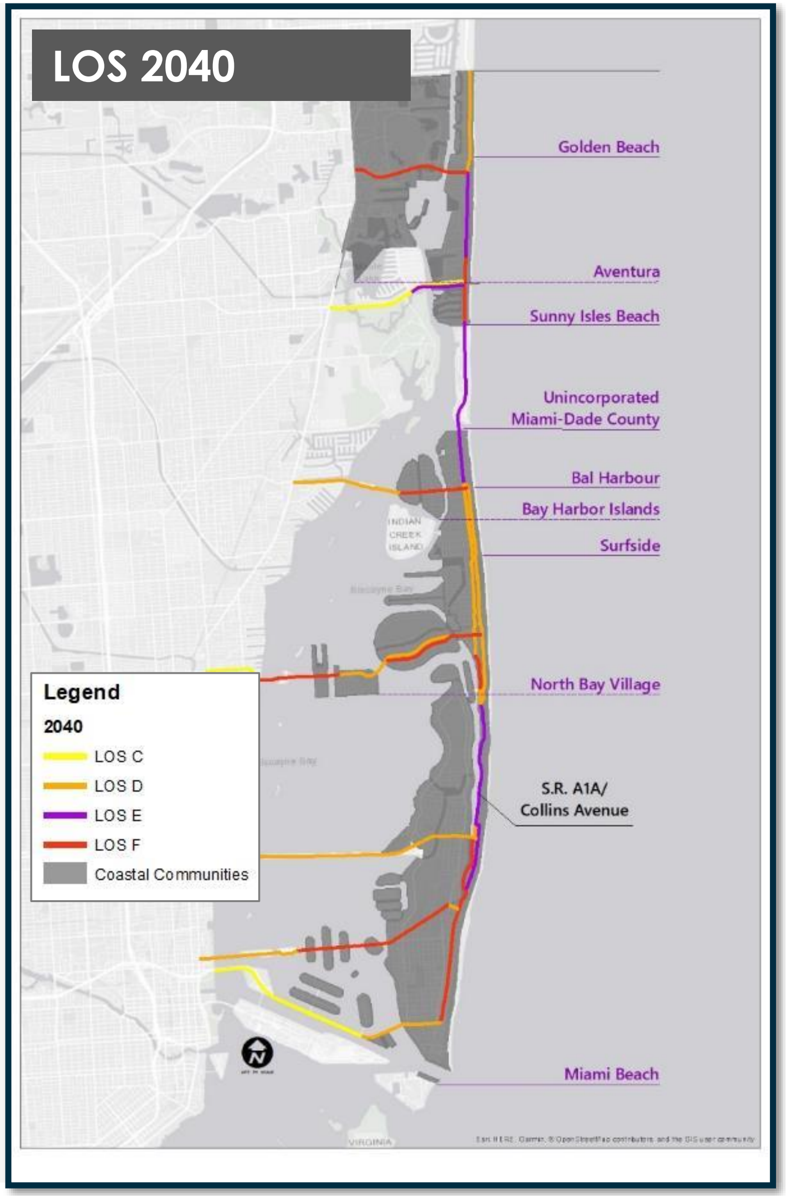

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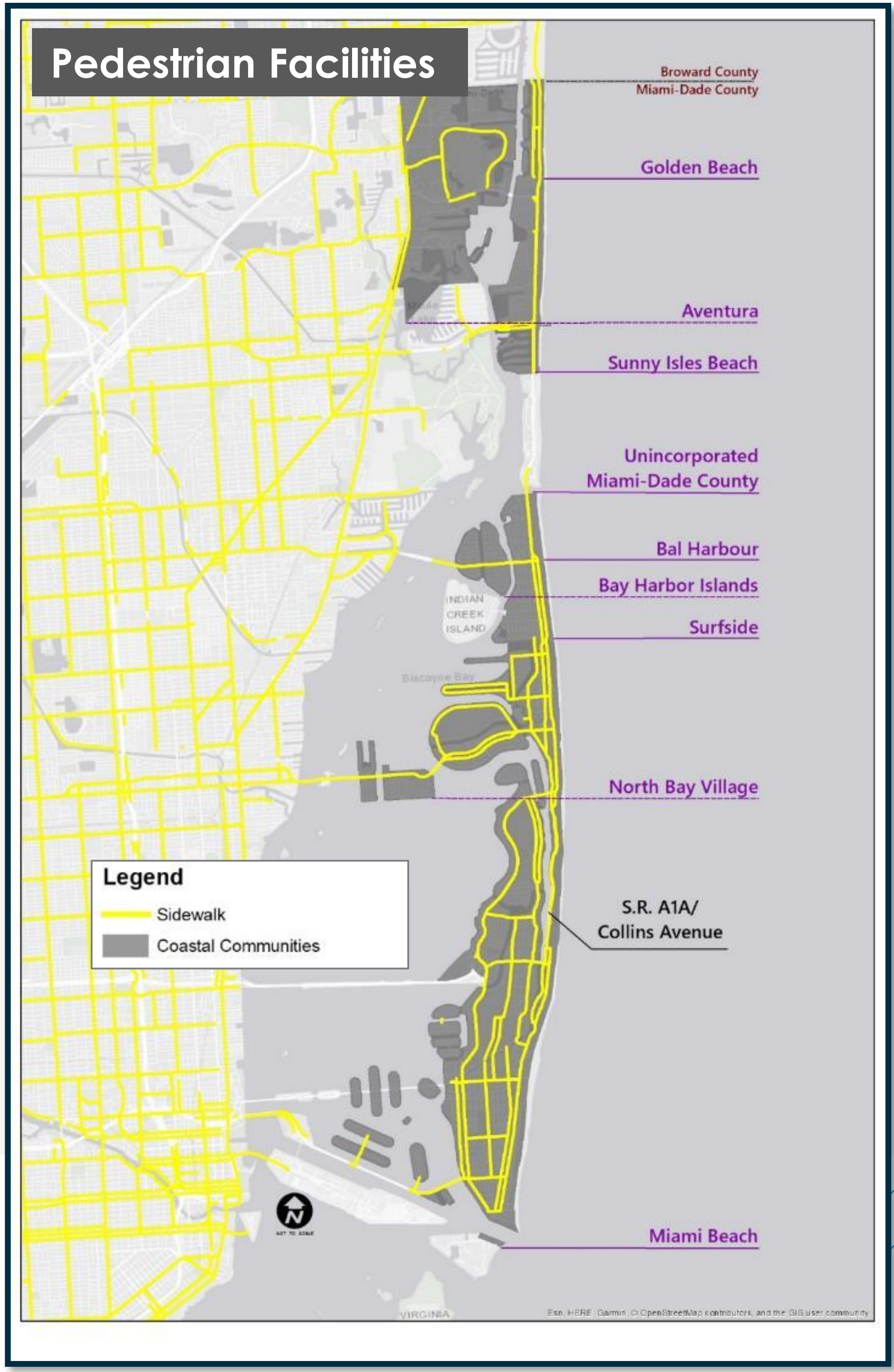
North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A



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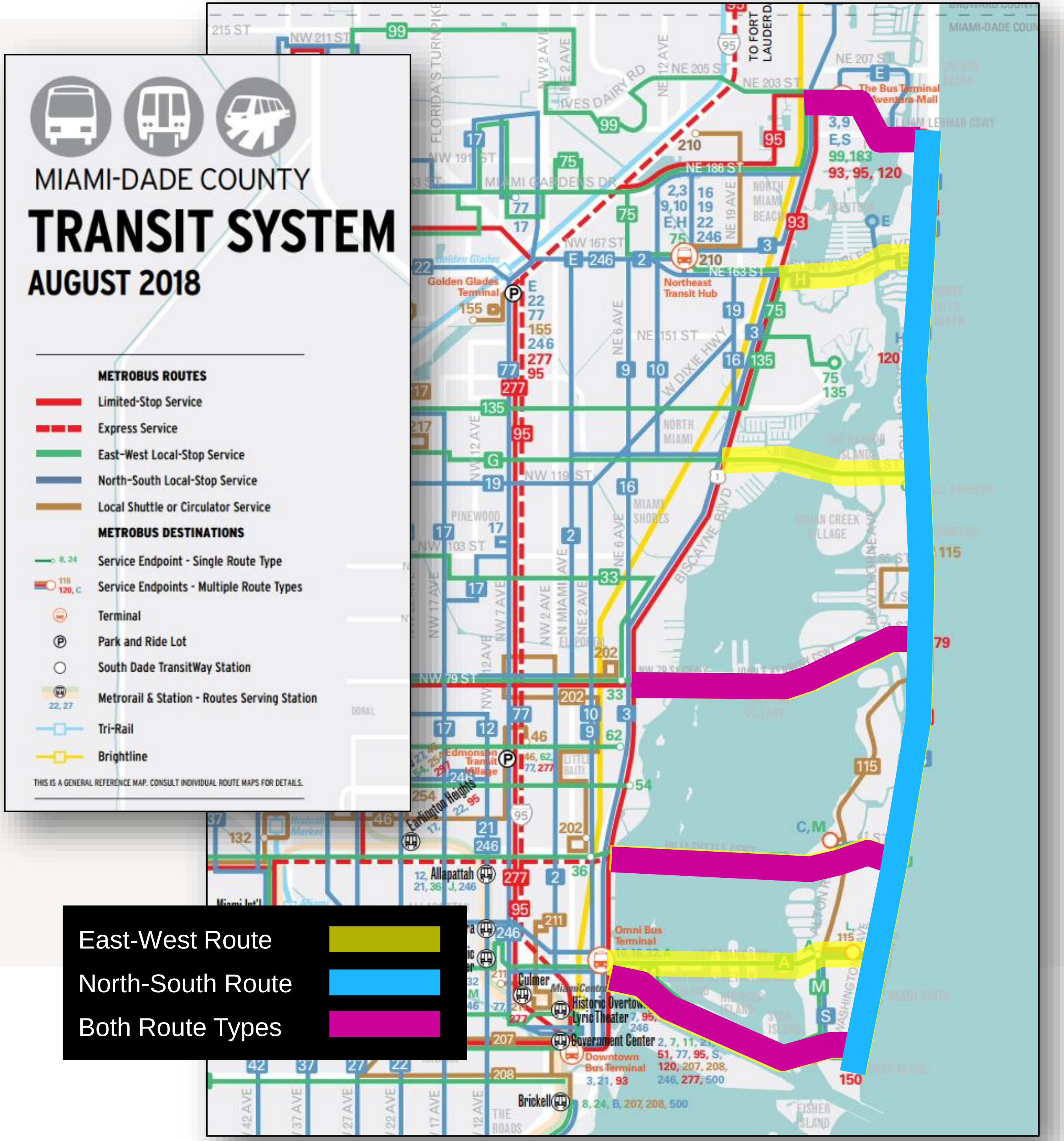

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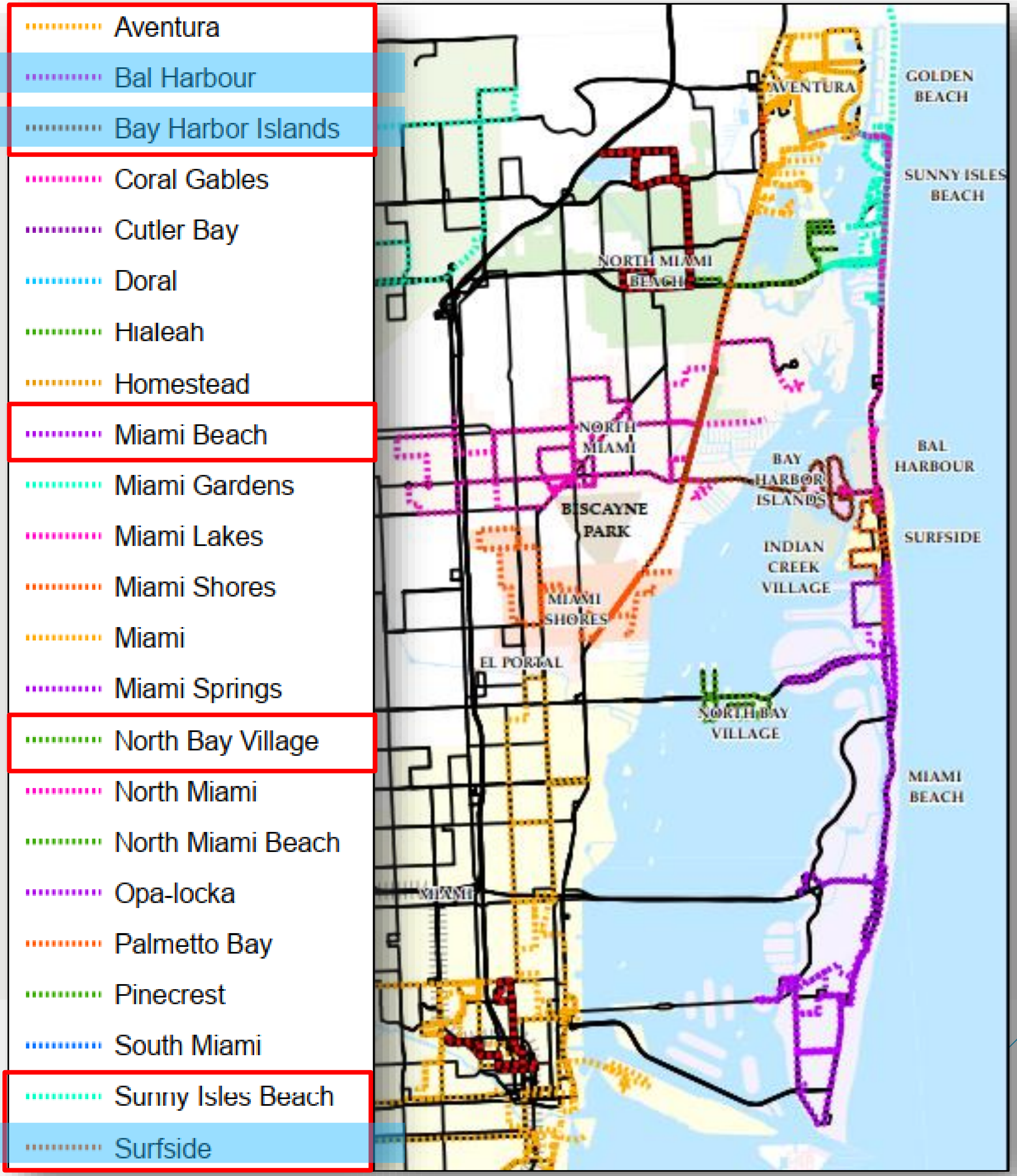

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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

Field Review – Pedestrian Environment along A1A

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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

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North - South Transportation Needs for the Coastal Communities
FEASIBILITY STUDY
A1A

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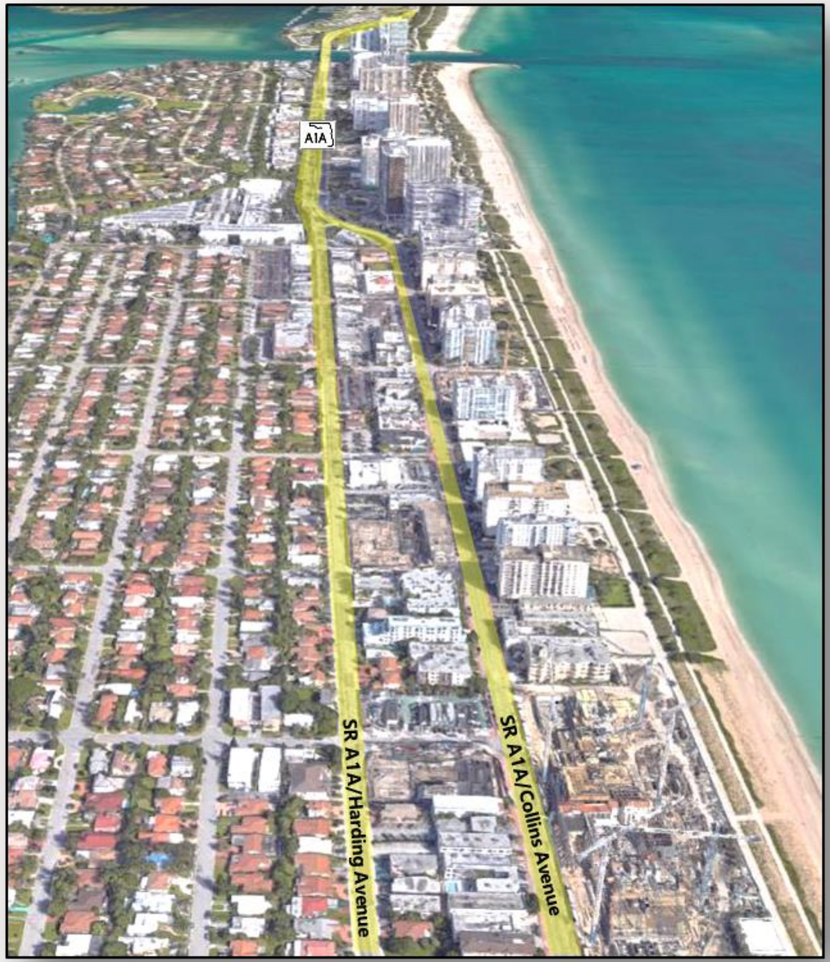

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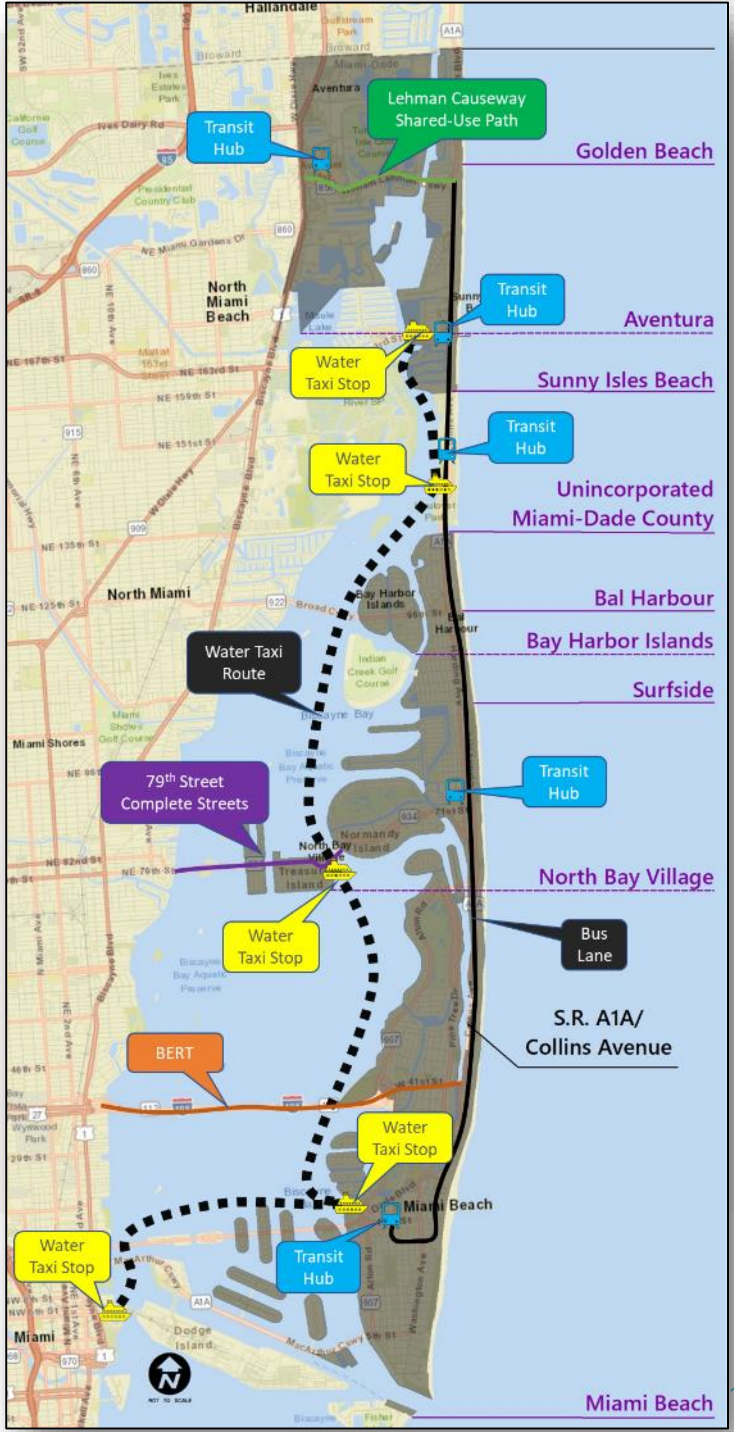

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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY

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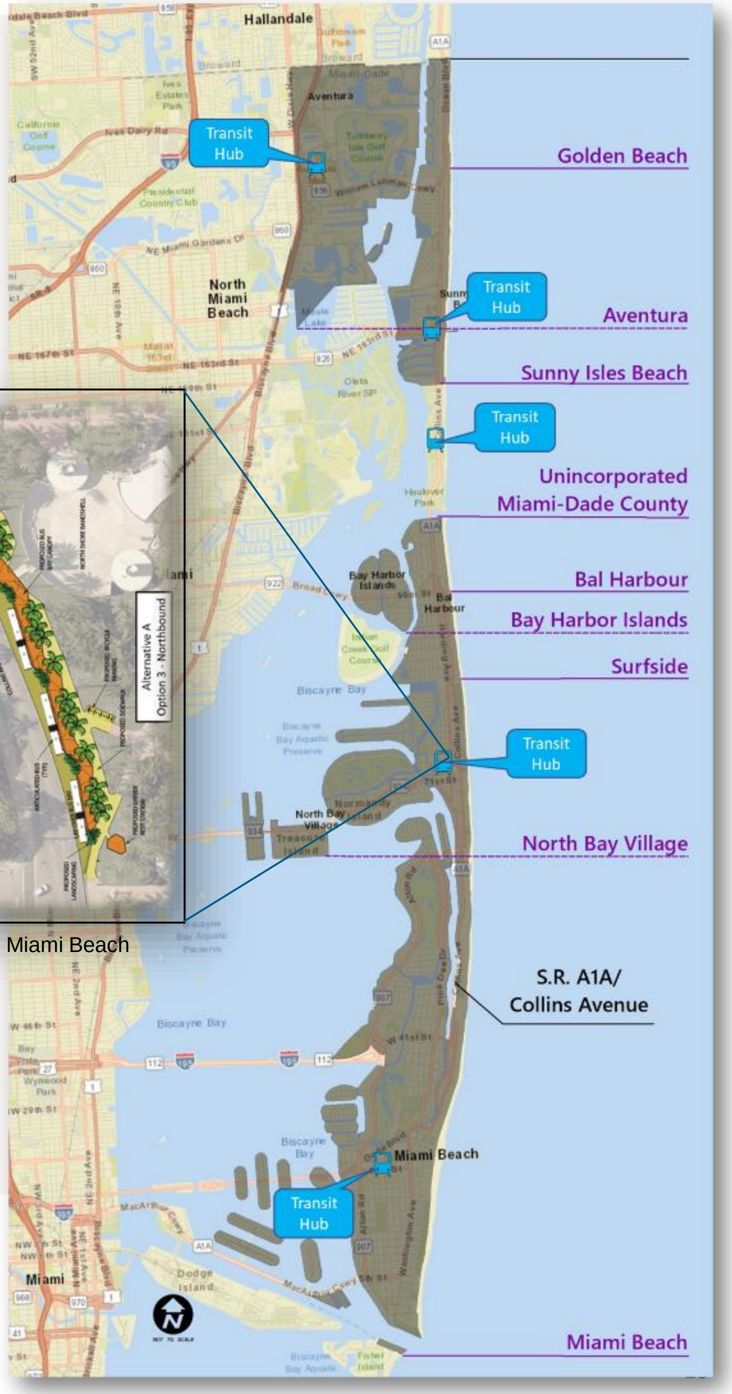
  - At 163rd Street (East end of Bella Island in SIB)
  - At Aventura Mall Transit Station

Between 72nd and 73rd Streets (Miami Beach); Miami Beach Intermodal Hubs Feasibility Study, 2018.



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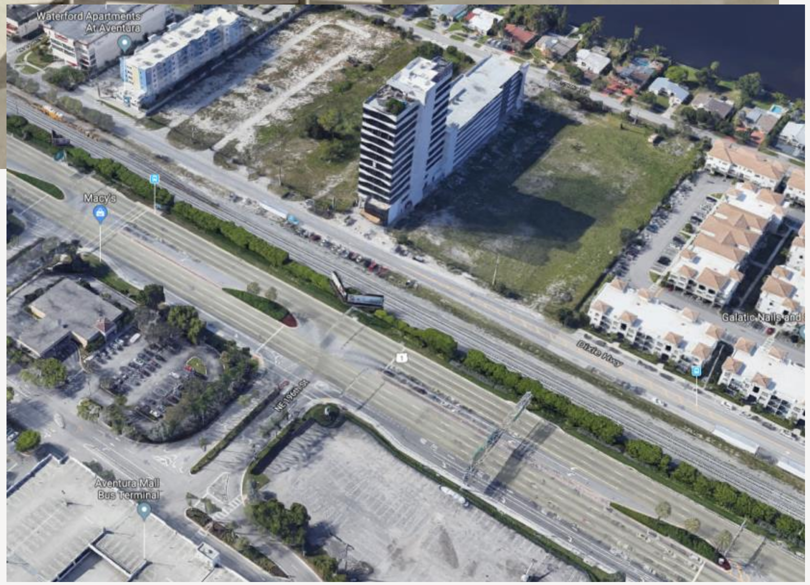
Aventura Train Station

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



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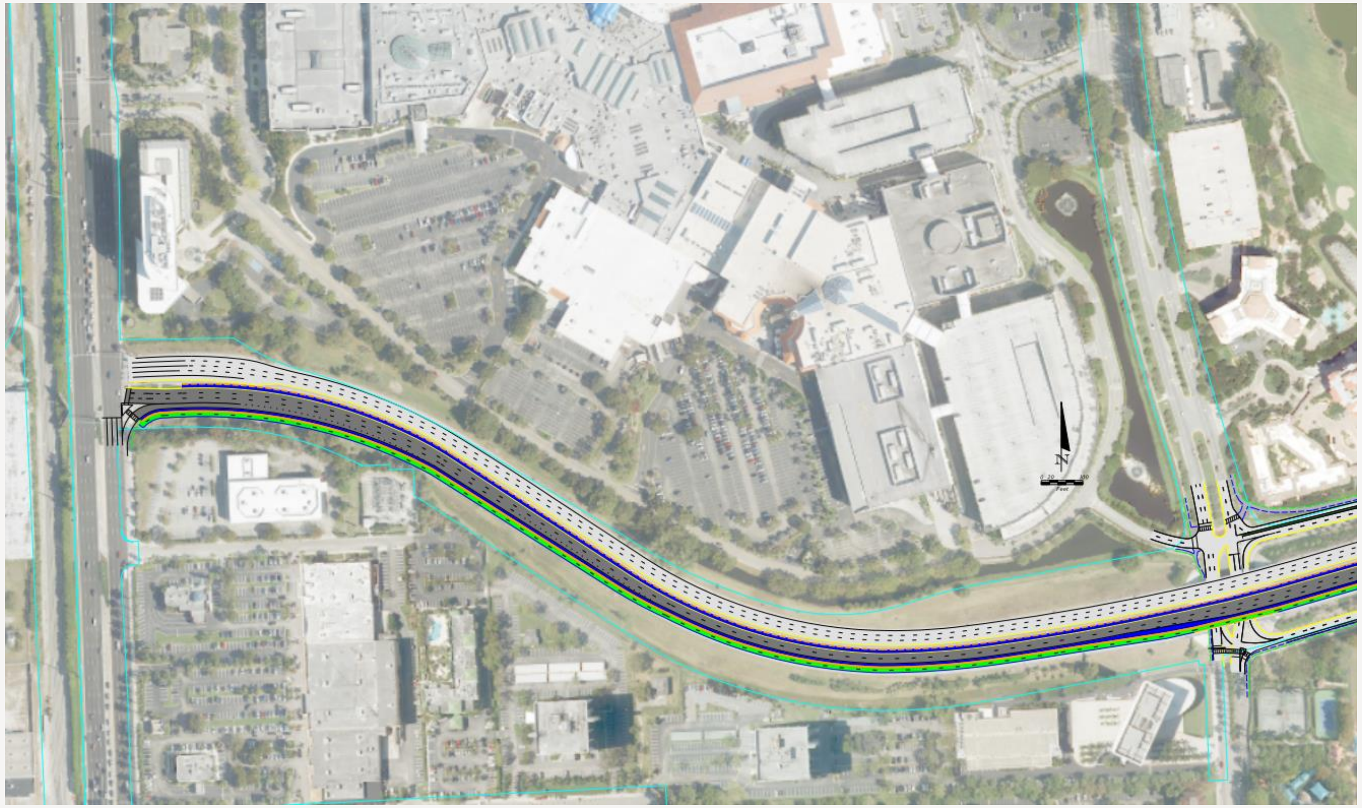
Proposed Improvements – Lehman Causeway Path

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



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Rendering of Lehman Causeway Path at Country Club Drive Loop

Proposed Improvements – Bus Lane Concept (Miami Beach)

