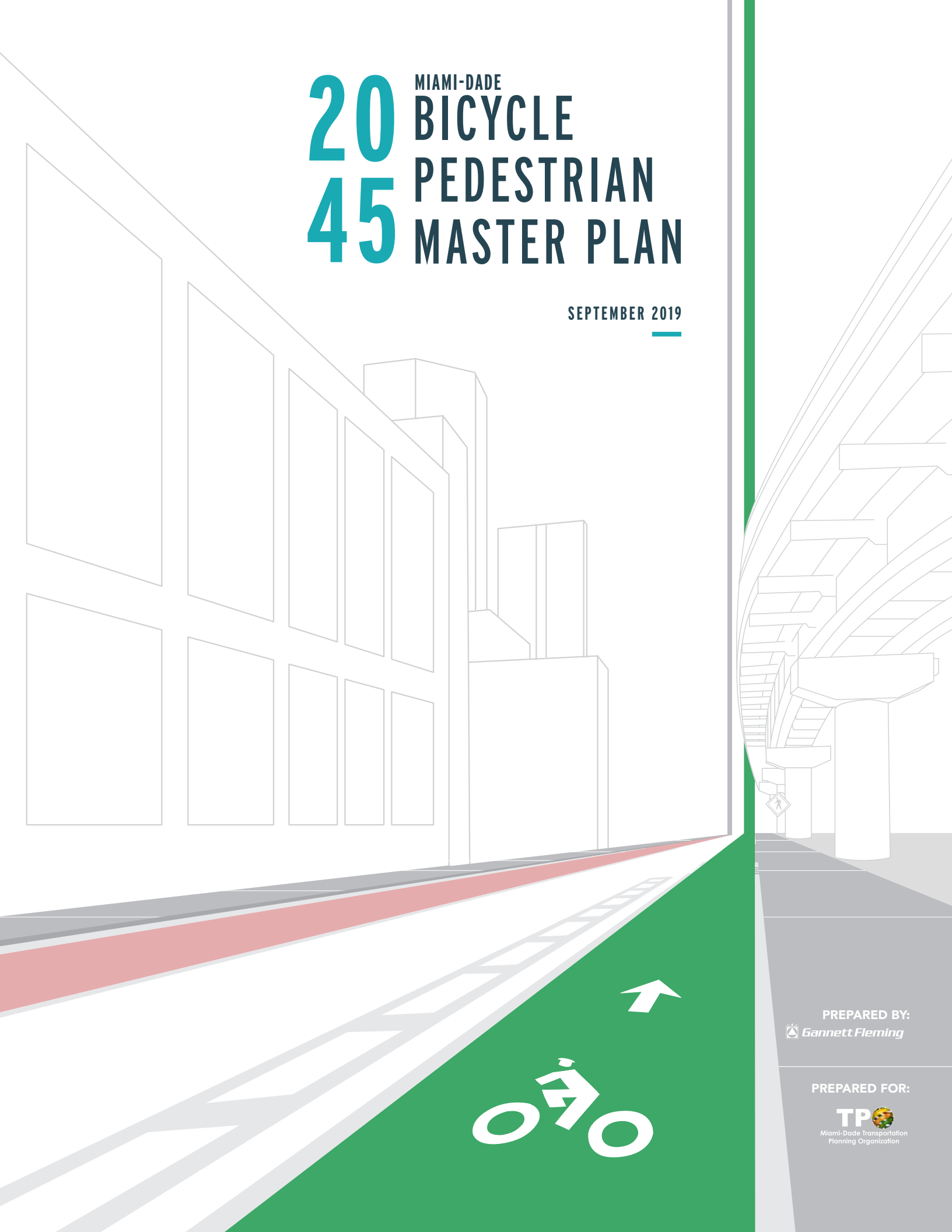
# 2045 MIAMI-DADE BICYCLE PEDESTRIAN MASTER PLAN

SEPTEMBER 2019



PREPARED BY:

Gannett Fleming

PREPARED FOR:

TPO
Miami-Dade Transportation Planning Organization

# MIAMI-DADE 2045 BICYCLE PEDESTRIAN MASTER PLAN

The Miami-Dade TPO complies with the provisions of Title VI of the Civil Rights Act of 1964, which states: No person in the United States shall, on grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance. It is also the policy of the Miami-Dade TPO to comply with all of the requirements of the Americans with Disabilities Act. For materials in accessible format please call (305) 375-4507.

The preparation of this report has been financed in part from the U.S. Department of Transportation (USDOT) through the Federal Highway Administration (FHWA) and/or the Federal Transit Administration (FTA), the State Planning and Research Program (Section 505 of Title 23, U.S. Code) and Miami-Dade County, Florida. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

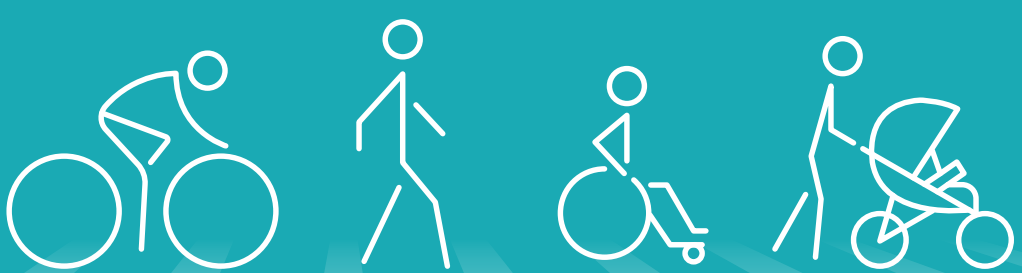
**PREPARED FOR:**

Transportation Planning Organization
for the Miami Urbanized Area

Learn More by Visiting:
www.miamidadetpo.org/

**PREPARED BY:**

GANNETT FLEMING, INC.



# TABLE OF CONTENTS

# TABLE OF CONTENTS
(CONTINUED)

V

# LIST OF FIGURES

# LIST OF FIGURES

# LIST OF FIGURES

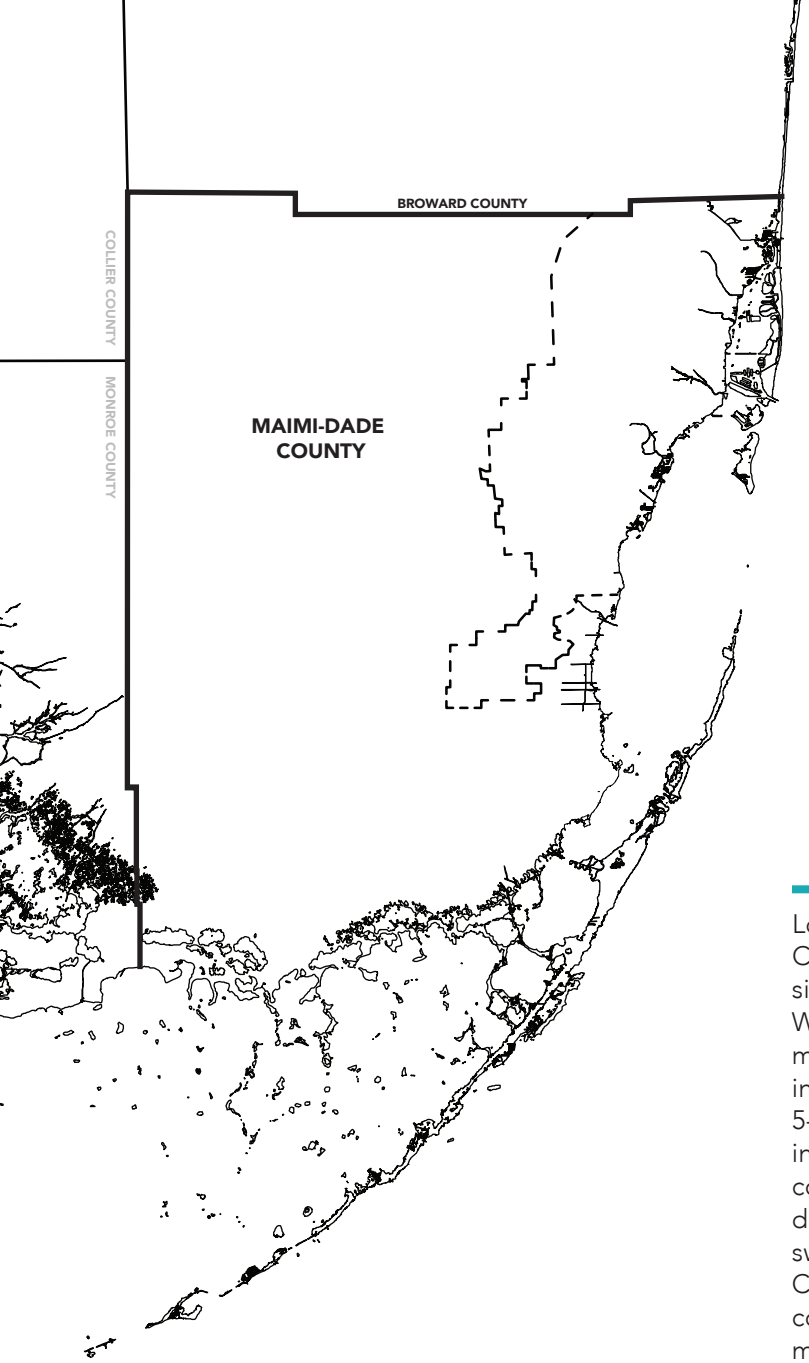
# LIST OF TABLES

# LIST OF ACRONYMS

| | |
|---|---|
| AADT | Annual Average Daily Traffic |
| AASHTO | American Association of State Highway and Transportation Officials |
| BCC | Board of County Commissioners |
| BERT | Bus Express Rapid Transit |
| BPAC | Bicycle Pedestrian Advisory Committee |
| CDMP | Comprehensive Development Master Plan |
| CITT | Citizen's Independent Transportation Trust |
| CRA | Community Redevelopment Areas |
| DDA | Downtown Development Authority |
| DTPW | Department of Transportation and Public Works |
| ETDM | Efficient Transportation Decision Making |
| FARS | Fatality Analysis Reporting System |
| FDM | Florida Design Manual |
| FDOT | Florida Department of Transportation |
| FHWA | Federal Highway Administration |
| FLAP | Federal Lands Access Program |
| FTA | Federal Transit Administration |
| ITE | Institute of Transportation Engineers |
| LOS | Level of Service |
| LRTP | Long Range Transportation Plan |
| LT | Left Turn |
| LTS | Level of Traffic Stress |
| MPH | Miles Per Hour |
| MTI | Mineta Transportation Institute |
| MUTCD | Manual on Uniform Traffic Control Devices |

| | |
|---|---|
| NACTO | National Association of City Transportation Officials |
| NHSTA | National Highway Traffic Safety Administration |
| PD&E | Project Development and Environmental |
| PEA | Planning Emphasis Area |
| PTP | People's Transportation Plans |
| ROW | Right-of-Way |
| RT | Right Turn |
| SDGN | South Dade Greenway Network |
| SFWMD | South Florida Water Management District |
| SHS | State Highway System |
| SMART | Strategic Miami Area Rapid Transit |
| SRTS | Safe Routes to School |
| STBG | Surface Transportation Block Grant |
| SUN | Shared Use Non-Motorized |
| TIF | Tax Increment Financing |
| TIP | Transportation Improvement Program |
| TMP | Transportation Master Plan |
| TOD | Transit Oriented Developed |
| TPO | Transportation Planning Organization |
| UDB | Urbanized Development Boundary |
| V/C | Volume to Capacity |
| VPD | Vehicles Per Day |
| MDX | Miami-Dade Expressway Authority |
| GIS | Geographic information system |

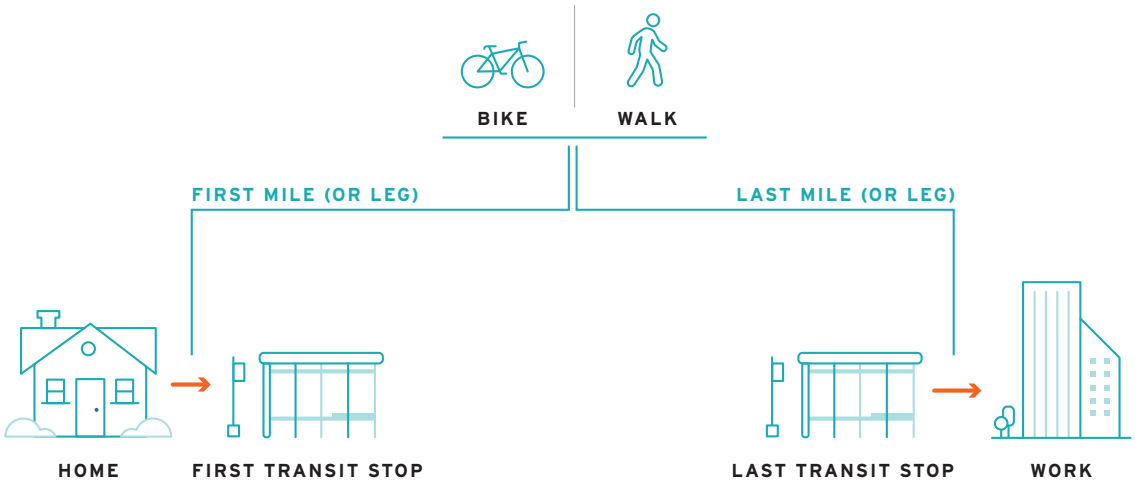
# INTRODUCTION




Located in the southeastern area of Florida, Miami-Dade County was established on January 18th, 1836 and has since become an industrious and cultured global hub. With a diversified population of 2,702,602 people[1], it maintains the superlative of most populated county in Florida. According to the US Census Bureau's 2017 5-year estimate, it's the seventh most populated county in the United States and growing. As the third largest county in Florida, it is not the most densely populated due to its land area of 2,431 square miles, including large swaths of the Everglades National Park Broward (north), Collier (west), and Monroe (south) are its neighboring counties. Within its boundaries reside 34 incorporated municipalities, as seen in Figure 1, with the City of Miami as its very first, established in 1896, and Cutler Bay its most recent, founded in 2005.[2] Miami-Dade possesses noteworthy industry centers, significant cultural venues, local and national parks. It hosts events that draw international attention. Its communities are as dynamic as the people who inhabit them. A visitor to the county can experience the urban core of Miami, the buzz of Miami Beach, and the historical significance of Coral Gables. Connecting these locations is a transportation system with major expressways such as I-95, I-75, SR 826/Palmetto Expressway, SR 836/Dolphin Expressway, SR 874/DonShula Expressway, SR 5/US-1/Biscayne Boulevard, and the Homestead Extension of Florida's Turnpike (HEFT).

[1] https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

[2] https://www8.miamidade.gov/global/government/municipalities.page




While ride-hailing and motorized scooters are becoming more popular, the Metrorail, Metromover, and Metrobus are the primary source of alternate modes of transportation for Miami-Dade County beyond the personal vehicle. With the county's ever-growing population, providing and/or enhancing alternative modes of travel is critical to allow people to move around the county to live and work. The Transportation Planning Organization's (TPO) efforts with the Strategic Miami Area Rapid Transit (SMART) Plan is an example of keeping a multimodal vision front-and-center for a healthy future for this county. "The SMART Plan is a comprehensive plan which advances six (6) rapid transit corridors and nine (9) Bus Express Rapid Transit (BERT) corridors to the Project Development and Environment (PD&E) study phase to determine the costs and potential sources of funding for the projects."[3] Seeking locally appropriate answers to the first mile/last mile question can play a huge role in determining that system's success. Cultivating a non-motorized network that empowers bicyclists and pedestrians, as well as improves accessibility to the greater transit network is a critical component to that answer. Non-motorized travel and transit working together in a symbiotic relationship can build upon one another, making each other more successful in Miami-Dade County.

The Miami-Dade 2045 Bicycle and Pedestrian Master Plan assesses opportunities amongst the SMART Plan transit hubs and stations to expand the reach of bicycle and pedestrian trip distances to the entire county, with the help of transit connections. This Bicycle and Pedestrian Plan's primary focus is on the daily commuter trip and aims to incentivize projects that safely connect the largest number of people, that need it the most, to the most places, on a daily basis. This plan also looks at other pedestrian and bicycle trip destinations such as educational facilities, major medical centers, high employment areas, and outdoor recreational locations. Realizing these opportunities will help manage the ever-present issue of traffic any metropolitan area deals with and further encourages healthy and sustainable communities within the County. This plan serves as the non-motorized element of the 2045 Long Range Transportation Plan (LRTP).

[3] https://www.miamidade.gov/citt/smart-plan.asp

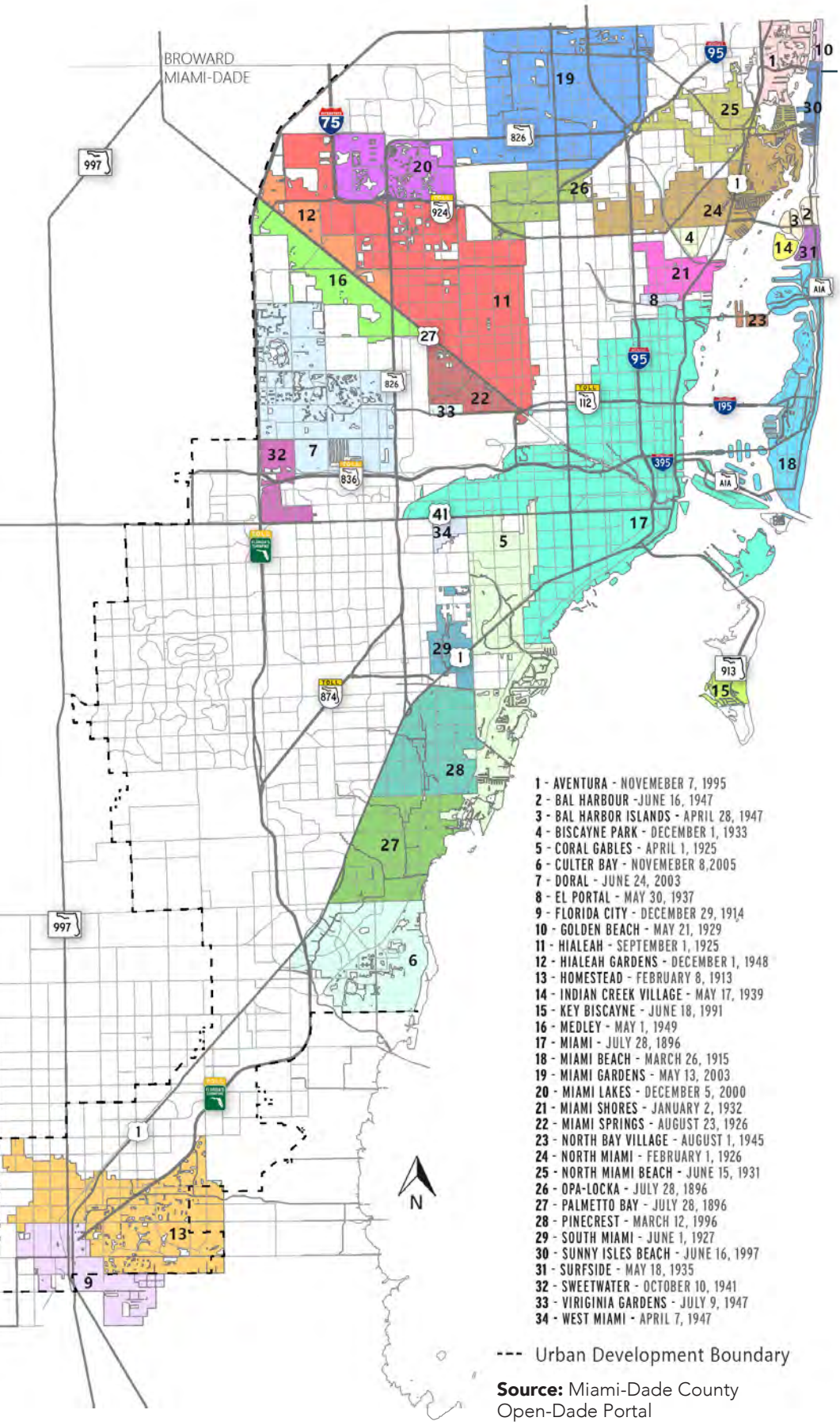



**FIGURE 1**
STUDY AREA

**Source:** Miami-Dade County Open-Dade Portal

The study area for this Bicycle and Pedestrian Master Plan is focused upon the urbanized environment of Miami-Dade County highlighted by the dashed line, in Figure 1, which represents the Urbanized Development Boundary (UDB).

The alignment of the UDB is assessed every seven years, as part of the Comprehensive Development Master Plan (CDMP), with the most recent adoption by the Board of County Commissioners (BCC) occurring in 2018. This boundary identifies the area where urban development may occur through the year 2020. Development orders permitting urban development will generally be approved within the UDB at some time through the year 2020 provided that level-of-service standards for necessary public facilities will be met. Adequate county-wide capacity will be maintained within the UDB by increasing development densities or intensities inside the UDB or by expanding the UDB when the need for such change is determined to be necessary through the amendment process.

The 34 municipalities which preside in the county can also be observed within Figure 1.

# VISION & GOALS

The vision of the Miami-Dade 2045 Bicycle and Pedestrian Master Plan is to enhance the accessibility, safety, public health, social equity, environment, and overall quality of life within Miami-Dade County for users of all abilities, at all times. This Plan also seeks to strengthen bicycle and pedestrian friendly communities' connections with existing and future transit opportunities to further encourage alternate modes of transportation throughout the county.

This vision is guided by goals set forth to achieve an overall multimodal vision for the County's transportation network. Thus, this plan reflects other state, agency, and municipal planning efforts such as area plans, corridor studies, or other decisions that modify and enhance the mobility and connectivity of the residents as well as its visitors. This study shares the following goals and/or strategies with the Miami-Dade 2045 Long Range Plan to develop recommendations and suggest improvements that benefit all who visit and live in Miami-Dade County.

**GOAL 1** Maximize Mobility Choices Systemwide

**GOAL 2** Increase the Safety of the Transportation System for All Users

**GOAL 3** Increase the Security of the Transportation System for All Users

**GOAL 4** Support Economic Vitality

**GOAL 5** Protect and Preserve the Environment and Quality of Life and Promote Energy Conservation

**GOAL 6** Enhance the Integration & Connectivity of the System, Across & Between Modes for the benefit of People

**GOAL 7** Optimize Sound Investment Strategies for System Improvement and Management/Operations

**GOAL 8** Improve and Preserve the Existing Transportation System


LITERATURE
REVIEW

An important element of a successful mobility plan is to understand prior initiatives that can provide information about the context in which this plan exists and can provide information about projects that can be used as a starting point for enhancing bicycle and pedestrian mobility. Recommendations and projects identified in prior studies that may affect the outcome of this plan's project bank have been highlighted.

# MIAMI-DADE TPO

## 2040 LRTP

The Miami-Dade TPO's 2040 LRTP is intended to assist stakeholders, citizens, community leaders, businesses, and elected officials in achieving the County's transportation vision through 2040. The LRTP serves as a tool in identifying needed improvements to the transportation network and provides a long-term investment framework to address current and future challenges.

## SMART PLAN

The SMART Plan is a comprehensive program which advances six (6) rapid transit corridors, and nine (9) BERT corridors, seen in Figure 2, to the Project Development and Environmental (PD&E) study phase to determine the costs and potential sources of funding for the projects. The Citizen's Independent Transportation Trust (CITT) has committed to work collaboratively with the County, the community, municipalities, transportation partners, and the private sector to develop a funding strategy to use People's Transportation Plan (PTP) funds to implement the projects in the SMART Plan. Tables 1 and 2 list the currently proposed Rapid Transit and BERT corridors.

**TABLE 1** SMART PLAN RAPID TRANSIT CORRIDORS

| CORRIDOR | FROM | TO | LOCALLY PREFERRED ALTERNATIVE SELECTION (LAP) DATE |
|---|---|---|---|
| Beach Corridor | Midtown Miami | Miami Beach Convention Center | Winter 2019-20 |
| East-West Corridor | Miami Intermodal Center (MIC) | Florida International University | Winter 2019-20 |
| Kendall Corridor | Dadeland Area Metrorail Stations | SR 997/Krome Avenue | Winter 2019-20 |
| North Corridor | Martin L. King, Jr. Metrorail Station | NW 215th Street | Winter 2019 |
| Northeast Corridor | Downtown Miami | City of Aventura | Under Negotiation |
| South Dade Transitway | Dadeland South Metrorail Station | SW 344th Street Transit Terminal (Florida City) | Fall 2018 |

**TABLE 2** SMART PLAN BERT CORRIDORS

| CORRIDOR | DESCRIPTION |
|---|---|
| Beach Express (N) | North – Miami Beach Convention Center to Golden Glades via I-95 |
| Beach Express (C) | Central – Miami Beach Convention Center to Civic Center via Julia Tuttle Causeway |
| Beach Express (S) | South – Miami Beach Convention Center to Downtown Miami via MacArthur Causeway |
| Flagler Corridor | Downtown Miami to West Dade via Flagler Street |
| Florida's Turnpike Express (N) | North – Dolphin Station to North Miami-Dade via the HEFT |
| Florida's Turnpike Express (S) | South – Dolphin Station to SW 344th Street via the HEFT |
| Northwest Miami-Dade Express | Palmetto Metrorail Station to Miami Gardens Drive Park-and-Ride via Palmetto Expressway and I-75 |
| South Miami-Dade Express | Dadeland North Metrorail Station to southern Miami-Dade County via SR-878, SR-874, and Florida's Turnpike |
| Southwest Miami-Dade Express | Dadeland North Metrorail Station to Miami Executive Airport via SR-878 and SR-874 |

## SMART PLAN (CONTINUED)

A significant influence on the 2045 LRTP is the SMART Plan. To ensure the selection of the most suitable technology, two major activities are ongoing as part of the planning and visioning process of the SMART Plan. These activities include:

- Land Use and Visioning studies headed by the TPO
- PD&E Studies headed by the Florida Department of Transportation (FDOT) and Miami-Dade Department of Transportation and Public Works (DTPW)

## 2020-2024 TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

The Transportation Improvement Program (TIP) is a staged multi-year program that prioritizes transportation improvement projects for federal, state, and local funding. The TIP puts the LRTP into action as the capital improvements element of the LRTP. The TIP is the vehicle that brings the projects in Miami-Dade County's LRTP to implementation. The TIP lists specific projects and the anticipated schedule and cost for each project. Projects in the TIP must be financially constrained, undergo a series of evaluations, and include opportunity for public comment. The prioritized list generated by the TIP can be amended in between each update. As a living document, the TIP must stay current and up-to-date documenting the funding and implementation schedule of the near term (the next five-years) investments.

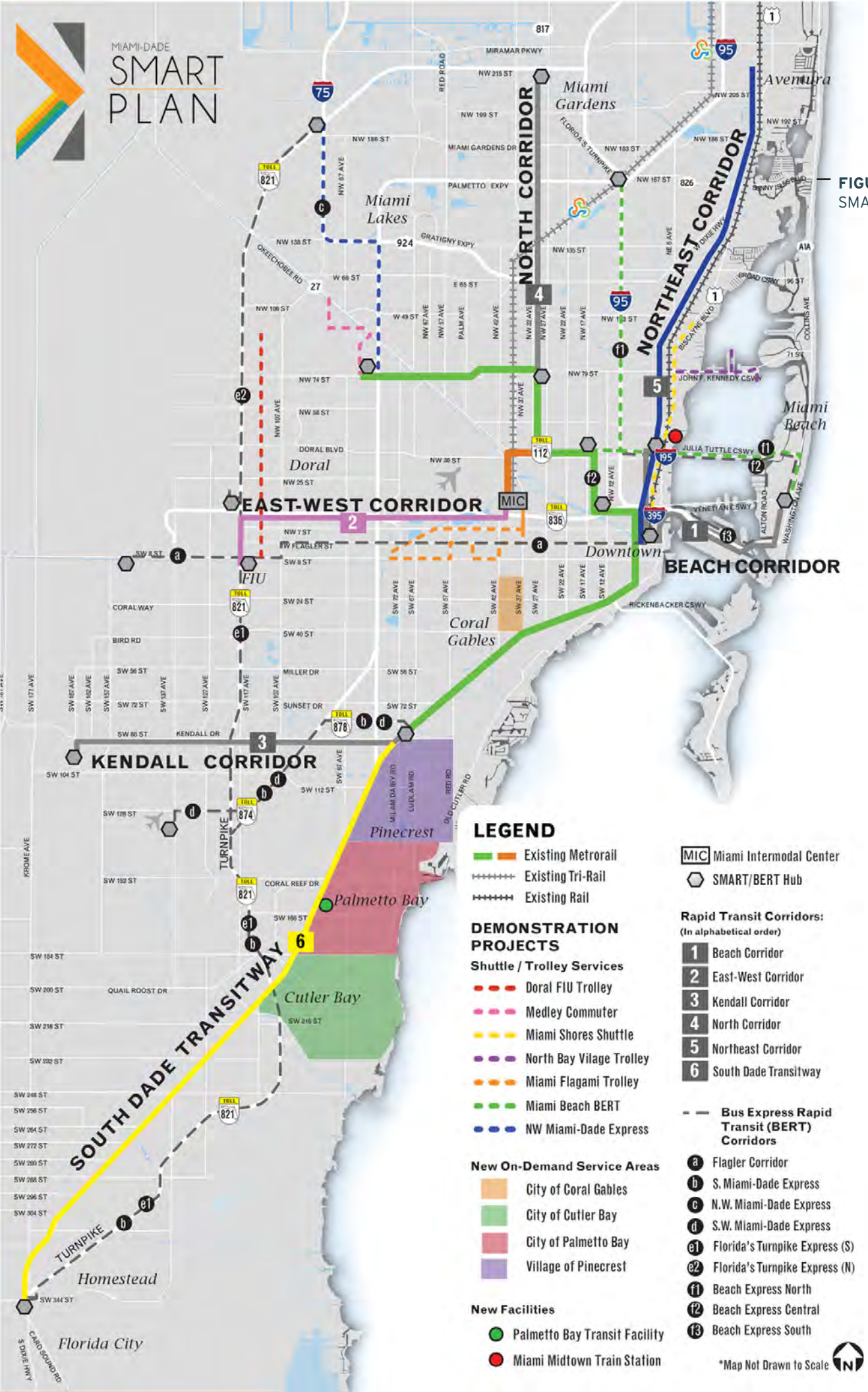



**FIGURE 2**
SMART PLAN MAP

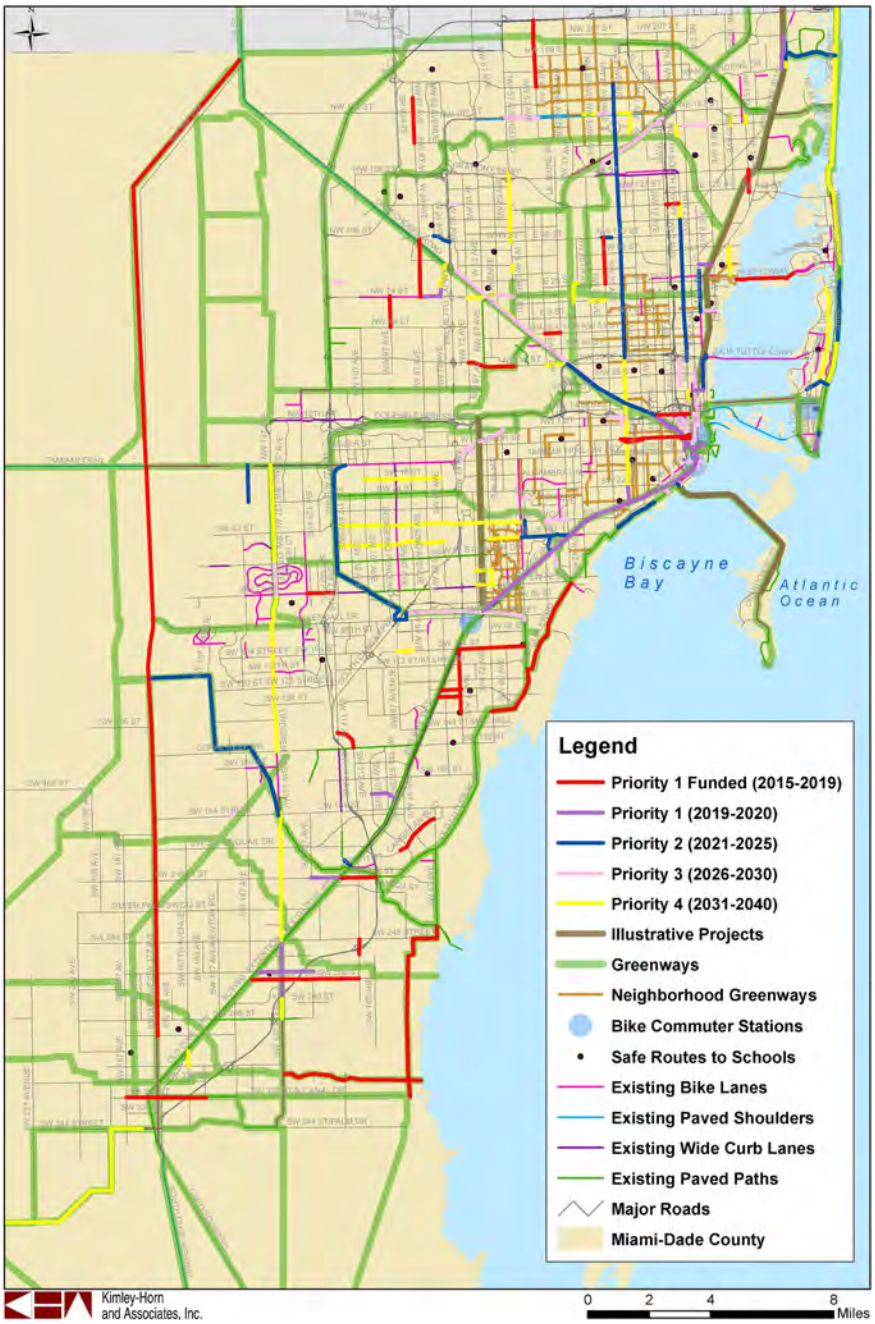



**FIGURE 3** 2040 BICYCLE AND PEDESTRIAN PLAN - EXISTING AND PROPOSED PROJECTS

## 2040 BICYCLE AND PEDESTRIAN PLAN

The 2040 Bicycle and Pedestrian Plan serves as the non-motorized element of the 2040 LRTP and presents a vision to enhance the transportation network of Miami-Dade County. The plan analyzes the bicycle and pedestrian Level of Service (LOS) on major arterials and highlights several showcase projects for the Greenways and Trails Network. Among these projects are the Atlantic Trail, Rickenbacker Causeway, Biscayne Boulevard, Flagler Trail, Ludlam Trail, and several others.

The Bicycle and Pedestrian Plan includes a bicycle needs assessment to identify facilities that should be more bicycle friendly. The evaluation criteria used for the assessment are:

- Operations and Safety (LOS and Crash Data)
- Connectivity (Existing Facilities and Missing Gaps)
- Local Support (Funding)
- Cost Feasibility (Right-of-Way Availability)

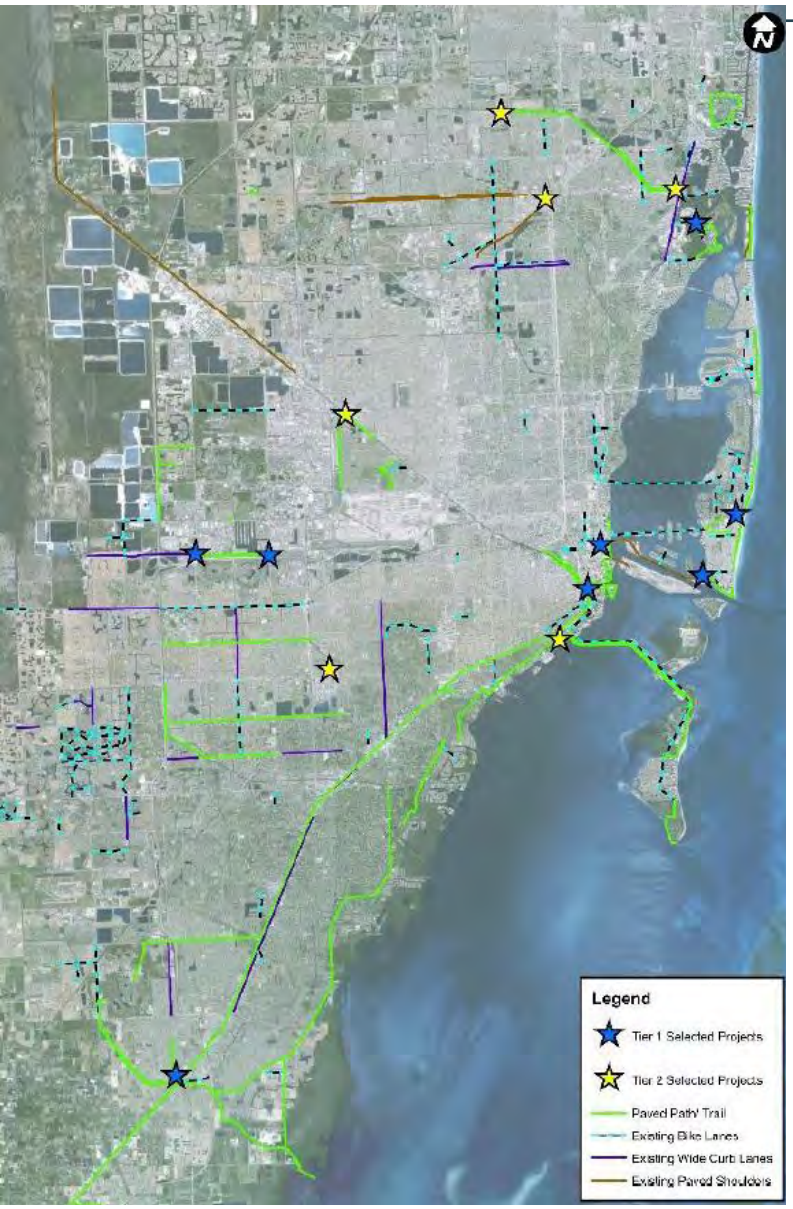



**FIGURE 4** TPO NON-MOTORIZED CONNECTIVITY PLAN RECOMMENDED PROJECTS

## NON-MOTORIZED NETWORK CONNECTIVITY PLAN

The non-motorized Mobility Network Connectivity Plan presents a vision for enhancing non-motorized transportation mobility and accessibility in Miami-Dade County to connect the county's cities, neighborhoods, key destinations, and existing infrastructure investments. The plan identified a preliminary list of 14 potential projects, of which six (6) were selected for further study and are listed below:

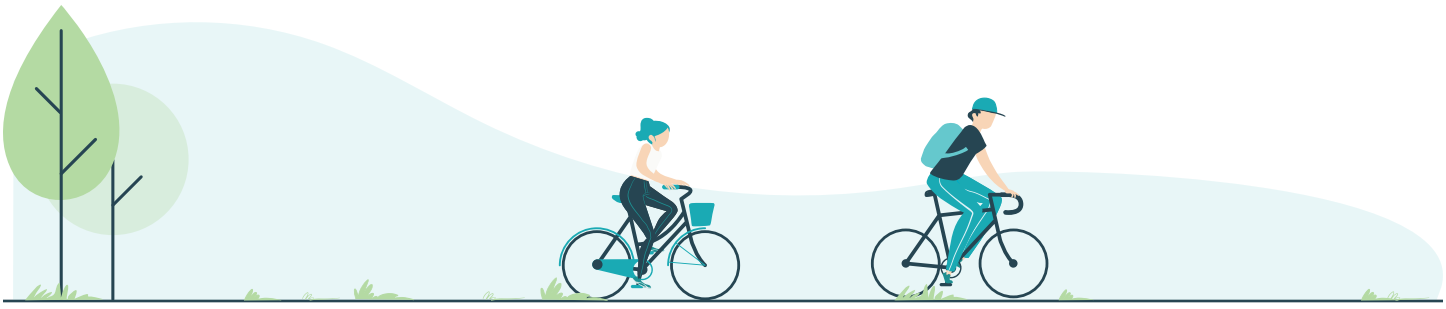
- Miami Gardens connection to the Golden Glades Tri-Rail Station;
- Snake Creek Trail extension to Unity Station (NW 27th Avenue) and NW 199th Street BRT Stations;
- Snake Creek Trail extension to Greynolds Park and Sunny Isles Causeway;
- Coral Way shared use path connection to A.D. "Doug" Barnes Park and Tropical Park;
- Commodore Trail connection to the Rickenbacker Causeway; and
- Miami Springs and Medley connection to Okeechobee Metrorail Station.

## PROTECTED BICYCLE LANES DEMONSTRATION PROJECT

The primary objective of the Protected Bicycle Lanes Demonstration Plan is to provide Miami-Dade County with two protected bicycle lane concept designs that are fit for fast-track demonstration project implementation. The plan also focuses on identifying demonstration-friendly segments that possess most of the following attributes:

- Connectivity to the SMART Plan and transit,
- Low Annual Average Daily Traffic (AADT),
- Low Volume to Capacity (V/C) ratios,
- Ample Right-of-Way (ROW),
- Existing on-street parking,
- Existing bike facilities, and
- Connectivity to numerous destinations.

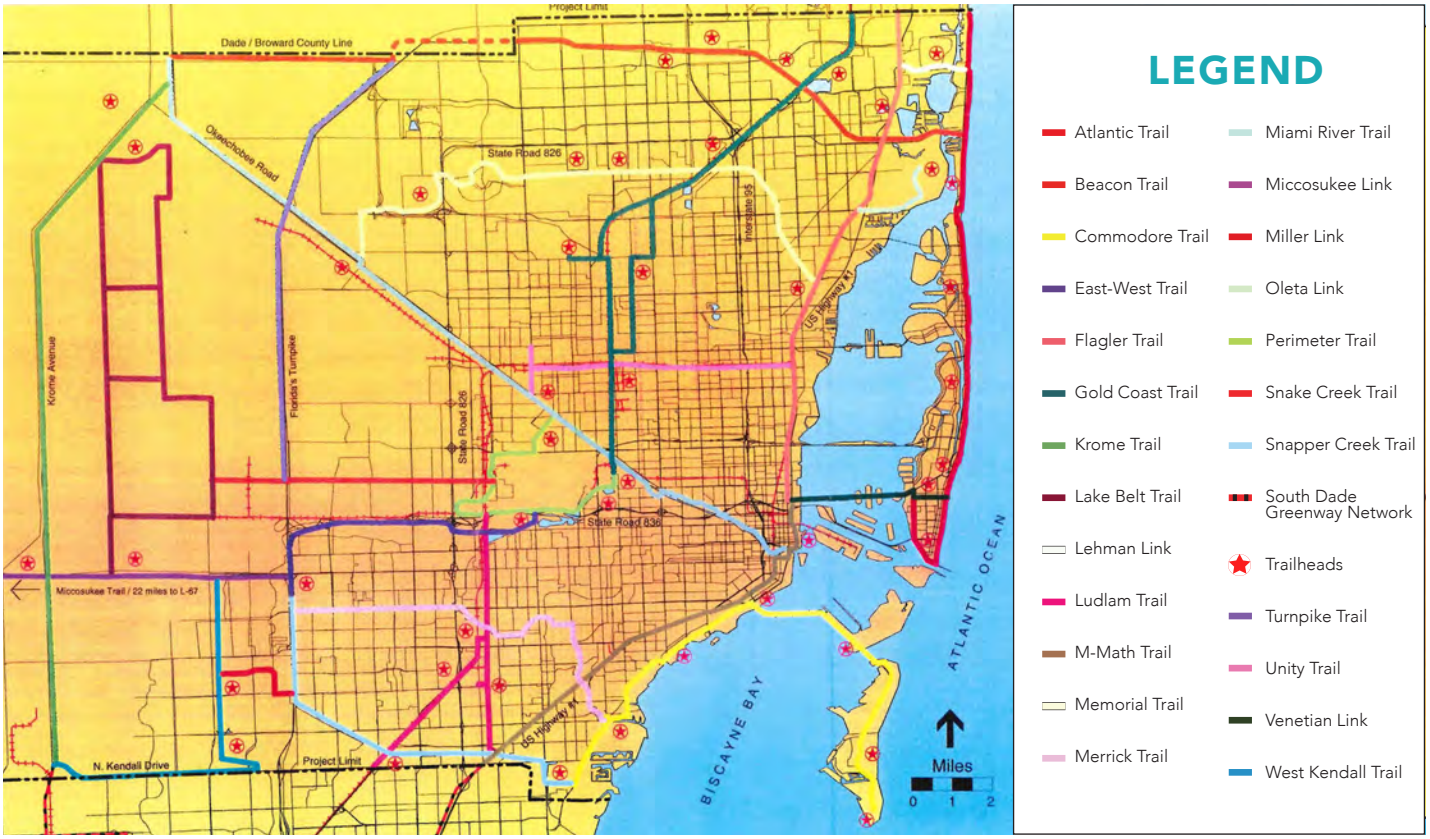
Background research was conducted on current Miami-area protected/separated bike-lane projects and a Study Advisory Committee was formed that comprised of municipal agency stakeholders who represented public works, bicycle and pedestrian planning, parks and recreation, parking authority, downtown development authority, and others. This committee analyzed and reviewed the research collected and provided advisement for potential protected bicycle lane segments. The two characteristics that are crucial in future efforts to build protected bicycle lane segments are safety and network connectivity. It is essential that any potential locations do not have any restraints that would affect these criteria.



## NORTH DADE GREENWAYS MASTER PLAN

The North Dade Greenways Master Plan proposed an integrated system of connectors for bicyclists and pedestrians along more than 300 miles of urban corridors in Miami-Dade County. The 24 connectors proposed in the Master Plan seek to enhance connectivity and provide aesthetically-pleasing recreational green spaces. These greenways are planned to decrease air pollution, create spaces that sustain biodiversity of plant and animal communities, create connectors that allow interchange between native plant and animal communities, and protect native ecosystems and landscapes. Figure 5 illustrates the 24 corridors proposed in the North Dade Greenways Master Plan.

**FIGURE 5** NORTH DADE GREENWAYS MASTER PLAN PROPOSED TRAILS



## SOUTH DADE GREENWAYS MASTER PLAN

Following the disastrous event of Hurricane Andrew in 1992, the South Dade community sought to create a comprehensive, multi-purpose trail network that would provide scenic, recreational, and utilitarian corridors to be enjoyed by both residents and tourists. This South Dade Greenway Network (SDGN) will be an organized system of ten interconnecting trails totaling 194 miles in length. The SDGN will traverse the area south of Kendall Drive to the Monroe County line and Biscayne Bay to Everglades National Park. The proposed/existing trails utilize publicly owned right-of-way and various locations requiring acquisition. Most of the right-of-way is maintained by the South Florida Water Management District (SFWMD) (98.1 miles), FDOT (54.3 miles), DTPW (41.1 miles) and City of Homestead (0.5 miles). Originally it was proposed that 147.5 miles, or 76%, of the SDGN will be paved and 158.8 miles, or 82%, of the SDGN will be built off-road. The ten trails listed in the report are as follows:

- Biscayne Trail
- Black Creek Trail
- Biscayne-Everglades Greenway
- Keys Trail
- Krome Trail
- Mowry Trail
- Princeton Trail
- South Dade Trail
- Southern Glades Trail
- Tallahassee Connector