- Dedicated Business Access + Transit (BAT) Lane – also shared w/ bikes
  - 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
  - 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:
  - 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

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Proposed Improvements – 79th Street Complete Street North Bay Village

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FEASIBILITY STUDY
A1A

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
  - Washington Ave from South Pointe Dr to Dade Blvd
  - Along Collins Ave from South Pointe to 63rd St
  - Along SR A1A one-way pairs north of 63rd St
  - Along Julia Tuttle Causeway
  - Along MacArthur Causeway
- Pedestrian Bridges (SIB)
  - Collins Ave @ 163rd St, @ 174th St, and @ 180th St (Priority 1)
  - Collins Ave @ Heritage Park (Priority 3)
- Signalized Crosswalks
  - Collins Ave and 36th St, RRFB (2020)
  - Collins Ave and 83rd St RRFB (2020)
  - Collins Ave and 87th St, RRFB (2020)
  - Collins Ave and 79th St, New Signal (2020)
  - 4300 Block of Collins Ave, RRFB (2024)
  - 41st St and Jefferson Ave, New Signal (2021)

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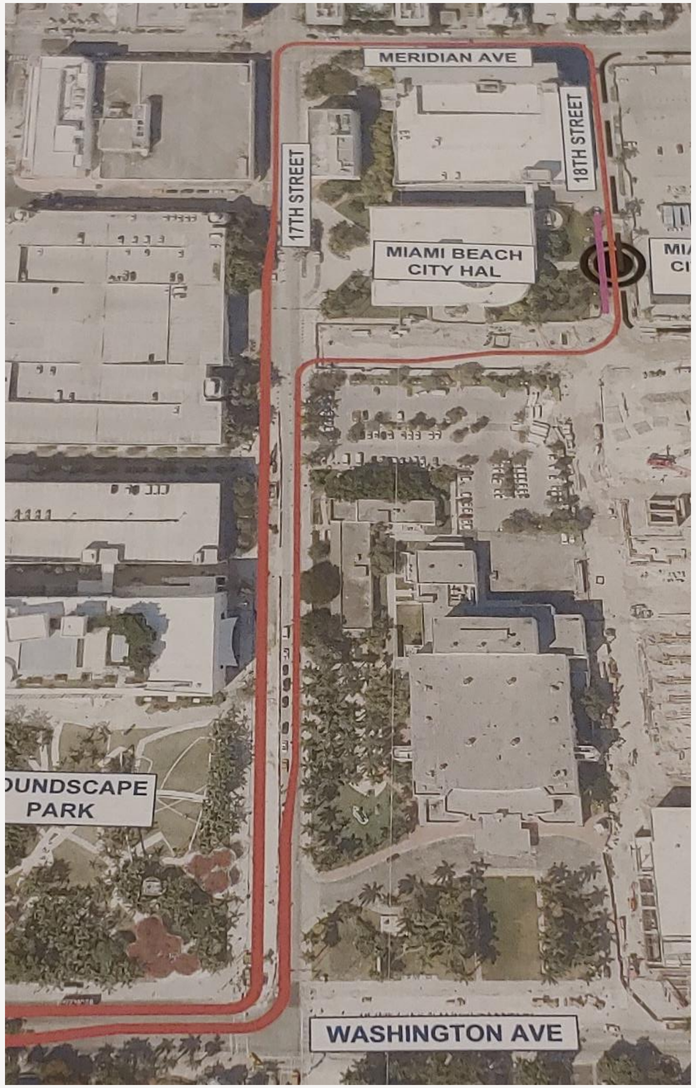
Potential Projects from other Miami Beach Plans & Studies

- 71st Street / Normandy Drive
  - Continuous protected bike lanes
  - Exclusive transit lanes
- 41st Street / Julia Tuttle Causeway
  - 41st Street complete streets concept (City proposal)
  - I-195 Enhanced Bike/ped path (I-195 Master Plan)
- Venetian Causeway / Dade Blvd. / 17th St.
  - Dade Blvd. shared path (City study)
  - 17th Street – part of Beach connection BRT option (PD&E Study)
- MacCarthur Causeway / 5th Avenue
  - Beach connection premium transit options (PD&E Study)
  - Connection to Convention Center using Washington Avenue



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North - South Transportation Needs for the Coastal Communities FEASIBILITY STUDY A1A

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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 of 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:

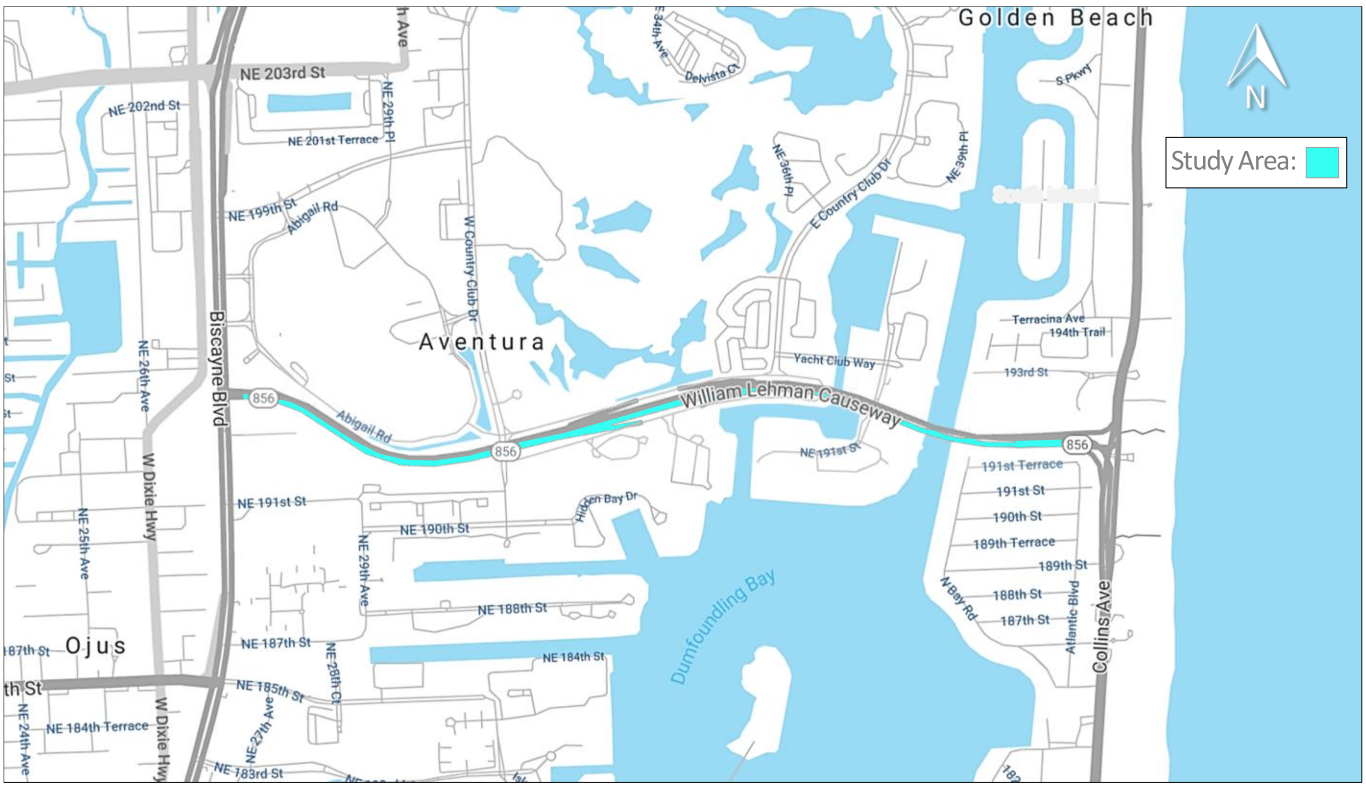
- Review of existing roadway characteristics
- Collection of most recently available (2019) traffic data
- Analysis of existing year traffic operations evaluation
- Development of future year (2040) traffic volumes
- Analysis of future year operational evaluation

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 Traffic Analysis Handbook (2014)
- FDOT Project Traffic Forecasting Handbook (2019)
- FDOT Project Development and Environmental Manual (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.

4.1. Roadway Characteristics.

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.

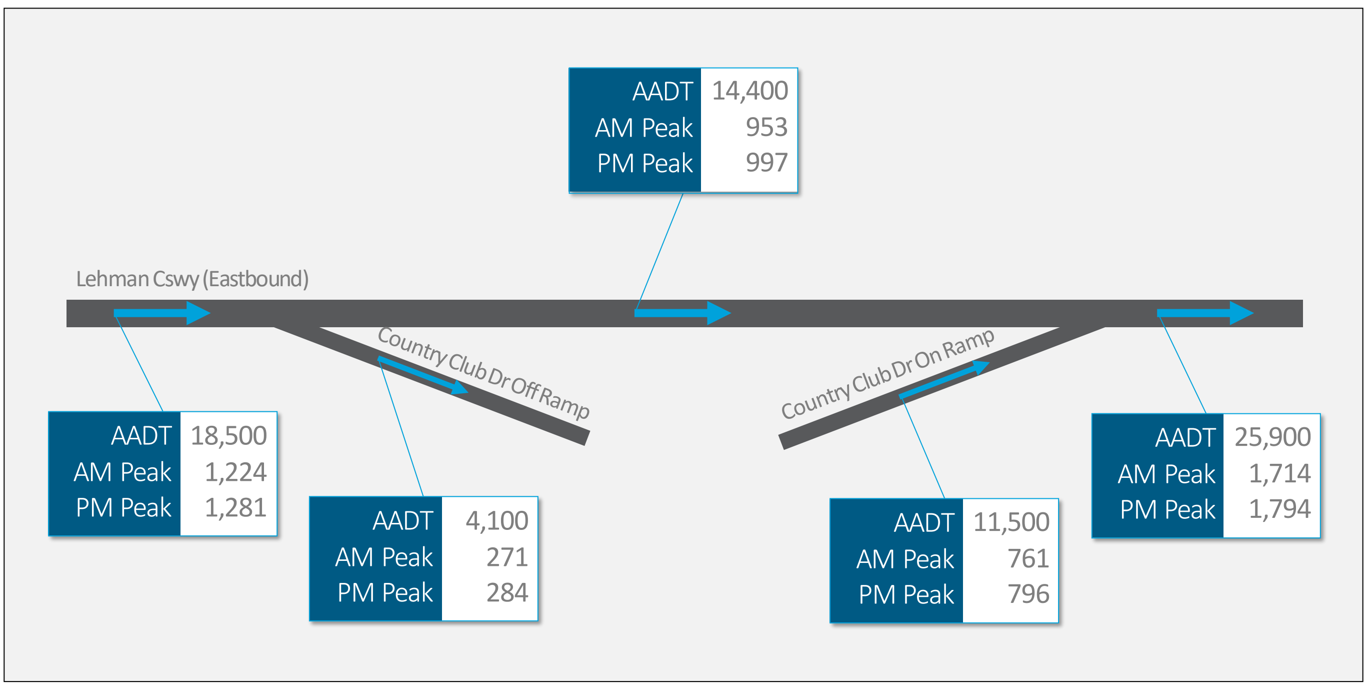
Table 4-1 - Existing Segment Volumes and Traffic Factors

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

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

Direction	Peak Hour	Collected Volume (veh/hr)	Adjusted Volume (veh/hr) *Seasonal Factor=1.02*
Eastbound	7:30-8:30 AM	1,200	1,225
	4:45-5:45 PM	1,255	1,280
Westbound	9:15-10:15 AM	1,655	1,690
	4:30-5:30 PM	1,565	1,600

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 caudated 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)

Segment	Segment Type	Number of Lanes	Density (pc/mi/ln)	d/c Ratio	LOS	LOS Targets
SR 856 west of Country Club Dr Off Ramp	Basic	3	8.0	0.20	A	D
Country Club Dr Off Ramp	Diverge	3	8.6	0.20	A	D
SR 856 between Country Club Dr Ramps	Basic	3	6.2	0.16	A	D
Country Club Dr On Ramp	Merge	3	11.8	0.28	B	D
SR 856 east of Country Club Dr On Ramp	Basic	3	11.1	0.29	B	D

4.4. Historical Crash Summary

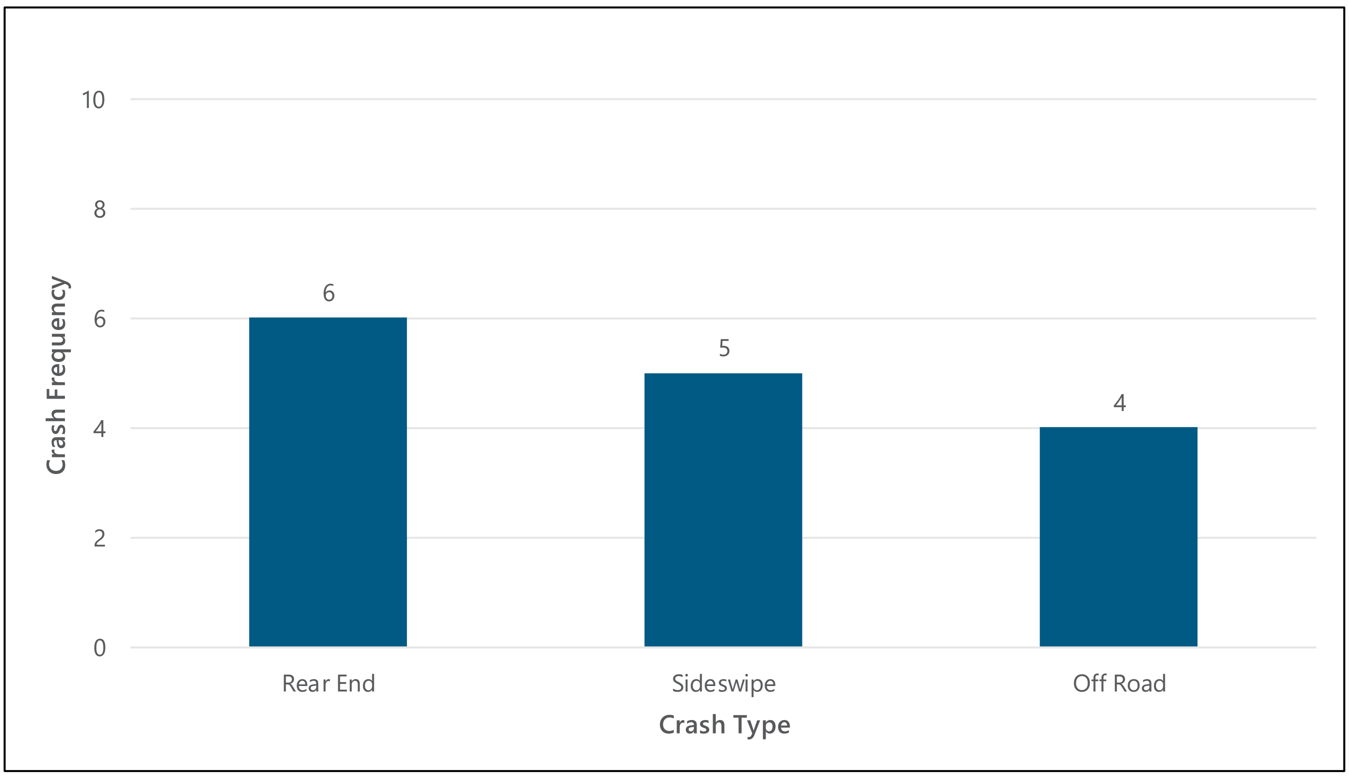
The crash records were obtained for Lehman Causeway using Florida's Signal4 Analytics crash reporting system. The crash study limits were identified as from 700 east of US-1/Biscayne Boulevard to 500 feet west of SR A1A/Collins Avenue. At first, the past five years of data (2015-2019) was queried, but 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



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

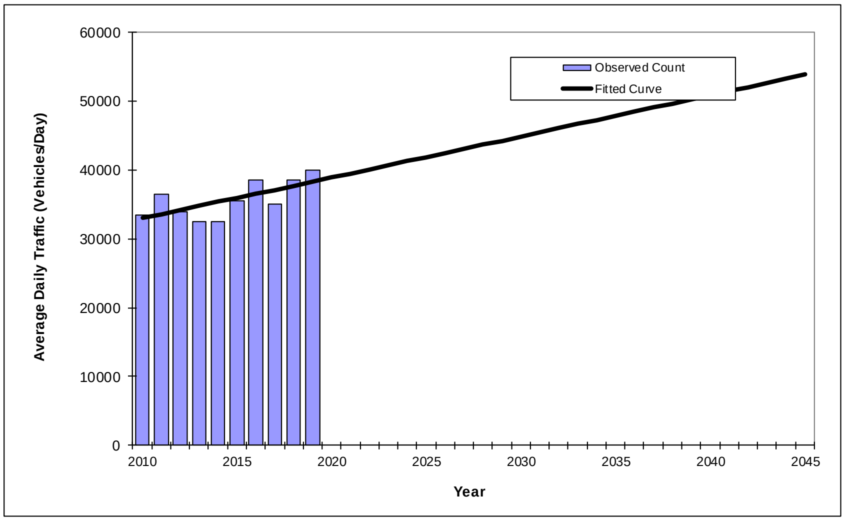
The South East Regional Planning Model (SERPM) was run for the study area and surrounding facilities for a 2040 forecast year. Based on the 2040 estimate, and adjusted by the peak season correction factor (0.97), the 2040 forecasted volume for SR 856 (just east of US 1) is 42,100 AADT. When compared 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.

Table 5-1 - Historical AADT

Year	AADT
2010	33,500
2011	36,500
2012	34,000
2013	32,500
2014	32,500
2015	35,500
2016	38,500
2017	35,000
2018	38,500
2019	40,000



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

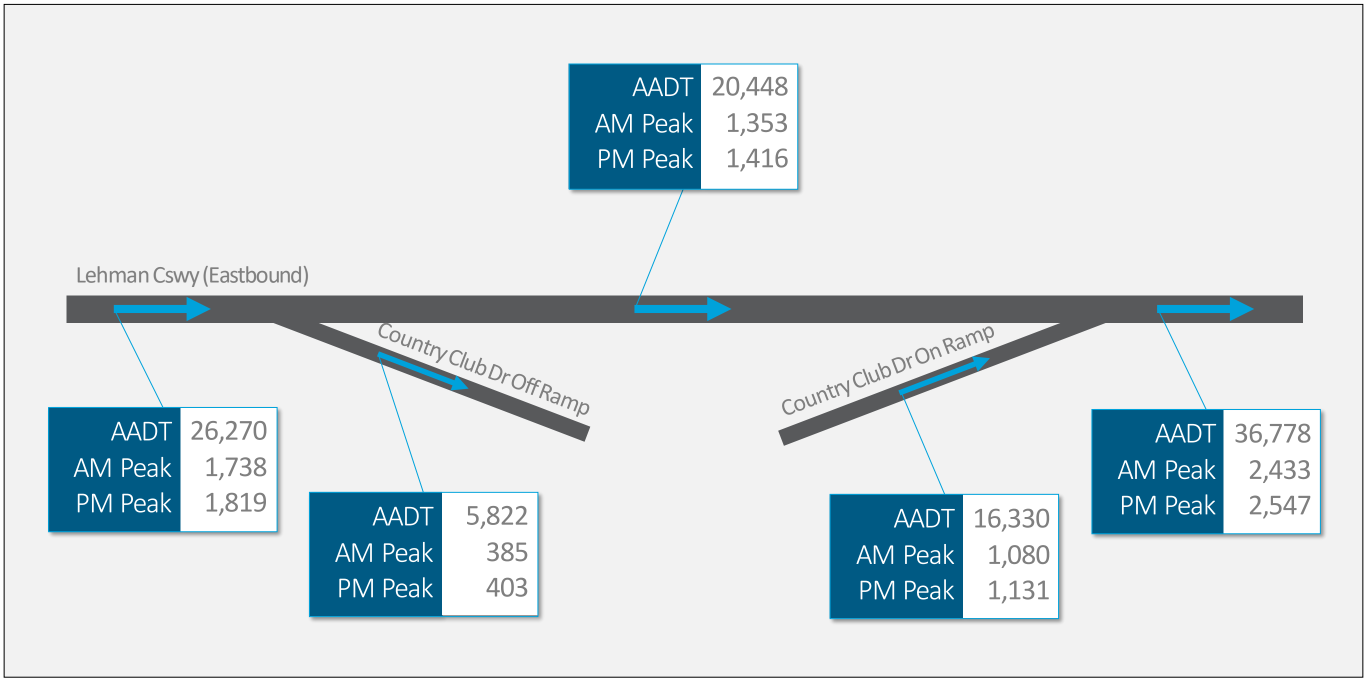
Source	Annual Growth Rate
Regional Demand Model	0.3%
Historical Volume Trends	1.6%
Population Projections	1.0%
Recommended Annual Growth Rate	**2.0%**

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)

Segment	Segment Type	Number of Lanes	Density (pc/mi/ln)	d/c Ratio	LOS	LOS Targets
SR 856 west of Country Club Dr Off Ramp	Basic	3	11.3	0.29	B	D
Country Club Dr Off Ramp	Diverge	3	12.2	0.29	B	D
SR 856 between Country Club Dr Ramps	Basic	3	8.8	0.23	A	D
Country Club Dr On Ramp	Merge	3	20.4	0.40	C	D
SR 856 east of Country Club Dr On Ramp	Basic	3	15.8	0.41	B	D

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)

Segment	Segment Type	Number of Lanes	Density (pc/mi/ln)	d/c Ratio	LOS	LOS Targets
SR 856 west of lane reduction	Basic	3	11.3	0.29	B	D
SR 856 west of Country Club Dr Off Ramp	Basic	2	13.4	0.41	B	D
Country Club Dr Off Ramp	Diverge	2	19.3	0.45	B	D
SR 856 between Country Club Dr Ramps	Basic	2	13.2	0.34	B	D
Country Club Dr On Ramp	Merge	2	26.1	0.63	C	D
SR 856 east of Country Club Dr On Ramp	Basic	2	23.7	0.61	C	D

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

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2019 HISTORICAL AADT REPORT

COUNTY: 87 - MIAMI-DADE

SITE: 0152 - SR 856/NE 192 ST, 200' E SR 5/US-1

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2019	40000 C	E 18500	W 21500	8.00	54.60	2.80
2018	38500 C	E 18000	W 20500	9.00	54.30	2.30
2017	35000 C	E 17500	W 17500	9.00	55.00	2.80
2016	38500 C	E 18500	W 20000	9.00	54.50	2.70
2015	35500 C	E 17000	W 18500	9.00	54.70	2.60
2014	32500 F	E 14500	W 18000	9.00	54.50	2.70
2013	32500 C	E 14500	W 18000	9.00	52.40	2.70
2012	34000 C	E 16500	W 17500	9.00	55.70	2.40
2011	36500 C	E 17500	W 19000	9.00	55.10	3.40
2010	33500 C	E 15500	W 18000	8.98	54.08	3.40
2009	38000 C	E 19500	W 18500	8.99	53.24	2.70
2008	36000 C	E 18000	W 18000	9.09	55.75	2.90
2007	36000 C	E 18000	W 18000	8.01	54.34	2.90
2006	34000 C	E 16500	W 17500	7.97	54.22	2.00
2005	35000 C	E 16500	W 18500	8.80	53.80	5.30
2004	35000 C	E 19000	W 16000	9.00	53.30	5.30

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

COUNTY: 87
STATION: 0152
DESCRIPTION: SR 856/NE 192 ST, 200' E SR 5/US-1
START DATE: 06/25/2019
START TIME: 0000

TIME	DIRECTION: E 1ST	2ND	3RD	4TH	TOTAL	DIRECTION: W 1ST	2ND	3RD	4TH	TOTAL	COMBINED TOTAL
0000	69	64	51	31	215	58	53	53	41	205	420
0100	35	32	31	22	120	27	33	19	23	102	222
0200	22	24	15	15	76	10	10	11	3	34	110
0300	16	11	13	12	52	20	36	12	16	84	136
0400	14	13	14	24	65	6	13	30	19	68	133
0500	30	34	71	92	227	38	23	44	44	149	376
0600	106	219	276	298	899	69	104	128	145	446	1345
0700	224	236	318	290	1068	191	259	311	325	1086	2154
0800	312	260	297	324	1193	368	388	379	362	1497	2690
0900	253	282	285	232	1052	381	388	400	394	1563	2615
1000	236	233	225	238	932	377	368	364	354	1463	2395
1100	245	245	244	242	976	349	290	293	324	1256	2232
1200	250	261	229	266	1006	368	371	347	375	1461	2467
1300	225	222	238	241	926	350	397	375	341	1463	2389
1400	223	251	306	267	1047	336	369	354	317	1376	2423
1500	267	245	244	246	1002	356	360	360	295	1371	2373
1600	233	275	232	238	978	388	398	409	391	1586	2564
1700	262	304	247	302	1115	398	379	362	356	1495	2610
1800	260	276	296	262	1094	374	321	276	280	1251	2345
1900	300	274	266	250	1090	292	239	220	240	991	2081
2000	237	251	236	227	951	200	202	201	222	825	1776
2100	230	193	206	177	806	209	177	147	144	677	1483
2200	190	160	178	166	694	124	152	133	124	533	1227
2300	140	119	82	92	433	148	133	96	89	466	899
24-HOUR TOTALS:					18017					21448	39465

PEAK VOLUME INFORMATION

	DIRECTION: E HOUR	VOLUME	DIRECTION: W HOUR	VOLUME	COMBINED DIRECTIONS HOUR	VOLUME
A.M.	800	1193	845	1531	800	2690
P.M.	1745	1134	1615	1596	1630	2613
DAILY	800	1193	1615	1596	800	2690

	E	W	COMBINED
TRUCK PERCENTAGE	3.48	2.65	3.03

CLASSIFICATION SUMMARY DATABASE

DIR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTTRK	TOTVOL
E	72	15307	1867	63	226	152	31	51	29	68	0	0	7	0	144	627	18017
W	96	18635	2093	61	180	147	41	57	51	26	0	0	6	0	55	569	21448

GENERATED BY SPS 5.0.47P

COUNTY: 87
STATION: 0152
DESCRIPTION: SR 856/NE 192 ST, 200' E SR 5/US-1
START DATE: 06/26/2019
START TIME: 0000

	DIRECTION: E					DIRECTION: W					COMBINED
TIME	1ST	2ND	3RD	4TH	TOTAL	1ST	2ND	3RD	4TH	TOTAL	TOTAL
0000	76	65	64	46	251	84	68	68	49	269	520
0100	34	42	34	25	135	22	31	15	24	92	227
0200	27	19	12	16	74	19	13	18	10	60	134
0300	19	17	15	10	61	22	23	18	14	77	138
0400	10	18	23	21	72	11	13	29	17	70	142
0500	26	31	65	98	220	29	34	53	53	169	389
0600	130	213	271	288	902	86	137	130	191	544	1446
0700	213	243	314	297	1067	257	279	318	351	1205	2272
0800	309	278	277	291	1155	360	356	358	384	1458	2613
0900	287	284	241	274	1086	375	419	406	422	1622	2708
1000	264	259	232	245	1000	408	375	324	275	1382	2382
1100	232	204	225	239	900	277	277	330	336	1220	2120
1200	223	232	235	235	925	345	360	370	366	1441	2366
1300	256	259	255	227	997	358	377	369	381	1485	2482
1400	220	252	274	291	1037	347	301	348	331	1327	2364
1500	279	267	250	252	1048	355	329	342	312	1338	2386
1600	261	281	240	303	1085	371	360	398	398	1527	2612
1700	311	321	321	291	1244	396	371	370	360	1497	2741
1800	314	313	264	284	1175	367	367	373	314	1421	2596
1900	274	275	261	268	1078	308	266	257	215	1046	2124
2000	243	244	218	201	906	201	204	157	180	742	1648
2100	206	230	219	203	858	179	165	185	214	743	1601
2200	195	185	173	191	744	142	132	88	99	461	1205
2300	125	126	137	98	486	144	105	97	63	409	895
24-HOUR TOTALS:					18506					21605	40111

PEAK VOLUME INFORMATION

	DIRECTION: E		DIRECTION: W		COMBINED DIRECTIONS	
	HOUR	VOLUME	HOUR	VOLUME	HOUR	VOLUME
A.M.	730	1198	845	1584	845	2687
P.M.	1645	1256	1630	1563	1645	2791
DAILY	1645	1256	915	1655	1645	2791

TRUCK PERCENTAGE 2.73 2.53 2.63

CLASSIFICATION SUMMARY DATABASE

DIR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTTRK	TOTVOL
E	56	15771	2100	48	217	66	38	71	24	34	1	0	7	0	73	506	18506
W	115	18847	2037	63	182	156	22	37	53	25	1	0	8	0	59	547	21605