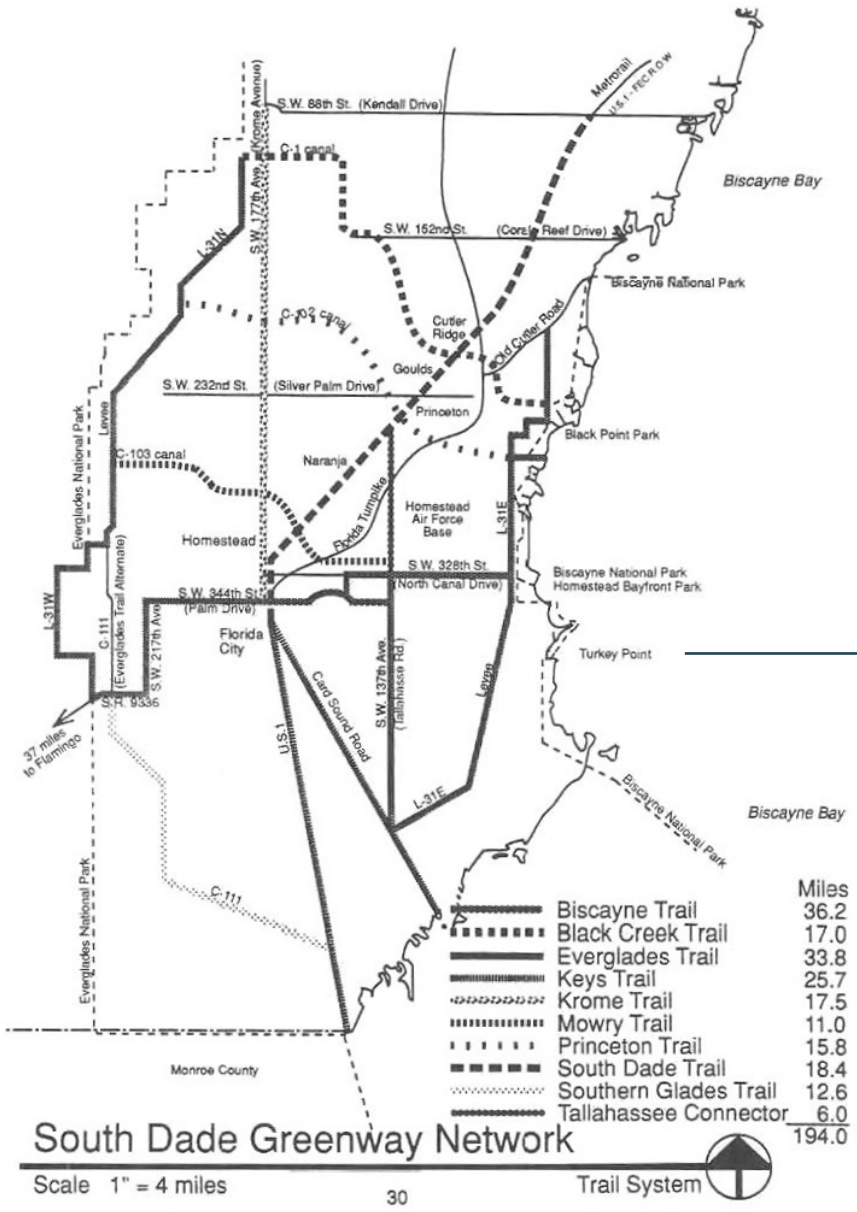



**FIGURE 6** SOUTH DADE GREENWAYS MASTER PLAN PROPOSED TRAILS

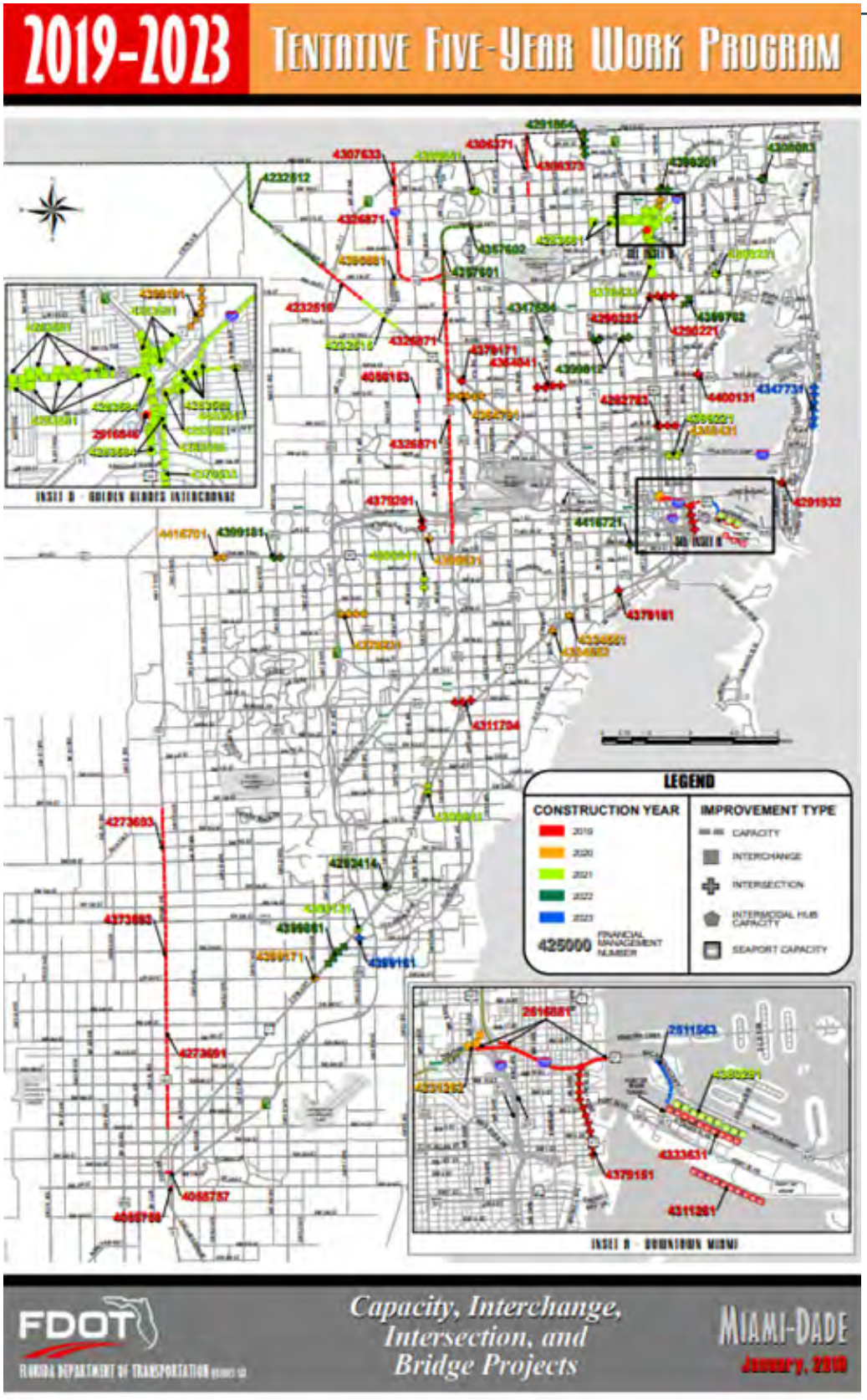



**FIGURE 7** 2019 WORK PROGRAM CAPACITY INTERCHANGE, INTERSECTION, AND BRIDGE PROJECTS

# FDOT

## 2019 WORK PROGRAM

The Work Program is a five-year plan developed and maintained to maximize the Department's production and service capabilities. The work program prioritizes the innovative use of resources, increased productivity, reduced cost, and strengthened organizational effectiveness and efficiency.

**FIGURE 8** 2019 FDOT WORK PROGRAM STRUCTURAL AND LIGHTING PROJECTS

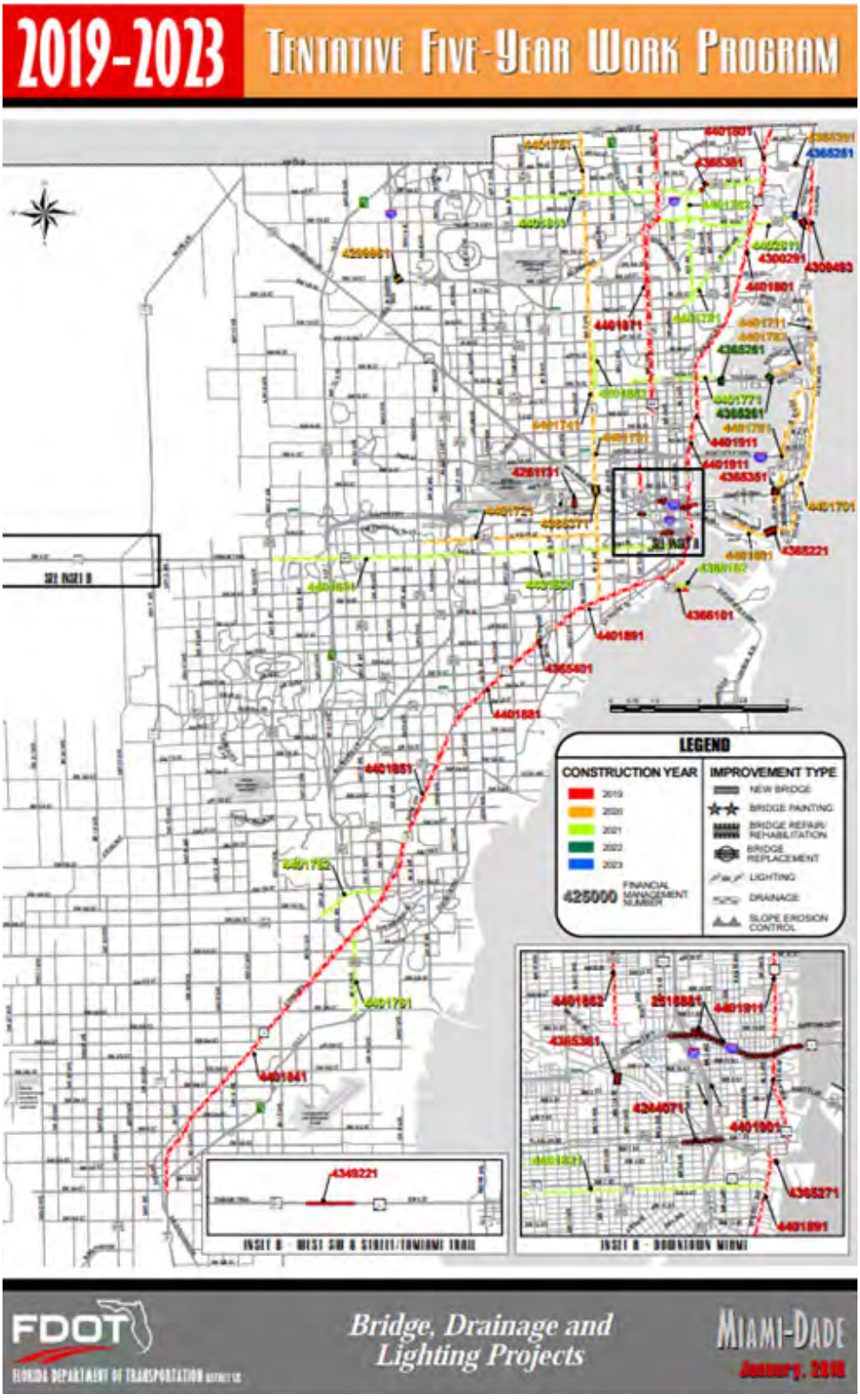
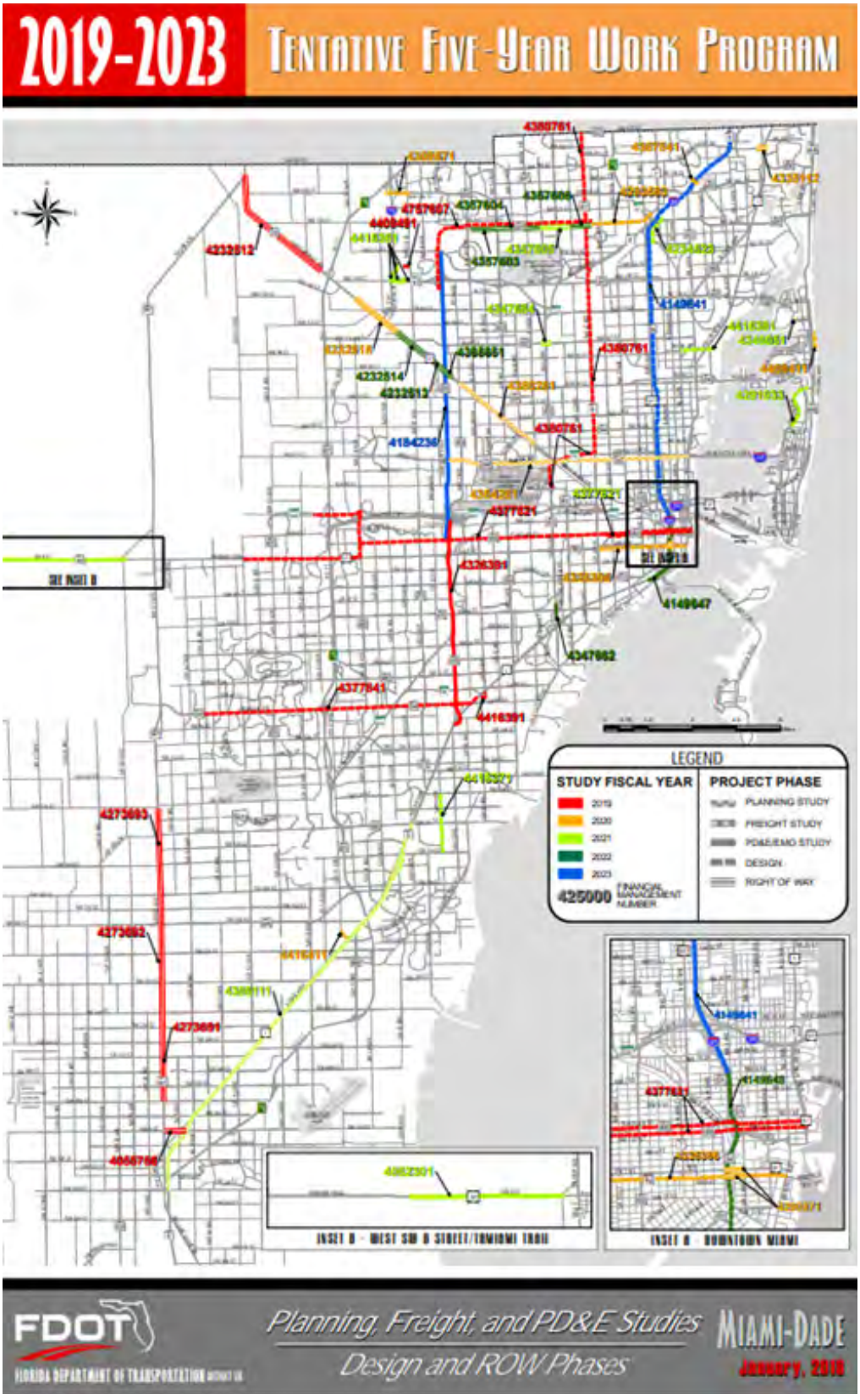
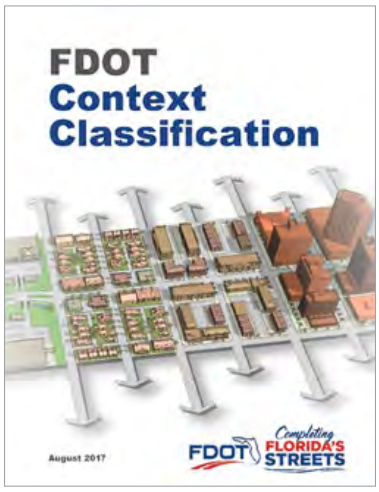


**FIGURE 9** 2019 FDOT WORK PROGRAM PLANNING PROJECTS




## FDOT COMPLETE STREETS & CONTEXT CLASSIFICATION

In 2014, FDOT adopted a Complete Streets policy to ensure that future transportation decisions and investments address the needs of all users and reflect community goals and context. In the following year, FDOT collaborated with Smart Growth America to develop a Complete Streets Implementation Plan. Revising the FDOT Design Manual to support Complete Streets was a part of this implementation plan and was necessary to move Complete Streets forward in Florida. The 2019 updated Florida Design Manual (FDM) describes how FDOT will take land use into consideration when making design decisions about planning and road design, as well as a general call for lower design speeds on roadways. It increases design flexibility and considerations for people walking, bicycling, using transit, driving, and freight. Design flexibility allows engineers to choose from a menu of design options to better adjust the road design to the needs of a community. The manual also includes components that support quality of life and economic development, such as wider sidewalks, on-street parking, and road diets to give more road space to non-car transportation.

To work in tandem with these new context sensitive design guidelines, FDOT also developed a specific method of evaluating the context of state roadways. This document outlines the steps to determine a roadway's context classification. Measures used to determine the context classification are presented in Table 3 and a process to define the context classification is outlined for:

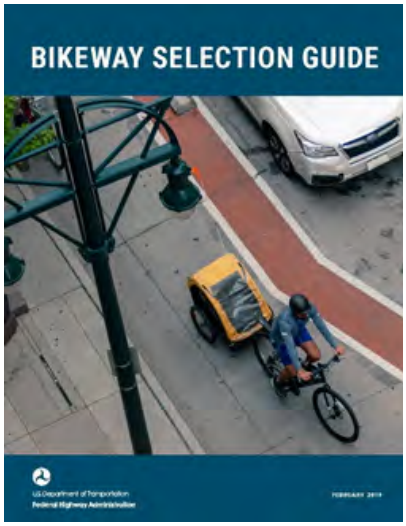
- All projects on existing roadways and for projects that propose new roadways and are in the PD&E or design phases, and
- Projects evaluating new roadways in the planning and ETDM screening phases.

**TABLE 3** FDOT CONTEXT CLASSIFICATIONS AND CORRESPONDING CHARACTERISTICS

| CONTEXT CLASSIFICATION | DISTINGUISHING CHARACTERISTICS |
|---|---|
| **C1-Natural** | Lands unsuitable for settlement due to natural conditions, such as preservation of wilderness |
| **C2-Rural** | Sparsely settled lands, such as agricultural sectors |
| **C2T-Rural Town** | Small concentrations of developed land surrounded by rural and natural areas |
| **C3R-Suburban Residential** | Residential land using large blocks and sparse roadway networks |
| **C3C-Suburban Commercial** | Non-residential land with large buildings and parking lots within large blocks and sparse roadway networks |
| **C4-Urban General** | Various land uses within small blocks with a well-connected roadway network that may connect to residential neighborhoods along the corridor or behind the uses fronting the roadway |
| **C5-Urban Center** | Various land uses within small blocks with a well-connected roadway network. Usually concentrated around a few blocks and identified as part of a center of a community, town, or city |
| **C6-Urban Core** | Land has highest densities and building heights. Population over 1,000,000. Usually regional centers and destinations. Buildings vary by usage and are built up to a well-connected roadway network |

Using the characteristics of each context classification, crucial design criteria can be determined for each roadway to enhance, instead of detract from, the surrounding community. The design criteria includes primary measures such as land use, building height and placement, fronting uses, parking location, and block length. The criteria also includes, secondary measures made up of various densities, such as those of residents and commercial uses.

## FEDERAL HIGHWAY ADMINISTRATION'S (FHWA) BIKEWAY SELECTION GUIDE




This document is a resource to help transportation practitioners consider and make informed trade-off decisions relating to the selection of bikeway types. It is intended to supplement planning and engineering judgment. It incorporates and builds upon the FHWA's support for design flexibility to assist transportation agencies in the development of connected, safe, and comfortable bicycle networks that meet the needs of people of all ages and abilities.

This guide references existing national resources from FHWA, the American Association of State Highway and Transportation Officials (AASHTO), the National Association of City Transportation Officials (NACTO), the Institute of Transportation Engineers (ITE), and others. It is not intended to supplant existing design guides, but rather serve as a decision support tool. It points to relevant sources of design information and focuses on the following question:

> **"WHAT TYPE OF BIKEWAY SHOULD BE CHOSEN ON THIS PARTICULAR STREET OR IN THIS PLAN GIVEN REAL-WORLD CONTEXT, CONSTRAINTS, AND OPPORTUNITIES?[4]"**

[4] Federal Highway Administration's Bikeway Selection Guide https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf

# MUNICIPALITY PLANS

## CITY OF MIAMI BICYCLE MASTER PLAN

The 20-year vision of the City of Miami Bicycle Master Plan was to provide a four (4) phase plan for the City's bikeway network, enhance or expand the available bicycle parking facilities, and promote non-motorized safety. The four (4) phases of the plan were developed based on the priorities and needs within specific districts and corridors throughout the City of Miami. The districts highlighted as critical areas of Miami are: Wynwood, Marlins Stadium, Civic Center, and Coconut Grove. The following table lists some of the priority corridors identified in the report:

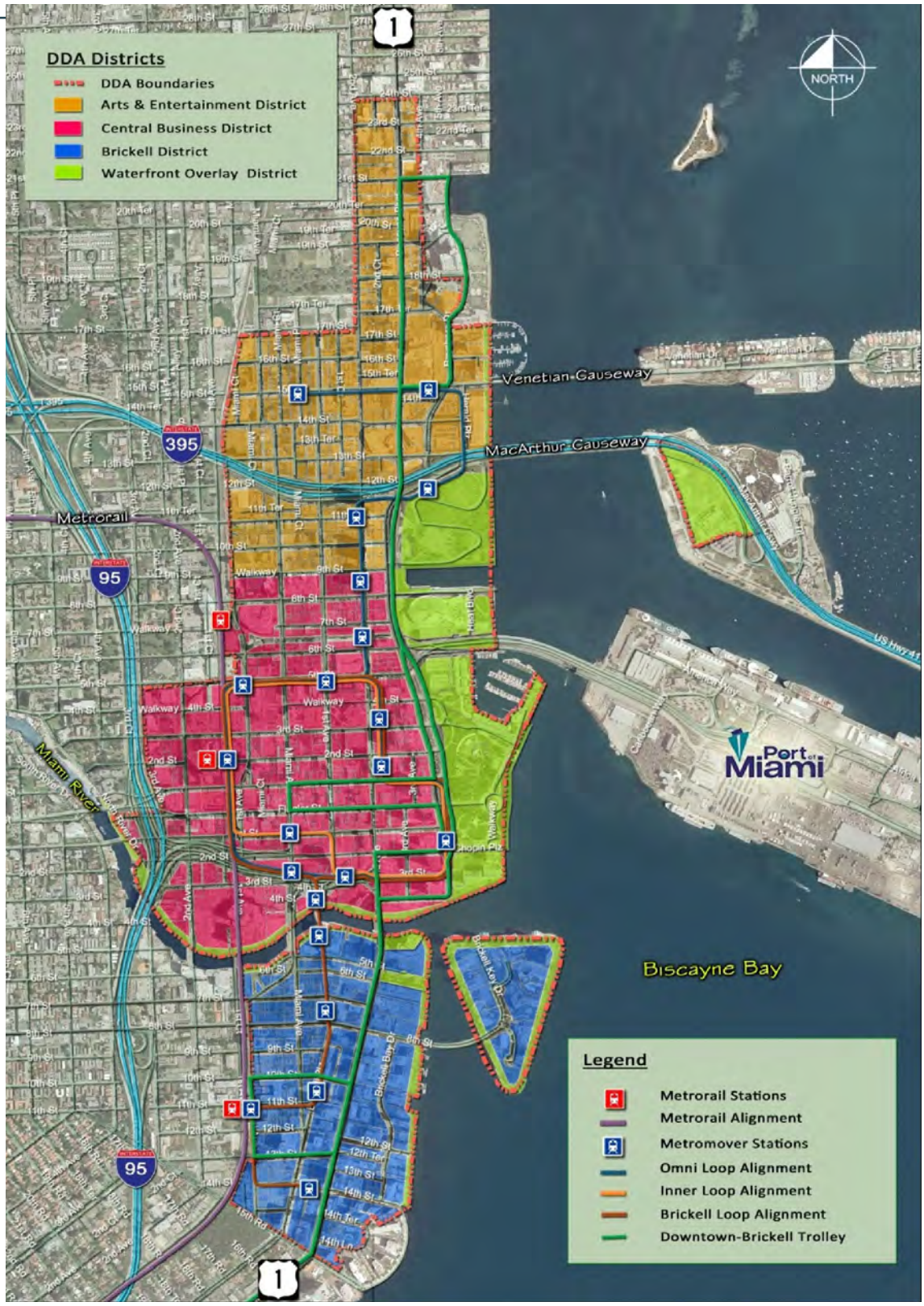
**TABLE 4** CITY OF MIAMI MASTER PRIORITY CORRIDORS

| PLANNING PERIOD | FACILITY NAME |
|---|---|
| **2010-2015** | US 1/Biscayne Boulevard |
| **2010-2015** | SR 972/SW 22nd Street/Coral Way |
| **2010-2015** | SW 1st Street |
| **2010-2015** | NW 3rd Avenue |
| **2010-2015** | SW 8th Street |

## MIAMI DDA BICYCLE & PEDESTRIAN PLAN

The Miami Downtown Development Authority (DDA) Bicycle and Pedestrian Mobility Plan used data collection, public feedback, and engineering evaluation to determine pedestrian and bicycle facility needs within four (4) areas of the DDA: the Arts & Entertainment District, Central Business District, Brickell District, and Waterfront District. After the assessments were completed, a list of areawide improvements, site-specific improvements, and non-engineering improvements were generated.

**FIGURE 10**
MIAMI DOWNTOWN DEVELOPMENT AUTHORITY DISTRICTS

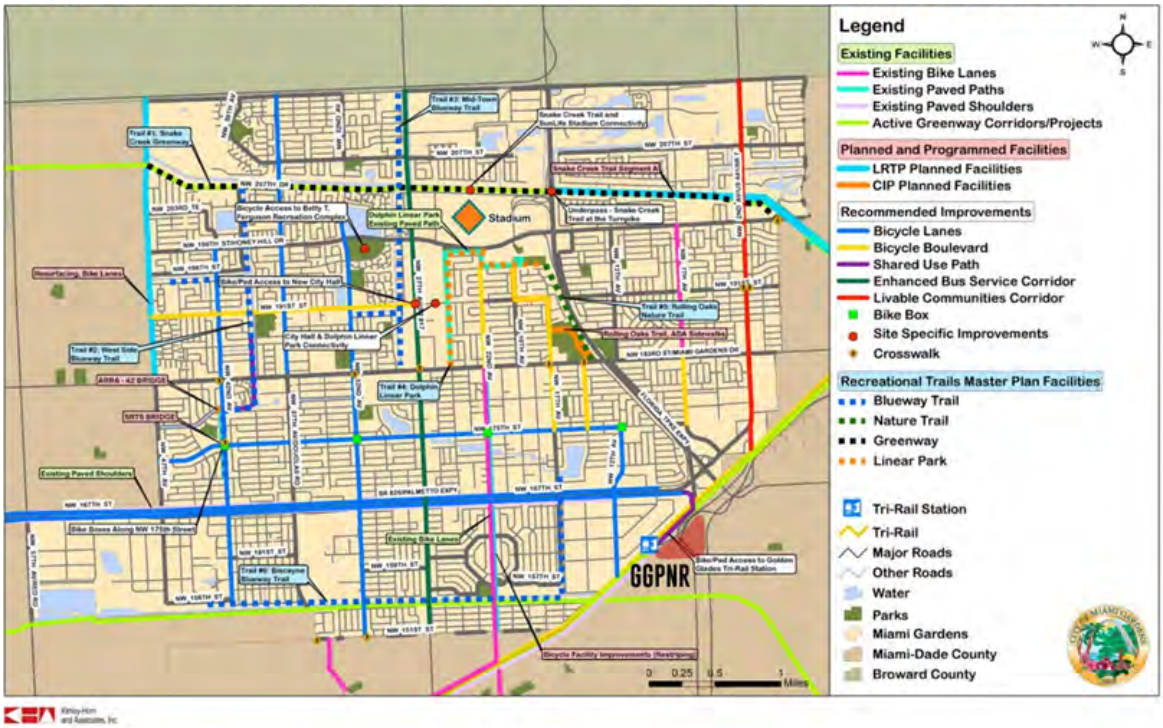


## CITY OF MIAMI GARDENS PEDESTRIAN/BICYCLE MOBILITY PLAN

The primary objective of this plan was to prepare a bicycle and pedestrian mobility vision for the City of Miami Gardens through a project bank that incorporates the greenways and blueways recommended in the Recreational Trails Master Plan. This plan aims to:

- Enhance the city-wide bicycle and pedestrian safety network,
- Provide bicycle facilities and amenities for use as a method of transportation,
- Improve traffic flow and safety for intermodal transportation, and
- Refine goals as identified in the City's Transportation Element of the Comprehensive Development Master Plan.

**FIGURE 11** CITY OF MIAMI GARDENS BICYCLE & PEDESTRIAN MOBILITY PLAN PROJECTS



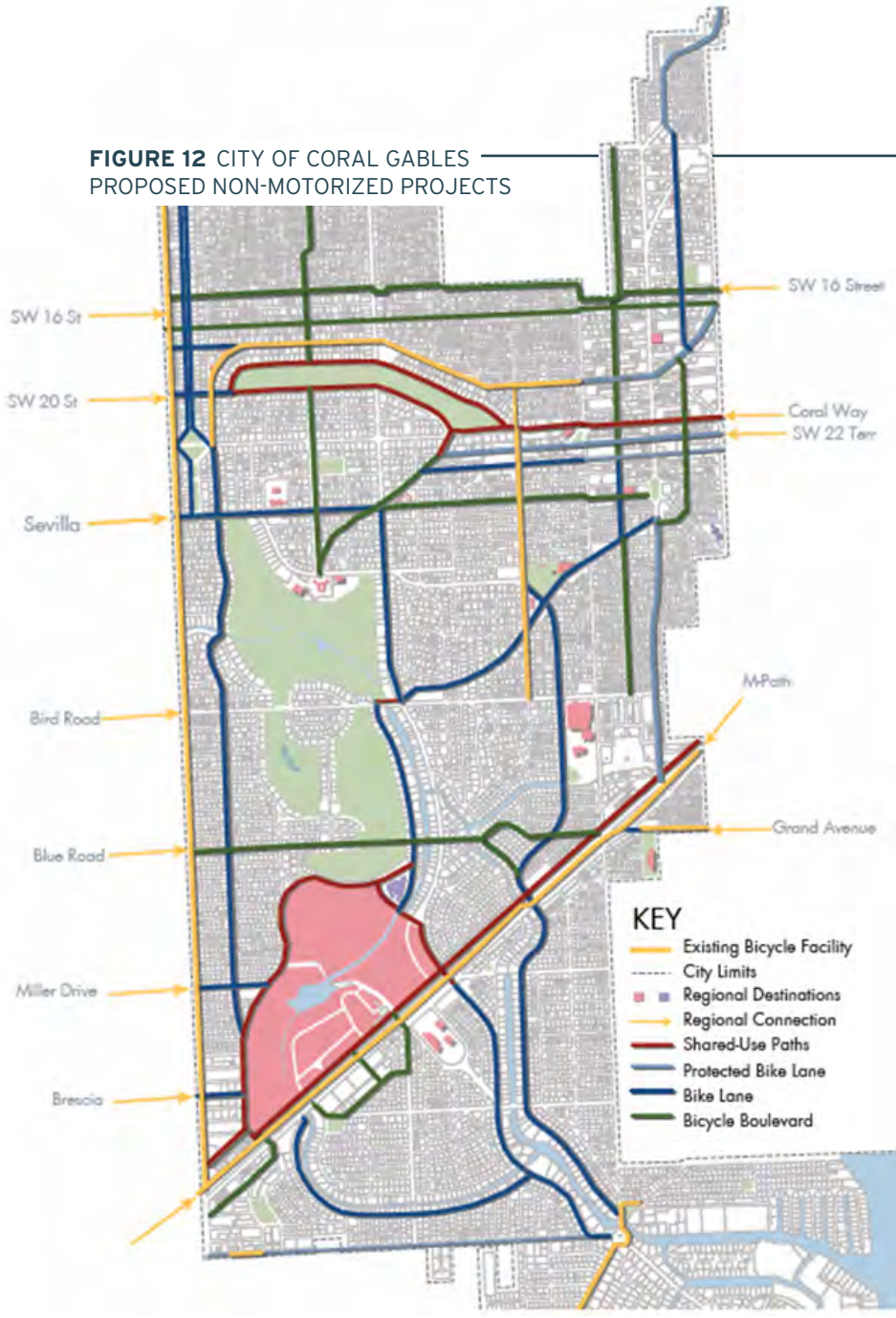
## CITY OF CORAL GABLES BICYCLE & PEDESTRIAN PLAN

In 2014, Coral Gables moved to invest $400,000 for the expansion of bike facilities in the short term, as well as identifying bicycle and pedestrian investments in the long term. Thirty-four (34) miles of new bikeways have been proposed. This means that Coral Gables' bike network is to be a total length of 36 miles, comprising of four (4) bikeway types:

- **Bicycle Boulevards:** Nine (9) miles total, comprised of a thoroughfare with shared vehicular lanes giving movement priority to bicyclists.
- **Bicycle Lanes:** Fifteen (15) miles total, comprised of lanes reserved for bicycle travel within a thoroughfare, marked by a painted line.
- **Shared Use Paths:** Six (6) miles total, comprised of a two-way facility separated from motor vehicle traffic with an open space or barrier, designed to accommodate pedestrians as well as bicyclists.
- **Protected Bike Lanes:** Four (4) miles total, comprised of lanes separated from motor vehicle traffic by curbs, railings, plantings, parked cars, or grade separation.

Other improvements include sidewalk and crosswalk improvements throughout the City, including crosswalk improvements at 11 different locations. Moreover, in an effort to incentivize bike usage, bicycle parking will be available at 16 different locations.

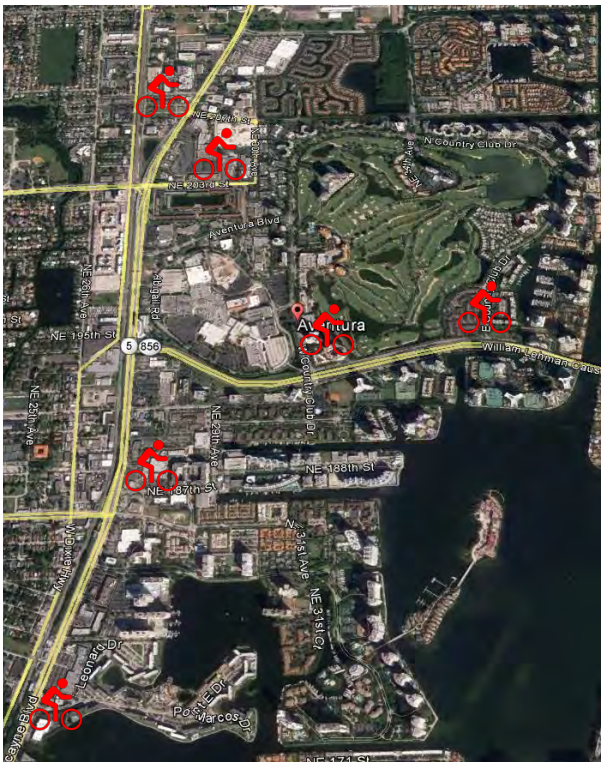
**FIGURE 12** CITY OF CORAL GABLES PROPOSED NON-MOTORIZED PROJECTS



## AVENTURA UNIFIED MASTER PLAN FOR PEDESTRIAN AND BICYCLE CONNECTIVITY

Aventura identified opportunities to connect to neighboring municipalities and the regional system of planned and existing bikeways. The municipality also identified pedestrian crossing strategies and current impediments in the sidewalk network. Other initiatives included expanding the network of bicycle facilities, including bike-share kiosks and bike lanes.

A list of improvements worth $2.3 million is proposed and is to be funded by a mixture of local funds and matching state funds. The improvements include crosswalk improvements, pedestrian islands, and new sidewalk connections at the following locations:




- NW 213rd Street (2 locations)
- NE 203rd Street
- NE 30th Avenue
- Aventura Boulevard (2 locations)
- Biscayne Boulevard (6 locations)
- NE 187th Street
- NE 188th Street
- NE 31st Avenue
- NE 183rd Street
- NE 191st Street
- E. Dixie Highway
- NE 190th Street (3 locations)
- Lehman Causeway
- Aventura Transit Hub

Improvements also include pathway connections through Aventura's "Central Park" and Turnberry Golf Course, which consist of a new sharrow lane on NE 34th Avenue. Additionally, an intersection improvement project is proposed at W Country Club Drive and the Lehman Causeway. Lastly, three to five (3-5) bike sharing locations are proposed throughout the city, incentivizing ride-share pedestrian mobility.

## SOUTH MIAMI-DADE EVALUATION OF MULTIMODAL MOBILITY OPTIONS

South Miami-Dade County experiences a flow of about 200,000 people moving in and out of the area each day due to the small percentage of jobs despite the massive population in the area. This discrepancy causes major traffic in one direction, as residents are heading north in the morning and south in the afternoon. There are six (6) Strategic Miami Area Rapid Transit (SMART) corridors that will form a connected transit system. Activity hubs will make the SMART corridors more effective and competitive for funding, increase transit ridership, and relieve neighborhood streets of congestion due to traffic overflow.

Ninety-two (92) projects, composed of roadway, transit, bicycle and pedestrian proposals, have been created as part of this plan. Some examples of each are as follows:

### ROADWAY

- New bridge on SW 77th Ave @ SW 160th St
- Widening Krome Ave to 4 lanes
- SW 128th St connection to SR-874

### TRANSIT

- Metrorail extension to Cutler Bay
- Expansion of Park-and-Ride parking lots
- Circulator in Pinecrest that runs 7:00 AM to 10:30 PM

### BICYCLE

- Bicycle lanes on SW 136th St between Old Cutler Rd and US-1
- Greenway along SW 137th Ave between Black Creek Trail and SW 88th St
- Snapper Creek Trail

### PEDESTRIAN

- Pedestrian bridge on SW 98th Ave @ Canal C-100
- Local Hub Studies throughout the area to determine sidewalk/ pedestrian infrastructure

## DORAL TRANSPORTATION MASTER PLAN

The City of Doral has grown exponentially since its incorporation in 2003. In 2014, over 70,000 workers who live outside of the city were commuting into Doral every day, creating a large amount of external traffic. With additional projected growth in the coming years, approximately 20% of the roadway network will fail to meet standard in 2025. To prevent this, Doral has created a Master Plan, containing multimodal, roadway, and transit projects.

As for multimodal projects, the plan prioritizes implementing pedestrian safety improvements. Projects include sidewalk gap fills and repairs, pedestrian islands, crosswalks, bicycle racks and rental programs, and pedestrian bridges.

## TOWN OF CUTLER BAY COMPLETE STREETS CORRIDOR ANALYSIS

The Town of Cutler Bay is made up of various parks, schools, and residential and commercial areas. While all of these are easily accessible and connected for cars, bicyclists and pedestrians have a harder time reaching these destinations. Being in South Dade, the area also houses some of the remaining developable land in Miami-Dade. By meeting with the citizens and analyzing studies, the Town of Cutler Bay prioritized projects based on the following factors:

- Ease of Implementation
- Efficiency
- Maintains/Enhances Town Character

The top priority project is based around SW 87th Avenue, the primary transit corridor in the area. Franjo Road is to become an urban connector with a bike lane on the roadway. It connects the main commercial centers on Old Cutler Road and SW 184th Street. There will be a shared pedestrian and furniture zone open for walking while also containing all kinds of street furniture. Despite linking commercial centers, parks, and schools, the project does not connect to a regional bikeway. A canal bridge is recommended for Marlin Road, ideally with two bike lanes and shade. No buses use this roadway, so there is much room for green plantings and shade trees. This project will link commercial centers in Cutler Bay. An enhanced sidewalk lined with shade trees should make Gulfstream Road the preferred corridor for walking in the area. The walking path should include benches, streetlamps, and bike racks. This will provide an easy and comfortable route to Old Cutler Road, Caribbean Boulevard, and Franjo Road.

## KEY BISCAYNE TRANSIT MOBILITY STUDY

The population of Key Biscayne has grown over the past several decades, housing 13,000 residents in 2015. While the island used to predominately be a seasonal home for many, the population has recently moved towards permanent residence. Most of the citizens work off the island, while nearly all the workers on the island come from the mainland. Being an island with only one ingress and egress point causes congestion. Using a web-based program called Community Remarks on the Village's website, over 300 remarks and suggestions were received, 47% of which stated that traffic and congestion need the most attention. The solutions are focused around pedestrian, bicycle, and transit systems to better accommodate the flow of people visiting the Village.

## CITY OF MIAMI BEACH TRANSPORTATION MASTER PLAN (TMP)

The City of Miami Beach Transportation Master Plan (TMP) aims to improve the 7.7 square miles of barrier islands formed by a compilation of 27 different land masses. The City maintains a wide range of land uses, people, and events that requires the TMP to provide a diverse group of projects for the City. This TMP is intended to provide future directions for the City of Miami Beach's (CMB) transportation system. It will be integrated into the City of Miami Beach 2025 Comprehensive Plan, other CMB plans, and any other plans that will affect the City's Transportation Network. In recognition of the exponential growth in population, future traffic and transit conditions will be forecasted into the year 2035. In an effort to provide guidance for future transportation strategies, this plan will generate a project bank for the City of Miami Beach, composed of multi-modal projects, and will analyze new prospects for funding the future endeavors and potential policy. This TMP ultimately seeks to provide recommendations for feasible multi-modal projects that aim to enhance the City's mobility and connectivity while providing project guidance to make this a reality. The project bank provides a comprehensive list of traffic congestion, freight, transit, and non-motorized projects. The TMP identifies dedicated corridors throughout the City recommending the specified roadway focus on transit, freight, or non-motorized improvements. Figures 13 through 15 show the priority tables for the TMP.


- Roadway Segment Project
- Site Specific Project
- FDOT Project
- City of Miami Beach Project Current Initiative

**FIGURE 13** CITY OF MIAMI BEACH TMP PRIORITY 1 PROJECTS

1. SR A1A/ Macarthur Cwsy
2. SR A1A/ Macarthur Cwsy
3. Miami Beach Light Rail/ Modern Street Car
4. West Avenue
5. 73rd Street
6. 72nd Street
7. Byron Avenue
8. Northbay Road
9. Alton Road and 17th Street
10. 51st Street
11. 63rd Street
12. SR 907/Alton Road
13. Dade Boulevard
14. Euclid Avenue
15. Meridian Avenue
16. Meridian Avenue
17. Pine tree Drive/ LaGorce Drive North of 51st Street
18. 6th Street/Michigan Avenue
19. Alton Road and 5th Street
20. Dade Boulevard and 17th Street
21. Dickens Avenue and 71st Street
22. SR A1A/ Macarthur Cwsy/ 5th Street
23. SR 907/Alton Road
24. 23rd Street
25. SR A1A/Collins/ Indian Creek
26. SR A1A/Indian Creek
27. Alton Road and Edsullivan Road
28. SR 934/71st/Normandy
29. SR 112/Julia Tuttle Cswy
30. 85th Street
31. Middle Beach and Collins Link
32. SR A1A/Collins and Indian Creek
33. SR 934/71st Street
34. 17th Street
35. SR 112/Julia Tuttle Cswy Ramps
36. Middle Beach and Collins Link
37. SR 112/Julia Tuttle Cswy and 41st Street
38. 11th Street
39. Alton Road and Michigan Avenue
40. SR 907/Alton Road
41. Middle Beach Recreational Corridor
42. 41st Street
43. 81st Street
44. 77th Street
45. Tatum Waterway Drive
46. Chase Avenue
47. SR 907/Alton Road and Lower North Bay Road
48. 16th Street
49. 47th Street
50. 42nd Street
51. Bay Drive
52. Royal Palm Avenue
53. Baywalk
54. South Beach


- Roadway Segment Project
- Site Specific Project

**FIGURE 14** CITY OF MIAMI BEACH TMP PRIORITY 2 PROJECTS

1. 17th Street
2. SR A1A/Collins Avenue and Indian Creek
3. Meridian Avenue
4. 69th Street
5. 21st Street and 22nd Street
6. 63rd Street
7. SR 934/71st Street and Normandy Drive
8. Alton Road and 41st Street
9. 41st Street and Prine Tree Drive
10. Collins Avenue and 44th Street
11. Meridian Avenue
12. Lincoln Road
13. Lincoln Lane North
14. Fairway Drive


**FIGURE 15** CITY OF MIAMI BEACH TMP PRIORITY 3 PROJECTS

1. SR A1A/Collins Avenue
2. Prairie Avenue
3. SR A1A/Collins Avenue/ Indian Creek Drive
4. SR A1A/Collins Avenue/ Indian Creek Drive
5. SR 934/79th Cswy
6. Abbott Avenue
7. 77th Street
8. 77th Street
9. 81st Street
10. South Pointe Drive
11. Alton Road
12. Washington Avenue
13. Venetian Causeway
14. SR 907/Alton Road
15. 24th Street/Liberty Avenue
16. Flamingo Drive/Indian Creek Drive
17. Biarritz Drive
18. Bay Drive
19. Park Avenue Bridge (Wayne Avenue)
20. Park Avenue Bridge II (Wayne Avenue)
21. Harding Avenue/Collins Avenue
22. Hawthorne Avenue
23. 85th Street
24. Pine Tree Drive
25. SR A1A/Macarthur Causeway
26. SR 112/41st Street
27. SR 112/Julia Tuttle Causeway
28. SR A1A/Indian Creek Drive
29. 15th Street
30. 20th Street
31. Ocean Drive
32. Crespi Avenue
33. Purdy Avenue
34. Drexel Avenue

Roadway Segment Project

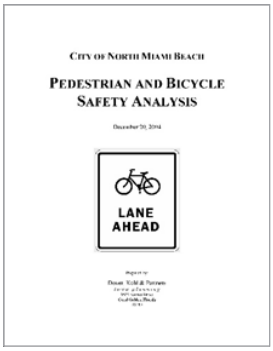
## MIAMI LAKES GREENWAYS & TRAILS MASTER PLAN

The Town of Miami Lakes is a master-planned, mixed-use community designed to encourage a variety of community activities, services in close proximity, and recreation through a unique system of 101 parks. The Miami Lakes Greenways and Trails Master Plan complements the Town's Comprehensive Master Plan vision to create safe and convenient non-motorized transportation to connect communities, recreational parks, schools, office parks, and businesses. When implemented, the Plan will provide a network of off-road shared use paths (for bicycling, walking, in-line skating, etc.), as well as a network of on-road facilities, including bike lanes, on major thoroughfares and neighborhood greenways on low-speed, low-volume streets. The following five (5) points outline the primary strategies of the plan for the Town of Miami Lakes.

- Capitalizing on the opportunity presented by the existing 8-foot wide sidewalks on major thoroughfares within the Town as the backbone of the future off-road facility network.
- Developing scenic greenway trails along canal corridors such as NW 77th Court, NW 139th Street/NW 57th Court, and NW 170th Street (portions completed already).
- Incorporating low-speed, low-volume residential streets where bicycling is already comfortable into a bike route network of neighborhood greenways.
- Filling in sidewalk gaps in key areas including business parks and access to bus stops.
- Incorporating elder pedestrian safety improvements at intersections including additional walk time for crossing the street and providing a leading pedestrian interval (LPI) would allow pedestrians to be more visible and establish right-of-way in the crosswalk.

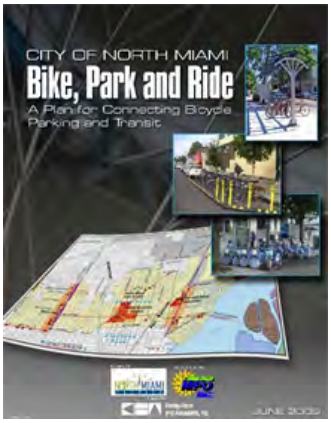
## MIAMI LAKES COMPLETE STREETS PROGRAM

The Town of Miami Lakes Complete Streets Program provides recommended street design improvements specific to the Town of Miami Lakes' roadways. Complete Streets are infrastructure enhancements that implement additional pedestrian and bike improvements to give all users a greater share of the right-of-way. The specific improvements can vary from pavement markings to new physical barriers built between travel lanes and bicycle and pedestrian pathways. Ultimately the improvements are focused on increasing safety of users without compromising traffic flow.




## CITY OF NORTH MIAMI BEACH PEDESTRIAN AND BICYCLE SAFETY ANALYSIS

The purpose for this study was to lay the groundwork for a network of trails and bikeways in the City of North Miami Beach. The three main reasons for the study are: 1) community interest in recreational bicycling and jogging/walking trails is demonstrated by the constant use of the existing Snake Creek Trail, 2) the existing trail has some problems that should be fixed with a comprehensive view, and 3) the nexus of the trail network needs to be the Fulford City Center, which already has the beginnings of a thriving pedestrian oriented mixed-use destination.




## CITY OF NORTH MIAMI BIKE, PARK-AND-RIDE

The City of North Miami plans to expand its bicycle network to promote bicycling as both a transportation and recreation activity. Promoting bicycling as a viable mode of transportation has several benefits, including the reduction in automobile trips, access to the transit network from a wider area, reduced need for motor vehicle parking, and environmental benefits. The City's Transportation Master Plan established the groundwork for a comprehensive bicycle network by identifying several bicycle projects and strategies. The Transit Oriented Development Feasibility Study increased the viability and accessibility of transit as a mode choice. Through the Bike, Park-and-Ride Study, the City seeks to improve the linkage between transit ridership and bicycle trips, and between surrounding land uses and bicycle trips, thereby increasing the mode share and enhancing opportunities for additional bicycle travel within the City.

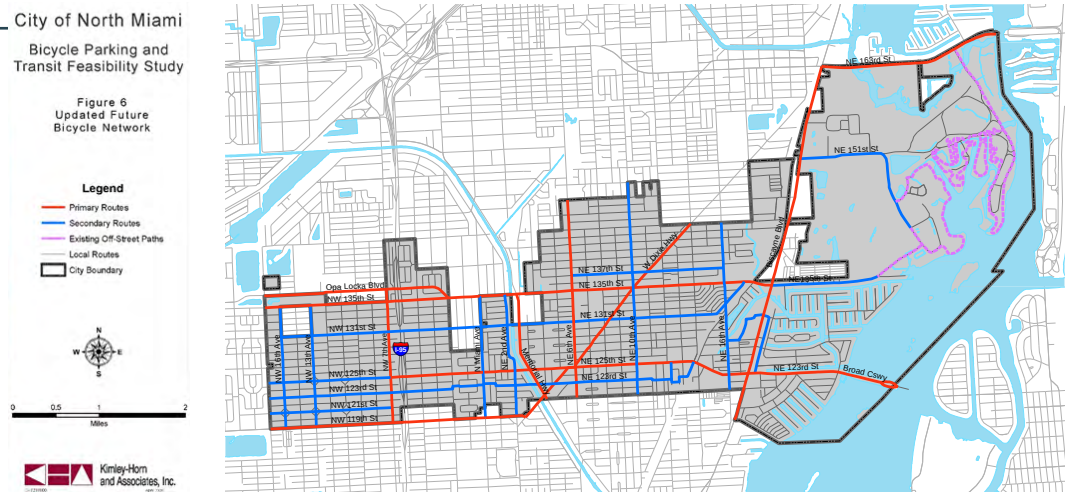
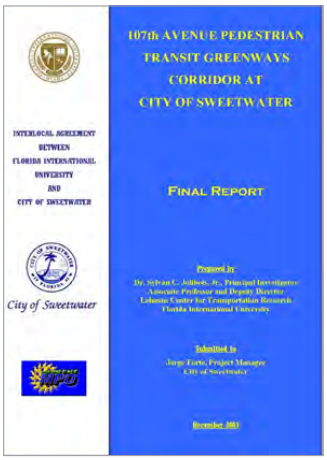



**FIGURE 16** CITY OF NORTH MIAMI BICYCLE PARKING PRIMARY AND SECONDARY ROUTES

## MIAMI SHORES VILLAGE MULTI-MODAL MOBILITY STUDY

The Village of Miami Shores conducted a Multimodal Mobility Study with the primary goal of increasing bicycle and pedestrian mobility and safety in the Village through identifying projects and recommendations that the Village Council can consider for programming and implementation. A safe, convenient, and accessible series of pedestrian and bicycle facilities were planned through this study that connect local neighborhoods, provide access to Downtown Miami Shores, and allow residents the opportunity to enjoy active transportation while gaining the health and social benefits that bicycling and walking has to offer. The plan identifies facilities that allow the Village to invest in accessible and accommodating bicycle and pedestrian facilities on local streets and identifies projects that can be coordinated with other transportation partners such as Miami-Dade County and the Florida Department of Transportation (FDOT).