GENERATED BY SPS 5.0.47P

COUNTY: 87
STATION: 0152
DESCRIPTION: SR 856/NE 192 ST, 200' E SR 5/US-1
START DATE: 06/27/2019
START TIME: 0000

TIME	DIRECTION: E 1ST	2ND	3RD	4TH	TOTAL	DIRECTION: W 1ST	2ND	3RD	4TH	TOTAL	COMBINED TOTAL
0000	75	59	61	52	247	83	56	55	40	234	481
0100	38	37	32	21	128	49	36	32	28	145	273
0200	26	18	20	22	86	26	23	28	20	97	183
0300	23	14	21	13	71	12	22	10	15	59	130
0400	19	11	24	26	80	12	12	15	26	65	145
0500	29	44	63	104	240	28	35	55	62	180	420
0600	117	218	275	289	899	55	102	134	196	487	1386
0700	222	223	277	297	1019	254	281	281	312	1128	2147
0800	256	267	285	287	1095	317	322	326	337	1302	2397
0900	290	263	274	244	1071	328	321	285	304	1238	2309
1000	262	238	227	207	934	310	326	288	316	1240	2174
1100	220	228	215	234	897	348	328	332	319	1327	2224
1200	207	224	210	254	895	305	337	233	309	1184	2079
1300	244	242	243	237	966	267	250	350	239	1106	2072
1400	230	227	305	284	1046	247	280	278	319	1124	2170
1500	251	265	226	244	986	334	382	362	367	1445	2431
1600	248	259	257	246	1010	359	398	359	361	1477	2487
1700	265	290	265	276	1096	357	231	288	313	1189	2285
1800	284	289	293	289	1155	332	287	223	289	1131	2286
1900	264	254	247	245	1010	283	277	274	244	1078	2088
2000	271	232	235	207	945	250	227	206	175	858	1803
2100	204	192	186	179	761	180	173	154	140	647	1408
2200	179	157	169	172	677	142	123	111	103	479	1156
2300	130	90	91	87	398	142	109	100	90	441	839
24-HOUR TOTALS:					17712					19661	37373

PEAK VOLUME INFORMATION

	DIRECTION: E HOUR	VOLUME	DIRECTION: W HOUR	VOLUME	COMBINED DIRECTIONS HOUR	VOLUME
A.M.	815	1129	815	1313	815	2442
P.M.	1800	1155	1530	1486	1615	2502
DAILY	1800	1155	1530	1486	1615	2502
TRUCK PERCENTAGE	3.22		2.48		2.83	

CLASSIFICATION SUMMARY DATABASE

DIR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTTRK	TOTVOL
E	90	15122	1868	50	172	190	40	55	33	25	0	0	5	0	62	570	17712
W	102	17308	1736	62	148	141	29	46	28	30	0	0	3	0	28	487	19661

GENERATED BY SPS 5.0.47P

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2019 HISTORICAL AADT REPORT

COUNTY: 87 - MIAMI-DADE

SITE: 6175 - RAMP 87210001 FROM EB SR856 TO EB NE 192 ST, 75' E OF SR 856

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2019	4100 F	0	0	8.00	99.90	1.90
2018	4100 C	E 4100	0	9.00	99.90	1.90
2017	3800 F	0	0	9.00	99.90	2.10
2016	3700 C	E 3700	0	9.00	99.90	2.10
2015	2900 F	0	0	9.00	99.90	3.10
2014	2800 C	E 2800		9.00	99.90	3.10
2013	3400 F	0	0	9.00	99.90	3.30
2012	3500 C	E 3500	0	9.00	99.90	3.30
2011	3100 F	0	0	9.00	99.90	1.70
2010	3100 C	E 3100	0	8.98	99.99	1.70
2009	3100 F	0	0	8.99	99.99	1.40
2008	3200 C	E 3200	0	9.09	99.99	1.40
2007	3300 F	0	0	8.01	99.99	2.80
2006	3300 C	E 3300	0	7.97	99.99	2.80
2005	8400 S	E	B	8.80	99.90	4.70
2004	8400 F	E	B	9.00	99.90	4.70

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

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

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2019	5500 F	0	0	8.00	99.90	2.80
2018	5500 C	W 5500	0	9.00	99.90	2.80
2017	5600 F	0	0	9.00	99.90	1.60
2016	5400 C	W 5400	0	9.00	99.90	1.60
2015	5000 F	0	0	9.00	99.90	5.50
2014	4800 C	W 4800		9.00	99.90	5.50
2013	5100 F	0	0	9.00	99.90	2.00
2012	5200 C	W 5200	0	9.00	99.90	2.00
2011	4500 F	0	0	9.00	99.90	1.20
2010	4600 C	W 4600	0	8.98	99.99	1.20
2009	4700 F	0	0	8.99	99.99	1.40
2008	4800 C	W 4800	0	9.09	99.99	1.40
2007	4600 F	0	0	8.01	99.99	1.90
2006	4600 C	W 4600	B 0	7.97	99.99	1.90
2005	9400 S	W	B	8.80	99.90	2.50
2004	9400 F	W	B	9.00	99.90	2.50

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

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
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

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2019	11500 F	0	0	8.00	99.90	2.50
2018	11500 C	E 11500	0	9.00	99.90	2.50
2017	11000 F	0	0	9.00	99.90	3.30
2016	10500 C	E 10500	0	9.00	99.90	3.30
2015	10500 F	0	0	9.00	99.90	4.80
2014	10000 C	E 10000		9.00	99.90	4.80
2013	11000 F	0	0	9.00	99.90	5.50
2012	11000 C	E 11000	0	9.00	99.90	5.50
2011	9200 F	0	0	9.00	99.90	3.10
2010	9300 C	E 9300	0	8.98	99.99	3.10
2009	9800 F	0	0	8.99	99.99	2.40
2008	10000 C	E 10000	0	9.09	99.99	2.40
2007	10000 F	0	0	8.01	99.99	2.30
2006	10000 C	E 10000	0	7.97	99.99	2.30
2005	4500 S	E	B	8.80	99.90	3.00
2004	4500 F	E	B	9.00	99.90	3.00

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

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

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2019	10500 F	0	0	8.00	99.90	2.70
2018	10500 C	W 10500	0	9.00	99.90	2.70
2017	6700 F	0	0	9.00	99.90	8.40
2016	6500 C	W 6500	0	9.00	99.90	8.40
2015	9600 F	0	0	9.00	99.90	5.90
2014	9300 C	W 9300		9.00	99.90	5.90
2013	10500 F	0	0	9.00	99.90	4.00
2012	10500 C	W 10500	0	9.00	99.90	4.00
2011	8600 F	0	0	9.00	99.90	3.50
2010	8700 C	W 8700	0	8.98	99.99	3.50
2009	9400 F	0	0	8.99	99.99	2.50
2008	9600 C	W 9600	0	9.09	99.99	2.50
2007	8800 F	0	0	8.01	99.99	2.90
2006	8800 C	W 8800	B 0	7.97	99.99	2.90
2005	2900 S	W	B	8.80	99.90	3.80
2004	2900 F	W	B	9.00	99.90	3.80

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

2019 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
CATEGORY: 8700 MIAMI-DADE NORTH

MOCF: 0.97

WEEK	DATES	SF	PSCF
1	01/01/2019 - 01/05/2019	1.03	1.06
2	01/06/2019 - 01/12/2019	1.02	1.05
3	01/13/2019 - 01/19/2019	1.01	1.04
4	01/20/2019 - 01/26/2019	1.00	1.03
* 5	01/27/2019 - 02/02/2019	0.98	1.01
* 6	02/03/2019 - 02/09/2019	0.97	1.00
* 7	02/10/2019 - 02/16/2019	0.96	0.99
* 8	02/17/2019 - 02/23/2019	0.96	0.99
* 9	02/24/2019 - 03/02/2019	0.96	0.99
*10	03/03/2019 - 03/09/2019	0.96	0.99
*11	03/10/2019 - 03/16/2019	0.97	1.00
*12	03/17/2019 - 03/23/2019	0.97	1.00
*13	03/24/2019 - 03/30/2019	0.97	1.00
*14	03/31/2019 - 04/06/2019	0.97	1.00
*15	04/07/2019 - 04/13/2019	0.98	1.01
*16	04/14/2019 - 04/20/2019	0.98	1.01
*17	04/21/2019 - 04/27/2019	0.98	1.01
18	04/28/2019 - 05/04/2019	0.99	1.02
19	05/05/2019 - 05/11/2019	0.99	1.02
20	05/12/2019 - 05/18/2019	1.00	1.03
21	05/19/2019 - 05/25/2019	1.00	1.03
22	05/26/2019 - 06/01/2019	1.01	1.04
23	06/02/2019 - 06/08/2019	1.01	1.04
24	06/09/2019 - 06/15/2019	1.02	1.05
25	06/16/2019 - 06/22/2019	1.02	1.05
26	06/23/2019 - 06/29/2019	1.02	1.05
27	06/30/2019 - 07/06/2019	1.02	1.05
28	07/07/2019 - 07/13/2019	1.03	1.06
29	07/14/2019 - 07/20/2019	1.03	1.06
30	07/21/2019 - 07/27/2019	1.03	1.06
31	07/28/2019 - 08/03/2019	1.02	1.05
32	08/04/2019 - 08/10/2019	1.02	1.05
33	08/11/2019 - 08/17/2019	1.02	1.05
34	08/18/2019 - 08/24/2019	1.02	1.05
35	08/25/2019 - 08/31/2019	1.02	1.05
36	09/01/2019 - 09/07/2019	1.03	1.06
37	09/08/2019 - 09/14/2019	1.03	1.06
38	09/15/2019 - 09/21/2019	1.03	1.06
39	09/22/2019 - 09/28/2019	1.02	1.05
40	09/29/2019 - 10/05/2019	1.01	1.04
41	10/06/2019 - 10/12/2019	1.00	1.03
42	10/13/2019 - 10/19/2019	0.99	1.02
43	10/20/2019 - 10/26/2019	1.00	1.03
44	10/27/2019 - 11/02/2019	1.00	1.03
45	11/03/2019 - 11/09/2019	1.01	1.04
46	11/10/2019 - 11/16/2019	1.01	1.04
47	11/17/2019 - 11/23/2019	1.02	1.05
48	11/24/2019 - 11/30/2019	1.02	1.05
49	12/01/2019 - 12/07/2019	1.02	1.05
50	12/08/2019 - 12/14/2019	1.03	1.06
51	12/15/2019 - 12/21/2019	1.03	1.06
52	12/22/2019 - 12/28/2019	1.02	1.05
53	12/29/2019 - 12/31/2019	1.01	1.04

* PEAK SEASON

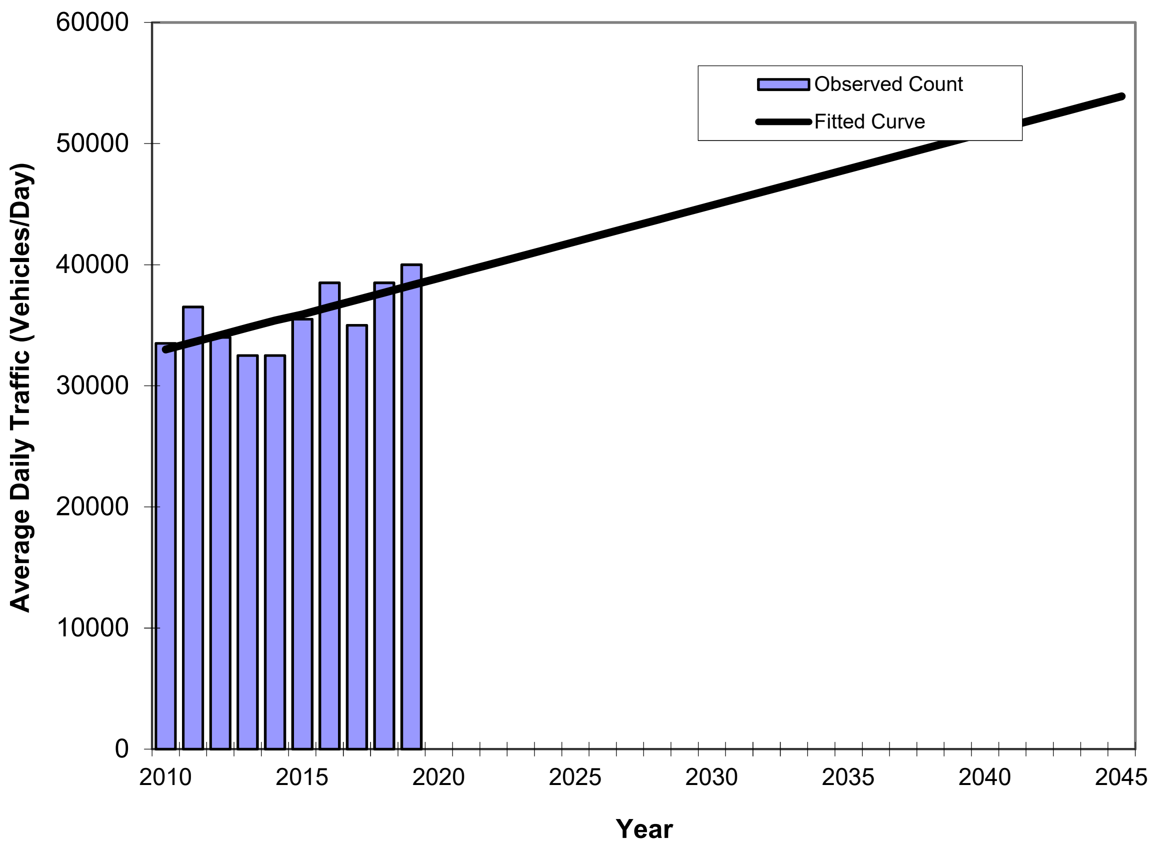
Appendix B2. Traffic Trends Worksheets

Traffic Trends - V03.a

SR 856 -- SR 856

FIN#	1234
Location	1

County:	Volusia (79)
Station #:	7046
Highway:	SR 856



Year	Traffic (ADT/AADT) Count*	Trend**
2010	33500	33000
2011	36500	33600
2012	34000	34200
2013	32500	34800
2014	32500	35400
2015	35500	35900
2016	38500	36500
2017	35000	37100
2018	38500	37700
2019	40000	38300
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		

*Axle-Adjusted

** 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

Appendix B3. Crash Data

HSMV Report Number	Agency Report Number	Reporting Agency	Form Type	Crash Date	Crash Time	City	County	Crash Street	Intersecting Street
88665856	19000432	Aventura PD	Long	1/26/2019	11:05 PM	Aventura	Miami-Dade	WILLIAM LEHMAN CSWY	BISCAYNE BLVD
87475901	18001377	Aventura PD	Long	3/13/2018	10:04 AM	Aventura	Miami-Dade	WILLIAM LEHMAN CSWY	BISCAYNE BLVD
84020798	1402277	Sunny Isles Beach PD	Long	8/13/2014	3:20 PM	Sunny Isles Beach	Miami-Dade	STATE ROAD 856	STATE RD A1A
84020799	1402261	Sunny Isles Beach PD	Long	8/11/2014	2:35 PM	Sunny Isles Beach	Miami-Dade	STATE ROAD 856	STATE ROAD A1A
88666989	19004260	Aventura PD	Long	9/3/2019	4:00 PM	Aventura	Miami-Dade	WILLIAM LEHMAN CSWY	BISCAYNE BLVD
87475916	18001403	Aventura PD	Short	3/15/2018	3:54 PM	Aventura	Miami-Dade	WILLIAM LEHMAN CSWY	BISCAYNE BLVD
84020809	1402347	Sunny Isles Beach PD	Long	8/20/2014	2:15 PM	Sunny Isles Beach	Miami-Dade	STATE ROAD 856	STATE ROAD A1A
84020793	1402241	Sunny Isles Beach PD	Long	8/9/2014	12:25 PM	Sunny Isles Beach	Miami-Dade	STATE RD 856	STATE RD A1A COLLINS AVE
88665428	18005719	Aventura PD	Short	11/16/2018	8:20 AM	Aventura	Miami-Dade	WILLIAM LEHMAN CSWY	BISCAYNE BLVD
84020512	1400659	Sunny Isles Beach PD	Long	3/7/2014	9:15 AM	Sunny Isles Beach	Miami-Dade	STATE ROAD 856	STATE ROAD A1A
89295736	19006108	Aventura PD	Long	12/19/2019	6:46 AM	Aventura	Miami-Dade	WILLIAM LEHMAN CSWY	BISCAYNE BLVD
87475900	18001375	Aventura PD	Short	3/13/2018	7:00 AM	Aventura	Miami-Dade	WILLIAM LEHMAN CSWY	BISCAYNE BLVD
88665648	18006450	Aventura PD	Short	12/22/2018	7:47 PM	Aventura	Miami-Dade	WILLIAM LEHMAN CSWY	BISCAYNE BLVD
88665808	19000267	Aventura PD	Long	1/17/2019	1:12 AM	Aventura	Miami-Dade	WILLIAM LEHMAN CSWY	BISCAYNE BLVD
88666776	19003575	Aventura PD	Long	7/25/2019	9:37 PM	Aventura	Miami-Dade	WILLIAM LEHMAN CSWY	BISCAYNE BLVD

HSMV Report Number	Offset Distance	Offset Direction	Crash Type	Vehicles	Non Motorists	Fatalities	Injuries	Alcohol Related	Distraction Related	Drug Related	Estimated Damages	Weather Condition	Light Condition
88665856	500	East	Off Road	1	0	0	0	N	N	N	$20,000	Rain	Dark - Not Lig
87475901	1200	East	Off Road	2	0	0	0	N	N	N	$15,000	Clear	Daylight
84020798	900	West	Rear End	2	0	0	0	N	N	N	$8,000	Clear	Daylight
84020799	950	West	Rear End	2	0	0	0	N	N	N	$4,000	Clear	Daylight
88666989	700	East	Rear End	2	0	0	0	N	N	N	$1,000	Clear	Daylight
87475916	5280	East	Rear End	2	0	0	0	N	N	N	$4,000	Clear	Daylight
84020809	300	West	Rear End	2	0	0	0	N	N	N	$3,000	Clear	Daylight
84020793	0	West	Sideswipe	2	0	0	0	N	N	N	$600	Clear	Daylight
88665428	1000	East	Sideswipe	2	0	0	0	N	N	N	$2,500	Clear	Daylight
84020512	300	West	Sideswipe	2	0	0	0	N	N	N	$3,300	Clear	Daylight
89295736	5280	East	Rear End	3	0	0	0	N	N	N	$4,500	Rain	Dawn
87475900	1000	East	Sideswipe	2	0	0	0	N	N	N	$7,000	Clear	Dawn
88665648	1000	East	Sideswipe	2	0	0	0	N	N	N	$1,000	Clear	Dark - Lighted
88665808	3000	East	Off Road	1	0	0	0	N	N	N	$30,500	Clear	Dark - Lighted
88666776	5280	East	Off Road	1	0	0	0	N	N	N	$700	Cloudy	Dark - Lighted

HSMV Report Number	Street Number	Crash Type Detailed	Crash Type Dir	Crash Severity	Within City Limits	Manner of Collision	First Harmful Event	First HE Location	First HE Relation to Jct
88665856		Off Road	E	Property Damage Only	Y	Other	Motor Vehicle in Transport	Off Roadway	Non-Junction
87475901		Off Road		Property Damage Only	Y	Other	Concrete Traffic Barrier	On Roadway	Non-Junction
84020798		Rear End	W	Property Damage Only	Y	Front to Rear	Motor Vehicle in Transport	On Roadway	Non-Junction
84020799		Rear End	W	Property Damage Only	Y	Front to Rear	Motor Vehicle in Transport	On Roadway	Non-Junction
88666989		Rear End	E	Property Damage Only	Y	Front to Rear	Motor Vehicle in Transport	On Roadway	Non-Junction
87475916		Rear End	E	Property Damage Only	Y	Front to Rear	Motor Vehicle in Transport	On Roadway	Non-Junction
84020809		Rear End	W	Property Damage Only	Y	Front to Rear	Motor Vehicle in Transport	On Roadway	Non-Junction
84020793		Same Direct	NE	Property Damage Only	Y	Sideswipe, Same Direction	Motor Vehicle in Transport	On Roadway	Non-Junction
88665428		Same Direct	E	Property Damage Only	Y	Sideswipe, Same Direction	Motor Vehicle in Transport	On Roadway	Non-Junction
84020512		Same Direct	E	Property Damage Only	Y	Sideswipe, Same Direction	Motor Vehicle in Transport	On Roadway	Non-Junction
89295736		Rear End	E	Property Damage Only	Y	Front to Rear	Motor Vehicle in Transport	On Roadway	Other
87475900		Same Direct	E	Property Damage Only	Y	Sideswipe, Same Direction	Motor Vehicle in Transport	On Roadway	Non-Junction
88665648		Same Direct		Property Damage Only	Y	Sideswipe, Same Direction	Motor Vehicle in Transport	On Roadway	Non-Junction
88665808		Off Road	E	Property Damage Only	Y	Other	Motor Vehicle in Transport	On Roadway	Non-Junction
88666776		Off Road	E	Property Damage Only	Y	Other	Motor Vehicle in Transport	On Roadway	Non-Junction

HSMV Report Number	First HE Within Interchange	Type of Intersection	Road Sys Identifier	Type of Shoulder	Road Surf Cond	Contrib Circum Road1	Contrib Circum Road2	Contrib Circum Road3	Contrib Circum Env1	Contrib Circum Env2	Contrib Circum Env3	School Bus Related	Work Zone Related
88665856	N	Not at Intersection	County	Unpaved	Wet	Road Surface			Weather C			N	N
87475901	N	Not at Intersection	State	Unpaved	Dry	None			None			N	N
84020798	N	Not at Intersection	State	Paved	Dry	None			None			N	N
84020799	N	Not at Intersection	State	Paved	Dry	None			None			N	Y
88666989	N	Not at Intersection	State	Paved	Dry	None			None			N	N
87475916	N	Not at Intersection	State	Paved	Dry	None			None			N	N
84020809	N	Not at Intersection	State	Paved	Dry	None			None			N	N
84020793	N	Not at Intersection	State	Paved	Dry	None			None			N	N
88665428	N	Not at Intersection	State	Unpaved	Dry	None			None			N	N
84020512	N	Not at Intersection	State	Curb	Dry	None			None			N	N
89295736	N	Not at Intersection	State	Curb	Wet	Other			Other			N	N
87475900	N	Not at Intersection	State	Unpaved	Dry	None			None			N	N
88665648	N	Not at Intersection	State	Paved	Dry	None			None			N	N
88665808	N	Not at Intersection	State	Paved	Dry	None			None			N	N
88666776	N	Not at Intersection	U.S.	Paved	Wet	None			Weather C			N	N

HSMV Report Number	Type of Work Zone	Loc in Work Zone	Workers in Work Zone	Law Enforcement in Work Zone	Mopeds	Motorcycles	Passengers	Bicyclists	Pedestrians	Fatalities Unrestrained	Injuries Unrestrained	Possible Injuries	Non Incapacitating Injuries
88665856					0	0	1	0	0	0	0	0	0
87475901					0	0	0	0	0	0	0	0	0
84020798					0	0	0	0	0	0	0	0	0
84020799	Lane Shift/	Terminati	N	N	0	0	0	0	0	0	0	0	0
88666989					0	0	1	0	0	0	0	0	0
87475916					0	0	0	0	0	0	0	0	0
84020809					0	0	1	0	0	0	0	0	0
84020793					0	0	0	0	0	0	0	0	0
88665428					0	0	0	0	0	0	0	0	0
84020512					0	0	3	0	0	0	0	0	0
89295736					0	0	3	0	0	0	0	0	0
87475900					0	0	0	0	0	0	0	0	0
88665648					0	0	0	0	0	0	0	0	0
88665808					0	1	0	0	0	0	0	0	0
88666776					0	0	0	0	0	0	0	0	0

ATKINS
Member of the SNC-Lavalin Group

HSMV Report Number	Incapacitating Injuries	Fatalities 30 Days	Non Traffic Fatalities	Transported by EMS	Transported by Law Enforcement	Transported by Other	Citations	Property Dmg Amt	Vehicle Dmg Amt	S4 Mapping	S4 Decimal Degree Longitude	S4 Decimal Degree Latitude
88665856	0	0	0	$0	$0	0	1	0	20000	Mapped, On Network	-80.14542363	25.95495858
87475901	0	0	0	$0	$0	0	0	0	15000	Mapped, On Network	-80.14352296	25.9541118
84020798	0	0	0	$0	$0	0	1	0	8000	Mapped, On Network	-80.12329492	25.95375398
84020799	0	0	0	$0	$0	0	1	0	4000	Mapped, On Network	-80.12345202	25.95378657
88666989	0	0	0	$0	$0	0	0	0	1000	Mapped, On Network	-80.14483711	25.95481136
87475916	0	0	0	$0	$0	0	1	0	4000	Mapped, On Network	-80.1315981	25.95518787
84020809	0	0	0	$0	$0	0	2	0	3000	Mapped, On Network	-80.12137714	25.95366005
84020793	0	0	0	$0	$0	0	1	0	600	Mapped, On Network	-80.12217008	25.95374974
88665428	0	0	0	$0	$0	0	1	0	2500	Mapped, On Network	-80.14403074	25.95441646
84020512	0	0	0	$0	$0	0	1	0	3300	Mapped, On Network	-80.12183717	25.95374754
89295736	0	0	0	$0	$0	0	2	0	4500	Mapped, On Network	-80.1315981	25.95518787
87475900	0	0	0	$0	$0	0	2	0	7000	Mapped, On Network	-80.14403074	25.95441646
88665648	0	0	0	$0	$0	0	0	0	1000	Mapped, On Network	-80.14403074	25.95441646
88665808	0	0	0	$0	$0	0	0	500	30000	Mapped, On Network	-80.13831551	25.95359843
88666776	0	0	0	$0	$0	0	1	500	200	Mapped, On Network	-80.1315981	25.95518787

HSMV Report Number	S4 Albers X	S4 Albers Y	S4 Mapping Date	Ped Crash Group Number	Ped Crash Group	Ped Crash Type Number	Ped Crash Type	Ped Crash Location	Ped Leg Of Intersection	Ped Motorist Travel Direction	Ped Motorist Maneuver	Ped Pedestrian Travel Direction	Ped Pedestrian Position
88665856	785372.0144	222773.9581	1/29/2019 15:27										
87475901	785564.9152	222685.9807	3/15/2018 23:58										
84020798	787587.8688	222709.7065	4/7/2016 18:29										
84020799	787572.0541	222712.8275	4/7/2016 18:28										
88666989	785431.1455	222759.462	9/7/2019 16:07										
87475916	786753.0102	222842.6726	3/18/2018 1:32										
84020809	787779.8703	222705.3181	4/7/2016 18:29										
84020793	787700.307	222712.7722	4/7/2016 18:32										
88665428	785513.1084	222718.184	11/20/2018 15:48										
84020512	787733.5876	222713.5751	4/7/2016 18:25										
89295736	786753.0102	222842.6726	12/20/2019 16:05										
87475900	785513.1084	222718.184	3/15/2018 23:58										
88665648	785513.1084	222718.184	12/25/2018 20:51										
88665808	786087.1627	222645.335	1/23/2019 15:51										
88666776	786753.0102	222842.6726	7/30/2019 18:40										

Appendix B4. Regional Planning Model Data

2040 Lehman Causeway PSWT

Appendix B5. FDOT Population Projection by County

Technical Memorandum

Projections of Florida Population by County, 2020-2070

Prepared for

Forecasting and Trends Office

FDOT Central Office

March 2020

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

Technique	Base Period	Number of Projection Set
Linear	2016–2018 (two-year period) 2008–2018 (ten-year period) 1998–2018 (twenty-year period)	3
Exponential	2013–2018 (five-year period period) 2003–2018 (fifteen-year period)	2
Share-of-growth	2016–2018 (two-year period) 2008–2018 (ten-year period) 1998–2018 (twenty-year)	3
Shift-share	2013–2018 (five-year period) 2003–2018 (fifteen-year period)	2
Constant share	2018 (one-year period)	1

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

	Population Projections (without Manual Adjustments)					
County	2020	2025	2030	2035	2040	2045
Alachua	269,500	283,500	295,000	305,700	316,200	326,300
Baker	28,300	29,700	30,900	32,000	32,900	33,900
Bay	185,800	196,200	204,700	212,000	219,400	226,400
Bradford	28,400	28,900	29,200	29,300	29,500	29,600
Brevard	597,600	629,300	654,600	677,200	697,100	718,500
Broward	1,940,300	2,034,600	2,118,200	2,188,700	2,250,400	2,307,500
Calhoun	15,400	16,000	16,500	17,000	17,500	18,000
Charlotte	183,100	195,700	205,900	214,400	222,200	229,700
Citrus	148,500	154,600	160,300	165,700	170,700	175,600
Clay	220,200	239,000	256,900	273,100	288,100	302,400
Collier	381,500	416,100	447,700	475,400	501,400	527,500
Columbia	71,100	74,100	76,800	79,400	81,800	83,900
DeSoto	36,000	36,800	37,600	38,300	39,000	39,700
Dixie	16,800	17,300	17,700	18,100	18,400	18,600
Duval	980,200	1,043,100	1,094,900	1,138,100	1,182,300	1,226,300
Escambia	323,900	335,900	347,200	356,200	363,900	370,600
Flagler	112,500	124,200	135,100	145,400	155,400	165,200
Franklin	12,200	12,700	13,000	13,400	13,700	14,000
Gadsden	48,400	49,000	49,400	49,700	49,800	49,800
Gilchrist	17,800	18,600	19,300	20,000	20,600	21,200
Glades	13,200	13,600	13,900	14,200	14,500	14,700
Gulf	16,700	17,000	17,200	17,400	17,600	17,700
Hamilton	14,700	14,800	14,800	14,700	14,800	14,800
Hardee	27,300	27,200	27,000	26,600	26,400	26,200
Hendry	40,200	41,500	42,600	43,400	44,100	45,000
Hernando	191,600	205,300	218,600	231,100	242,600	253,800
Highlands	104,200	107,400	110,200	112,800	115,200	117,500
Hillsborough	1,462,300	1,588,700	1,705,700	1,812,100	1,906,900	1,999,800
Holmes	20,300	20,500	20,700	20,900	21,100	21,300
Indian River	156,900	168,600	178,800	188,100	197,200	205,400
Jackson	50,700	51,400	51,700	52,000	52,200	52,500
Jefferson	14,900	15,200	15,500	15,700	15,800	16,000
Lafayette	8,600	8,700	8,800	8,900	8,900	9,000
Lake	359,300	398,800	434,700	469,600	503,600	535,100
Lee	747,000	825,200	897,100	963,100	1,025,400	1,085,200
Leon	298,000	311,200	323,100	334,500	344,300	353,600