**FIGURE 17** MIAMI SHORES VILLAGE RECOMMENDED NON-MOTORIZED NETWORK

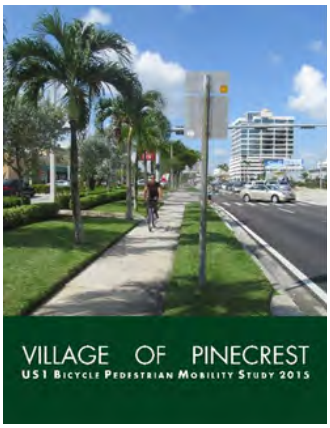



## 107TH AVENUE PEDESTRIAN TRANSIT GREENWAYS CORRIDOR AT CITY OF SWEETWATER

The main purpose of this project is to illustrate a community transportation system that can not only generate new opportunities in residential, commercial, and recreational growth, but is also compatible with the City's planning, development, and redevelopment efforts. Through careful planning, the City of Sweetwater can be enhanced through:

- Appropriate development of vacant land use areas
- Redevelopment of business areas and adjacent residential communities
- Implementation of a Transit Greenway Corridor to calm the existing roadway network and link key areas through improved pedestrian, bicycle and transit facilities

A transit greenway is a place for people to enjoy nature and green space in an urban environment. It is an element of connection, rather than separation, in the landscape which enables it to convert the use of space from freight movement to a transit, bicycle, and pedestrian corridor. Most critical elements of transit greenways are greening (planting) the corridor and building attractive sidewalks, networks of footpaths, slowing vehicle traffic, narrowing streets, and providing safe intersections for pedestrians and bicycle riders.

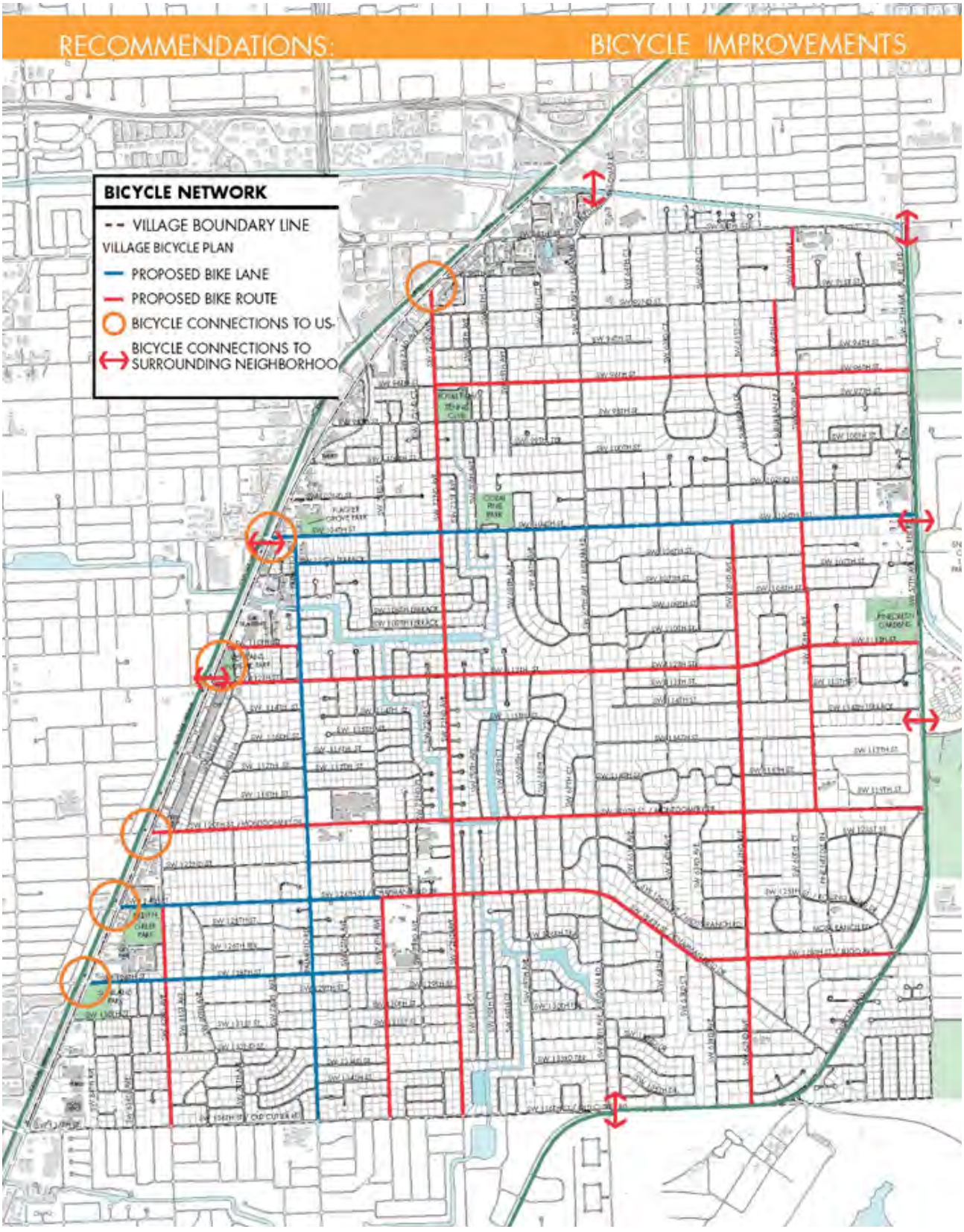



## VILLAGE OF PINECREST US-1 BICYCLE AND PEDESTRIAN MOBILITY STUDY

The challenge of improving pedestrian and bicycle connectivity along US-1 is as much an infrastructure issue as it is a building form and land development issue. Sidewalks, crosswalks, and bike facilities are half of the solution, while improved frontage conditions and transition spaces are the other half. The work produced by the research team on the literature review, data collection, community outreach and handlebar survey, resulted in recommendations in the following four (4) categories:

- Pedestrian Improvements
- Bicycle Improvements
- Frontage Improvements
- Transition Spaces

**FIGURE 18** PINECREST VILLAGE US-1 BIKE RECOMMENDATIONS



# VILLAGE OF PALMETTO BAY BICYCLE AND PEDESTRIAN MASTER PLAN

Due to the influx of density, Bicycle and Pedestrian Plans and studies have been numerous in Miami-Dade County. In an order to try to not repeat previous studies, many previous studies have been reviewed. Where applicable, the results of these previous studies will be applied to the Village of Palmetto Bay Bicycle and Pedestrian Master Plan.

The ultimate goal of the Village of Palmetto Bay Bicycle and Pedestrian Master Plan was to have a fully connected network. This network would provide safe facilities and encourage use. The system would connect major existing generators such as schools and parks. The network could potentially reduce congestion and would provide for a multimodal connection. The goal in prioritization was to rank projects and assign a time horizon for implementation. It was the approach to initially undertake projects where mitigated problems were most easily implemented and then move to projects that could solve level of service deficiencies in an inexpensive manner. As always the Village is most concerned with projects that, while effective and efficient, also make the community safer and can be done with as little funding as possible. Each project was organized into Short Term, Mid Term, and Long Term.

**FIGURE 19** PALMETTO BAY SHORT TERM PRIORITIZED PROJECTS

| | SHORT TERM PRIORITY PROJECTS | | | | | | |
|---|---|---|---|---|---|---|---|
| | ROAD/SITE | SEGMENT/INTERSECTION | | RECOMMENDED IMPROVEMENTS | QUANTITY | UNIT | TOTAL |
| | | FROM | TO | | | | |
| COMMERCIAL | Commercial Intersection | Old Cutler Road | SW 168 ST | Enhance Pedestrian Connections | | | |
| | | | | High Visibility Crosswalk | 300 | feet | 10,500.00 |
| | | | | Install Pedestrian Countdown Type Heads | 4 | No. | 3,500.00 |
| | | | | Install Raised Sidewalk | 60 | feet | 2,350.00 |
| | | | | Chevron Markings | 80 | feet | 2,800.00 |
| | Publix | SW 148 ST | SW 87 PL | Passage between Mutli-Families & Shopping Ctr. | | | |
| | | | | Two Directional 12 ft. Shared Use Path | 300 | feet | 14,000.00 |
| SIDEWALK NETWORK | SW 144 ST | SW 87 AVE | SW 82 AVE | South Side | 250 | feet | 10,400.00 |
| | | SW 90 AVE | SW 87 AVE | South Side, (North Side) | 650, (240) | feet | 35,500.00 |
| | SW 160 ST | SW 87 AVE | SW 82 AVE | South Side | 300 | feet | 12,000.00 |
| | | SW 82 AVE | SW77 CT | South Side, (North Side) | 325, (350) | | |
| | | | | | 520, (430) | feet | 65,400.00 |
| | | US-1 | SW 92 AVE | South Side, (North Side) | 2020, (2270) | feet | 171,600.00 |
| | SW 175 ST | SW 92 AVE | SW 87 AVE | South Side, (North Side) | 2620, (1930) | feet | 182,000.00 |
| | | SW 87 AVE | SW 84 AVE | Both Sides | 1280 | feet | 51,200.00 |
| | SW 82 AVE | SW 84 AVE | SW 170 TER | Both Sides | 140 | feet | 5,600.00 |
| | | SW 135 ST | SW 144 ST | West Side | 3750 | feet | 150,000.00 |
| | | SW 144 ST | SW 152 ST | West Side | 2872 | feet | 114,880.00 |
| | | SW 152 ST | SW 162 ST | West Side | 3,300 | feet | 132,000.00 |
| | Old Cutler Road | SW 152 ST | SW 166 ST | West Side | 1,955 | feet | 78,600.00 |
| | | SW 155 ST | SW 174 ST | West Side | 1930 | feet | 77,200.00 |
| | | SW 174 ST | SW 184 ST | West Side | 4080 | feet | 163,200.00 |
| COMMUTER ACCESS | | US-1 | SW 67 AVE | Install 4' wide bike lanes | 2.5 | gross mile | 1,081,200.00 |
| | | SW 135 ST | SW 168 ST | Install 4' wide bike lanes | 1.1 | gross mile | 454,150.00 |
| | | | | | | **TOTAL:** | **2,818,080.00** |

**FIGURE 20** PALMETTO BAY MID TERM PRIORITIZED PROJECTS

| | MIDTERM PRIORITY PROJECTS | | | | | | |
|---|---|---|---|---|---|---|---|
| | ROAD/SITE | SEGMENT/INTERSECTION FROM | SEGMENT/INTERSECTION TO | RECOMMENDED IMPROVEMENTS | QUANTITY | UNIT | TOTAL |
| LOCAL CONNECTIVITY | SW 160 ST | SW 79 AVE | SW 90 AVE | Install 8' wide multi-use path | 1.3 | gross mile | 205,950.00 |
| | SW 72 AVE | SW 136 ST | SW 144 ST | Install 8' wide multi-use path | 0.5 | gross mile | 79,200.00 |
| SIDEWALK NETWORK | SW 154 ST | SW 82 AVE | Old Cutler RD | North Side | 2500 | feet | 100,000.00 |
| | SW 136 ST | US-1 | SW 82 AVE | South Side | 240 | feet | 9,500.00 |
| | | SW 82 AVE | SW 77 AVE | South Side | 620 | feet | 24,800.00 |
| | | SW 77 AVE | SW 72 AVE | South Side | 650 | feet | 26,000.00 |
| | SW 144 ST | SW 72 AVE | SW 57 AVE | Both Sides | 4600 | feet | 184,000.00 |
| | | SW 72 AVE | SW 67 AVE | North Side | 315 | feet | 12,600.00 |
| | SW 152 ST | SW 77 AVE | SW 72 AVE | South Side, (North Side) | 315, 940 (620) | feet | 15,000.00 |
| | SW 158 ST | SW 72 AVE | SW 82 AVE | North Side | 640 | feet | 25,000.00 |
| | SW 136 ST | SW 168 ST | SW 174 ST | West Side | 1075 | feet | 43,000.00 |
| | SW 92 AVE | SW 174 ST | SW 160 ST | West Side | 515 | feet | 20,600.00 |
| | SW 87 AVE | SW 136 ST | SW 144 ST | East Side & Ped Bridge | 1480 | feet | 59,200.00 |
| | SW 82 AVE | SW 144 ST | SW 160 ST | East Side, (Both Sides) | 160, (1290), 90 | feet | 61,600.00 |
| | | SW 160 ST | SW 168 ST | East Side | 370 | feet | 14,400.00 |
| | SW 77 AVE | ST 168 ST | SW 184 ST | West Side, (Both Sides) | 280, 675, 100 (190) | feet | 49,800.00 |
| | SW 72 AVE | SW 136 ST | SW 144 ST | East Side | 7,201,705 | feet | 100,600.00 |
| | Local | | | HV/LV Crosswalks | | | 8,850.00 |
| COMMUTER ACCESS | SW 184 ST | | | | 2.4 | gross mile | 1,038,000.00 |
| | SW 67 AVE | | | | 1.2 | gross mile | 475,750.00 |
| | | | | | | **TOTAL:** | **2,553,850.00** |

**FIGURE 21** PALMETTO BAY LONG TERM PRIORITIZED PROJECTS

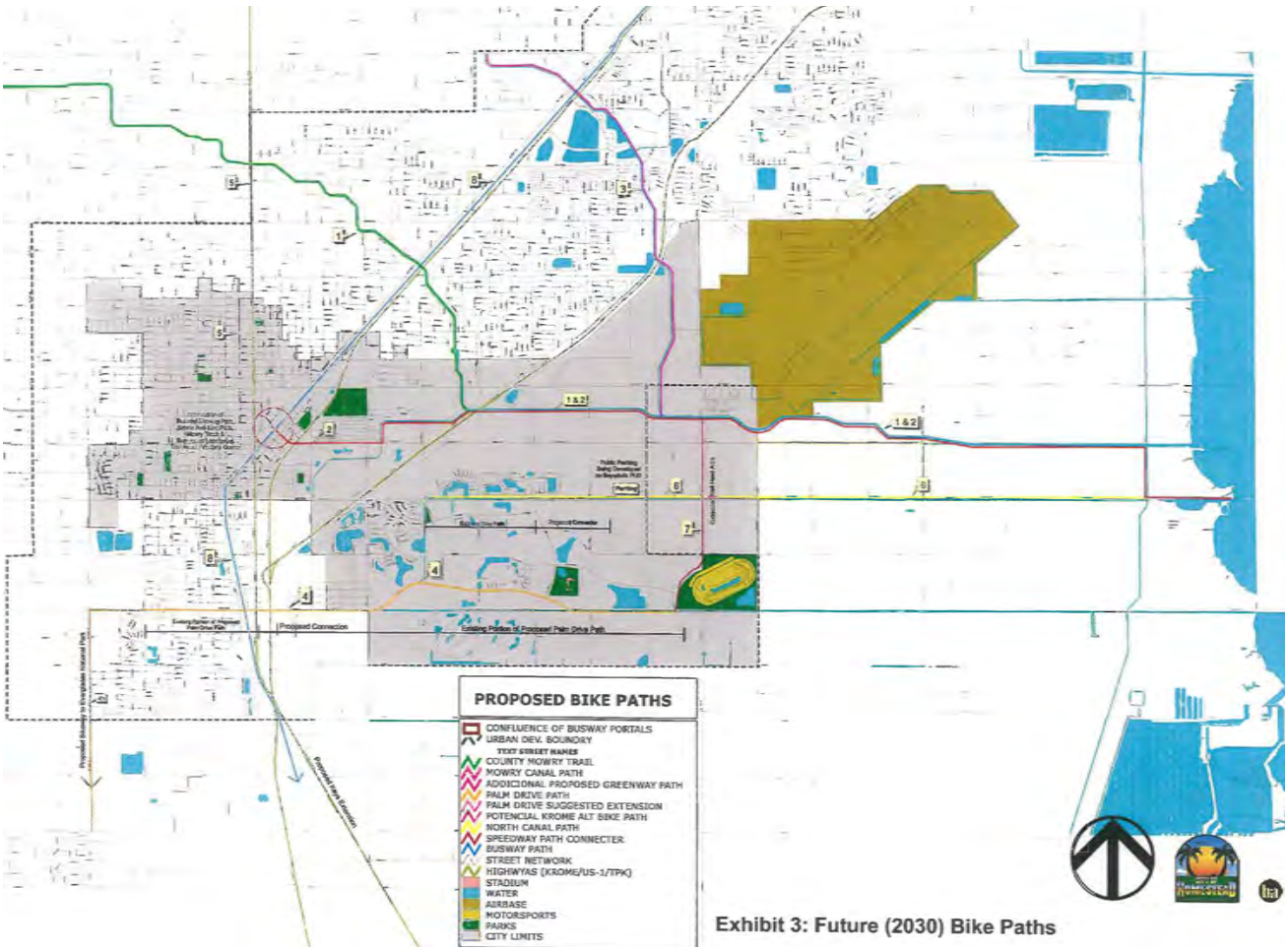
| | LONG TERM PRIORITY PROJECTS | | | | | | |
|---|---|---|---|---|---|---|---|
| | ROAD/SITE | SEGMENT/INTERSECTION FROM | SEGMENT/INTERSECTION TO | RECOMMENDED IMPROVEMENTS | QUANTITY | UNIT | TOTAL |
| COMMERCIAL | SW 160 ST | SW 79 AVE | SW 90 AVE | Enhance Pedestrian Connections | | | |
| | | | | Textured Asphalt Paving with Thermoplastic Inlay | 240 | feet | 22,000.00 |
| | | | | Relocate Pedestrian Crossing to median creating Pedestrian Refuge | 300 | feet | 93,000.00 |
| | | | | Install Pedestrian Countdown Type Heads | 4 | No. | 3,500.00 |
| | | | | Pedestrian Overpass | 1 | No. | 4,000,000.00 |
| | Franjo Triangle | US-1 | SW 174 ST | High Visibility Crosswalk | 250 | feet | 9,000.00 |
| | | | | Install Pedestrian Countdown Type Heads | 2 | No. | 2,000.00 |
| | | | | Enhance Pedestrian Connections | | | |
| | | | | High Visibility Crosswalk | 300 | feet | 10,500.00 |
| | | | | Install Pedestrian Countdown Type Heads | 4 | No. | 3,500.00 |
| | PB Business Center | Old Cutler Road | SW 184 ST | Enhance Pedestrian Connections | | | |
| | | | | High Visibility Crosswalk | 300 | feet | 10,500.00 |
| | | | | Install Pedestrian Countdown Type Heads | 4 | No. | 3,500.00 |
| LOCAL CONNECTIVITY | SW 94 AVE | SW 175 ST | SW 184 ST | Install 8' wide multi-use path | 0.5 | gross mile | 95,050.00 |
| | SW 160 ST | SW 164 ST | SW 89 AVE | Install 8' wide multi-use path | 1.5 | gross mile | 253,000.00 |
| | SW 141 ST | SW 87 AVE | SW 175 ST | Install 8' wide multi-use path | 2.4 | gross mile | 380,200.00 |
| | SW 152 ST | SW 85 AVE | SW 151 ST | Install 8' wide multi-use path | 0.7 | gross mile | 110,900.00 |
| | SW 77 CT | SW 139 TER | SW 57 AVE | Install 8' wide multi-use path | 3.9 | gross mile | 617,800.00 |
| | SW 87 AVE | SW 79 AVE | SW 79 AVE | Install 8' wide multi-use path | 1.3 | gross mile | 205,950.00 |
| | SW 135 ST | Old Cutler Road | SW 184 ST | Install 8' wide multi-use path | 3.5 | gross mile | 554,400.00 |
| | SW 152 ST | SW 72 AVE | Old Cutler Road | Install 8' wide multi-use path | 1.2 | gross mile | 190,100.00 |
| | Old Cutler Road | SW 135 ST | SW 184 ST | Install 8' wide multi-use path | 3.4 | gross mile | 1,077,150.00 |
| SIDEWALK NETWORK | SW 87 AVE | SW 144 ST | SW 152 ST | West Side, (East Side) | 1000, (140), 515, (245) | feet | 75,000.00 |
| | SW 77 AVE | SW 168 ST | SW 174 ST | West Side, (East Side), [Both Sides] | 280, 385, (270), 220, 120, [140] | feet | 56,650.00 |
| | SW 67 AVE | SW 135 ST | SW 144 ST | Both Sides | 2590 | feet | 107,500.00 |
| | | SW 144 ST | SW 152 ST | Both Sides | 2,570 | feet | 105,800.00 |
| | County Roadways | | | HV/LV Crosswalks | | | 18,650.00 |
| COMMUTER ACCESS | SW 144 ST | US-1 | SW 57 AVE | Install 4' wide bike lanes | 2.3 | gross mile | 994,750.00 |
| | SW 168 ST | US-1 | Old Cutler Road | Install 4' wide bike lanes | 2.3 | gross mile | 994,750.00 |
| | | | | Install 4' wide bike lanes | 1.1 | gross mile | 475,750.00 |
| GREENWAYS | Village Wide | North | | Install 8' wide multi-use greenway | 1.8 | gross mile | 285,150.00 |
| | | Central | | Install 8' wide multi-use greenway | 2.2 | gross mile | 348,500.00 |
| | | South | | Install 8' wide multi-use greenway | 1.3 | gross mile | 205,950.00 |
| | | | | | | **TOTAL:** | **11,313,000** |

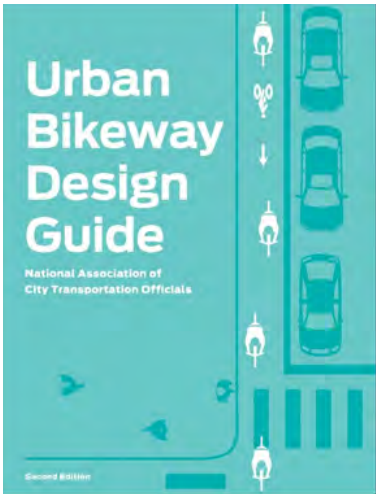
## CITY OF HOMESTEAD COMPREHENSIVE PLAN

The Comprehensive Plan is a tool available to the City of Homestead in enhancing economic development and protecting the area's quality of life. The plan provides a five-year projection on the capital improvements needed in the City.

Regarding non-motorized facilities, the comprehensive plan documents and encourages further development of the proposed South Dade Greenways Network. Focusing on this network aligns with Homestead's goals to further encourage economic development through eco-tourism. Figure 22 displays the Comprehensive Plan's Greenways map.

**FIGURE 22** HOMESTEAD COMPREHENSIVE PLAN PROJECTS







# NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS (NACTO)

## URBAN BIKEWAY DESIGN GUIDE

The purpose of the NACTO Urban Bikeway Design Guide (part of the Cities for Cycling initiative) is to provide cities with state-of-the-practice solutions that can help create complete streets that are safe and enjoyable for bicyclists.

The NACTO Urban Bikeway Design Guide is based on the experience of the best cycling cities in the world. The designs in this document were developed by cities, for cities, since unique urban streets require innovative solutions. The FHWA has posted information regarding Manual on Uniform Traffic Control Devices (MUTCD) approval status of all of the bicycle related treatments in this Guide and in August of 2013 they issued a memorandum officially supporting use of the document. All of the NACTO Urban Bikeway Design Guide treatments are in use internationally and in many cities around the US.

To create the Guide, the authors conducted an extensive worldwide literature search from design Guidelines and real-life experiences. They worked closely with a panel of urban bikeway planning professionals from NACTO member cities, as well as traffic engineers, planners, and academics with deep experience in urban bikeway applications.

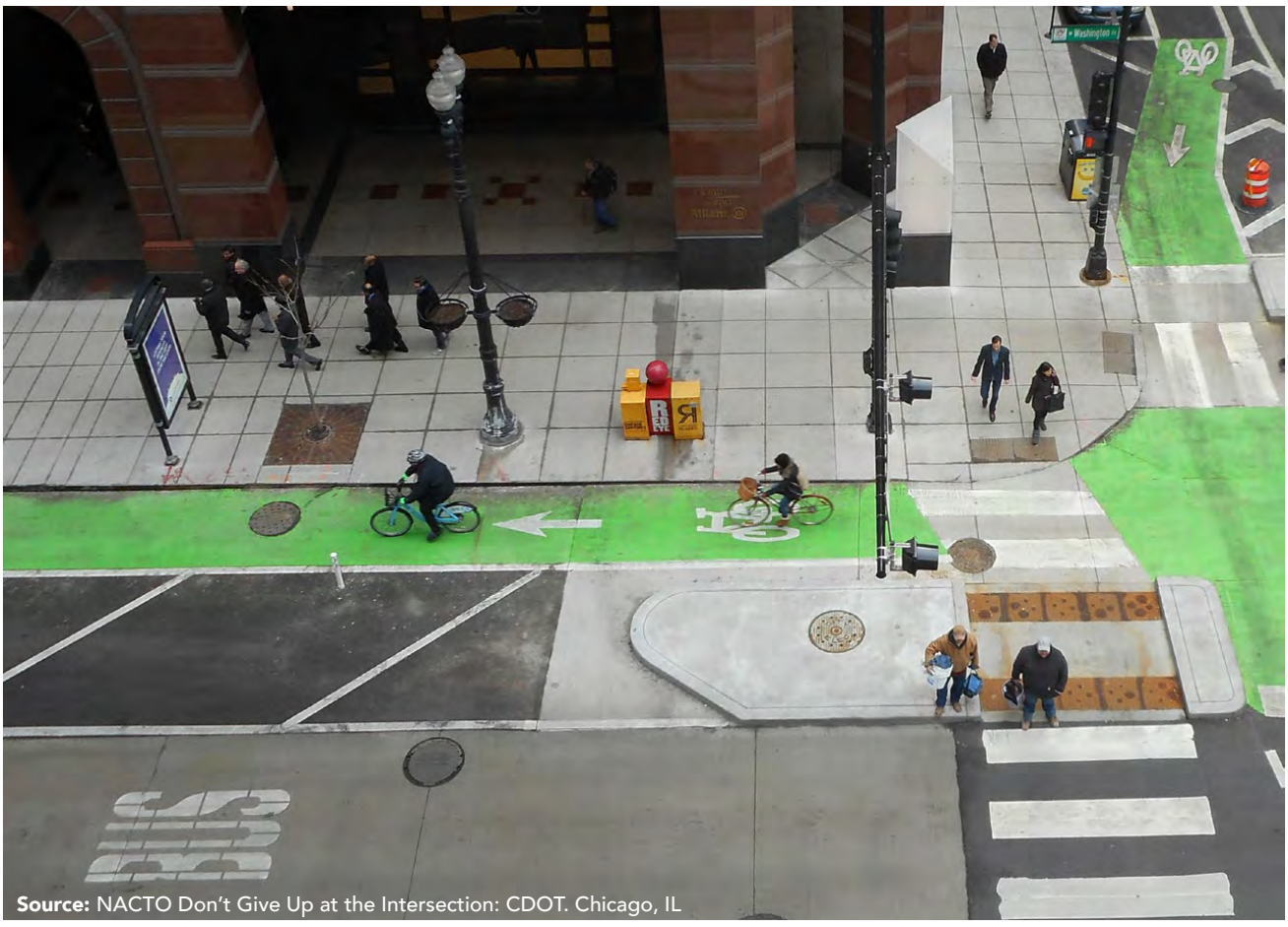
## TRANSIT STREET DESIGN GUIDE

The Transit Street Design Guide provides design guidance for the development of transit facilities on city streets, and for the design and engineering of city streets to prioritize transit, improve transit service quality, and support other goals related to transit. The Guide has been developed on the basis of other design guidance, as well as city case studies, best practices in urban environments, research, and evaluation of existing designs, and professional consensus. These sources, as well as the specific designs and elements included in the Guide, are based on North American street design practice.

## DON'T GIVE UP AT THE INTERSECTION

In May 2019, NACTO released Don't Give Up at The Intersection, a publication illustrating best practices for planners and engineers when designing intersections with document bicycle through traffic. It is meant to work in unison with the Urban Bikeway Design Guide and the other released documentation from the agency. NACTO's three (3) primary recommendations for intersection improvements are as follows:

- Reduce turn speed. Drivers yield more frequently to people walking and biking when speeds are low, making it safer for bicyclists to pass in front of turning cars. Lower speeds give drivers more time to stop if needed and reduce the severity of collisions. Smaller turn radii, centerline hardening, turn speed bumps, and raised bike crossings can all reduce the speed at which drivers turn.
- Make bicyclists and pedestrians visible. Setting back the bikeway crossing, installing recessed (early) stop lines for motor vehicles, and building raised bikeway crossings all make it easier for drivers to see people using the bikeway. The designer's challenge is to provide good lines of sight without encouraging higher speeds.
- Give bikes the right-of-way. People on bikes crossing a busy intersection need clear priority over turning motor vehicles. Formal right-of-way often is not enough, but driver yielding can be improved by prohibiting motor vehicle turns on red, implementing bike-friendly signal strategies, and letting bikes move past stopped vehicles while waiting for a signal.



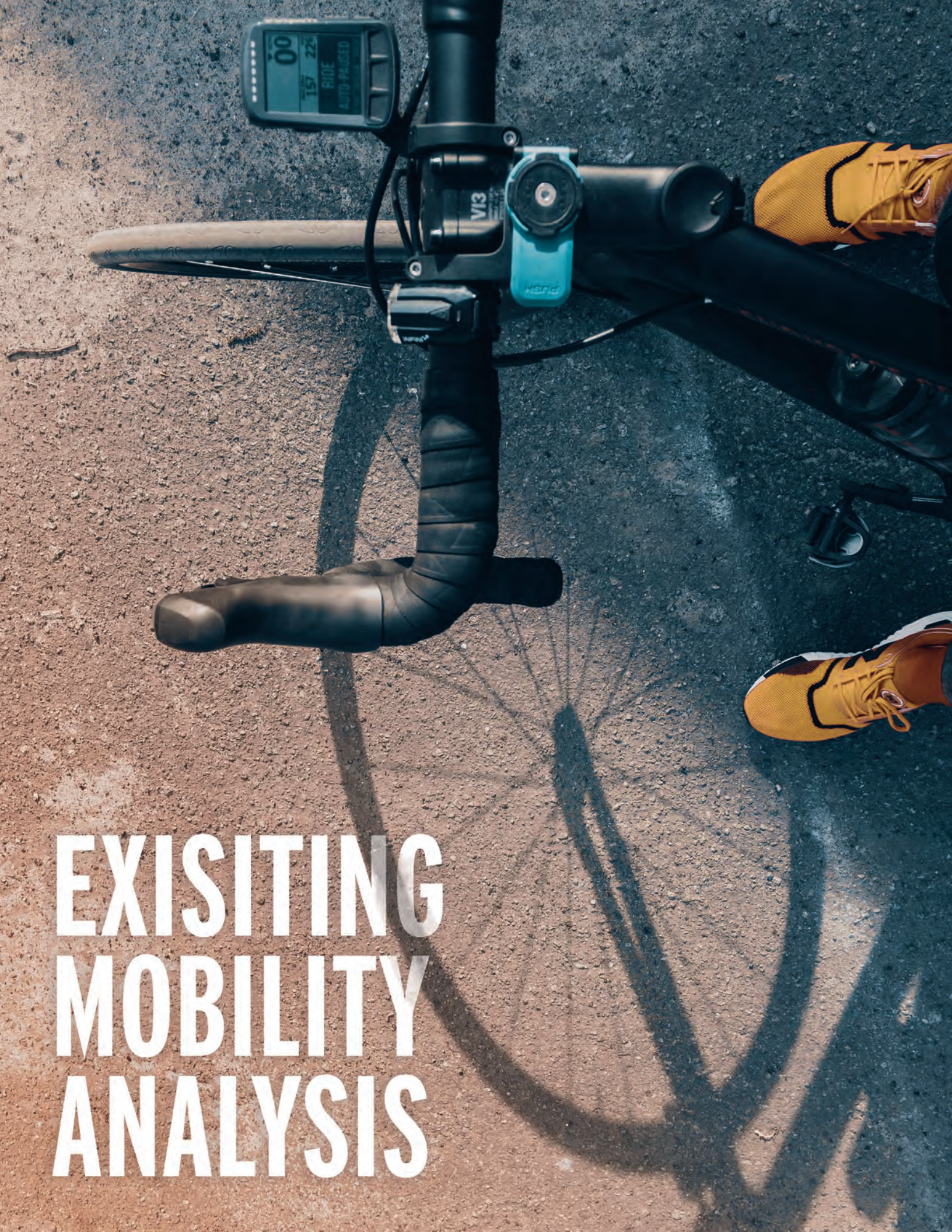
**Source:** NACTO Don't Give Up at the Intersection: CDOT. Chicago, IL

# Don't Give Up at the Intersection

## Designing All Ages and Abilities Bicycle Crossings

NACTO National Association of City Transportation Officials

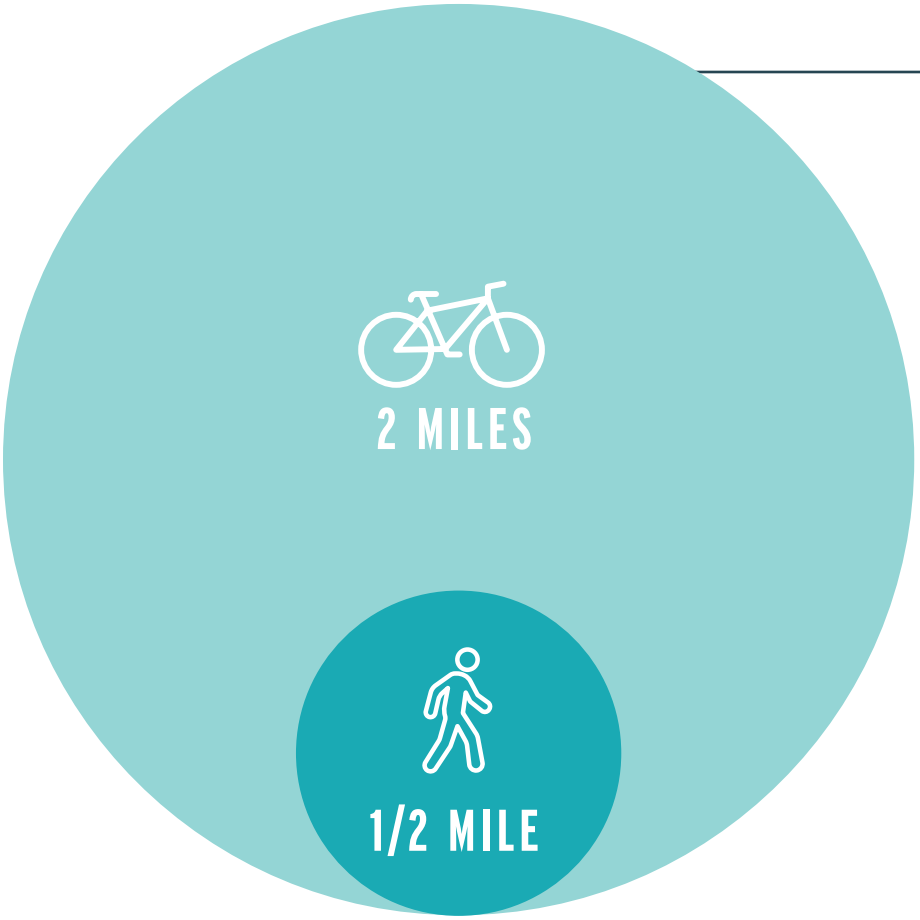
May 2019


EXISITING
MOBILITY
ANALYSIS

Long distance bicycle trips and hiking are popular recreational activities for everyone. However, nationwide, state, and local studies have shown residents reject walking and biking as a mode of travel for daily trips that exceed comfortable distances. Providing non-motorized travelers with mobility options for easy access to transit within the desirable two-mile bicycle trip and the half-mile pedestrian trip lengths is a strategy that may help shift mode-share away from personal vehicle usage. These distances are based on the research from the Federal Transit Administration (FTA) and the Mineta Transportation Institute (MTI).

To organize the evaluation of non-motorized projects throughout the county, this plan will use TPO's SMART Plan as a point of reference for evaluation. Its long-term focus towards improving multimodal transportation in the county aligns with this report's goal to connect to transit.

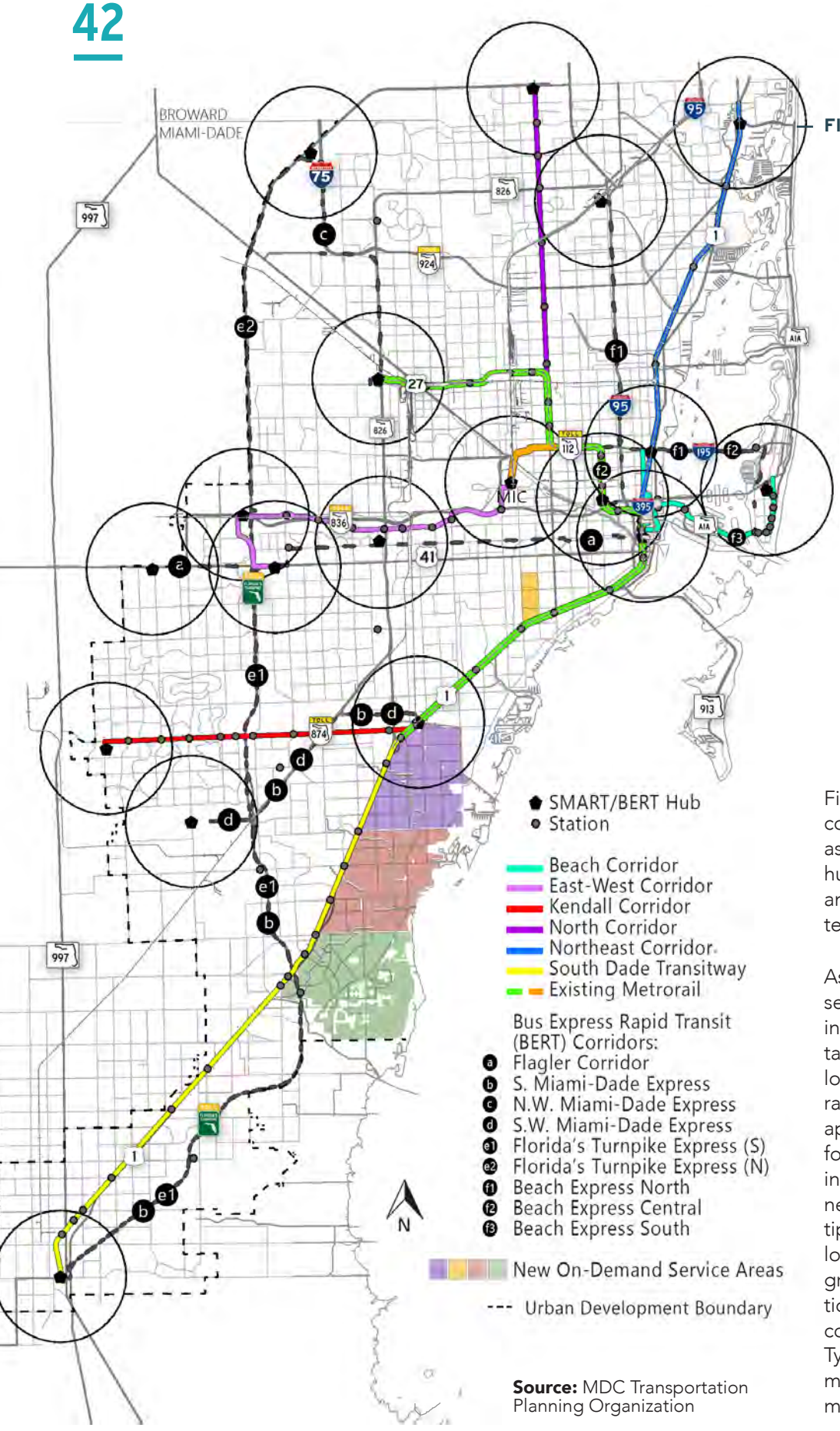
MOST DESIRABLE
DISTANCES TO TRANSIT




**Sources**

FTA 2011 Final Policy Statement on Eligibility of Pedestrian and Bicycle Improvements under Federal Public Transportation Law (76 FR 52046)

Mineta Transportation Institute 2012 Integration of Bicycling and Walking Facilities into the Infrastructure of Urban Communities Report




**Source:** MDC Transportation Planning Organization

**FIGURE 23** SMART PLAN MAP

Figure 2 displays the six (6) rapid transit corridors and nine (9) BERT routes, as well as the SMART Plan terminals/hubs. Currently, there are 18 proposed and/or existing SMART Plan transit terminals/hubs.

As seen in Figure 2, each terminal possesses a 2-mile radius drawn around it, indicating the ideal bicycle trip distance. In the following subsections, the location of these terminals and 2-mile radii for every data set will become apparent. Terminals are an ideal focus for first mile/last mile connections in the County. Within transportation networks, terminals often have multiple transit routes converge on their location. This entices a more varied group of transit riders to these locations. These facilities enable a larger concentration of various travel modes. Typically, these transit facilities attract more people due to the location's memorability and permanence.

Table 5 lists the names and the current status of each of these SMART Plan terminals. Eleven (11) current Metrorail stations and multimodal centers are identified as SMART Plan terminals to serve the SMART Plan corridors. Of these existing locations, six (6) are marked for proposed improvements. These improvements vary in scope. For example, MiamiCentral Station has recently completed its renovations to become a leading example of Transit Oriented Development (TOD). There are seven (7) proposed facilities to serve the SMART Plan corridors.

**TABLE 5** SMART PLAN TERMINALS

| TERMINAL NAME | STATUS |
|---|---|
| **Dadeland North Metrorail Station** | Existing |
| **Dolphin Station** | Existing |
| **Miami Intermodal Center** | Existing |
| **MiamiCentral Station** | Existing |
| **I-75/Miami Gardens Station** | Existing |
| **344th Street Station** | Existing with Proposed Improvements |
| **West Kendall Terminal/SW 162nd Avenue** | Existing with Proposed Improvements |
| **Mall of the Americas Station** | Existing with Proposed Improvements |
| **Civic Center Metrorail Station** | Existing with Proposed Improvements |
| **Palmetto Metrorail Station** | Existing with Proposed Improvements |
| **Golden Glades Multimodal Transportation Facility** | Existing with Proposed Improvements |
| **Miami Executive Airport Station** | Proposed |
| **Tamiami Station** | Proposed |
| **FIU Panther Station** | Proposed |
| **Unity Station** | Proposed |
| **192nd Street Station** | Proposed |
| **Midtown Station** | Proposed |
| **Miami Beach Convention Center Station** | Proposed |


# MULTIMODAL FACILITIES

Over the years, there's been a lifestyle shift as millennials are coming of age and prefer more concentrated, urbanized living spaces and more connectivity. "Millennials don't want the urban sprawl and instead, want to be close to work and other activities."[5] This is a source for the growing demand for multimodal facilities. The demand for bike lanes, trails, and mass transit has been steadily growing. These transportation modes offer mobility options to a transportation network, but the challenges of implementing and/or expanding them in a car-centric nation vary as much as these facility types. In this section the following will be discussed:

- Existing Bicycle Network
- Existing Pedestrian Network
- Non-Motorized Crash Assessments
- Existing Transit Facilities
- Transit Ridership

[5] "Urban Revival by Millennials? Intraurban Net Migration Patterns of Young Adults," Yongsung Lee Bumsoo Lee Md Tanvir Hossain Shubho. April, 2019

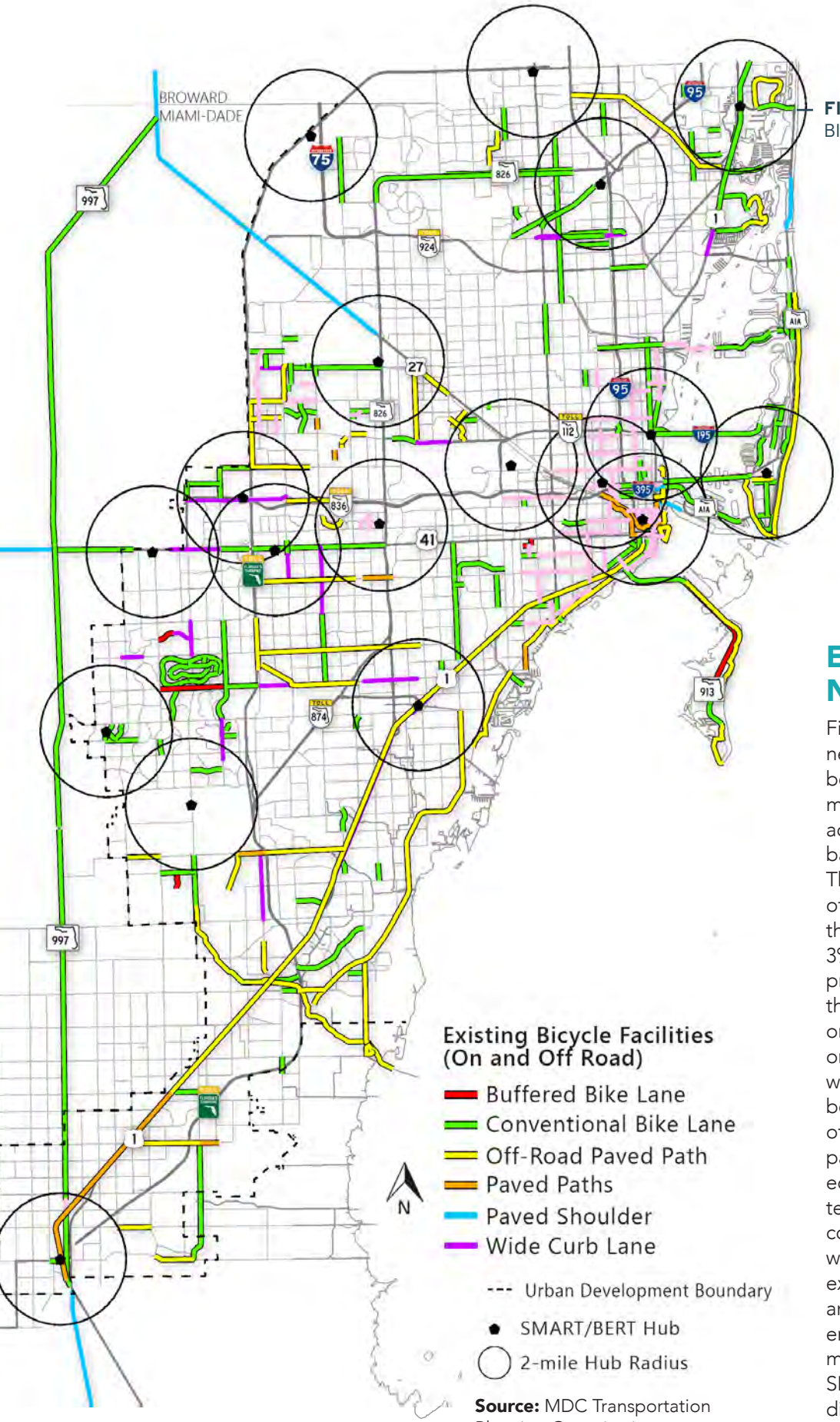


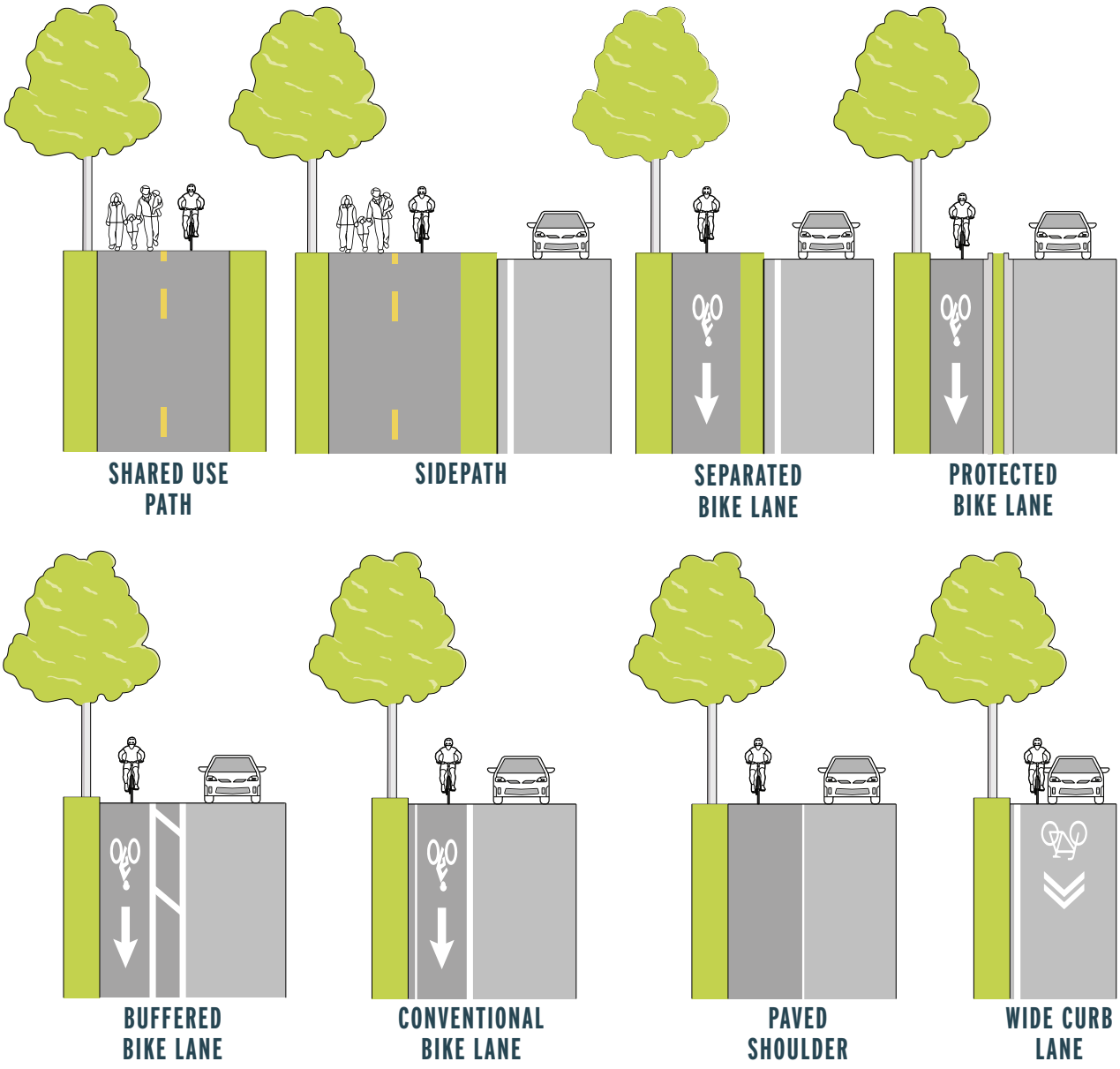

**FIGURE 24** EXISTING BICYCLE FACILITIES MAP

**Source:** MDC Transportation Planning Organization

## EXISTING BICYCLE NETWORK

Figure 24 displays the existing bicycle network within Miami-Dade County. To better understand the existing non-motorized network, documentation of additional characteristics beyond the basic type of facility was undertaken. The existing bicycle network consists of 197.5 miles of on-road bike lanes. Of these bike lanes, 97% are unprotected, 3% are buffered, and 0.005% are protected/separated. 48.7 miles of these bike lanes travel adjacent to on-street parking, while 65% of this on-street parking has sub-optimal widths, increasing the chance of being "doored." Of the 135.9 miles of paved paths (trails and shared use paths), 73% of these paths' widths are equal to or greater than the minimum ten (10) feet. Many of these paths contain short segments where the width becomes very constrained. Two examples of these points of constraint are bridge-crossings and vegetation encroachment. As can been seen, many of the proposed and existing SMART Plan terminals are missing direct non-motorized connections.