County	Population Projections (without Manual Adjustments)					
	2020	2025	2030	2035	2040	2045
Levy	41,700	42,900	44,000	44,900	45,800	46,600
Liberty	9,100	9,600	10,100	10,500	10,800	11,200
Madison	19,600	19,700	19,900	20,000	20,100	20,300
Manatee	393,900	431,100	463,700	494,400	523,000	551,400
Marion	363,600	385,800	407,000	426,900	445,000	462,500
Martin	159,200	166,900	173,900	180,200	186,800	193,000
Miami-Dade	2,857,700	3,036,500	3,189,400	3,327,400	3,464,400	3,588,700
Monroe	76,000	77,500	79,000	80,500	82,000	83,600
Nassau	86,000	94,100	101,600	108,500	115,200	121,800
Okaloosa	202,200	211,500	219,900	227,600	234,900	241,700
Okeechobee	41,700	42,800	43,600	44,300	45,000	45,700
Orange	1,408,000	1,555,800	1,691,000	1,814,600	1,925,100	2,033,400
Osceola	377,200	440,400	499,900	556,200	606,700	658,100
Palm Beach	1,472,400	1,559,600	1,637,800	1,703,100	1,766,500	1,828,600
Pasco	533,700	578,600	622,500	662,400	698,500	732,800
Pinellas	982,800	1,011,600	1,035,200	1,054,200	1,069,700	1,082,800
Polk	697,700	755,400	807,400	856,700	900,600	941,800
Putnam	73,100	73,000	72,900	72,900	72,800	72,800
St. Johns	254,400	294,600	330,900	363,600	395,600	427,100
St. Lucie	313,000	337,900	360,900	382,300	402,700	422,600
Santa Rosa	182,100	199,600	215,600	230,200	243,700	256,400
Sarasota	429,800	459,700	484,300	504,900	522,700	540,400
Seminole	476,700	507,700	532,900	555,000	575,100	594,500
Sumter	133,900	155,400	177,000	196,200	214,500	232,200
Suwannee	46,100	48,600	50,800	52,800	54,600	56,200
Taylor	22,400	22,700	22,800	22,800	22,800	22,800
Union	16,100	16,600	17,000	17,400	17,700	18,000
Volusia	543,100	570,000	591,800	610,500	627,200	642,300
Wakulla	32,800	34,700	36,500	38,000	39,500	40,800
Walton	71,200	80,300	88,700	96,500	104,000	111,600
Washington	25,500	26,300	27,000	27,500	28,000	28,400

Table 3 Percent Errors of Florida Population by County, 2020-2045

	Percent Errors (between BEBR's Projections and Unadjusted Projections)					
County	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Alachua	0.4%	1.5%	2.2%	3.1%	4.2%	5.3%
Baker	0.0%	0.7%	1.0%	1.9%	2.2%	3.4%
Bay	1.0%	3.5%	3.3%	3.1%	3.6%	4.4%
Bradford	0.7%	0.3%	1.0%	1.0%	1.4%	1.4%
Brevard	0.2%	0.2%	0.3%	0.2%	0.2%	0.2%
Broward	0.1%	0.3%	0.1%	0.3%	0.5%	0.7%
Calhoun	1.9%	3.2%	3.8%	4.3%	4.8%	5.9%
Charlotte	0.3%	0.2%	0.1%	0.1%	0.0%	0.3%
Citrus	0.1%	0.5%	0.5%	0.3%	0.3%	1.1%
Clay	0.0%	0.0%	0.5%	1.3%	2.3%	3.3%
Collier	0.3%	0.5%	0.4%	0.0%	0.9%	2.2%
Columbia	0.1%	0.3%	0.4%	1.0%	1.9%	2.6%
DeSoto	0.0%	0.3%	0.3%	0.3%	0.0%	0.5%
Dixie	1.2%	3.0%	4.7%	6.5%	7.6%	8.1%
Duval	0.2%	0.2%	0.0%	0.1%	0.4%	1.2%
Escambia	0.2%	0.4%	0.1%	0.2%	0.5%	0.8%
Flagler	0.0%	0.2%	0.5%	1.3%	2.5%	3.9%
Franklin	0.8%	0.0%	0.8%	0.7%	0.7%	0.0%
Gadsden	0.6%	1.2%	1.9%	2.3%	2.3%	2.0%
Gilchrist	0.0%	0.5%	0.5%	0.0%	0.0%	0.5%
Glades	0.0%	0.0%	0.0%	0.7%	1.4%	1.4%
Gulf	1.8%	0.6%	0.6%	1.7%	2.8%	3.8%
Hamilton	1.3%	2.6%	3.3%	4.5%	4.5%	5.1%
Hardee	0.0%	0.4%	1.5%	2.9%	3.6%	4.4%
Hendry	0.2%	1.0%	1.4%	2.3%	3.1%	3.2%
Hernando	0.1%	0.2%	0.1%	0.8%	1.8%	2.8%
Highlands	0.1%	0.1%	0.1%	0.1%	0.5%	1.0%
Hillsborough	0.3%	0.6%	0.2%	0.7%	1.5%	2.5%
Holmes	0.0%	0.5%	1.0%	0.5%	0.5%	0.5%
Indian River	0.2%	0.4%	0.3%	0.2%	1.3%	2.2%
Jackson	1.0%	1.4%	1.0%	1.0%	0.8%	0.8%
Jefferson	0.0%	0.0%	0.6%	1.3%	1.3%	1.3%
Lafayette	1.1%	2.2%	4.3%	5.3%	6.3%	6.3%
Lake	0.4%	0.8%	0.6%	0.5%	2.0%	3.5%
Lee	0.1%	0.1%	0.6%	1.4%	2.6%	3.8%
Leon	0.1%	0.2%	0.1%	0.9%	1.5%	2.2%
Levy	0.2%	0.0%	0.0%	0.0%	0.4%	0.6%
Liberty	2.2%	1.0%	1.0%	1.9%	2.9%	3.7%
Madison	0.5%	0.0%	0.5%	0.5%	0.5%	1.0%
Manatee	0.3%	0.8%	0.9%	0.5%	0.0%	1.0%

	Percent Errors (between BEBR's Projections and Unadjusted Projections)					
County	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Marion	0.0%	0.1%	0.2%	0.8%	1.6%	2.5%
Martin	0.1%	0.1%	0.0%	0.0%	0.5%	1.2%
Miami-Dade	0.1%	0.1%	0.0%	0.3%	1.1%	1.9%
Monroe	1.3%	2.3%	3.3%	4.3%	4.9%	5.2%
Nassau	0.5%	0.7%	0.5%	0.1%	1.1%	2.7%
Okaloosa	0.2%	0.3%	0.2%	0.1%	0.6%	1.1%
Okeechobee	0.5%	0.9%	1.2%	1.6%	1.8%	2.2%
Orange	0.5%	0.8%	0.2%	0.9%	1.8%	2.9%
Osceola	0.9%	1.1%	0.1%	1.5%	2.7%	4.4%
Palm Beach	0.1%	0.2%	0.2%	0.3%	0.2%	1.0%
Pasco	0.1%	0.1%	0.4%	1.3%	2.3%	3.4%
Pinellas	0.1%	0.1%	0.1%	0.3%	0.6%	0.7%
Polk	0.3%	0.5%	0.1%	0.9%	1.8%	2.8%
Putnam	0.0%	0.3%	0.5%	0.7%	1.0%	1.1%
St. Johns	0.7%	0.4%	0.4%	1.4%	2.9%	4.6%
St. Lucie	0.0%	0.1%	0.4%	1.0%	1.9%	3.0%
Santa Rosa	0.3%	0.2%	0.4%	1.5%	2.6%	3.8%
Sarasota	0.3%	0.2%	0.0%	0.1%	0.2%	0.0%
Seminole	0.2%	0.2%	0.1%	0.1%	0.2%	0.9%
Sumter	0.0%	0.1%	1.1%	2.3%	4.0%	5.8%
Suwannee	0.4%	0.8%	1.2%	1.5%	2.2%	2.9%
Taylor	2.2%	3.0%	4.6%	6.2%	7.3%	8.4%
Union	0.0%	1.8%	3.0%	4.8%	6.0%	7.8%
Volusia	0.2%	0.3%	0.4%	0.5%	0.4%	0.4%
Wakulla	0.0%	1.4%	1.9%	2.3%	2.0%	1.7%
Walton	0.8%	1.2%	0.9%	0.1%	1.2%	3.0%
Washington	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%

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.

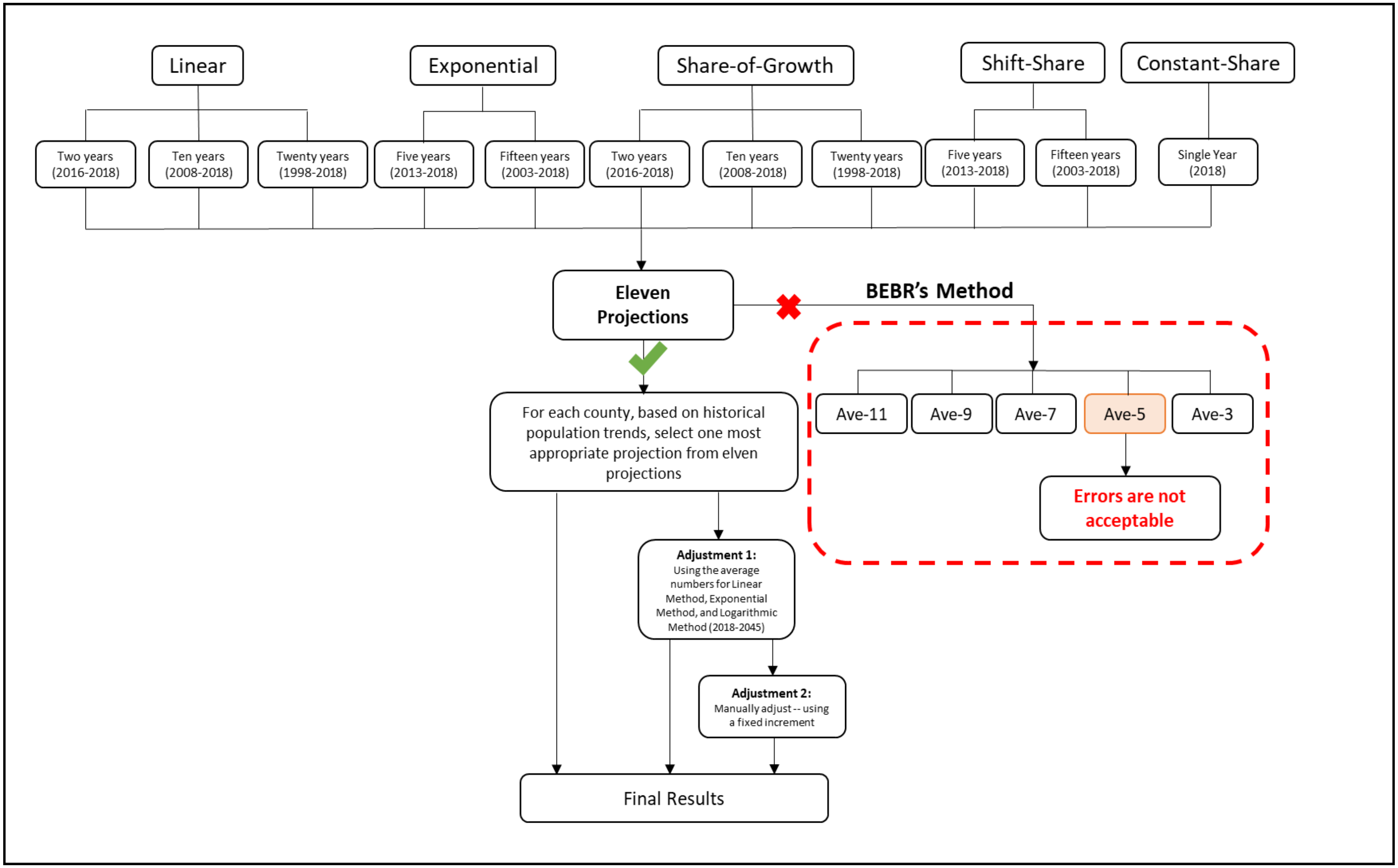


Figure 1 2050-2070 County-Level Projection Process

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.

Table 4 Projections of Florida Population by County (2020–2070 with Estimates for 2018)

	Census	Estimate (BEBR)	Projections (BEBR)						Projections (FDOT)				
County	2010	2018	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Alachua	247,336	263,291	268,300	279,300	288,600	296,500	303,500	309,800	318,700	327,700	336,800	345,900	355,000
Baker	27,115	27,652	28,300	29,500	30,600	31,400	32,200	32,800	34,100	35,100	36,100	37,200	38,200
Bay	168,852	181,199	178,500	189,600	198,200	205,600	211,800	216,900	218,300	224,500	230,800	237,000	243,200
Bradford	28,520	28,057	28,600	28,800	28,900	29,000	29,100	29,200	29,400	29,600	29,800	30,000	30,100
Brevard	543,376	583,563	598,500	630,300	656,300	678,700	698,700	716,900	738,900	768,000	798,200	829,600	862,200
Broward	1,748,066	1,897,976	1,942,700	2,041,100	2,120,300	2,183,000	2,238,300	2,290,500	2,350,800	2,406,600	2,458,200	2,505,800	2,549,200
Calhoun	14,625	15,093	14,900	15,500	15,900	16,300	16,700	17,000	17,400	17,500	17,600	17,700	17,700
Charlotte	159,978	177,987	183,700	196,000	206,100	214,600	222,100	229,100	242,100	252,200	262,500	272,900	283,600
Citrus	141,236	145,721	148,600	155,300	161,100	166,200	170,200	173,700	177,400	182,400	187,400	192,400	197,300
Clay	190,865	212,034	220,200	239,100	255,700	269,700	281,700	292,600	302,100	316,300	330,400	344,500	358,600
Collier	321,520	367,347	382,800	418,400	449,500	475,200	496,800	516,100	556,100	586,700	618,200	650,400	683,500
Columbia	67,531	69,721	71,000	73,900	76,500	78,600	80,300	81,800	83,500	85,600	87,800	89,900	92,100
DeSoto	34,862	35,520	36,000	36,900	37,700	38,400	39,000	39,500	40,000	40,700	41,400	42,100	42,900
Dixie	16,422	16,489	16,600	16,800	16,900	17,000	17,100	17,200	17,300	17,400	17,500	17,600	17,700
Duval	864,263	952,861	981,900	1,044,700	1,095,200	1,139,100	1,177,600	1,212,100	1,241,100	1,286,300	1,331,400	1,376,500	1,421,700
Escambia	297,619	318,560	324,400	337,300	347,600	355,500	362,100	367,700	374,400	383,800	393,300	402,700	412,200
Flagler	95,696	107,511	112,500	123,900	134,400	143,600	151,600	159,000	164,600	174,300	184,100	194,200	204,500
Franklin	11,549	12,009	12,100	12,700	13,100	13,500	13,800	14,000	14,600	15,000	15,400	15,800	16,200
Gadsden	46,389	47,828	48,100	48,400	48,500	48,600	48,700	48,800	49,000	49,200	49,400	49,500	49,700
Gilchrist	16,939	17,424	17,800	18,700	19,400	20,000	20,600	21,100	21,600	22,300	23,100	23,900	24,700
Glades	12,884	13,002	13,200	13,600	13,900	14,100	14,300	14,500	14,900	15,200	15,400	15,700	16,000
Gulf	15,863	16,499	16,400	16,900	17,300	17,700	18,100	18,400	18,800	19,100	19,500	19,800	20,200
Hamilton	14,799	14,621	14,900	15,200	15,300	15,400	15,500	15,600	15,700	15,900	16,000	16,200	16,300
Hardee	27,731	27,296	27,300	27,300	27,400	27,400	27,400	27,400	27,400	27,500	27,500	27,500	27,500
Hendry	39,140	39,586	40,300	41,900	43,200	44,400	45,500	46,500	47,400	48,600	49,800	51,000	52,300
Hernando	172,778	185,604	191,700	205,800	218,300	229,200	238,400	246,900	258,200	269,500	280,900	292,300	303,600
Highlands	98,786	102,525	104,100	107,500	110,300	112,700	114,600	116,300	118,500	121,000	123,400	125,900	128,400
Hillsborough	1,229,226	1,408,864	1,466,800	1,598,400	1,708,600	1,800,200	1,878,700	1,950,500	2,050,200	2,152,900	2,255,700	2,358,400	2,461,100
Holmes	19,927	20,133	20,300	20,600	20,900	21,000	21,200	21,400	21,700	21,900	22,200	22,400	22,600
Indian River	138,028	151,825	157,200	169,300	179,400	187,700	194,700	200,900	205,100	213,400	221,800	230,100	238,400
Jackson	49,746	50,435	50,200	50,700	51,200	51,500	51,800	52,100	52,500	52,800	53,200	53,500	53,900
Jefferson	14,761	14,733	14,900	15,200	15,400	15,500	15,600	15,800	16,000	16,200	16,400	16,600	16,800
Lafayette	8,870	8,501	8,700	8,900	9,200	9,400	9,500	9,600	9,900	10,100	10,300	10,600	10,800
Lake	297,052	342,917	360,700	402,100	437,200	467,400	493,600	517,200	563,900	600,600	638,400	677,400	717,900
Lee	618,754	713,903	747,400	824,400	892,100	949,800	999,900	1,045,200	1,104,600	1,165,800	1,227,000	1,288,100	1,349,300
Leon	275,487	292,332	298,300	311,900	322,800	331,500	339,200	346,000	350,400	359,800	369,300	378,700	388,100

	Census	Estimate (BEBR)	Projections (BEBR)						Projections (FDOT)				
County	**2010**	**2018**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**2065**	**2070**
Levy	40,801	41,054	41,600	42,900	44,000	44,900	45,600	46,300	47,000	47,900	48,900	49,800	50,700
Liberty	8,365	8,915	9,300	9,700	10,000	10,300	10,500	10,800	11,000	11,400	11,700	12,000	12,400
Madison	19,224	19,473	19,500	19,700	19,800	19,900	20,000	20,100	20,200	20,300	20,400	20,500	20,700
Manatee	322,833	377,826	395,200	434,500	467,700	496,700	523,000	545,700	584,600	615,500	646,200	676,900	707,600
Marion	331,298	353,898	363,700	386,200	406,200	423,600	438,200	451,400	476,200	495,600	515,400	535,600	556,100
Martin	146,318	155,556	159,100	167,000	173,900	180,200	185,800	190,800	194,900	201,100	207,200	213,400	219,600
Miami-Dade	2,496,435	2,779,322	2,861,600	3,040,300	3,190,200	3,315,900	3,427,200	3,523,500	3,611,000	3,727,700	3,840,600	3,949,900	4,055,500
Monroe	73,090	73,940	74,000	74,200	74,300	74,400	74,600	74,700	74,900	75,000	75,100	75,300	75,400
Nassau	73,314	82,748	86,400	94,800	102,100	108,600	113,900	118,600	125,500	132,300	139,000	145,800	152,600
Okaloosa	180,822	198,152	202,600	212,100	220,400	227,400	233,400	239,100	249,200	257,200	265,200	273,400	281,700
Okeechobee	39,996	41,120	41,500	42,400	43,100	43,600	44,200	44,700	45,200	45,900	46,500	47,100	47,800
Orange	1,145,956	1,349,597	1,415,500	1,568,100	1,694,000	1,799,300	1,891,800	1,975,300	2,051,300	2,164,300	2,277,300	2,390,300	2,503,300
Osceola	268,685	352,496	380,700	445,300	500,200	548,100	591,000	630,400	707,200	769,000	833,800	902,100	974,200
Palm Beach	1,320,134	1,433,417	1,473,700	1,563,100	1,641,000	1,707,500	1,763,200	1,811,000	1,909,500	1,984,700	2,061,100	2,138,700	2,217,700
Pasco	464,697	515,077	534,500	579,400	619,900	654,000	682,900	708,900	742,000	778,800	815,800	853,200	890,900
Pinellas	916,542	970,532	983,900	1,012,900	1,034,300	1,050,600	1,063,500	1,075,000	1,103,400	1,123,200	1,143,100	1,163,100	1,183,300
Polk	602,095	673,028	699,600	758,900	807,900	849,400	884,700	916,200	938,900	980,500	1,022,100	1,063,700	1,105,300
Putnam	74,364	72,981	73,100	73,200	73,300	73,400	73,500	73,600	73,700	73,800	73,900	74,000	74,200
St. Johns	190,039	238,742	256,100	295,900	329,500	358,600	384,600	408,500	433,100	463,900	494,700	525,500	556,200
St. Lucie	277,789	302,432	313,100	337,500	359,500	378,700	395,100	410,100	421,900	440,600	459,300	478,000	496,700
Santa Rosa	151,372	174,887	182,600	199,900	214,700	226,900	237,500	247,000	256,600	269,700	282,900	296,000	309,200
Sarasota	379,448	417,442	431,100	460,500	484,300	505,200	523,700	540,200	555,900	583,200	611,800	641,800	673,300
Seminole	422,718	463,560	477,800	508,500	533,500	555,500	573,700	589,200	622,300	647,300	672,700	698,500	724,700
Sumter	93,420	124,935	133,900	155,500	175,100	191,700	206,200	219,500	239,300	257,200	275,100	293,000	310,900
Suwannee	41,551	44,879	45,900	48,200	50,200	52,000	53,400	54,600	57,100	59,100	61,000	63,000	65,000
Taylor	22,570	22,283	22,900	23,400	23,900	24,300	24,600	24,900	25,600	26,000	26,500	27,000	27,400
Union	15,535	15,867	16,100	16,300	16,500	16,600	16,700	16,700	16,800	16,800	16,900	16,900	17,000
Volusia	494,593	531,062	544,100	571,700	594,300	613,600	629,900	644,600	661,600	678,000	693,200	707,400	720,500
Wakulla	30,776	31,943	32,800	35,200	37,200	38,900	40,300	41,500	43,000	44,800	46,500	48,200	50,000
Walton	55,043	67,656	71,800	81,300	89,500	96,600	102,800	108,400	112,900	120,000	127,100	134,200	141,300
Washington	24,896	25,129	25,500	26,300	27,000	27,500	27,900	28,300	29,000	29,600	30,200	30,800	31,400
FLORIDA	**18,801,310**	**20,840,568**	**21,517,100**	**23,050,800**	**24,340,500**	**25,429,300**	**26,373,300**	**27,219,700**	**28,307,400**	**29,471,900**	**30,637,400**	**31,804,900**	**32,976,100**

Appendix B6. HCM Analysis Reports

HCS7 Freeway Facilities Report

Project Information

Analyst	Atkins	Date	6/19/2020
Agency		Analysis Year	2019
Jurisdiction	Miami-Dade County	Time Period Analyzed	EB PM
Project Description	William Lehman Causeway, Existing		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.52		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		2200	3
2	Diverge	Diverge		1000	3
3	Basic	Basic		1900	3
4	Merge	Merge		700	3
5	Basic	Basic		2200	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.973	1401	6861	0.20	58.7	8.0	A

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.973	0.973	1401	311	6900	2000	0.20	0.16	54.4	51.8	8.6	7.3	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.973	1090	6861	0.16	58.3	6.2	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.973	0.973	1960	870	6900	2000	0.28	0.44	55.4	54.2	11.8	15.6	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.94	0.973	1960	6861	0.29	58.4	11.1	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	57.6	8.8	8.6	1.60	A

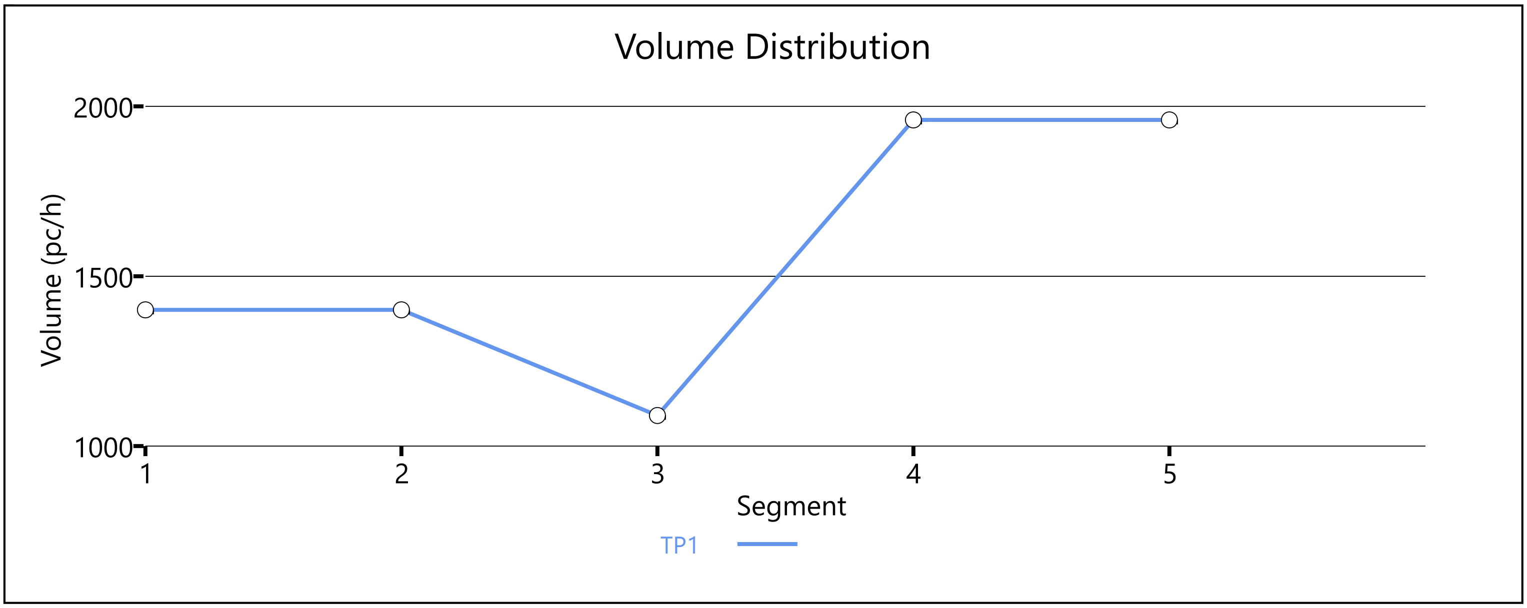
Facility Overall Results

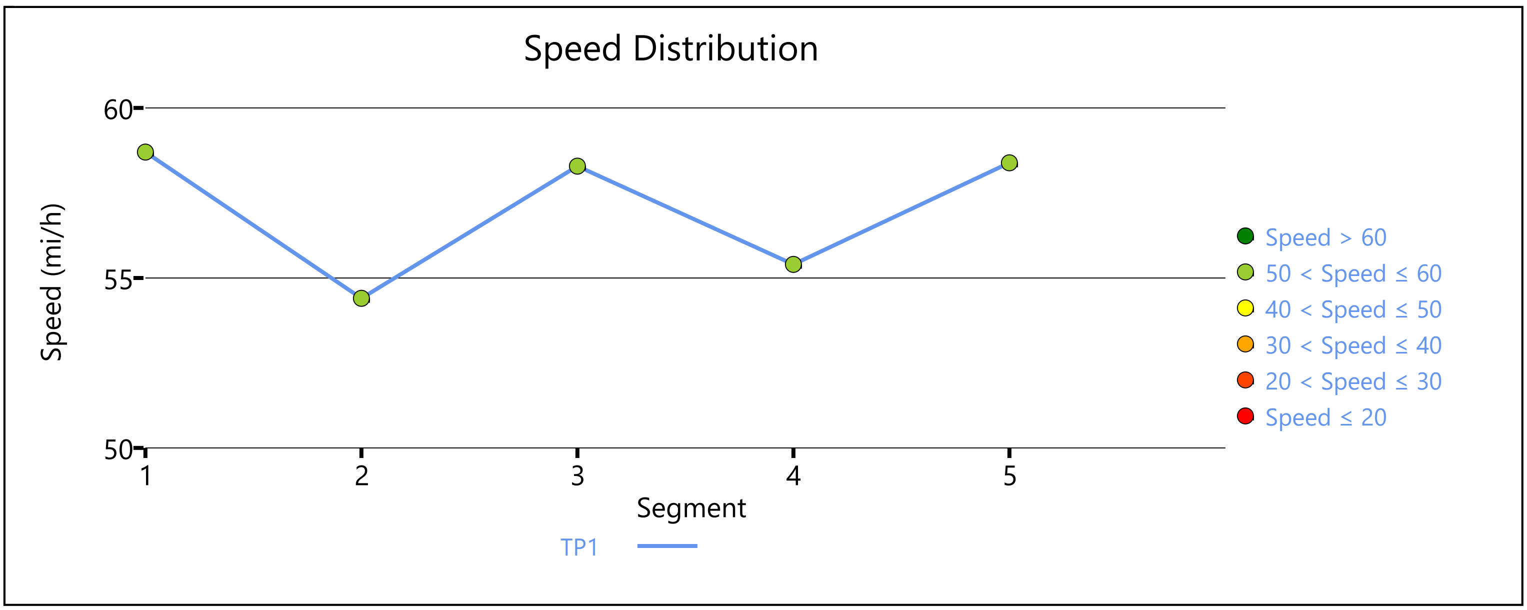
Space Mean Speed, mi/h	57.6	Density, veh/mi/ln	8.6
Average Travel Time, min	1.60	Density, pc/mi/ln	8.8

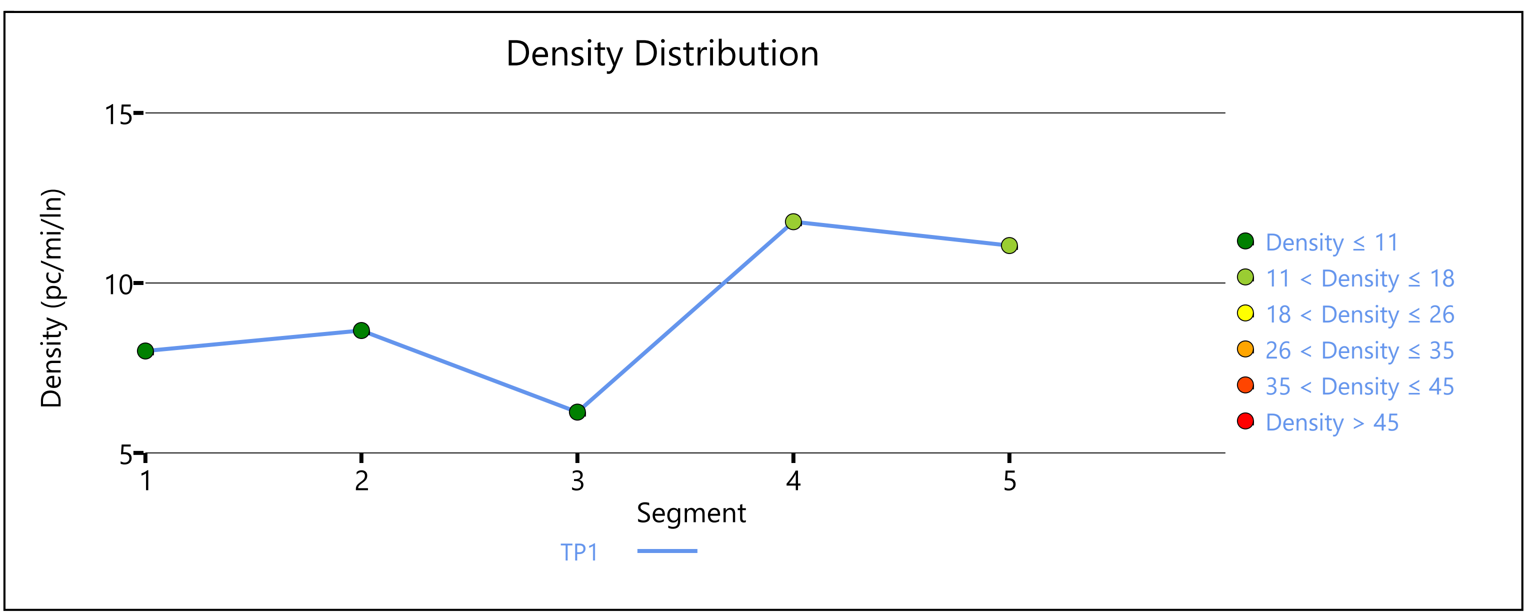
Messages

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







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HCS7 Freeway Facilities Report

Project Information

Analyst	Atkins	Date	6/19/2020
Agency		Analysis Year	2040
Jurisdiction	Miami-Dade County	Time Period Analyzed	EB PM
Project Description	William Lehman Causeway, 2040 No-Build		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	5
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.52		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic		2200	3
2	Diverge	Diverge		1000	3
3	Basic	Basic		1900	3
4	Merge	Merge		700	3
5	Basic	Basic		2200	3

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.973	1990	6861	0.29	58.7	11.3	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.973	0.973	1990	441	6900	2000	0.29	0.22	54.4	51.6	12.2	10.9	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.973	1549	6861	0.23	58.3	8.8	A

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.973	0.973	2786	1237	6900	2000	0.40	0.62	55.1	53.9	16.9	20.4	C

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

1	0.94	0.973	2786	6861	0.41	58.4	15.8	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	57.6	12.6	12.2	1.60	B

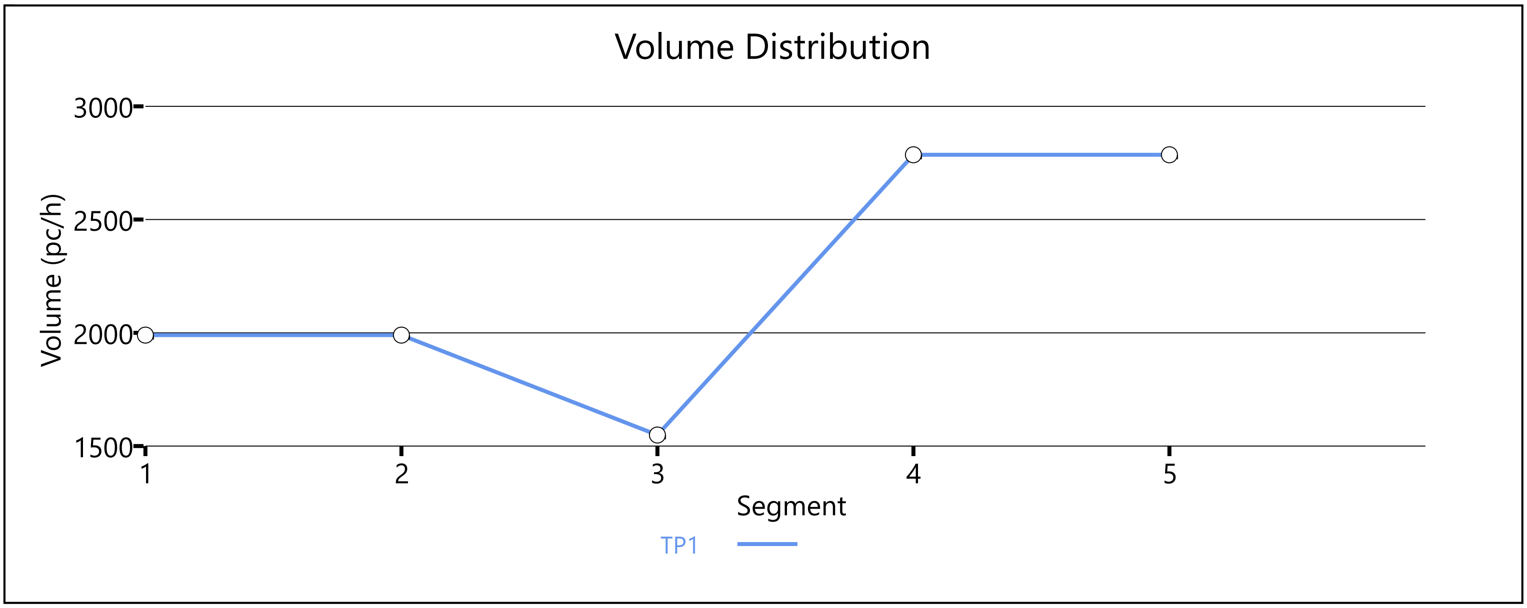
Facility Overall Results

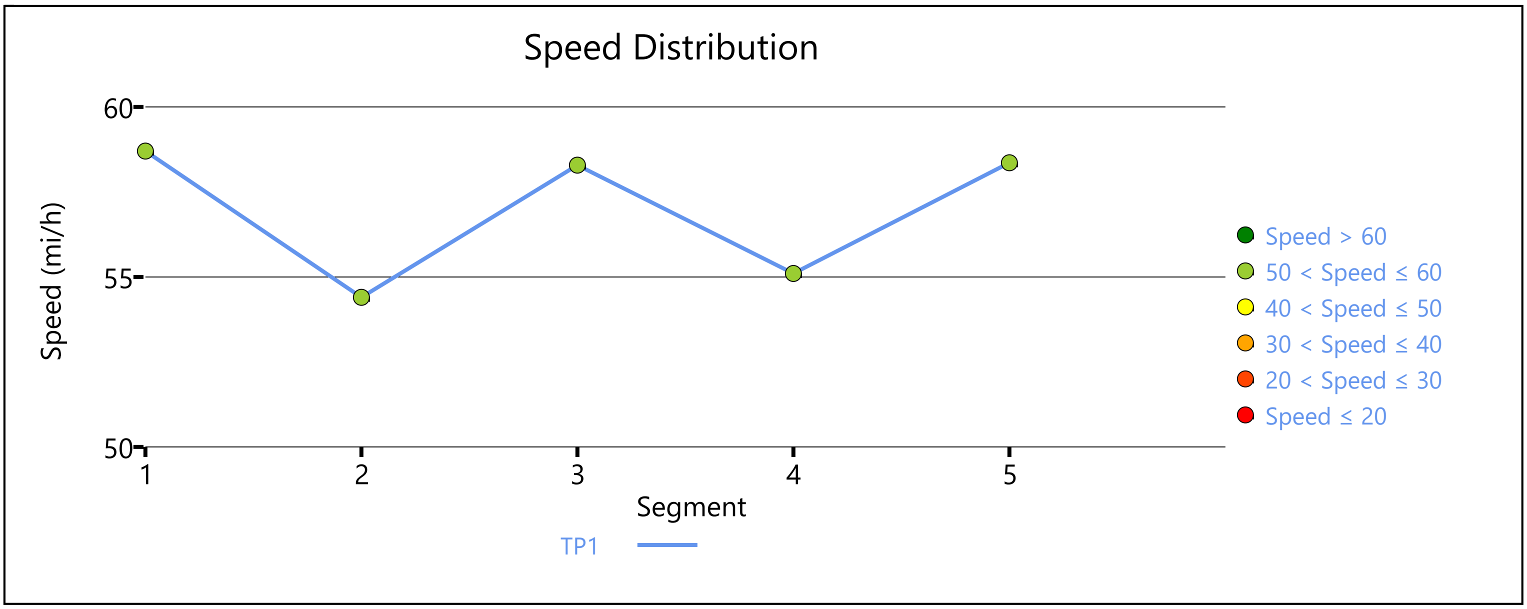
Space Mean Speed, mi/h	57.6	Density, veh/mi/ln	12.2
Average Travel Time, min	1.60	Density, pc/mi/ln	12.6

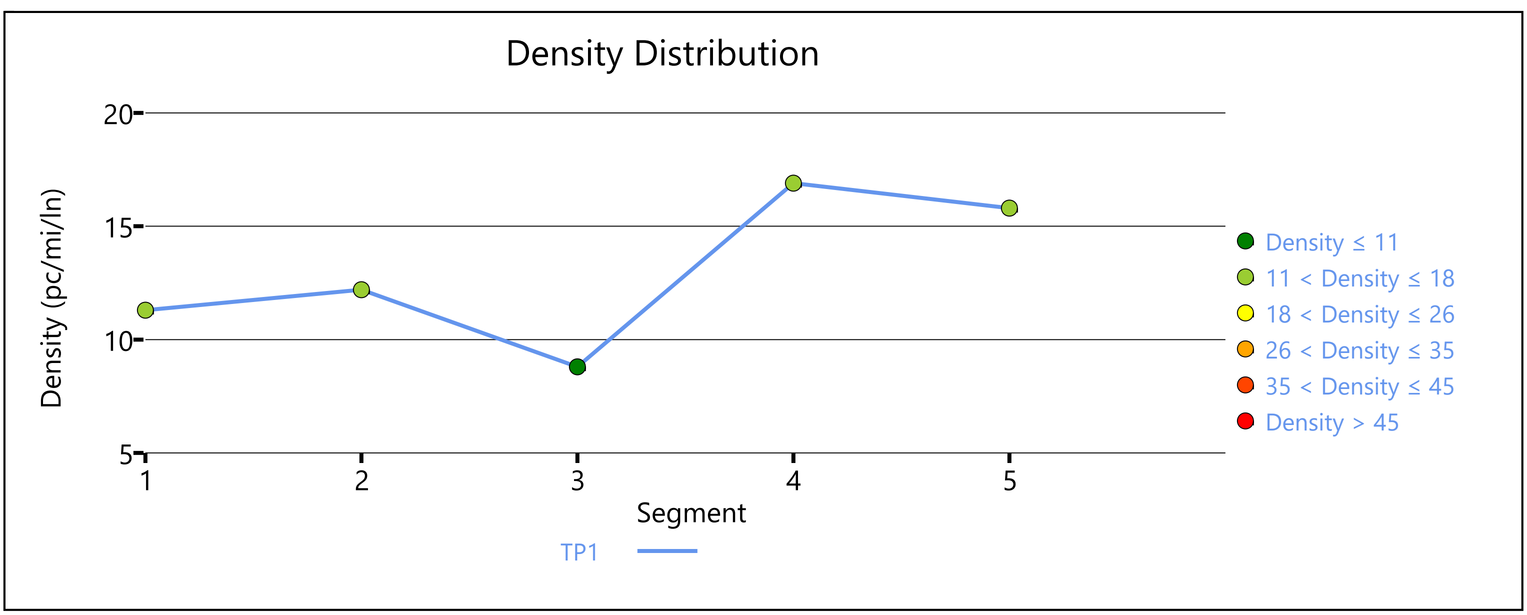
Messages

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







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HCS7 Freeway Facilities Report

Project Information

Analyst	Atkins - CSR	Date	6/19/2020
Agency		Analysis Year	2040
Jurisdiction		Time Period Analyzed	EB PM
Project Description	William Lehman Causeway, 2040 Build Alternative		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	6
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.57		

Facility Segment Data

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

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.973	1990	6861	0.29	58.7	11.3	B

Segment 2: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.973	1990	4800	0.41	72.1	13.4	B

Segment 3: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.973	0.973	1990	441	4400	2000	0.45	0.22	51.6	51.6	19.3	15.1	B

Segment 4: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.973	1549	4574	0.34	58.0	13.2	B

Segment 5: Merge

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.94	0.94	0.973	0.973	2786	1237	4400	2000	0.63	0.62	53.3	53.3	26.1	25.5	C

Segment 6: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	0.973	2786	4574	0.61	58.2	23.7	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	58.7	17.3	16.8	1.60	B

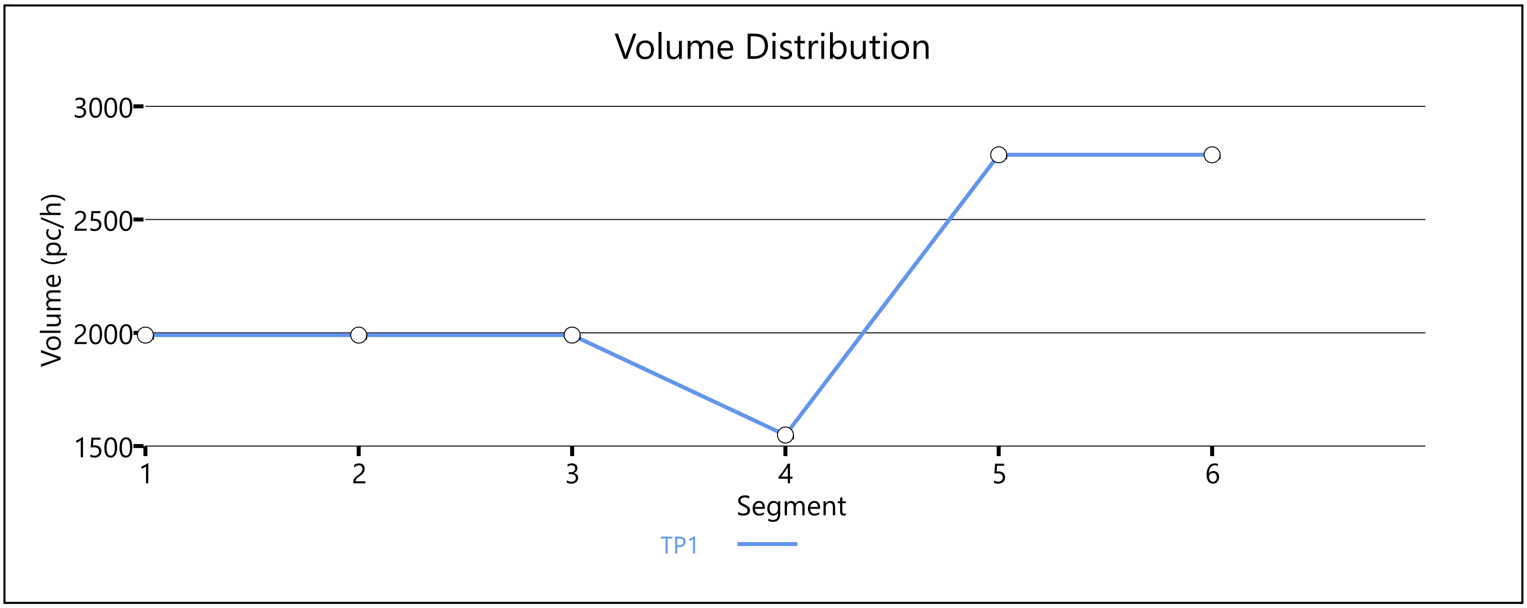
Facility Overall Results

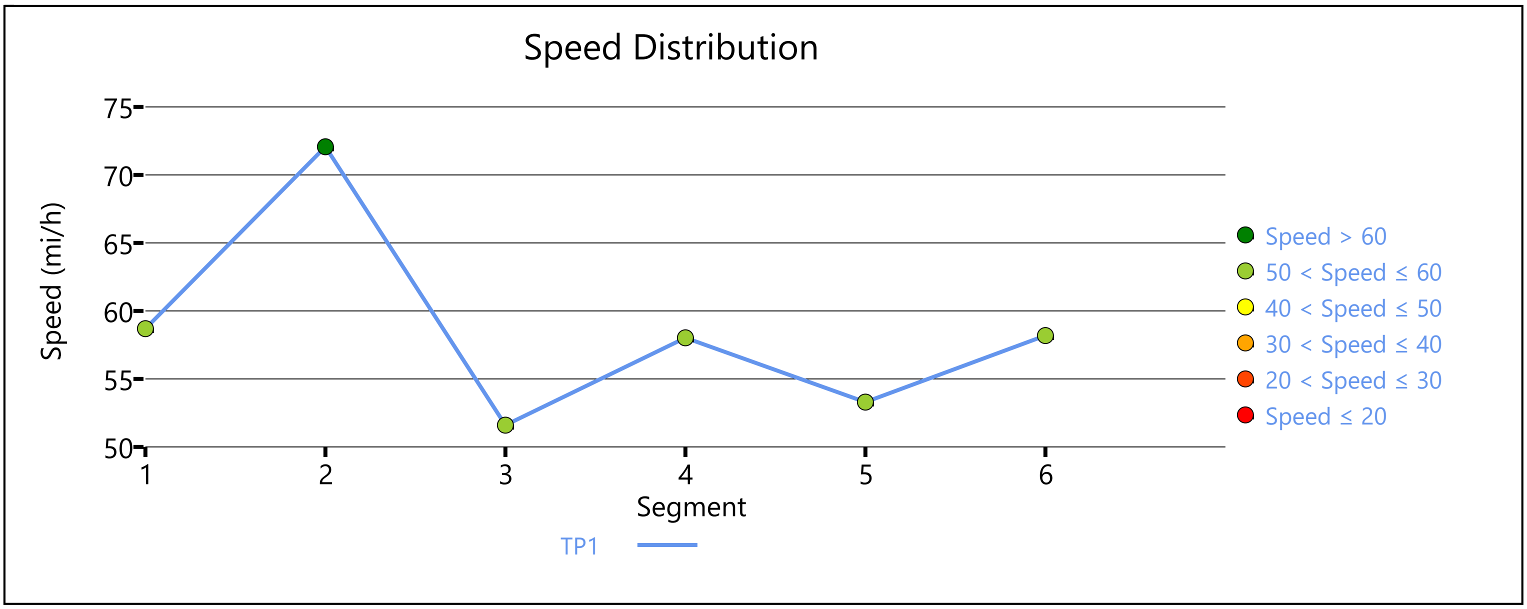
Space Mean Speed, mi/h	58.7	Density, veh/mi/ln	16.8
Average Travel Time, min	1.60	Density, pc/mi/ln	17.3

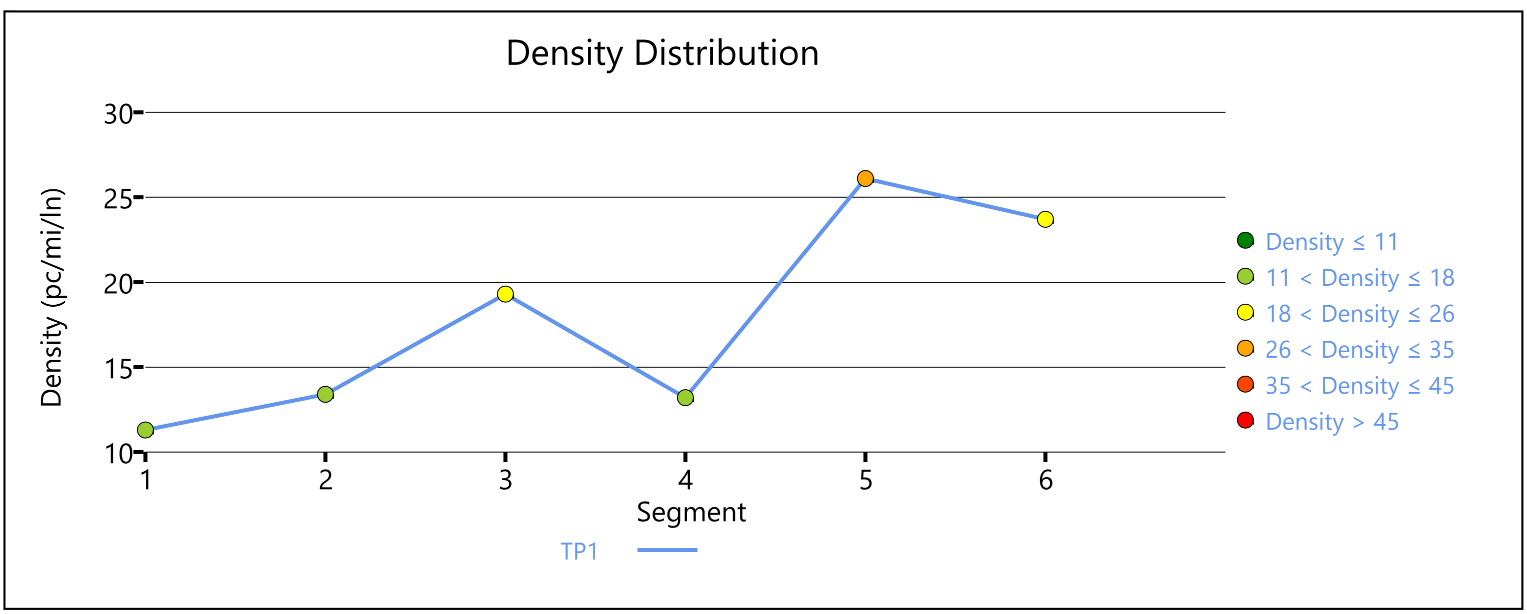
Messages

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







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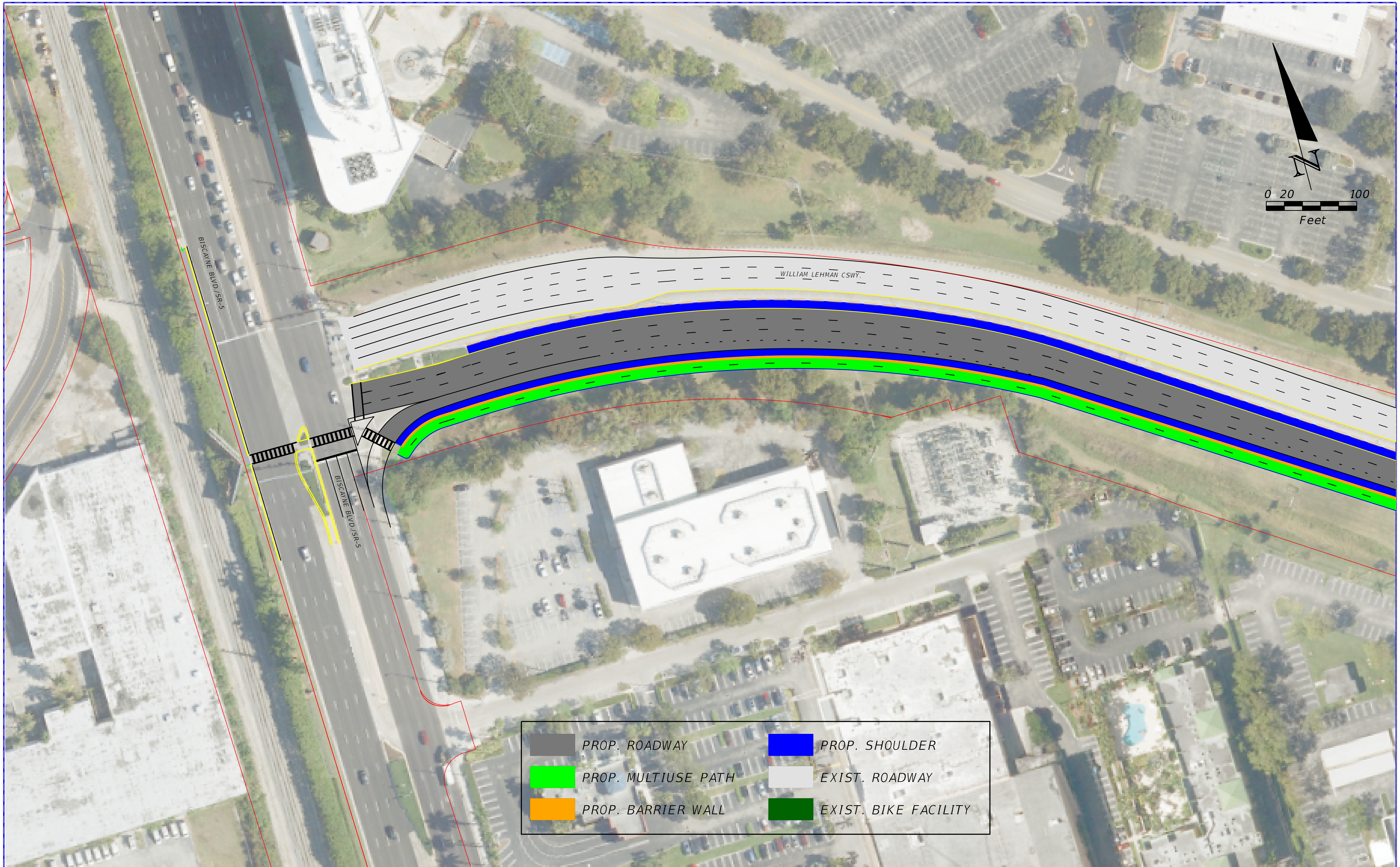
Fax: +1 407 806 4500
christopher.russo@atkinsglobal.com

Appendix C
Lehman Causeway Concept Plans



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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MULTI USE PATH