**FIGURE 25** COMMON BICYCLE FACILITIES




## COMMON BICYCLE FACILITIES

Each of these facilities provides a different experience for its users. Figure 25 displays the eight (8) common dedicated and non-dedicated bicycle facilities developed for an environment like Miami-Dade County. The difference comes from each facilities' design requirements and how much separation is placed between the users and operating traffic. Each of these archetypal facilities is discussed in further detail after Figure 25.

**FIGURE 26** BLACK CREEK TRAIL SHARED USE PATH

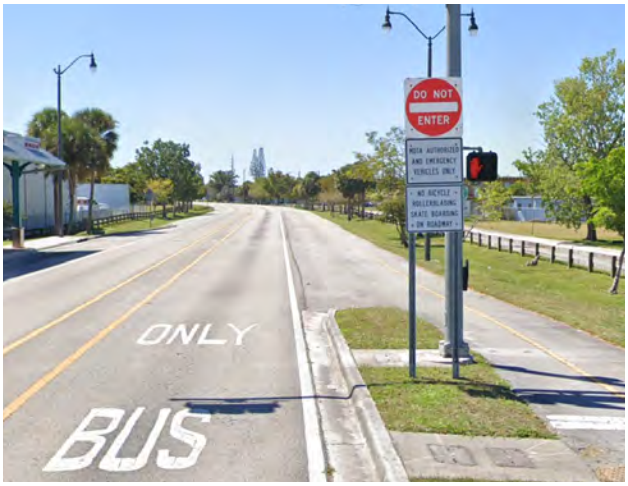



**FIGURE 27** SOUTH TRANSITWAY - SIDEPATH

## SHARED USE PATHS AND SIDEPATHS

Shared use paths are paved off-road dedicated facilities, either within public right-of-way or independent right-of-way. The term "off-road" within the context of this report refers to any non-motorized facility that is physically separated from operating traffic by an open space or physical barrier. Sidepaths differ from shared use paths by lack of any significant separation between the path and the adjacent roadway. Shared use paths and sidepaths within this report always refer to paved facilities. Grass and Gravel trails, as well as multiuse trails (i.e. equestrian) will always be specifically referred to as such.

Shared use paths and sidepaths are used by bicyclists, pedestrians, skaters, runners, and others. The FDOT Design Manual indicates these two paths must comply with the Americans with Disabilities Act (ADA) standards because they serve as pedestrian facilities. In addition to required accessible pedestrian facility characteristics, the bicycle's operating standards also govern the design of these paths.[6] According to FHWA's Separating Bicyclist from Traffic, "The guidance from NACTO, CROW, TAC, New Zealand, and AASHTO recommend pedestrian volume be incorporated into bikeway selection decisions when deciding between a sidepath or a bike lane."[7] If a bicycle and pedestrian improvement project is proposed within urbanized environments where pedestrian activity is high, a bike lane becomes more ideal to separate the two forms of non-motorized travel and allow for bicyclists to operate at preferred speeds. Along with operational benefits, it helps mitigate safety between pedestrians and bicyclists that would otherwise have to share the same facility.

[6] Florida Department of Transportation Design Manual

[7] FHWA - Separating Bicyclist from Traffic

**FIGURE 28** SEPARATED BIKE LANE
VASSAR STREET, CAMBRIDGE, MA

**FIGURE 29** SEPARATED BIKE LANE
SW 152ND STREET, MIAMI, FL

## BIKE LANES

Bike lanes are dedicated non-motorized bicycle facilities that utilize a portion of a roadway. Bike lanes are one-way facilities that permit bicycle travel in the same direction as adjacent motor vehicle traffic. An ideal design shows bikes on both sides of a roadway to allow bicycle travel in both directions. There are different types of bike lanes depicted in a hierarchy from most desirable facilities, attracting the widest range of users, to facilities meeting the absolute minimum design standards, attracting a limited range of users.

### SEPARATED BIKE LANES

Separated bike lane facilities allow for dedicated bicycle traffic that is detached from the roadway. The designs of these facilities can vary in approach as they are often designed within wide sidewalks or have designated space immediately adjacent to a sidewalk. All bike lane variations require bicycle travel to move in the same direction of traffic, therefore requiring a lane on each side of the roadway for bi-directional navigation. Figure 28 and 29 are examples of separated bike lanes in an urbanized environment and a more suburban environment, respectively. The bike lane in Cambridge delineates the space for bike traffic by implementing different materials and surface treatments. SW 152nd Street primarily relies on a six-inch white line and green pavement marking near intersections to specify space for the two modes of non-motorized travel. The context and treatment of these two separated bike lanes are different, but the functional purpose of the two is essentially the same. These facilities are second only to shared use paths in appeal to new or cautious cyclists due in part to the separation from roadways.

### PROTECTED BIKE LANE

Protected bike lanes are dedicated "on-road" bicycle facilities operating within curbed roadways. These facilities maintain a physical barrier between the bike lane and the operating vehicle traffic. These barriers between the cyclist and motorist vary, along with an actual level of protection for cyclists. Two difficulties experienced when attempting to implement protected bike lanes in Miami-Dade are that the physical barrier limits the options available to emergency vehicles attempting to navigate around points of congestion, and that the County has a lot of driveways, creating frequent conflict zones between the bicycle facility and vehicles. Figures 30 and 31 show two protected bike lanes with different barriers. Alternative forms of this facility, such as cycle tracks, place the contraflow bike lanes together on one side of a roadway, behind a singular barrier.

**FIGURE 30** LOS ANGELES ARTESIA BOULEVARD

**FIGURE 31** SAN FRANCISCO OAK STREET

**FIGURE 32** RICKENBACKER CAUSEWAY BUFFERED BIKE LANE


**FIGURE 33** DENVER BUFFERED BIKE LANE

## BUFFERED BIKE LANE

Buffered bike lanes are dedicated "on-road" bicycle facilities that offer unprotected buffering between the bike lane and adjacent traffic. The buffer between the bike lane is often two (2) six-inch-wide white pavement markings. The FDOT Design Manual lists a 7-foot buffered bicycle lane as the standard for new construction projects. While protected bike lanes occupy space between the bike and roadway with barriers intented to increase safety, the buffered bike lane also offers opportunities for bicyclists. The pavement markings provide space for cyclists while making it clear to motorists that the space is not an additional travel lane or parking lane, depicted in Figure 32. Cyclists have an opportunity to safely pass each other without utilizing the adjacent vehicle lane. As seen in Figure 33, this buffer for a bike lane in Denver has been designed to ensure cyclists within the bike lane can prevent being "doored" from parked cars. This term refers to when a parked car opens its door suddenly and an oncoming cyclist either does not have enough time and/or space to avoid the vehicle's door and a crash occurs.

**FIGURE 34** SR 997/KROME AVENUE SOUTH OF US 41/SW 8TH STREET

**FIGURE 35** VENETIAN CAUSEWAY (WESTERN END OF SAN MARCO ISLAND)

## CONVENTIONAL BIKE LANE

Conventional bike lanes are "on-road" bicycle facilities that provide the bare minimum for a dedicated bicycle facility. These bike lanes retain the core features of the previously discussed on-road bicycle facilities, such as providing a designated space within the roadway for bicyclists. It visually reinforces the message that bicyclists have a right to the roadway. This space also increases the predictability of bicyclist and motorist positioning and interaction. Figures 34 and 35 are two examples of conventional bike lanes.

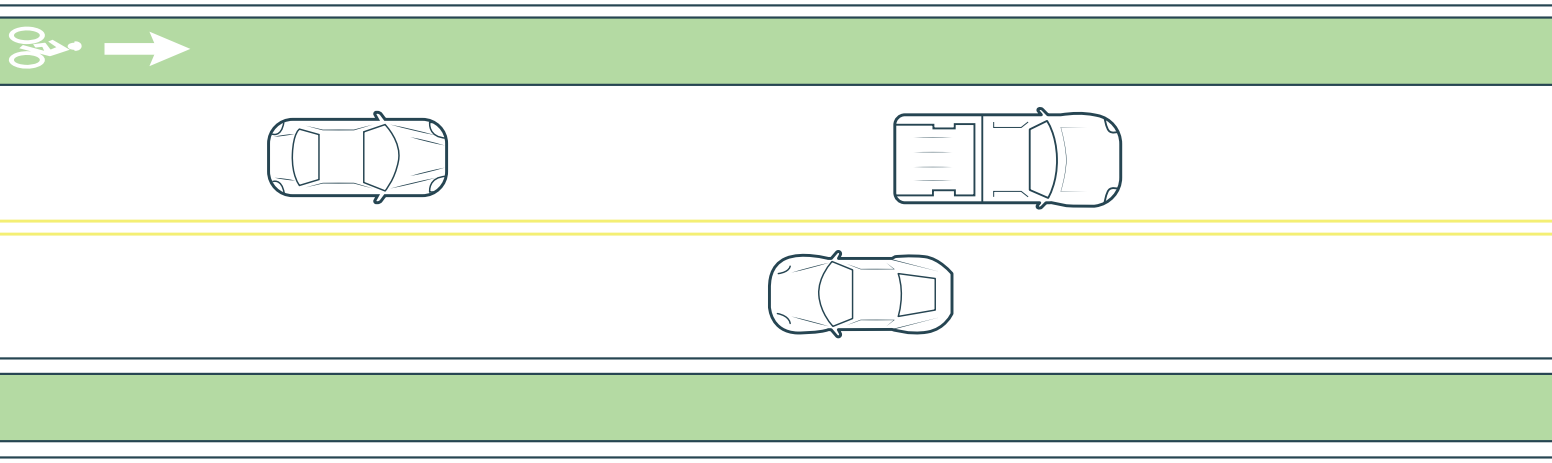


**FIGURE 36** SR 997/KROME AVENUE & NW 2ND AVENUE

**FIGURE 37** SR 997/KROME AVENUE NORTH OF SW 264TH STREET

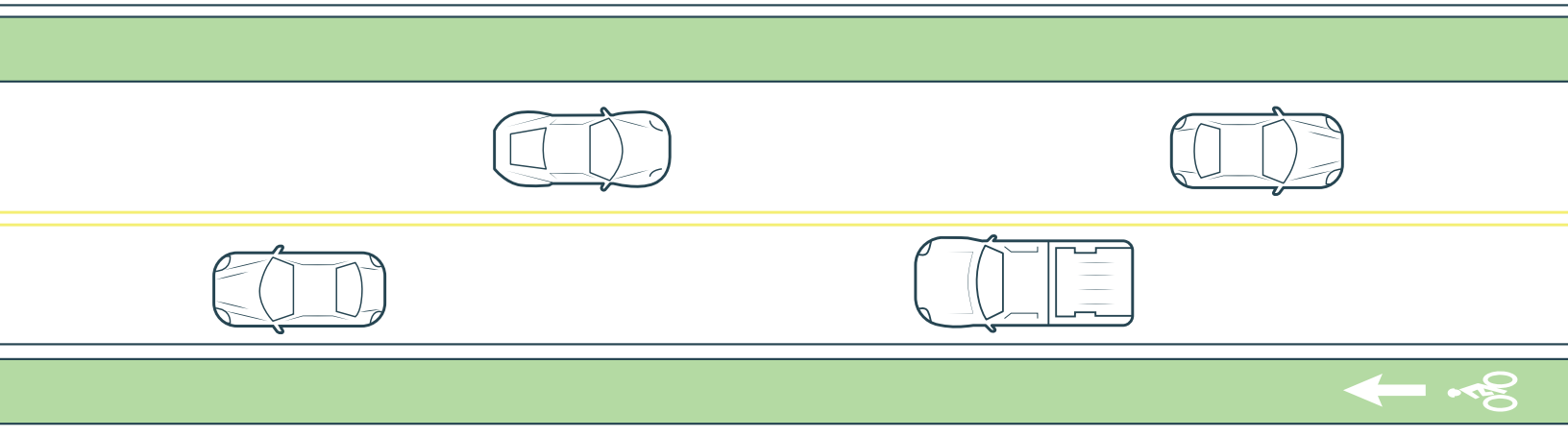
## MIXED TRAFFIC AND NON-DEDICATED FACILITIES

### WIDE CURB LANES AND BIKE BOULEVARDS

Wide curb lanes and bike boulevards are non-dedicated on-road facilities that place bicyclists in vehicle travel lanes. Visual identification is achieved with a sharrow to remind motorists to share the lane with potential bicyclists. These facilities are often referred to as mixed traffic due to the bikes and autos/trucks operating in the same space. FHWA has marked these facilities only appropriate for low traffic, low speed roadways. Implementing sharrows into roadways with an Average Daily Traffic (ADT) greater than 3,000 and a posted speed limit greater than 25 mph would be dangerous for cyclists. Even then, these facilities do not come across as inviting for residents and tourists that may be new to biking nor as a replacement for a dedicated facility.

### PAVED SHOULDERS

Paved shoulders are another type of facility in Miami-Dade County, as well as other parts of the United States. They are facilities that can provide additional pavement width adjacent to the outside travel lane, thereby improving operating conditions for drivers of motor vehicles and providing space for bicycle traffic, especially in rural areas. Where paved shoulders are provided, the surface condition is critical for safe bicycling. Debris and potholes are common issues that create hazardous conditions for bicyclists. Many of the benefits provided by paved shoulders are entirely geared towards improved traffic operations, not non-motorized travel.



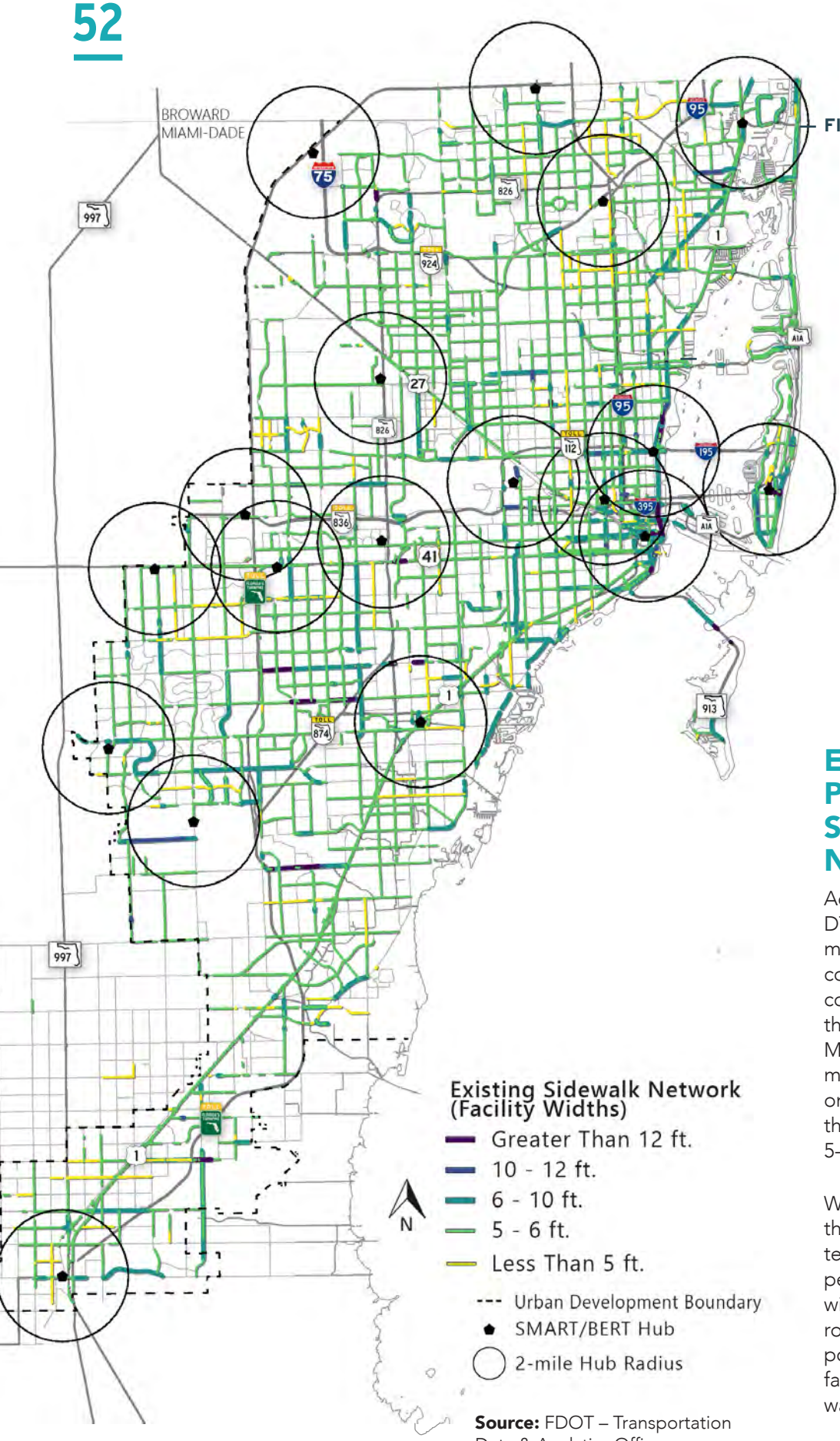



**FIGURE 38** EXISTING SIDEWALK MAP

**Source:** FDOT – Transportation Data & Analytics Office

## EXISTING PEDESTRIAN SIDEWALK NETWORK

According to the Miami-Dade DTPW, there are approximately 5,500 miles of dedicated public roads. A comprehensive database for the most common dedicated pedestrian facility, the sidewalk, is an on-going process in Miami-Dade County. Currently, 1,712 miles of sidewalk have been mapped on major and state roadways. 59% of these mapped sidewalk facilities are 5-feet wide or less.

With the data currently available, the majority of the SMART Plan terminals have some type of pedestrian connection. However, without a complete picture of local roadway conditions, there is a possibility that these important transit facilities have low accessibility by walking from the surrounding areas.


**FIGURE 39** LINCOLN ROAD & SR 907/ALTON ROAD

**FIGURE 40** SOUTH RIVER DRIVE & WEST FLAGLER STREET

**FIGURE 41** US 41/SW 8TH STREET & SW 103RD PLACE

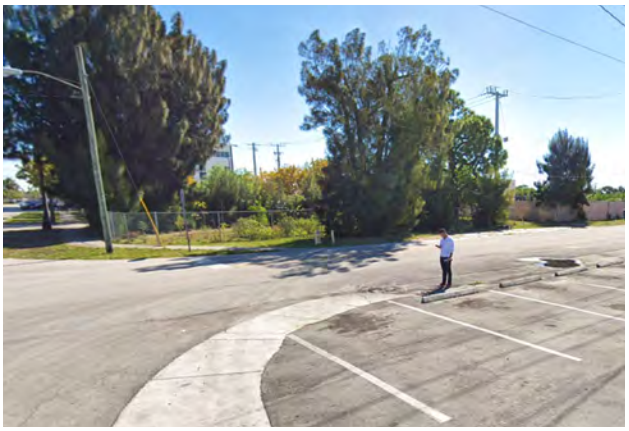


**FIGURE 42** ALADDIN STREET

## EXAMINING SIDEWALK WIDTHS

There are other important aspects to a sidewalk aside from width, but the images above, Figures 39 through 42, demonstrate how it can play a critical factor into the success of that facility. Figure 39 displays the western termini of the Lincoln Road pedestrian mall, a 90-foot wide roadway completely converted for non-motorized use, which attracts users of all ages and abilities and has become a source of economic development for the City of Miami Beach. Figure 40 shows a portion of South River Drive and an example of a more standard 6-foot sidewalk that has been enhanced with landscaped buffers and shading. Designing a buffer within the road creates distance between pedestrians and vehicles, thus increasing safety while offering a beautified experience.

US-41/SW 8th Street, as seen in Figure 41, highlights why the 6-foot sidewalk width is the minimum for urbanized environments. This sidewalk deals with utility encroachment, which significantly reduces its effective pedestrian through zone. Miami-Dade residents reliant on ADA access and standards feel these substandard conditions the most. Furthermore, no shading or buffering between pedestrians and the heavy traffic laden roadway increases the likelihood of people opting out of non-motorized trips and relying on personal vehicles. Figure 42, portrays a portion of a sidewalk on Aladdin Street, where the sidewalk is flush with the roadway and lacks all other amenities for safe pedestrian travel, creating a stressful experience even for able-bodied individuals. Figures 39 and 40 represent just two of many examples in Miami-Dade County that benefit bicyclists and pedestrians. Figures 41 and 42 are just two of numerous examples where bicyclists and pedestrians are being underserved.

## CRASH ANALYSIS

When studying existing bicycle and pedestrian accessibility to an area, it is important to perform a crash analysis to determine existing safety needs within the area as well as bicycle and pedestrian route choices and limitations. From 2016 to 2019, Florida held the number one spot as the most dangerous place in the United States for pedestrians. According to Smart Growth America, "Part of the reason for this may be because much of the growth in these places occurred in the age, and the development scale of, the automobile. Previous research by Smart Growth America found that, in general, the most sprawling metropolitan areas with wider roads and longer blocks typically cluster in the southern states. Furthermore, academic research has consistently linked these sprawling growth patterns to higher rates of both traffic-related deaths for people walking and traffic-related deaths overall."[8] The 2017 Florida Bicycle and Pedestrian Strategic Safety Plan reinforces this by highlighting Miami-Dade County maintaining some of the highest rates of bicyclist and pedestrian fatalities statewide.

As part of this analysis, 5-year crash data (2014–2018) was obtained from the Florida Signal Four database, and the results are summarized in Tables 6 and 7. From 2014 to 2018, the total number of pedestrian crashes in the County was 4,557, with a mean of 911 crashes per year. During this same period, the total number of bicyclist crashes in the County was 2,328, with a mean of 466 crashes per year. Of this combined total of 6,885 bicycle and pedestrian crashes, 5.2%, or 357, were fatal.