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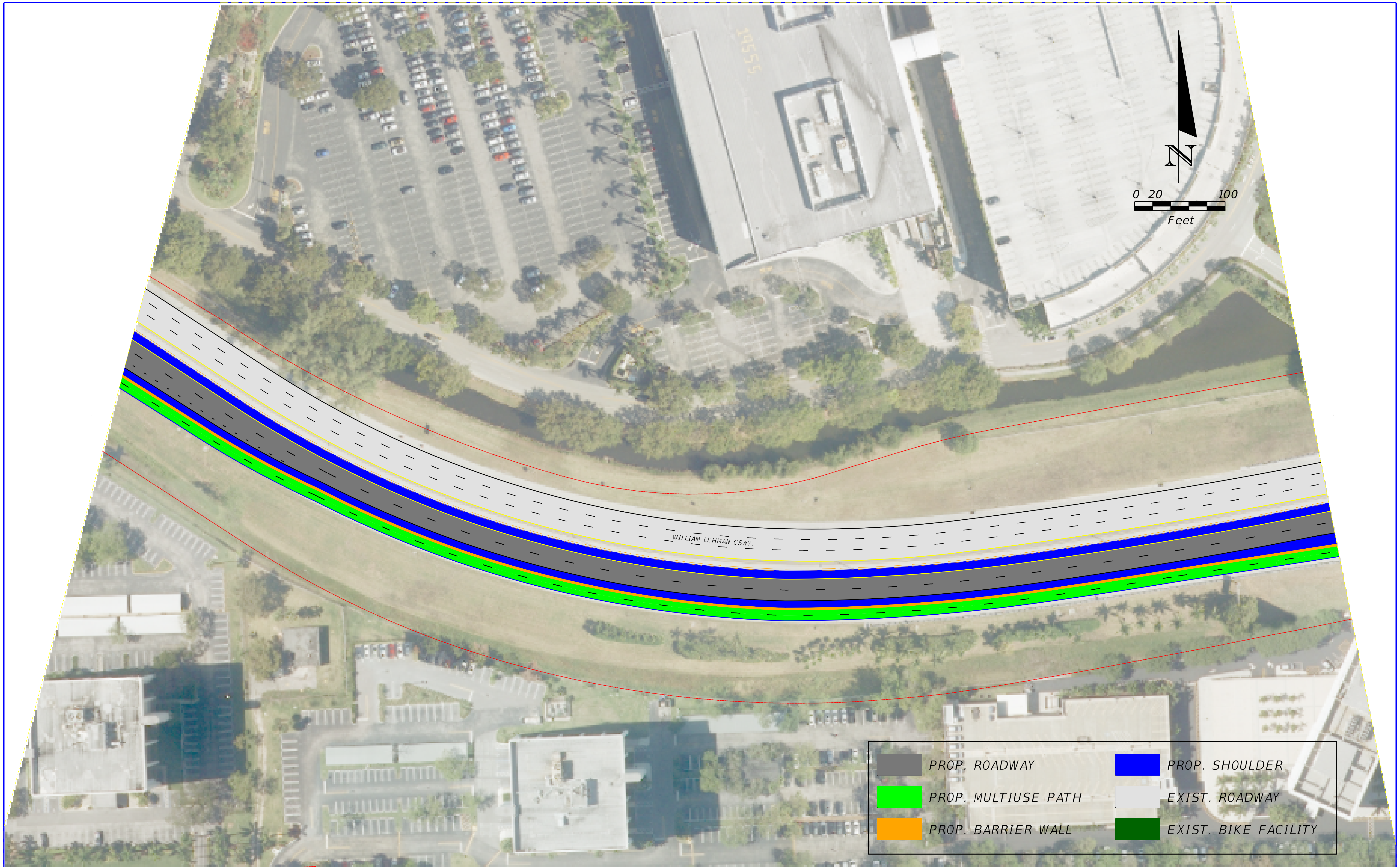

REVISIONS			
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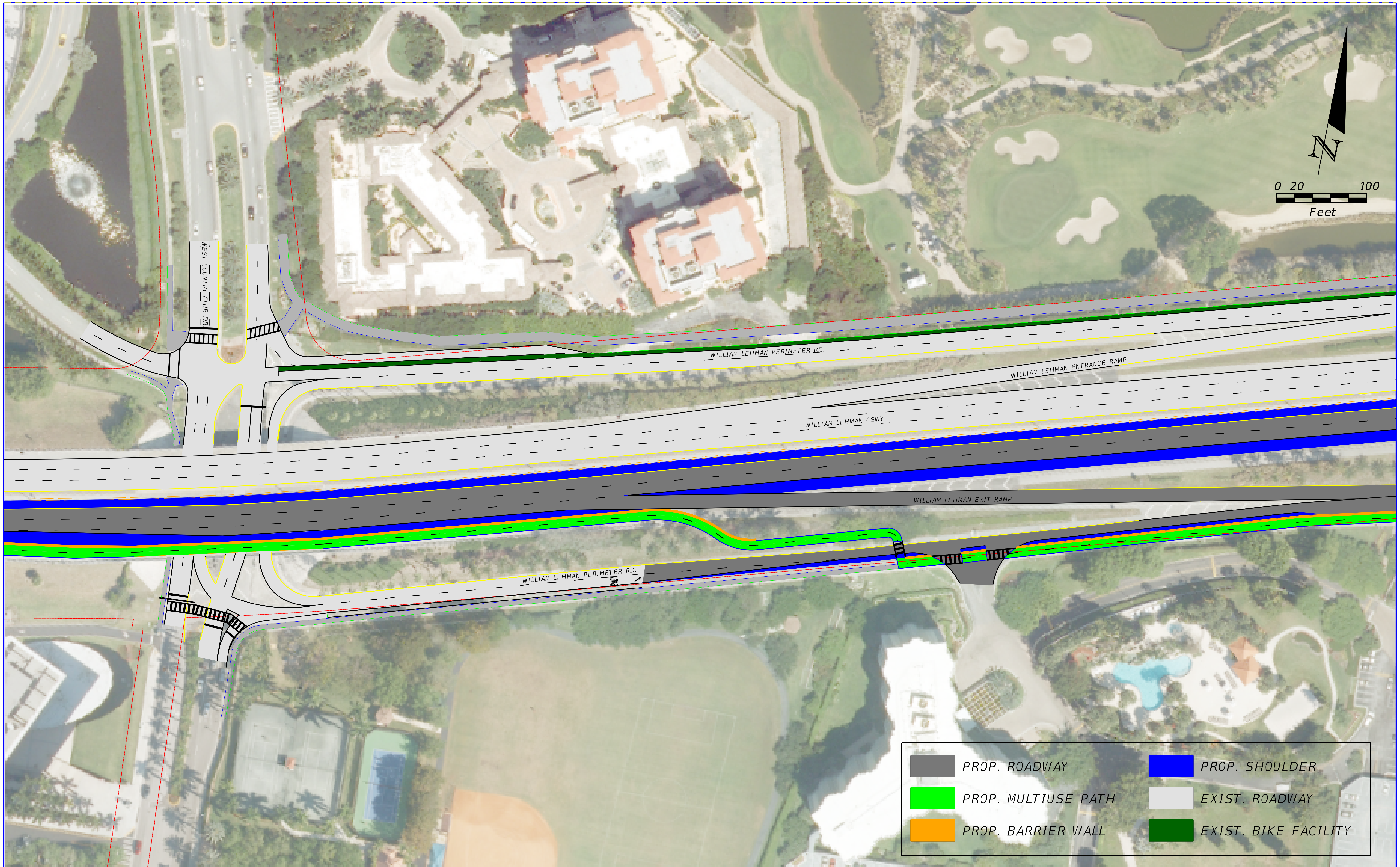
MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
WILLIAM LEHMAN CSWY	

MULTI USE PATH

SHEET NO.

2



REVISIONS

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WILLIAM LEHMAN CSWY	

MULTI USE PATH

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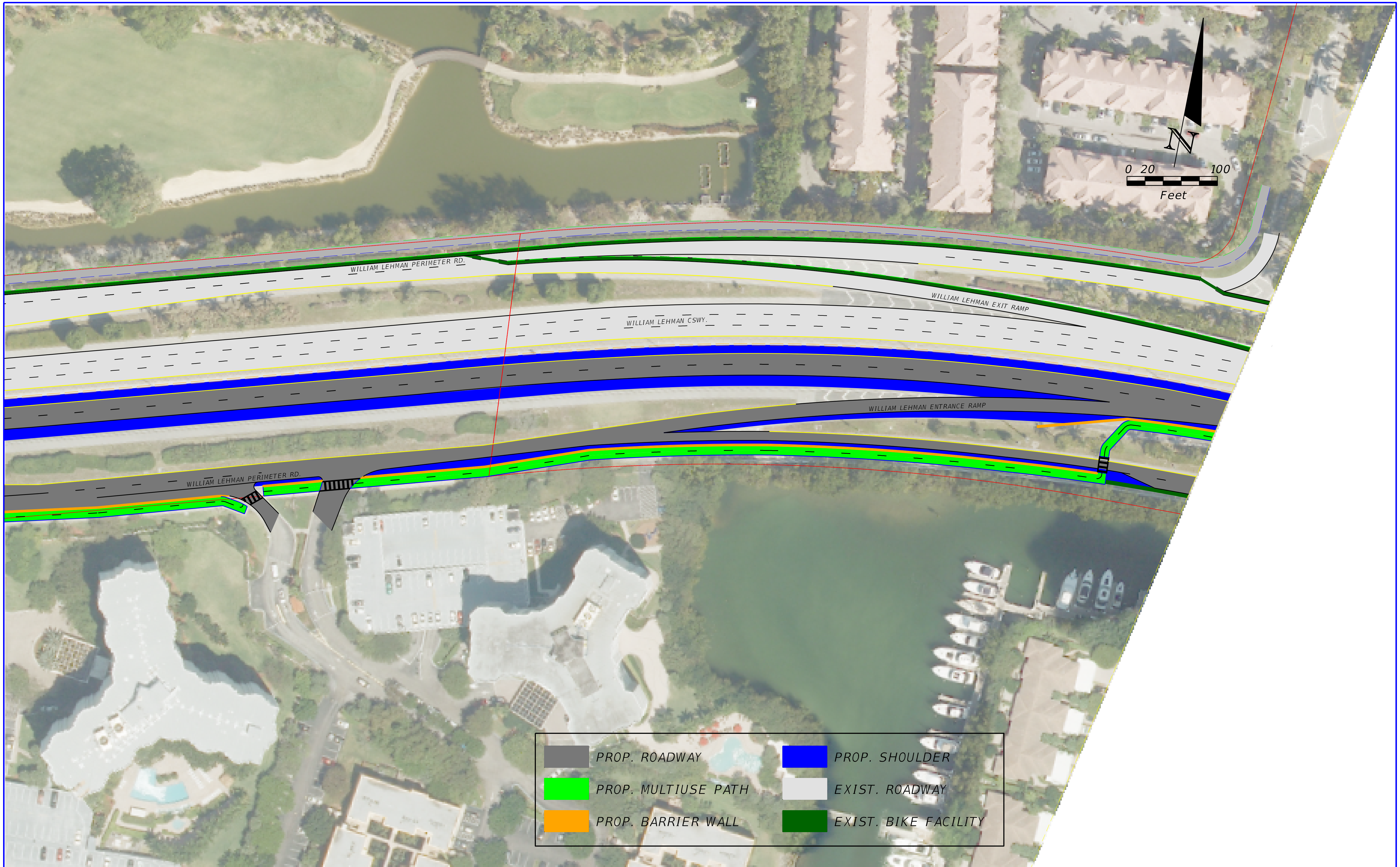

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WILLIAM LEHMAN CSWY	

MULTI USE PATH

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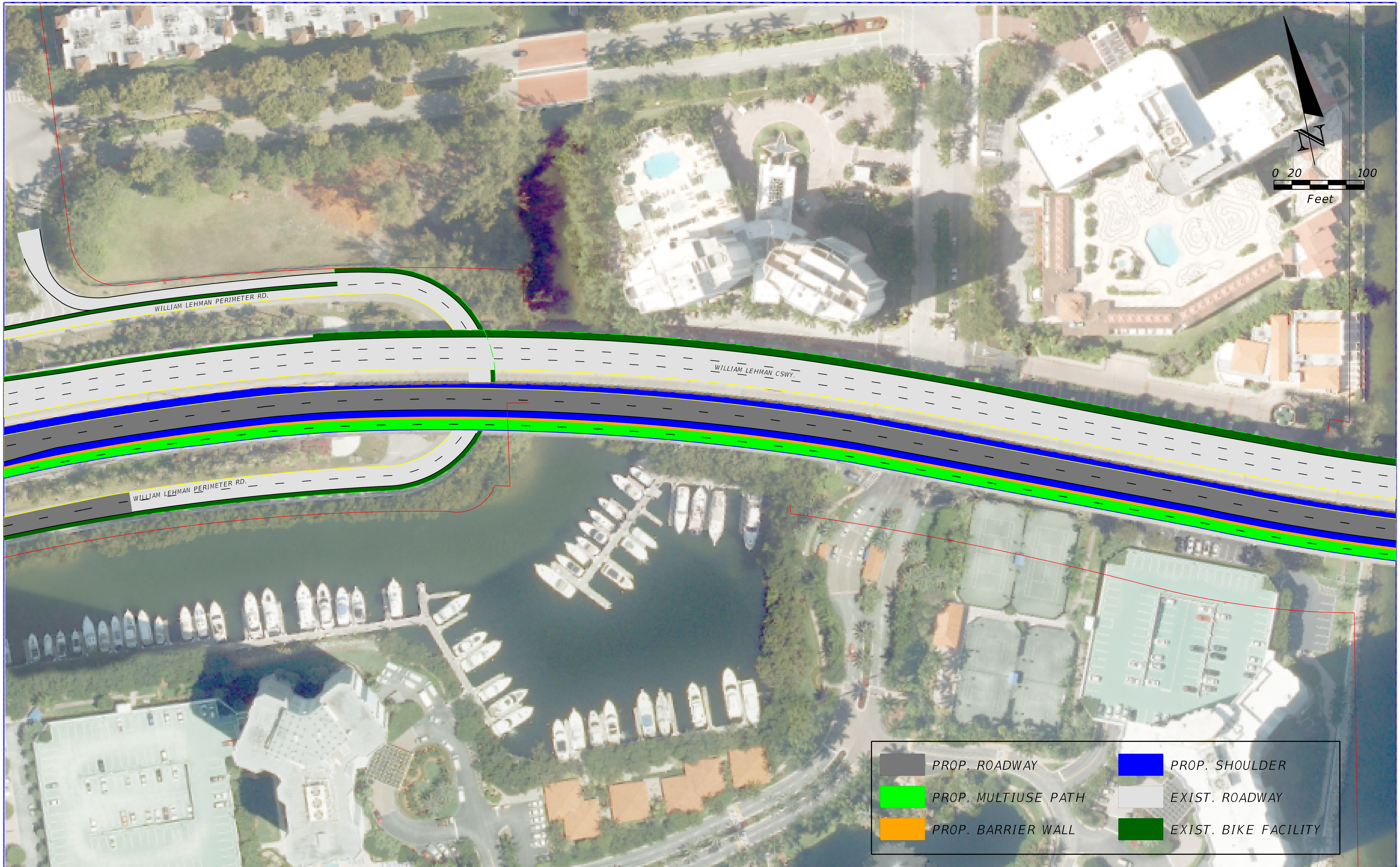

REVISIONS			
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MIAMI-DADE MPO

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WILLIAM LEHMAN CSWY	

MULTI USE PATH

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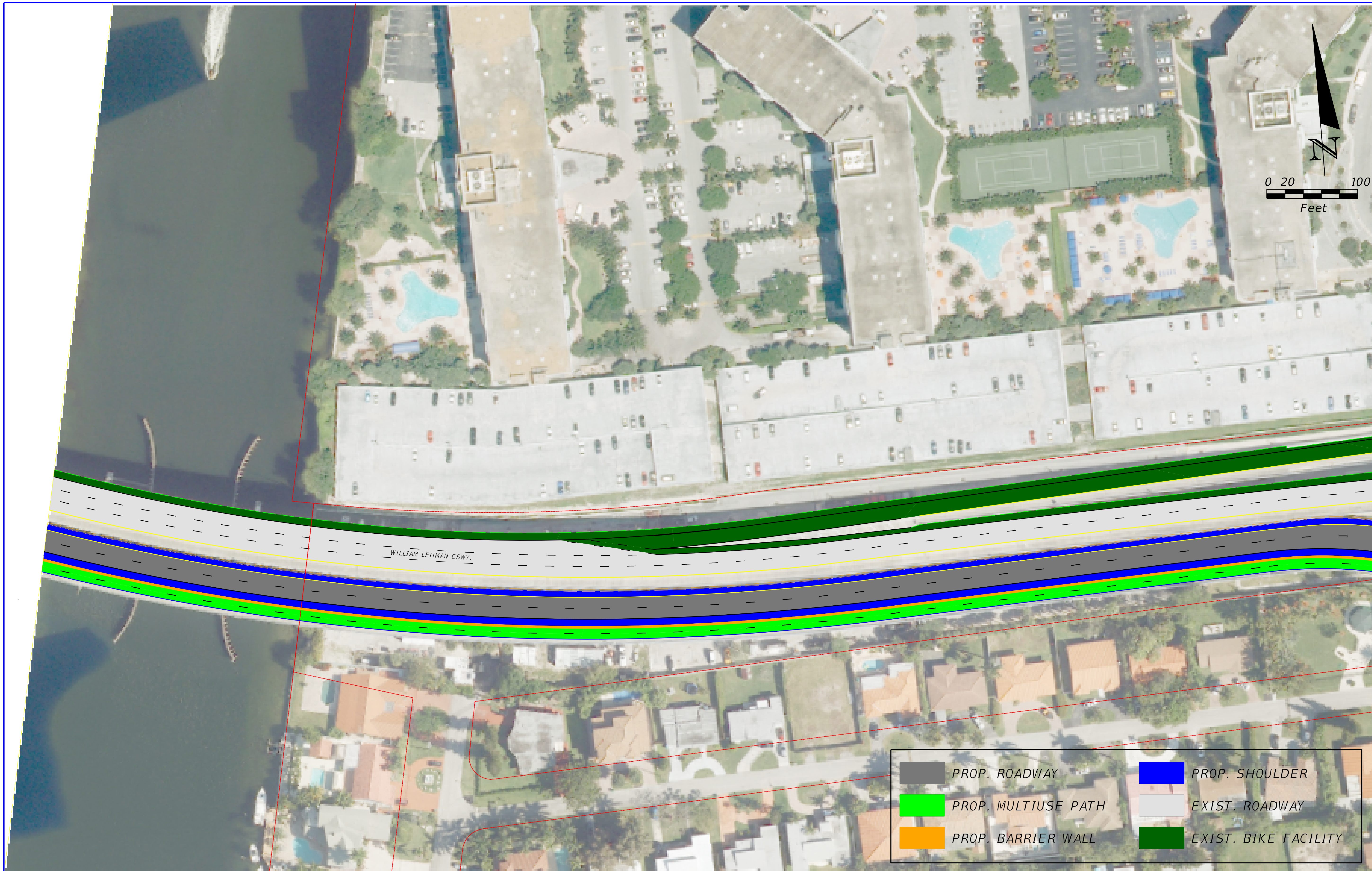

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
WILLIAM LEHMAN CSWY	

MULTI USE PATH

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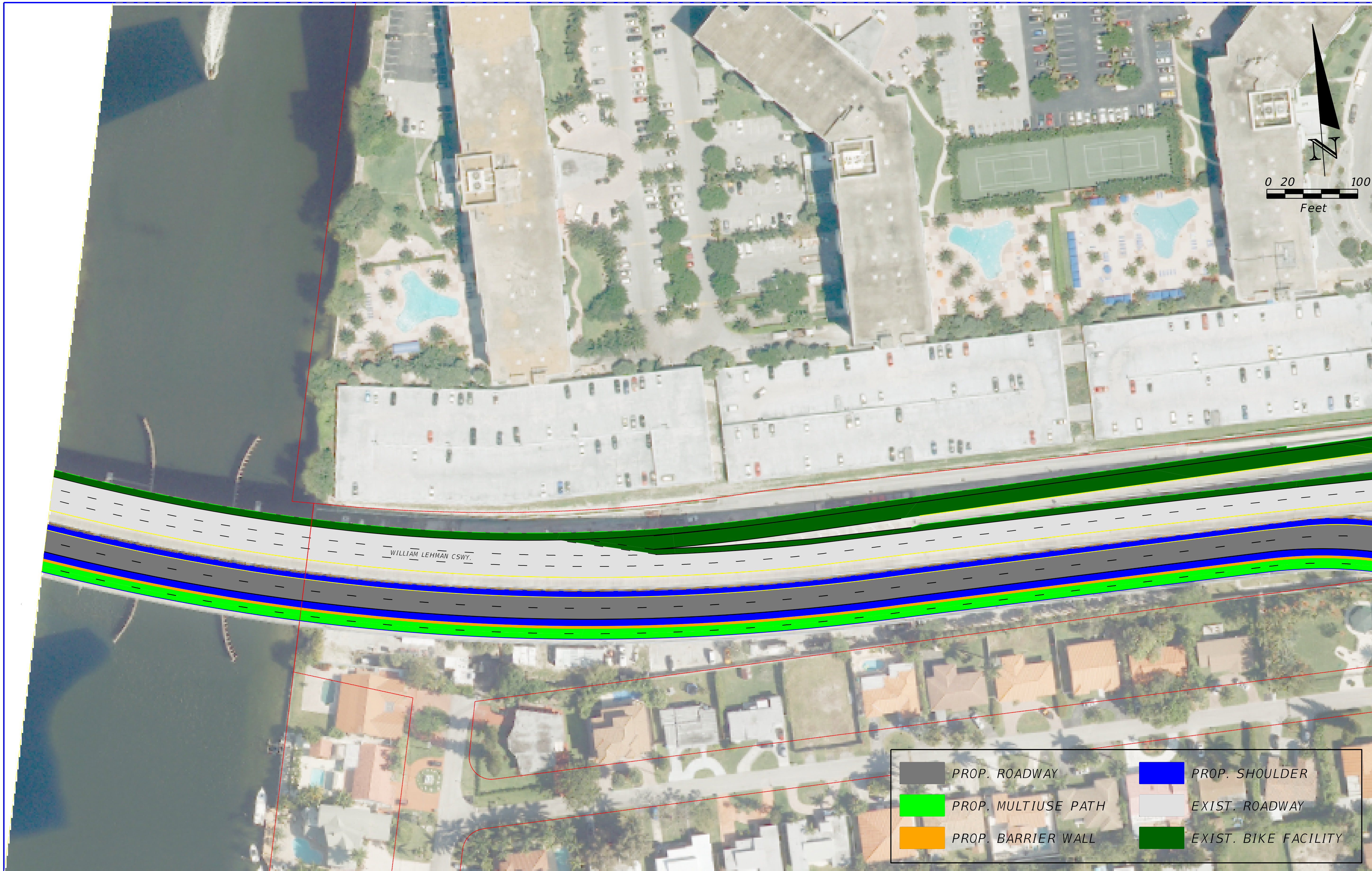

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
WILLIAM LEHMAN CSWY	

MULTI USE PATH

SHEET NO.

7

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
WILLIAM LEHMAN CSWY	

MULTI USE PATH

SHEET NO.

8

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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

Description	**Value**
Standard Clearing and Grubbing Limits L/R	0.00 / 0.00
Incidental Clearing and Grubbing Area	1.11
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

Pay item	**Description**	**Quantity Unit**	**Unit Price**	**Extended Amount**
110-1-1	CLEARING & GRUBBING	1.11 AC	$88,705.52	$98,463.13
	Earthwork Component Total			$98,463.13

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	3
Existing Roadway Pavement Width L/R	0.00 / 36.00
Structural Spread Rate	110
Friction Course Spread Rate	110
Widened Outside Pavement Width L/R	0.00 / 0.00
Widened Inside Pavement Width L/R	0.00 / 0.00
Widened Structural Spread Rate	0
Widened Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
327-70-5	MILLING EXIST ASPH PAVT, 2" AVG DEPTH	35,270.40 SY	$3.73	$131,558.59
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,939.87 TN	$140.48	$272,512.94
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	1,939.87 TN	$157.02	$304,598.39

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	4,600.00 SY	$5.90	$27,140.00
	Comment: Type "B" Stabilization 14' in width X the length of multi use path not available on the existing shoulder (0.56 miles)			
285-701	OPTIONAL BASE,BASE GROUP 01	3,942.00 SY	$19.32	$76,159.44
	Comment: Optional base group one, 12' in width X multi use path not available on the existing shoulder (0.56 miles)			
327-70-5	MILLING EXIST ASPH PAVT, 2" AVG DEPTH	8,682.00 SY	$3.73	$32,383.86
	Comment: 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 pvmt width x 0.74miles)			
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	478.00 TN	$140.48	$67,149.44
	Comment: 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 pvmt x 0.74 miles)			
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	478.00 TN	$157.02	$75,055.56
	Comment: 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 pvmt x 0.74 miles)			
339-1	MISCELLANEOUS ASPHALT PAVEMENT	395.00 TN	$270.06	$106,673.70
	Comment: 2" of 100 lb/cy per inch asphalt for 12' multiuse path X multi use path not available on existing shoulder (0.56)			
521-72-40	SHLDR CONC BARRIER,38" OR 44" HEIGHT	8,518.00 LF	$209.23	$1,782,221.14
	Comment: Concrete barrier to separate traffic lanes from 12' multi use path			

711-11-123	THERMOPLASTIC, STD, WHITE, SOLID, 12"	690.00 LF	$1.90	$1,311.00
	Comment: For existing and proposed crosswalks for multi use path			
711-12-125	THERMOPLASTIC,REFURB, WHITE, SOLID, 24"	463.00 LF	$4.80	$2,222.40
	Comment: For existing and proposed crosswalks for multi use path			

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	1

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
706-1-1	RAISED PAVMT MARK, TYPE B W/O FINAL SURF	451.00 EA	$25.14	$11,338.14
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	13.36 GM	$784.13	$10,475.98
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	3.34 GM	$374.29	$1,250.13
	Roadway Component Total			$2,902,050.71

SHOULDER COMPONENT

User Input Data

Description	Value
Existing Total Outside Shoulder Width L/R	0.00 / 10.00
New Total Outside Shoulder Width L/R	0.00 / 7.25
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 5.00
Sidewalk Width L/R	0.00 / 0.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
570-1-1	PERFORMANCE TURF	4,898.67 SY	$1.57	$7,690.91

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	8,817.00 LF	$2.25	$19,838.25
	Comment: For constructible length (1.67 miles)			

Erosion Control

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-11	FLOATING TURBIDITY BARRIER	1,750.00 LF	$13.93	$24,377.50
104-18	INLET PROTECTION SYSTEM	30.00 EA	$109.43	$3,282.90

	Shoulder Component Total				**$55,189.56**

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	37.00	AS	$339.70	$12,568.90
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	4.00	AS	$1,080.97	$4,323.88
700-1-50	SINGLE POST SIGN, RELOCATE	4.00	AS	$287.52	$1,150.08
700-1-60	SINGLE POST SIGN, REMOVE	37.00	AS	$22.95	$849.15
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	2.00	AS	$4,738.95	$9,477.90
700-2-60	MULTI- POST SIGN, REMOVE	2.00	AS	$569.31	$1,138.62
	Signing Component Total				$29,508.53

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

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.

Project Sequences Subtotal			**$3,085,211.93**
102-1	Maintenance of Traffic	8.00 %	$246,816.95
101-1	Mobilization	10.00 %	$333,202.89
Project Sequences Total			**$3,665,231.77**
Project Unknowns		0.00 %	$0.00
Design/Build		0.00 %	$0.00

Non-Bid Components:

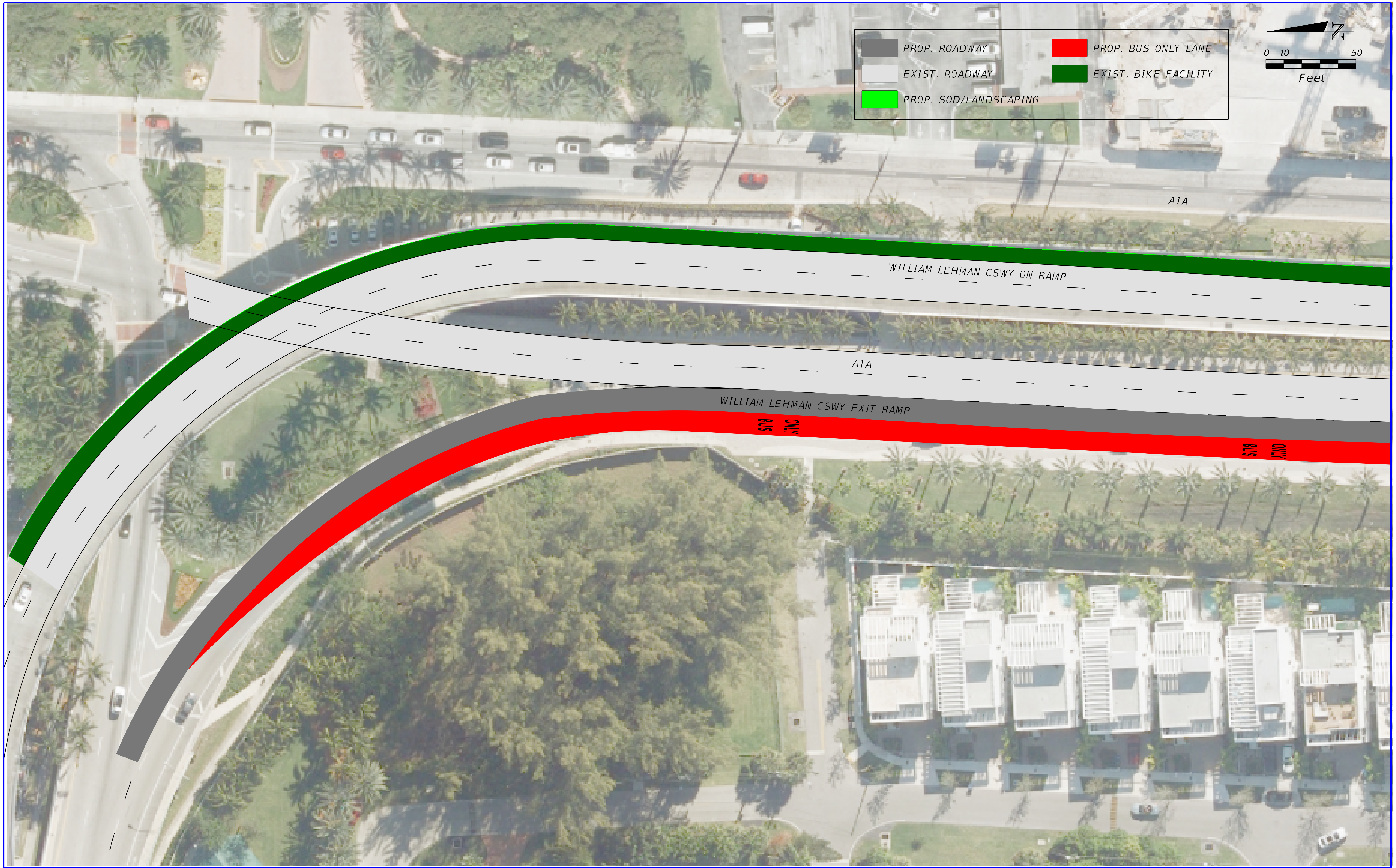
Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)		LS	$50,000.00	$50,000.00

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



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO. 1

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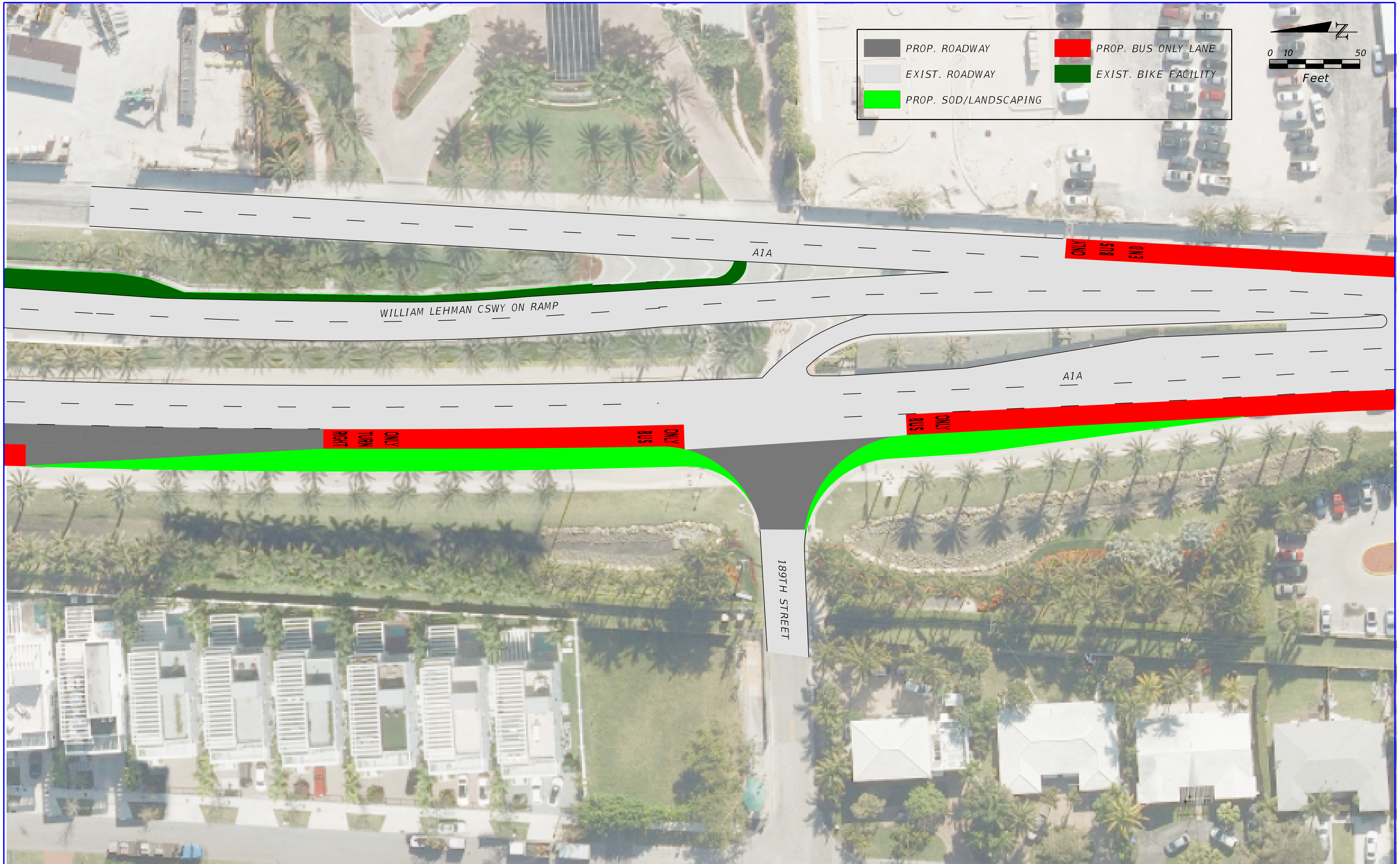

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO. 2

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO.

3

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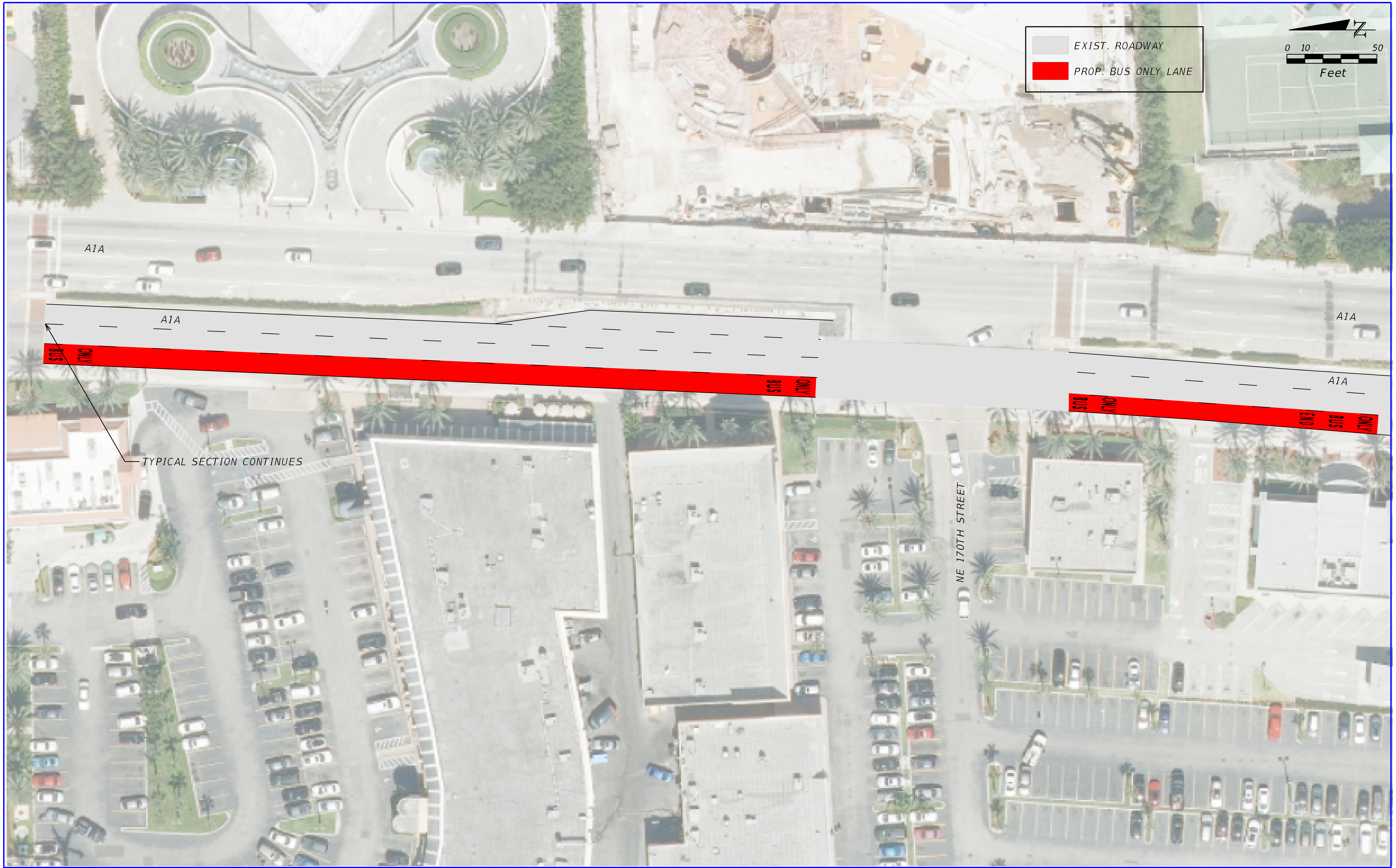


REVISIONS

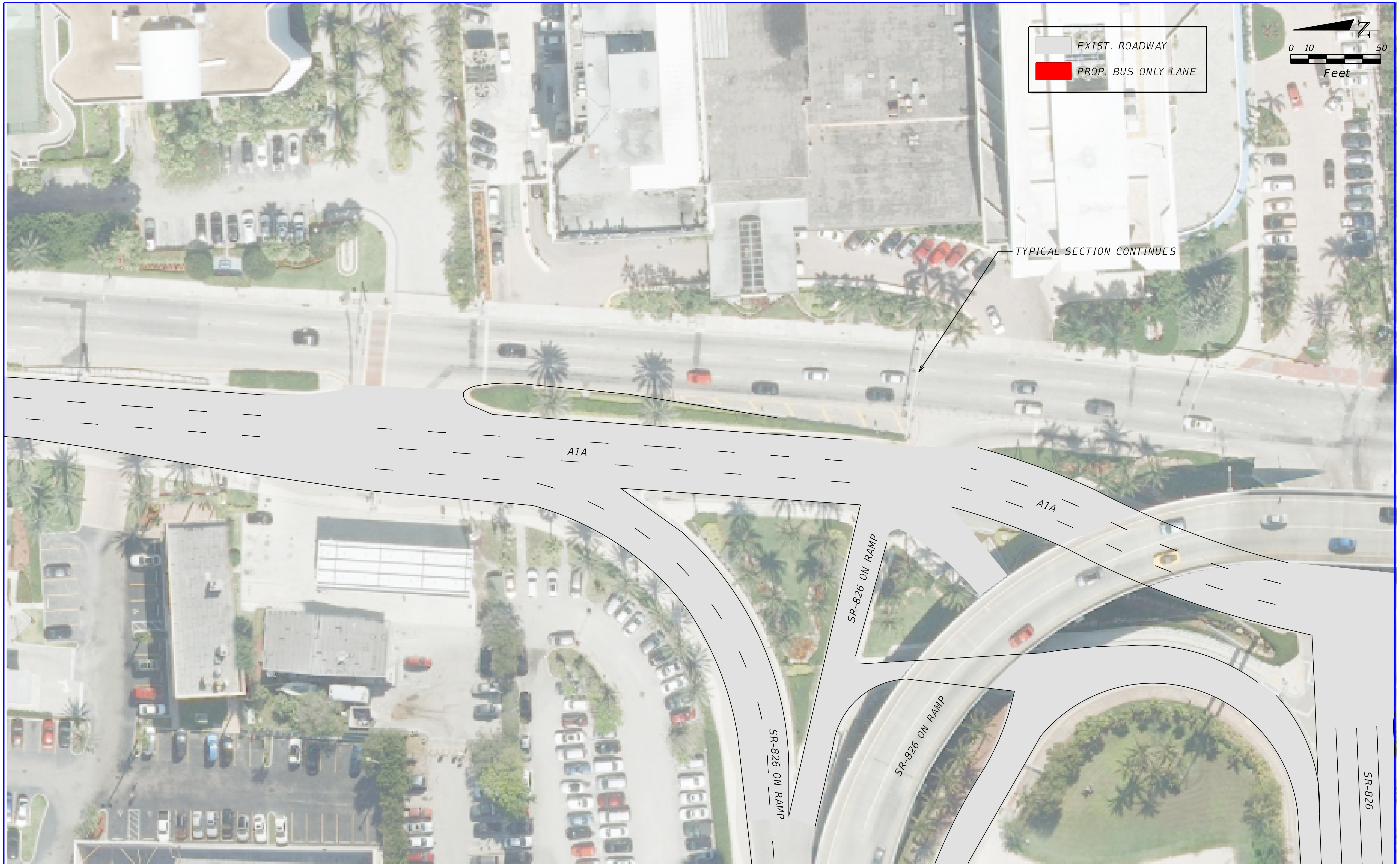
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO. 4



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO. 5

REVISIONS

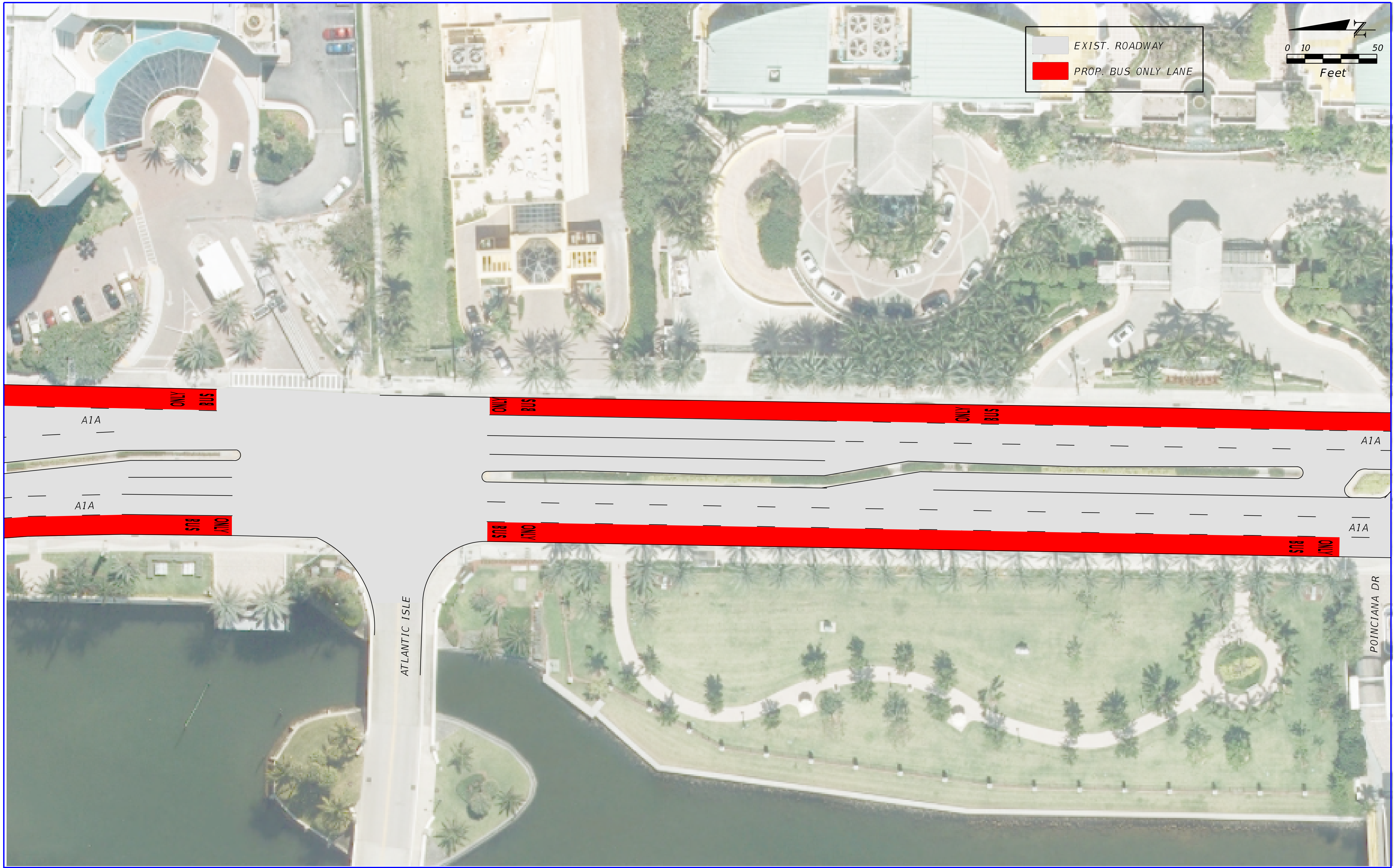
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO.
6



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO.

7

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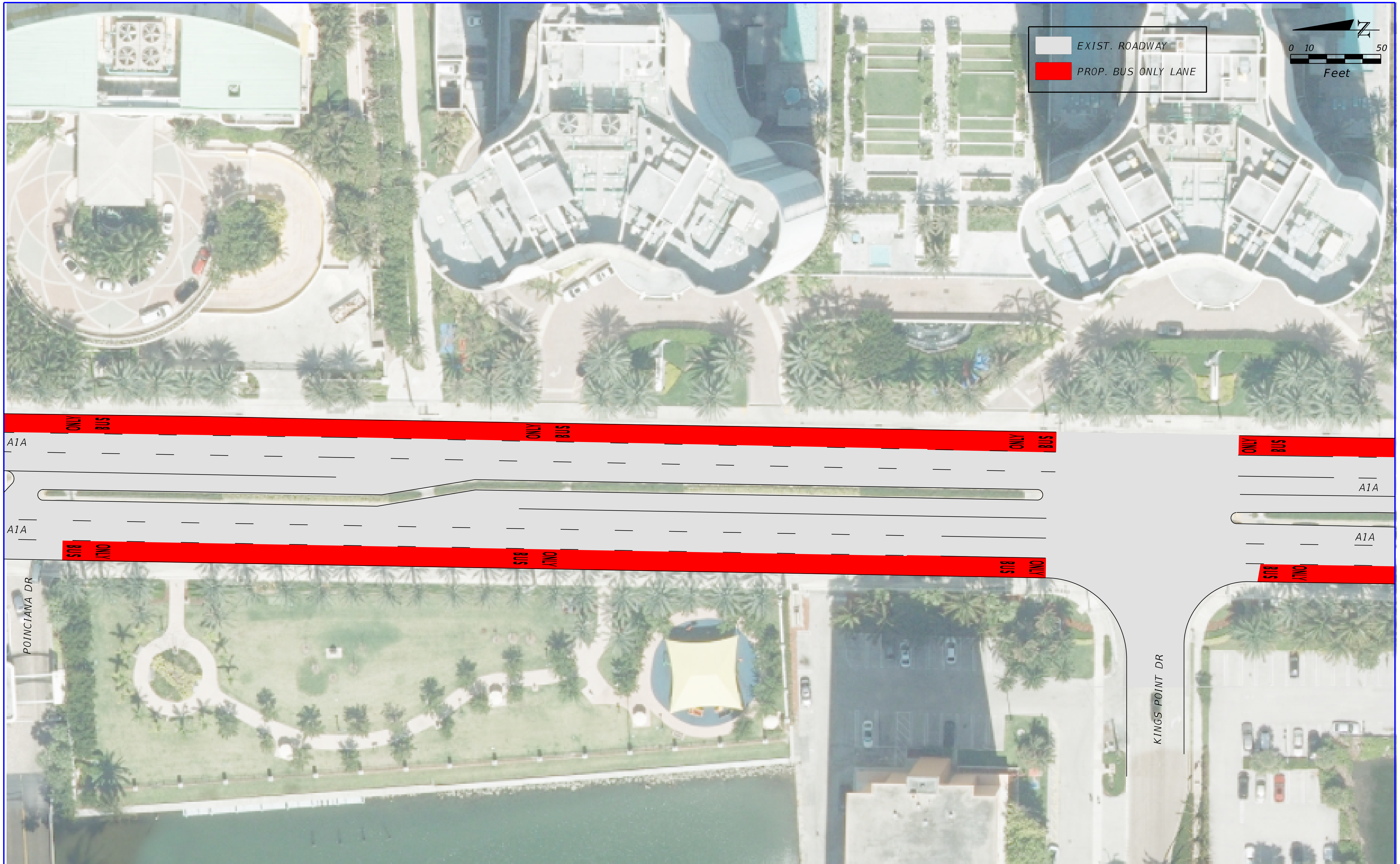

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO.

8

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO.

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EXIST. ROADWAY
PROP. BUS ONLY LANE

0 10 50
Feet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO.
10

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO.
11

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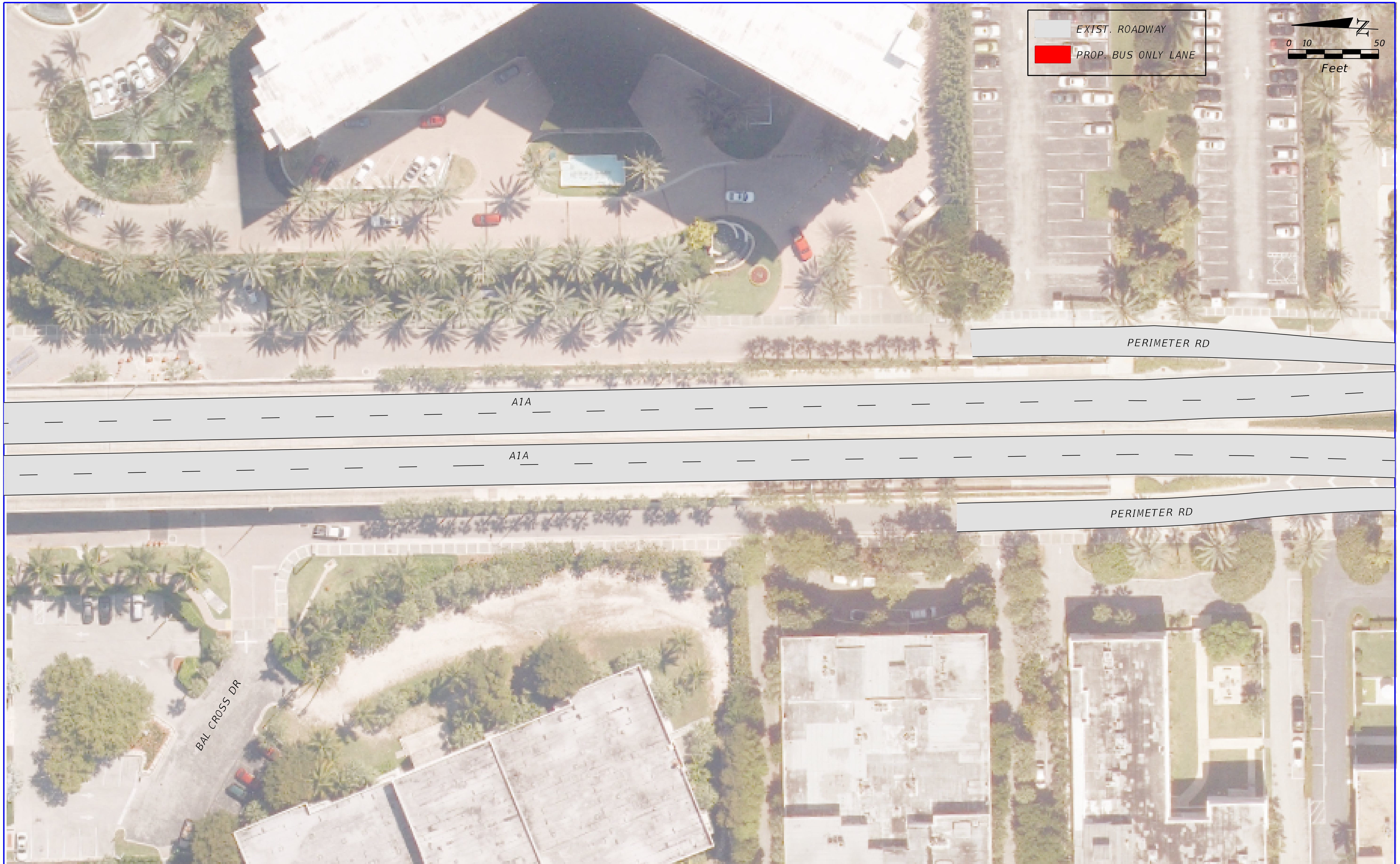

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

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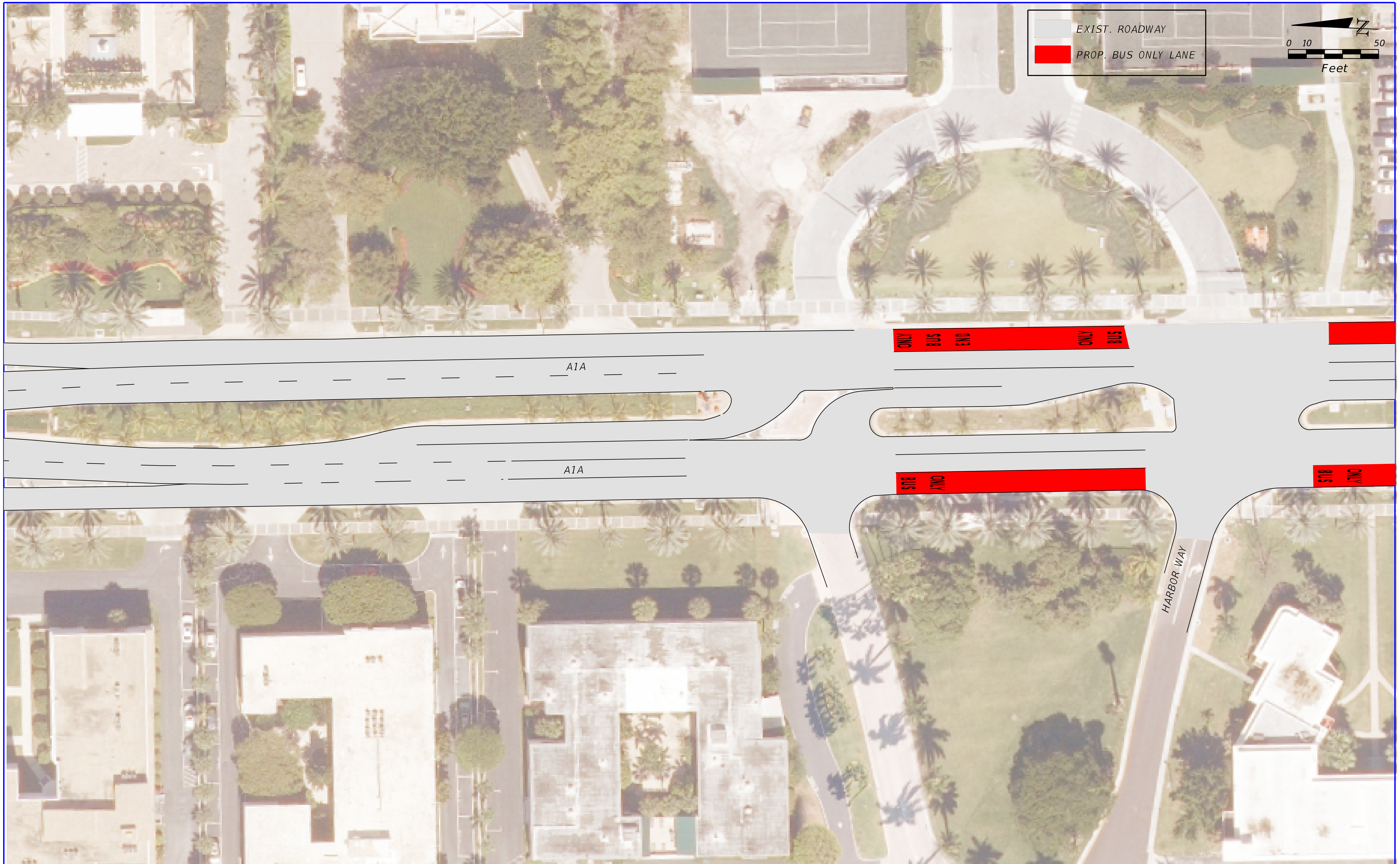


REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

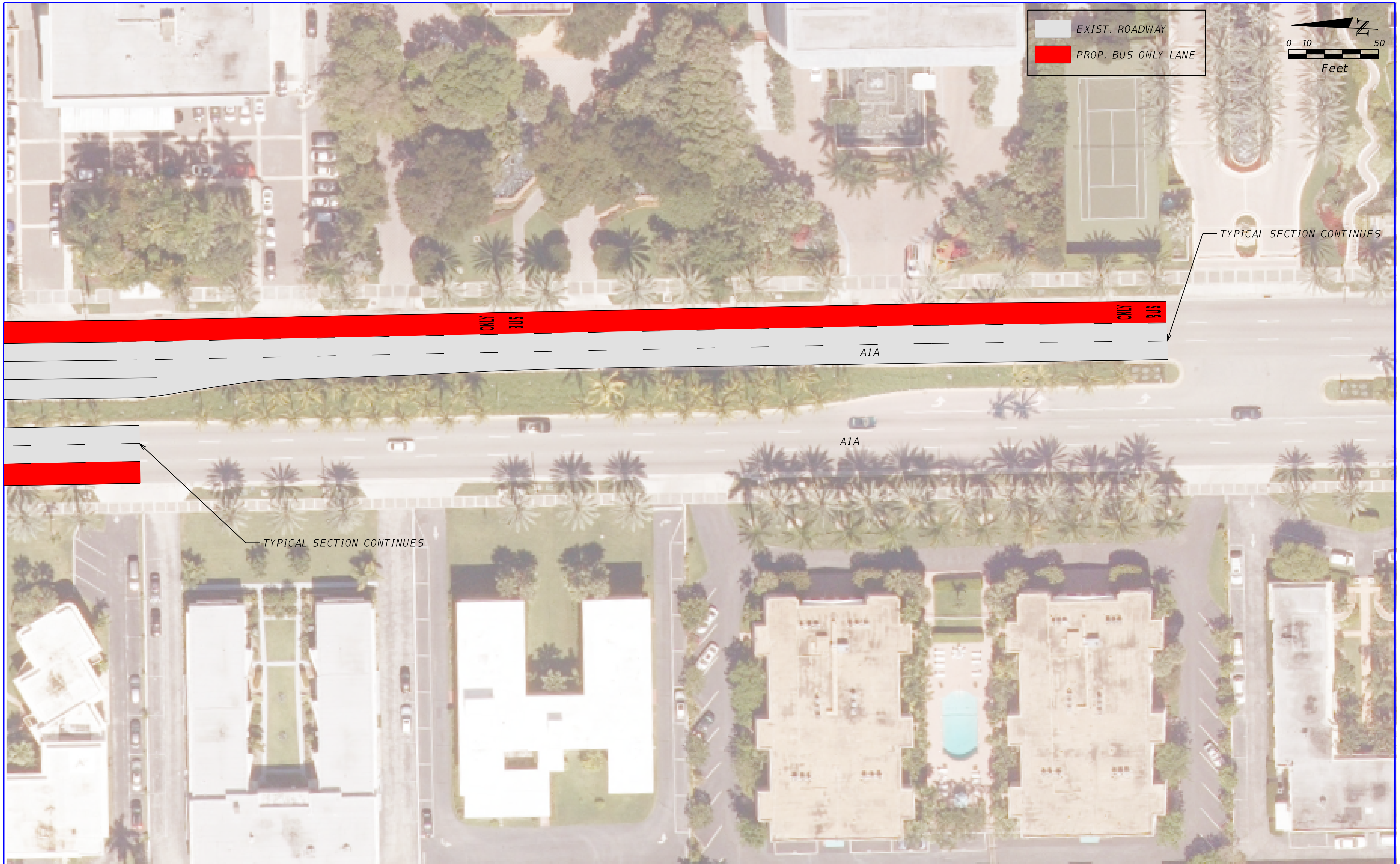
MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO.

13



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO. 14

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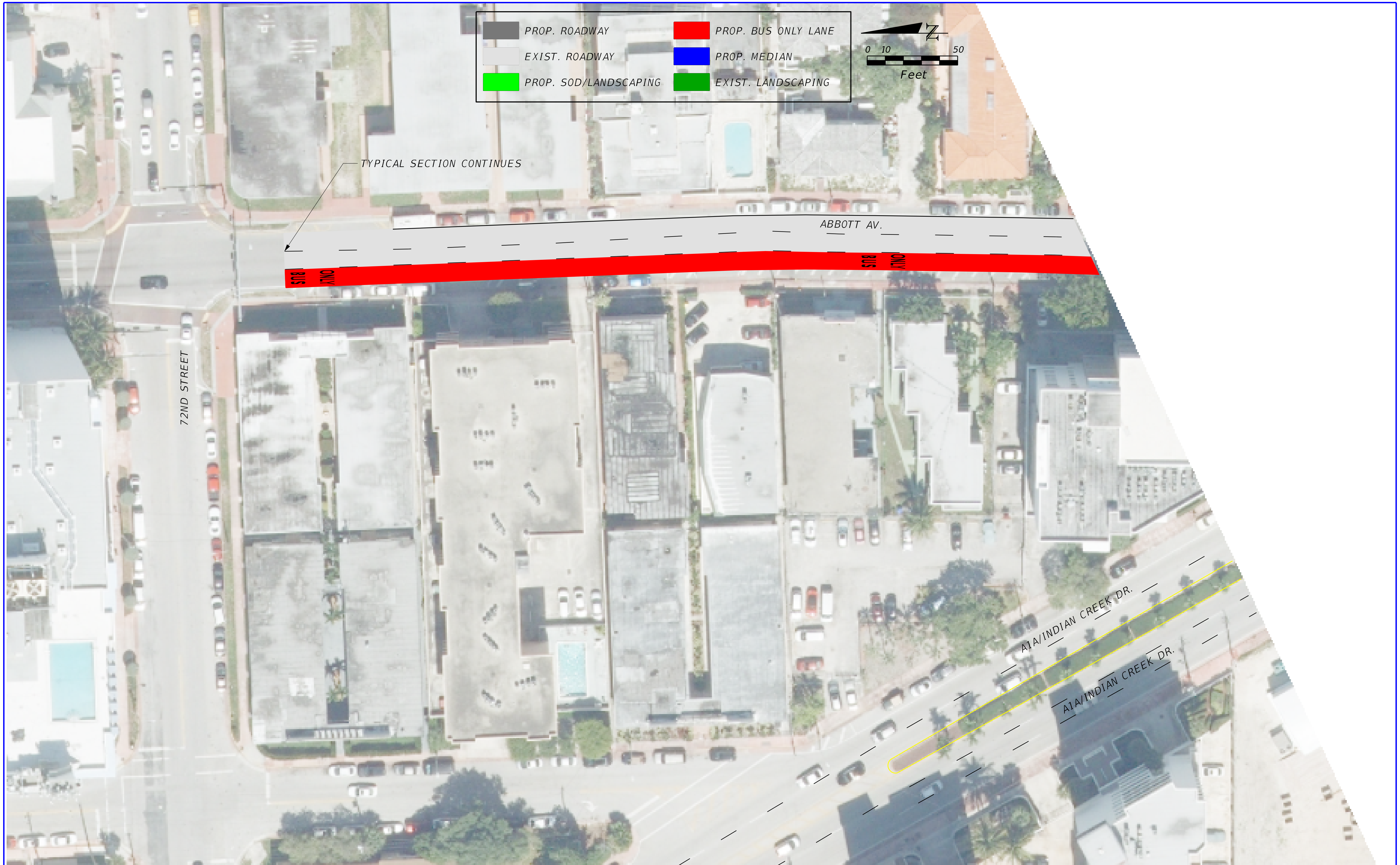


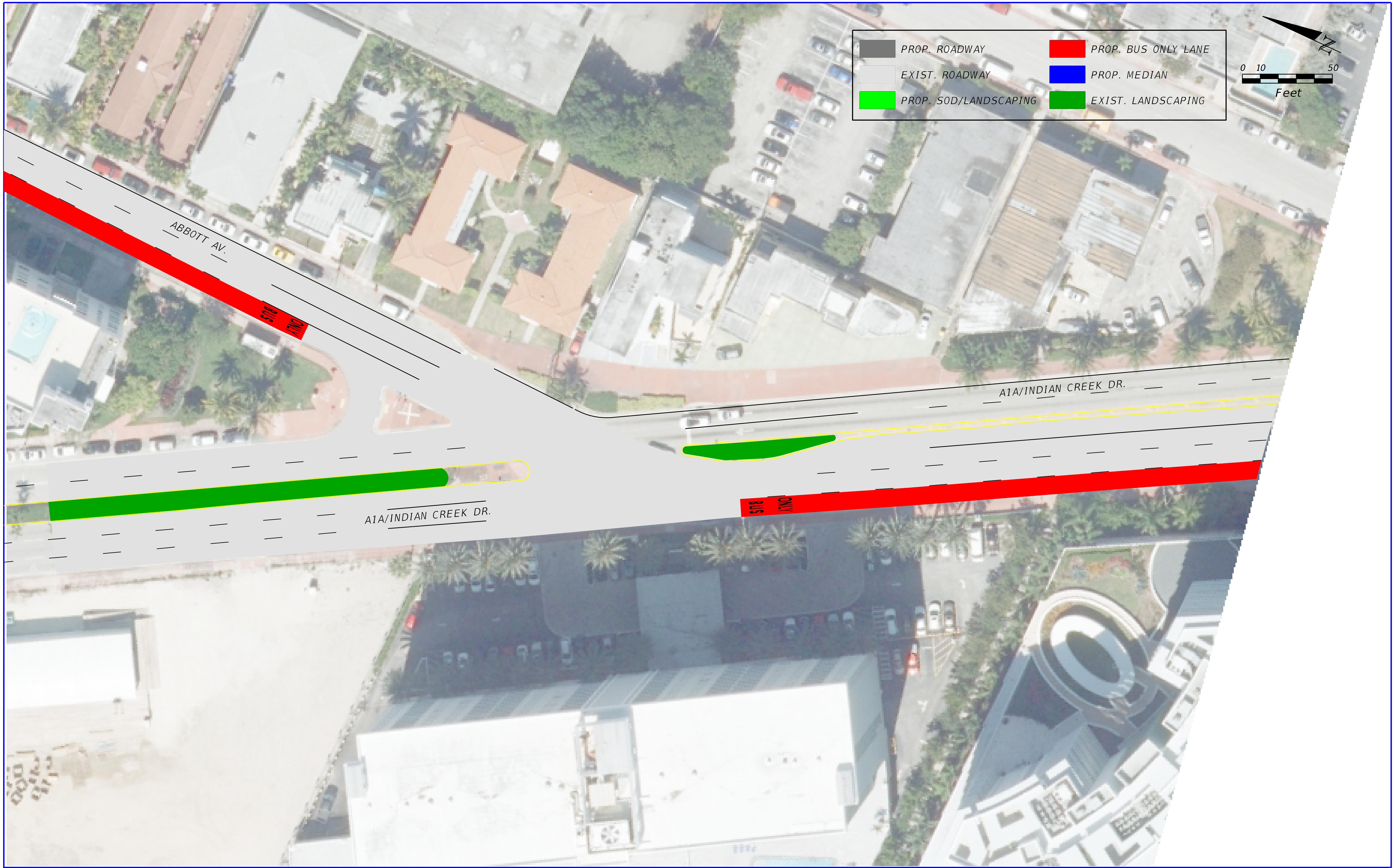
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO.
15



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
AIA DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO. 16

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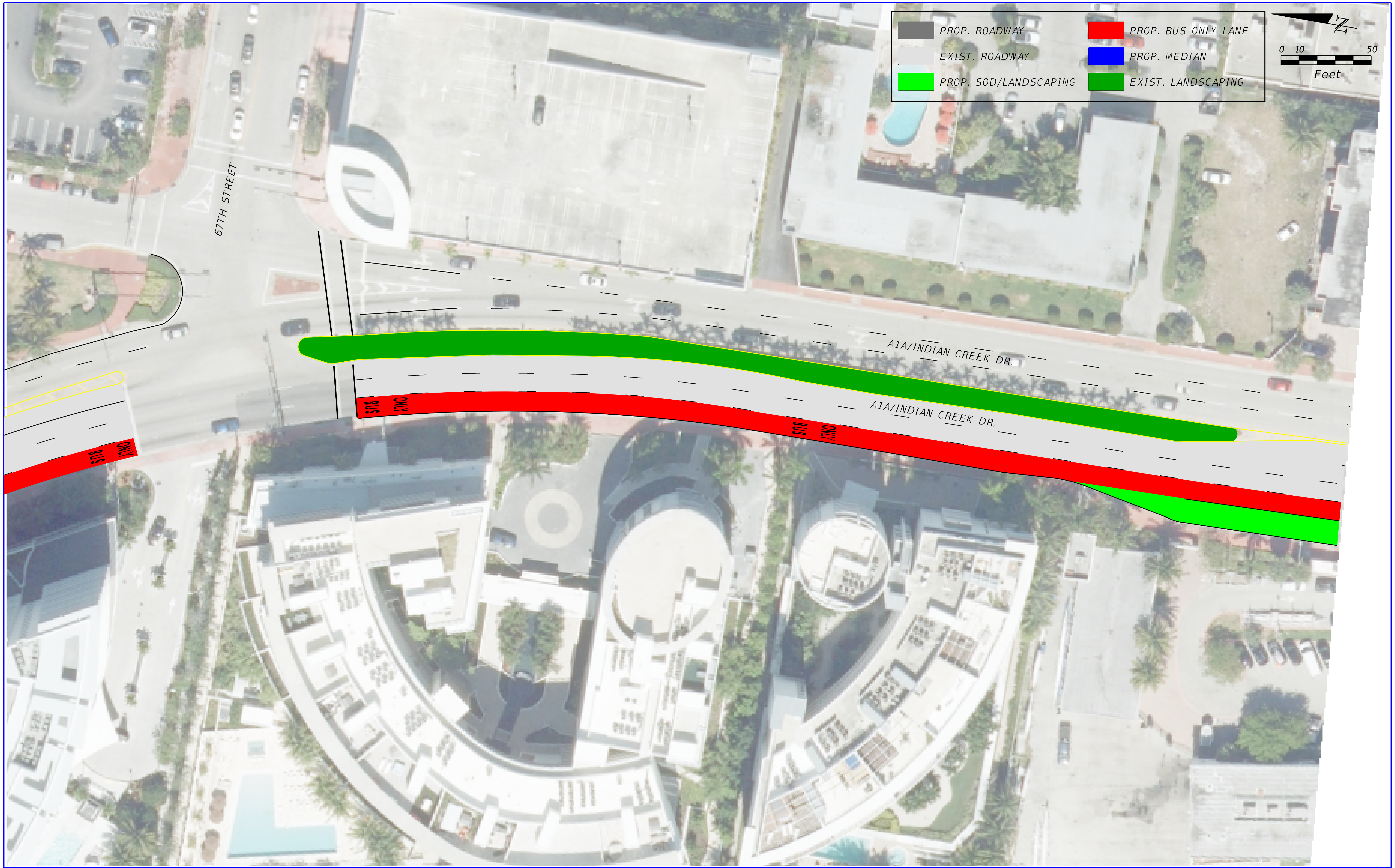


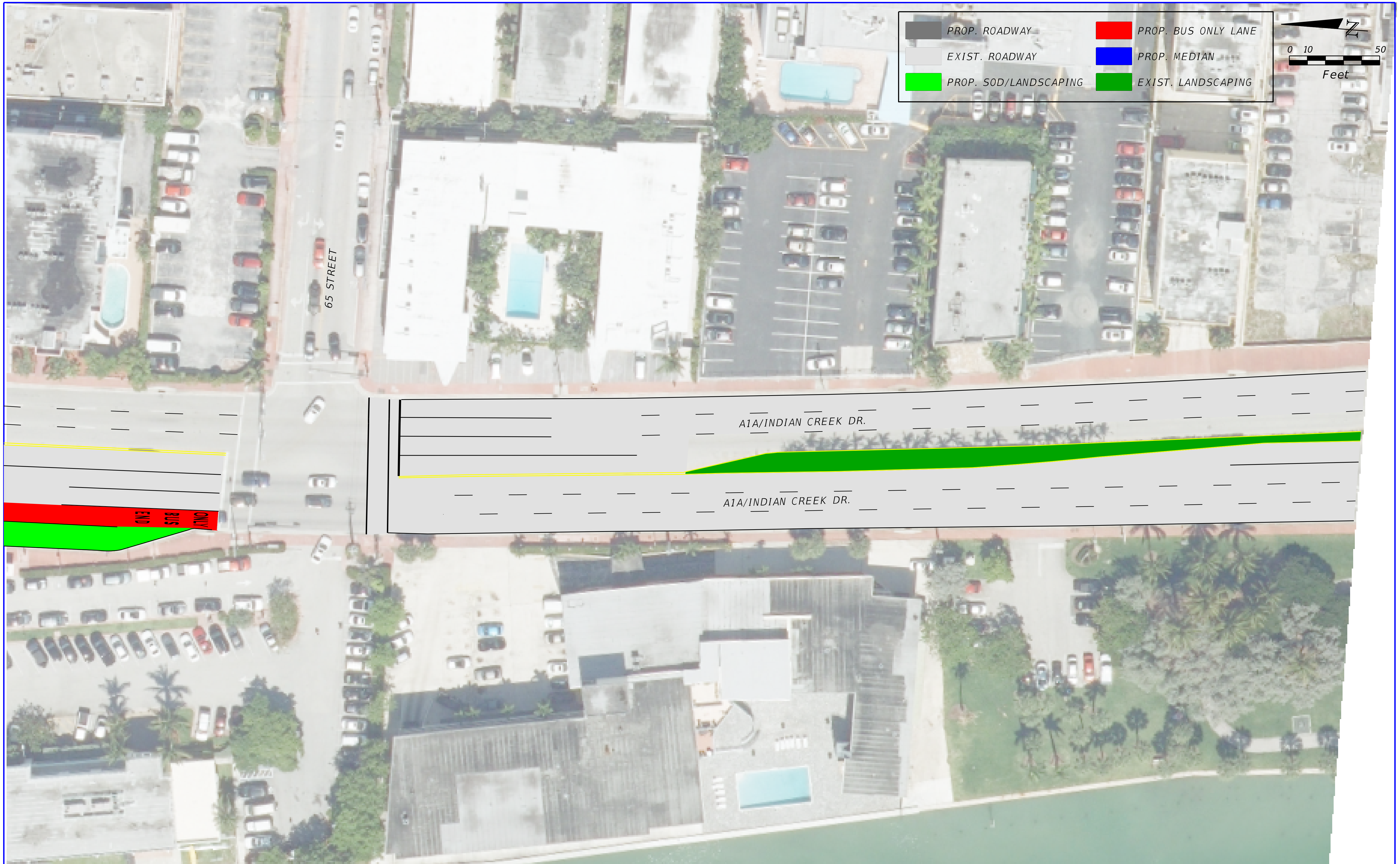
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO. 17



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO. 18

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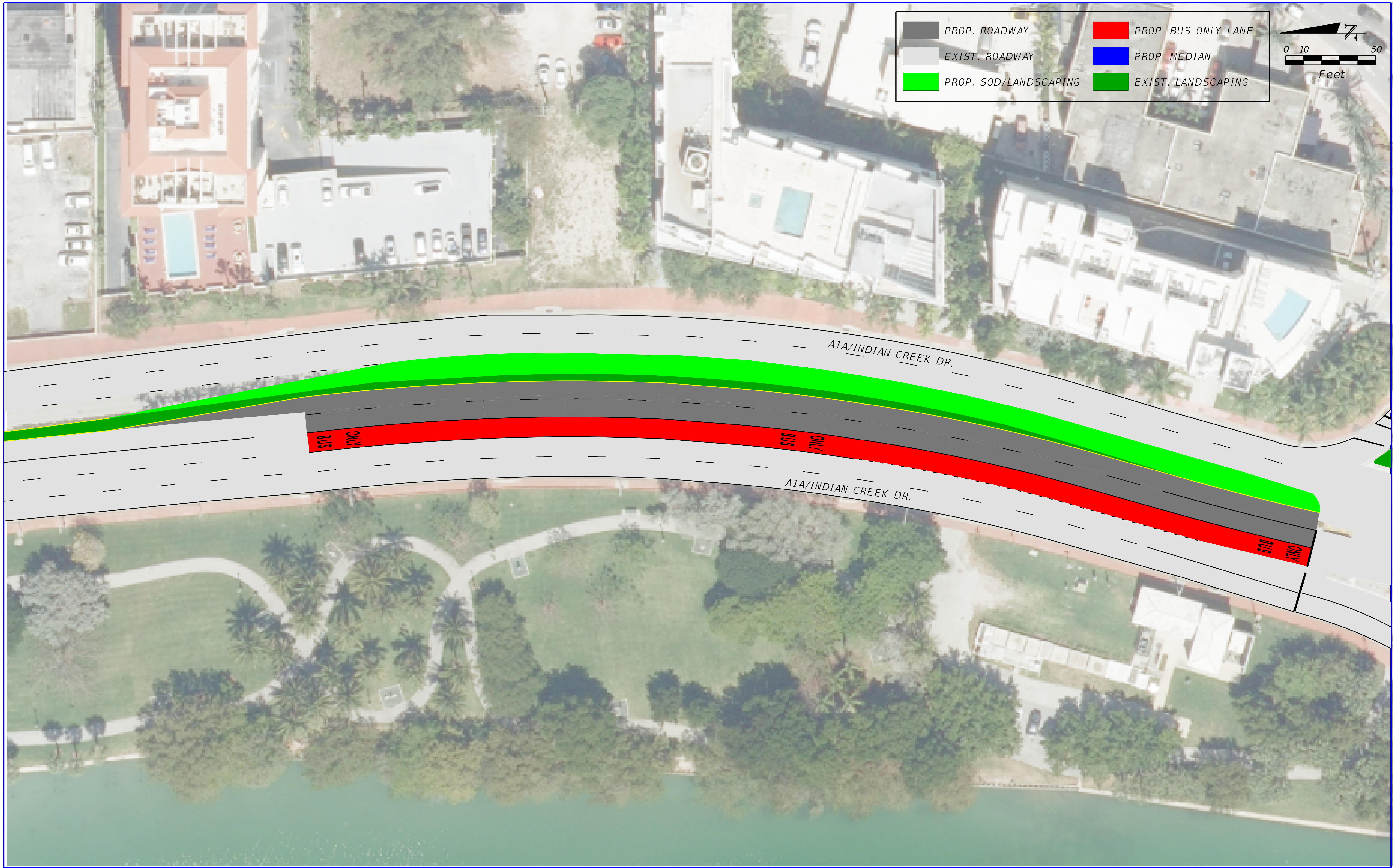

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO. 19

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REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO. 20

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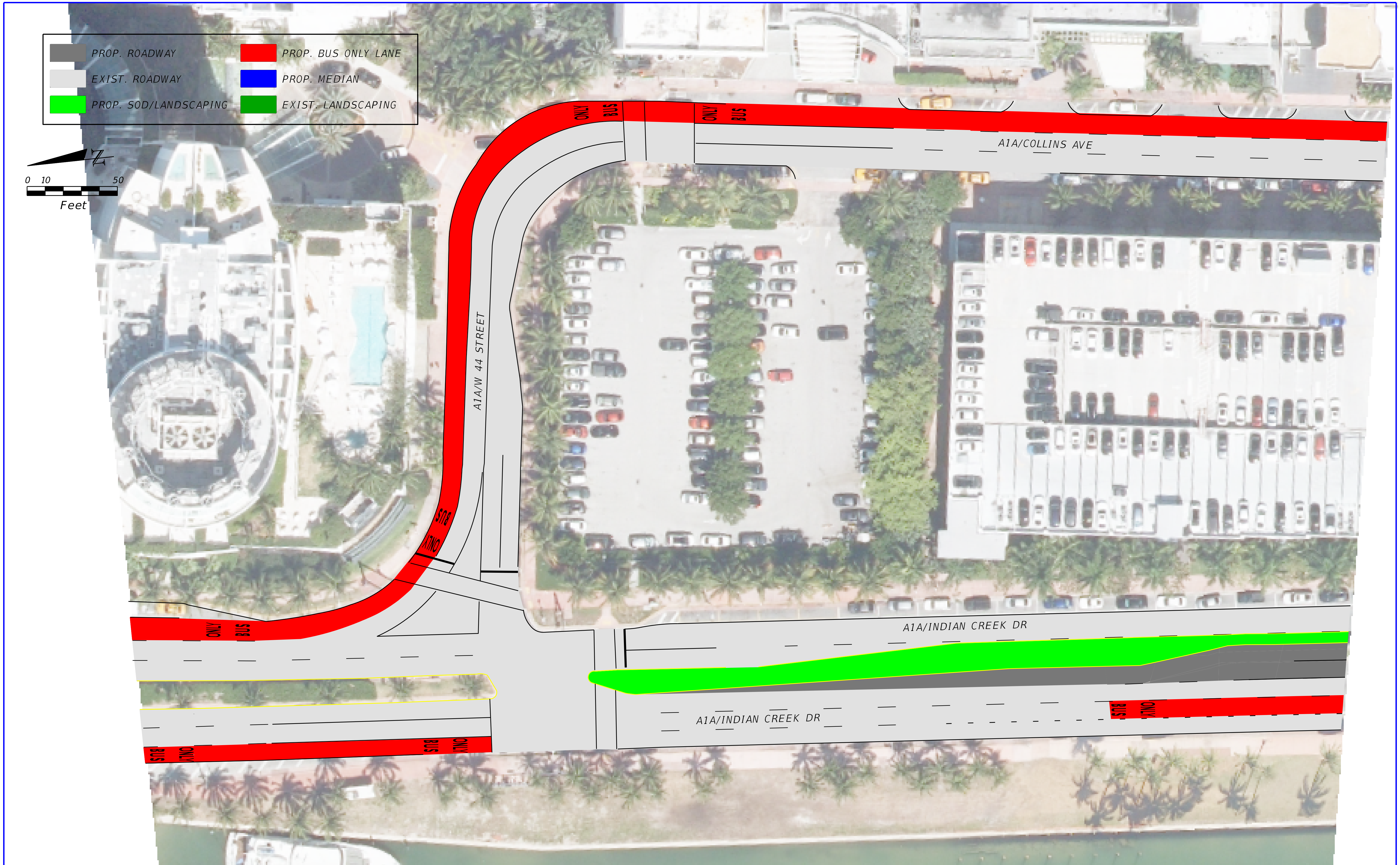

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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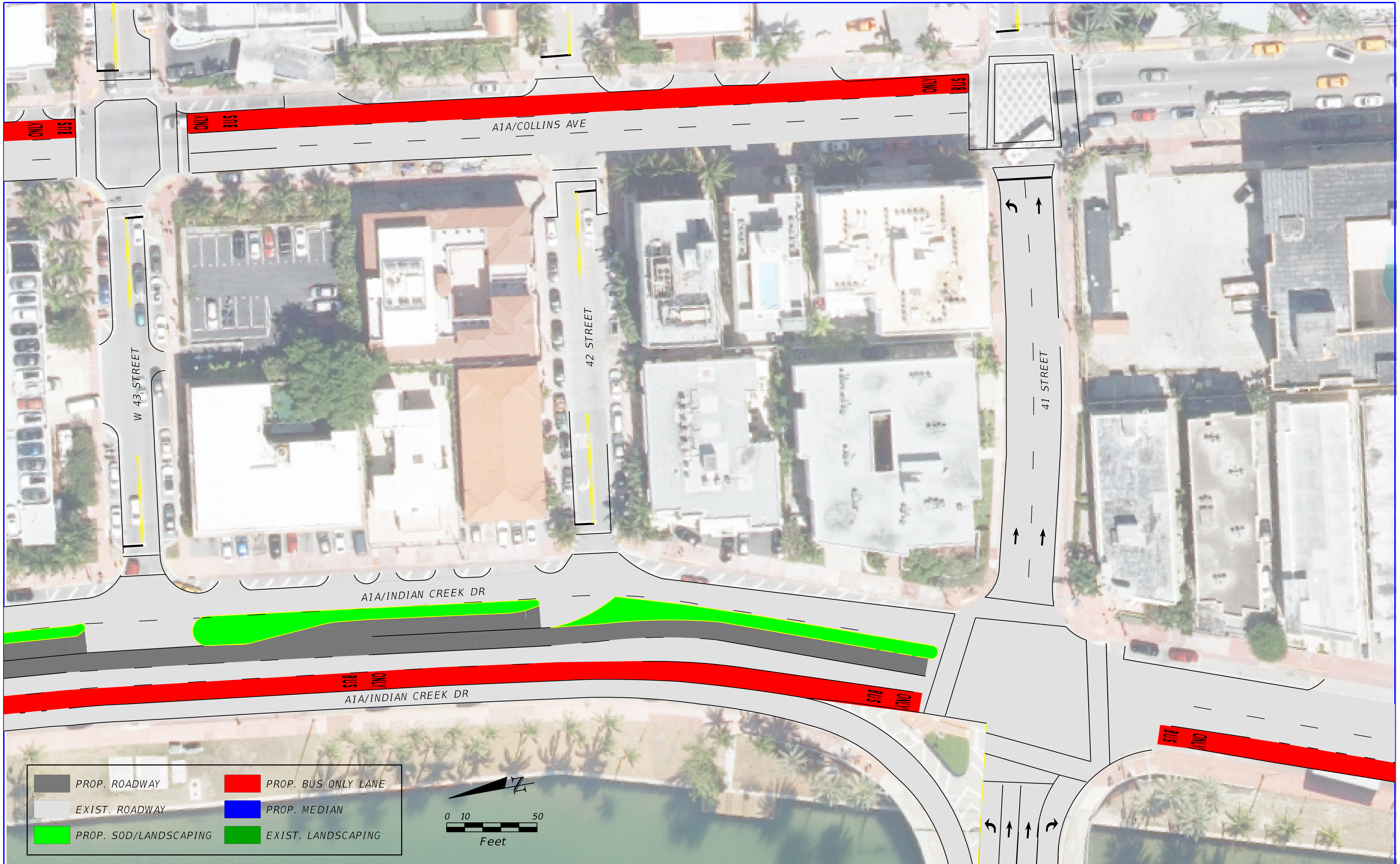
ROAD NO.	PROJECT NUMBER		21
A1A DEDICATED BUSWAY			



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO.
22

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

MIAMI-DADE MPO

ROAD NO.	PROJECT NUMBER
A1A DEDICATED BUSWAY	

PROPOSED DEDICATED BUSWAY

SHEET NO.
23

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