[8] 2019 Dangerous By Design," Smart Growth America. National Complete Streets Coalition

**TABLE 6** TOTAL PEDESTRIAN AND BICYCLE CRASHES 2014 - 2018 (CRASHES PER YEAR)

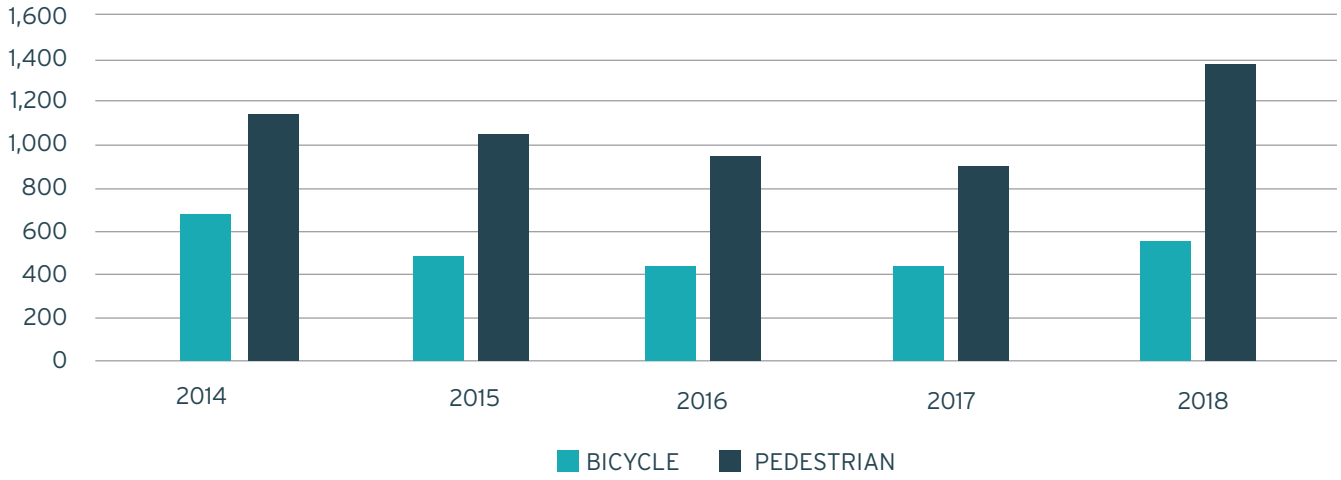
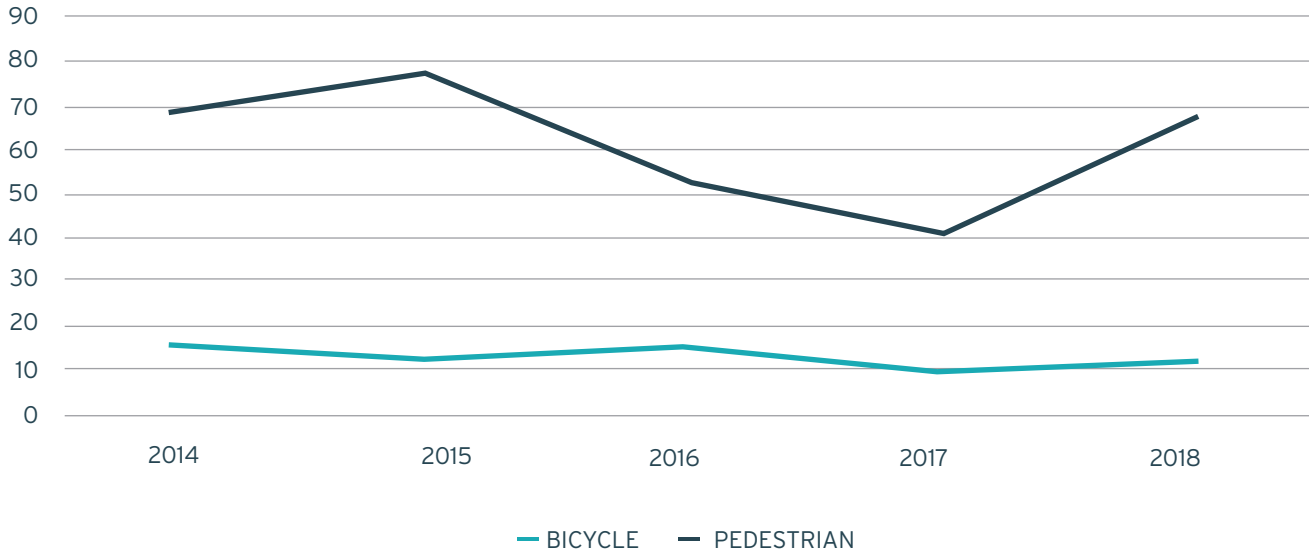
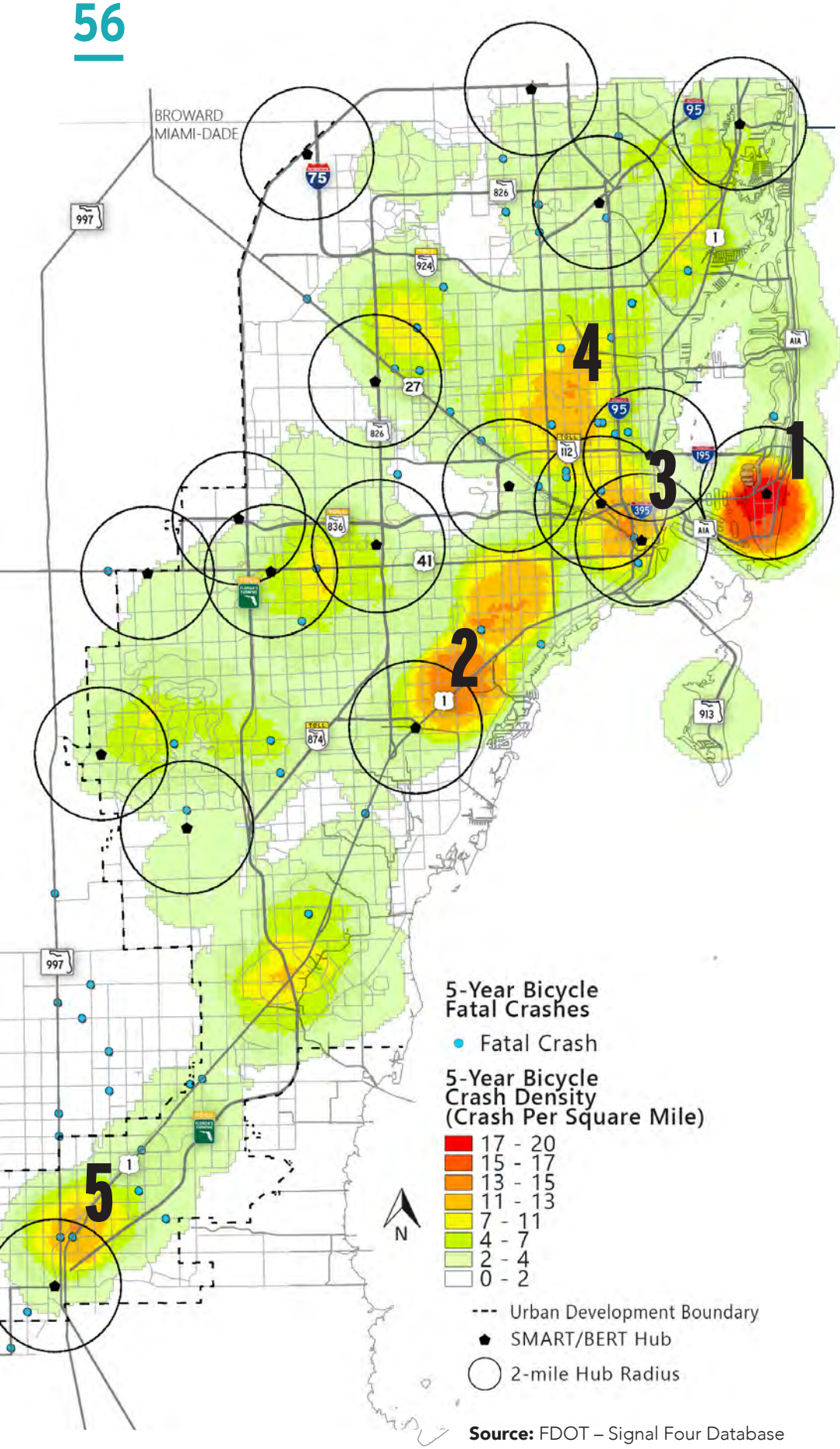



**TABLE 7** FATAL BICYCLE AND PEDESTRIAN CRASHES 2014 - 2018






**Source:** FDOT – Signal Four Database

**FIGURE 43** 5-YEAR BICYCLE CRASH DENSITY

## BICYCLE CRASHES

Figure 43 highlights the locations within Miami-Dade County from 2014 to 2018 that maintained a high density of bicycle crashes. Five areas that stand out are described below.

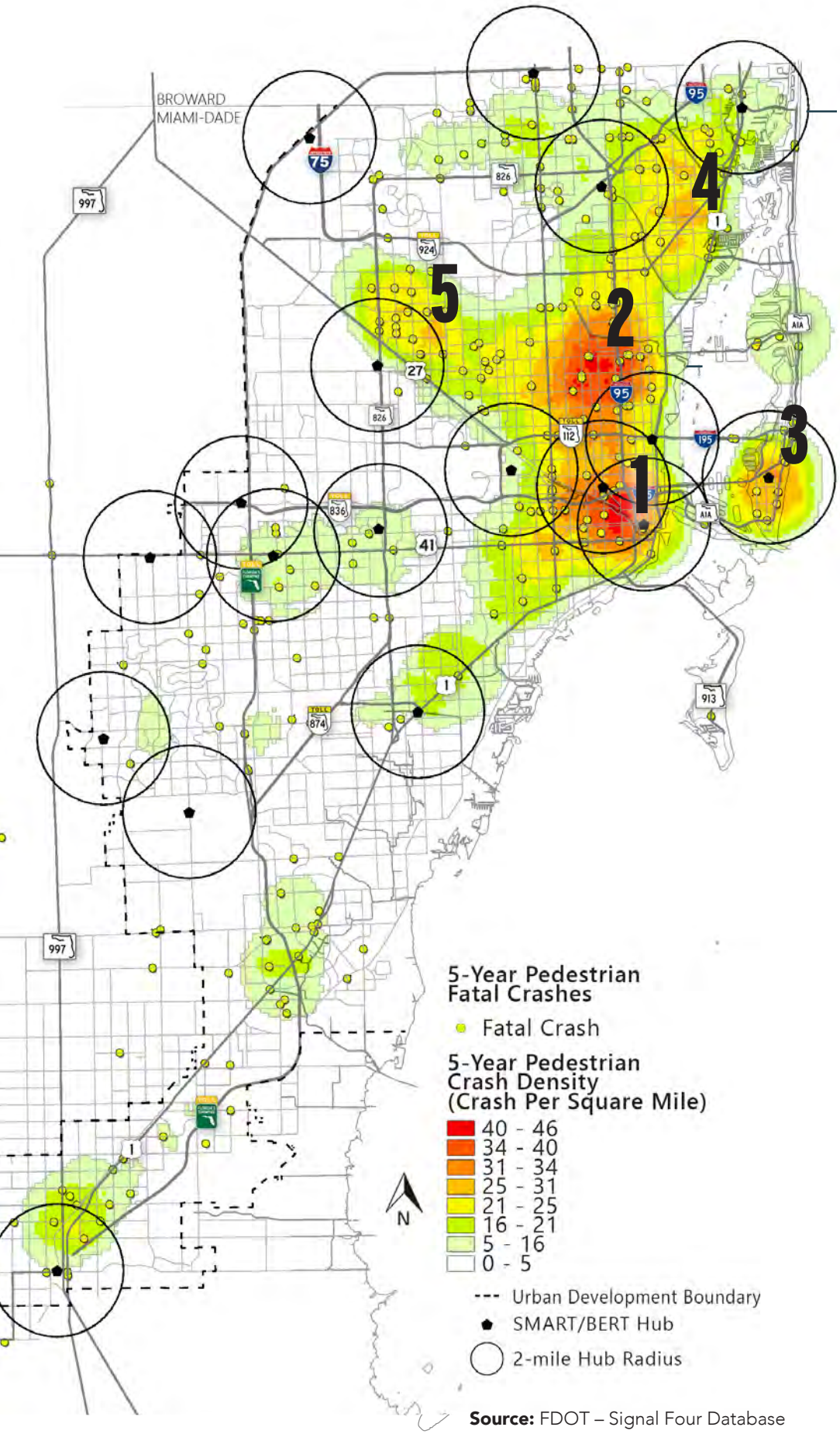
1. Northern section of South Beach. Possible factors that contribute to this area's high density of crashes: regional and international draw for tourists who utilize the rental bikes found around the city as well as the gaps found in the non-motorized network while navigating congested AM and PM peak traffic volumes.

2. Area around US-1/S. Dixie Highway and SR 959/SW 57th Avenue maintains a large student population more inclined to use non-motorized travel that must navigate along US-1 and connecting arterials which consistently operate with high speed and traffic volumes.

3. Central Business District maintains a high population density more reliant on alternate modes of travel with significant AM and PM peak daily motor vehicle congestion.

4. The area of Liberty City also possesses a high population density more reliant on alternate modes of travel with a limited existing non-motorized network.

5. Homestead Town Square commercial center maintains a limited non-motorized network of dedicated facilities.




**Source:** FDOT – Signal Four Database

**FIGURE 44** 5-YEAR PEDESTRIAN CRASH DENSITY

## PEDESTRIAN CRASHES

Figure 44 highlights the locations within Miami-Dade county from 2014 to 2018 that maintained a high density of pedestrian crashes. Five areas that stand out are described below.

1. Central Business District maintains a high population density more reliant on alternate modes of travel with significant AM and PM peak daily motor vehicle congestion.

2. Northern area of Liberty City maintains a high concentration of elderly belonging to racial or ethnic minority groups reliant on alternate modes of transportation. The Florida Department of Elder Affair's 2018 projections showed this area of Miami-Dade to have a distinctly high concentration of this pedestrian crash vulnerable population.

3. Pedestrian crashes occurring are similar to the concentration of bicycle crashes previously discussed – frequent draw for regional and international tourists and high congestions during PM and AM peak periods

4. This area within North Miami Beach deals with larger roadways with larger turn radii that encourage vehicles to make fast, sweeping turns while pedestrians navigate to and from local trip generators.

5. This portion of Hialeah has similar conditions as North Miami Beach, described in point 4.

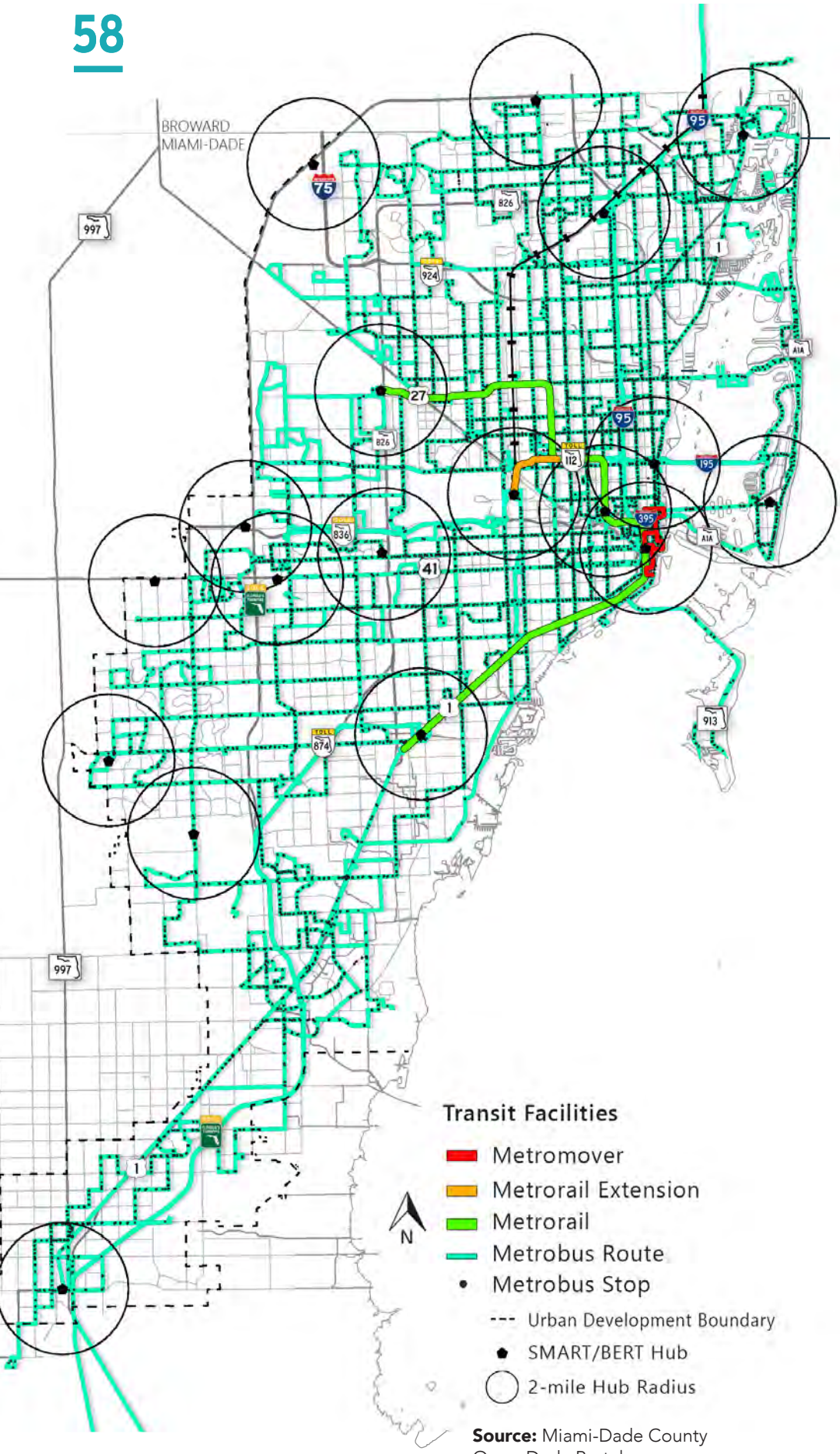
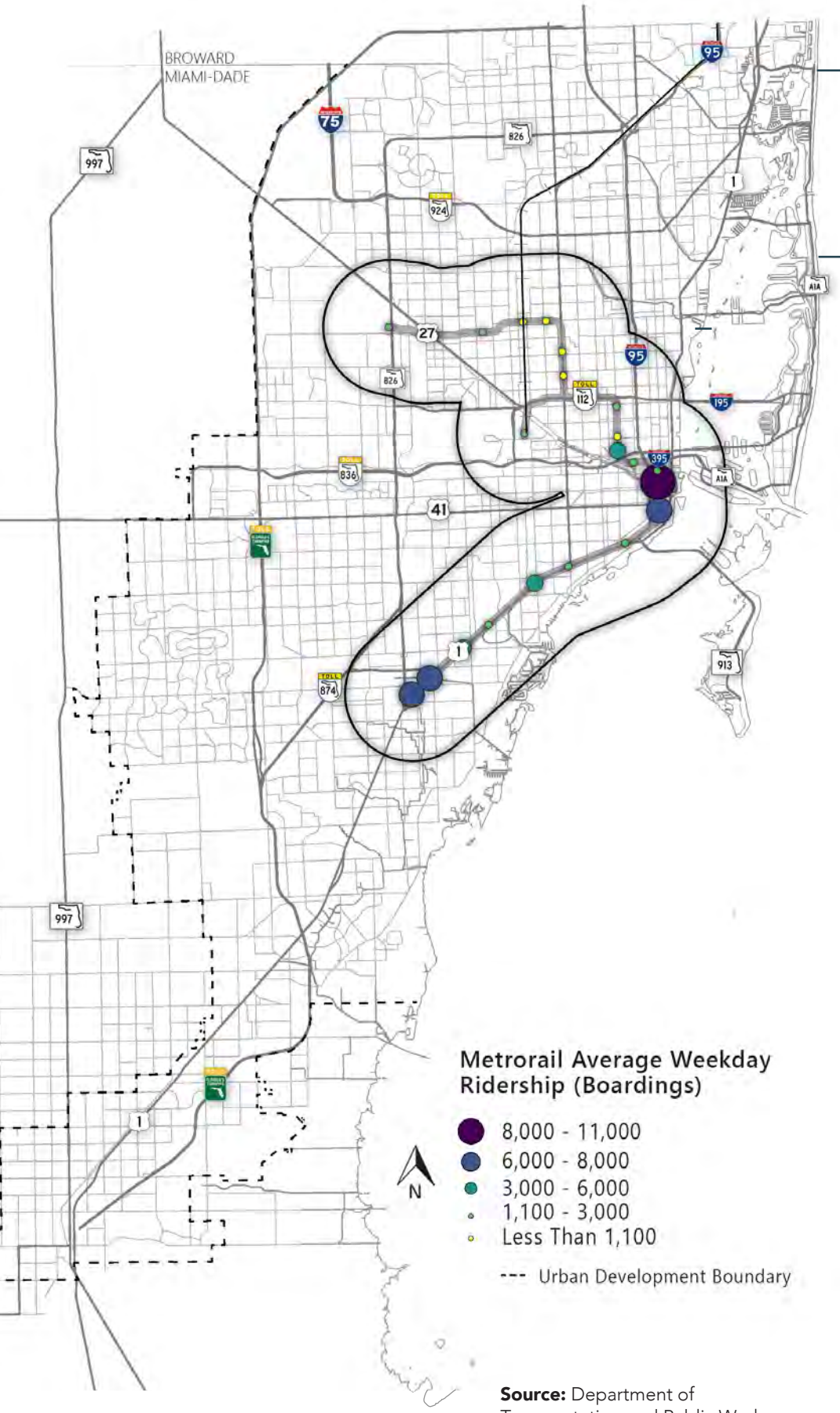



**FIGURE 45** EXISTING TRANSIT ROUTES AND STOPS

**Source:** Miami-Dade County Open-Dade Portal

## EXISTING TRANSIT ROUTES AND STOPS

The Metrorail is a 25-mile dual track premium transit service that transfers people to and from the Central Business District (CBD). The existing alignment provides connections to Miami International Airport (MIA) and runs from Kendall through South Miami, Coral Gables, to the Civic Center/Jackson Memorial Hospital area; and to Brownsville, Liberty City, Hialeah, and Medley in northwest Miami-Dade County. The Metromover provides premium transit within the CBD area. Metromover is a free service that operates seven (7) days a week in the downtown and Brickell area. Major destinations include the American Airlines Arena, Bayside Marketplace, and Miami-Dade College. Miami-Dade County maintains approximately 8,000 bus stops to service the 113 metrobus and trolley routes operating within the county, moving on average around 3,500,000 people per month.




**Source:** Department of Transportation and Public Works

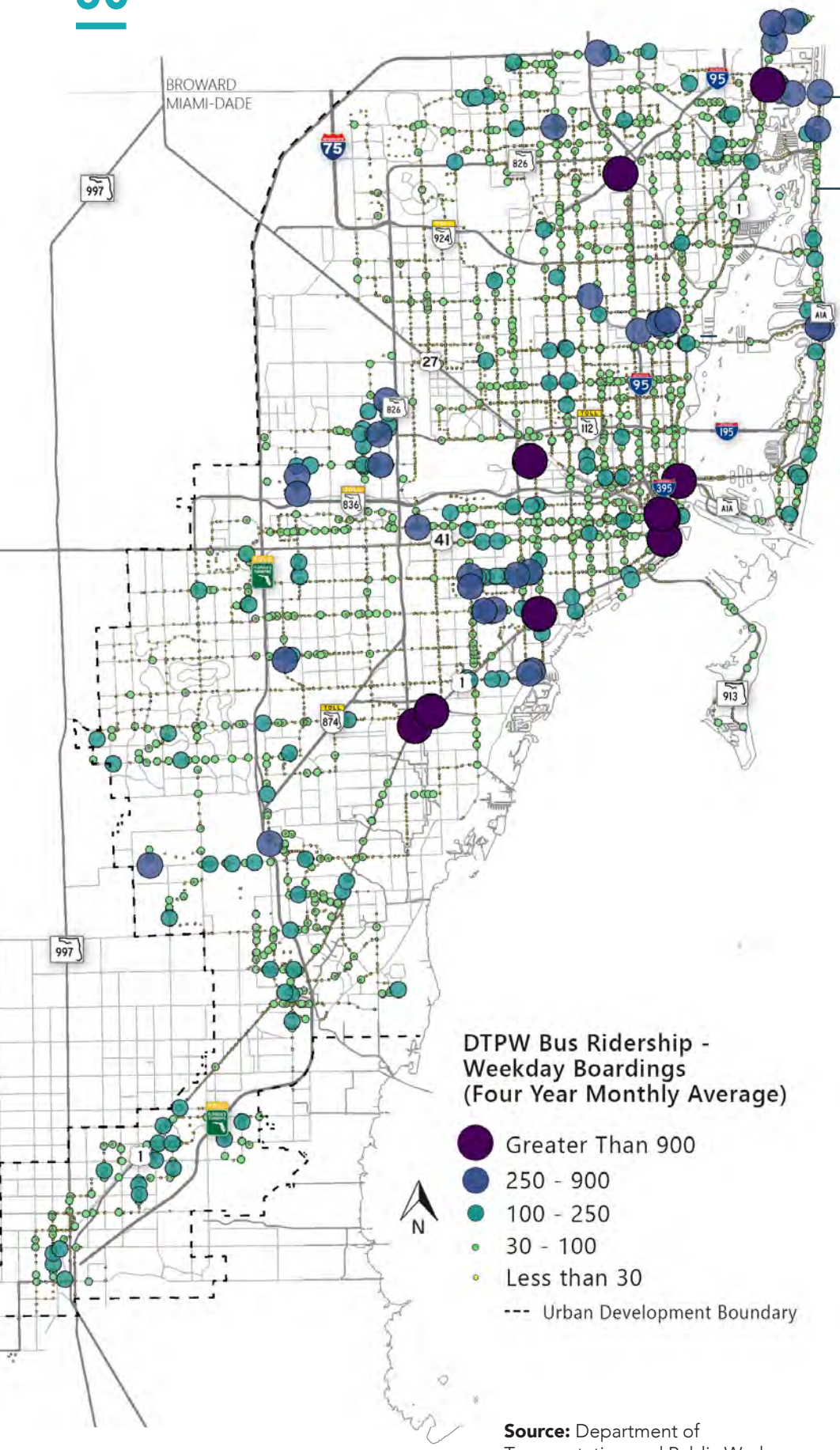
**FIGURE 46** METRORAIL RIDERSHIP - BOARDING

**TABLE 8** METRORAIL STATION WEEKDAY RIDERSHIP

| METRORAIL STATION | AVERAGE BOARDING |
|---|---|
| **Government Center** | 10,684 |
| **Dadeland South** | 7,175 |
| **Brickell** | 6,395 |
| **Dadeland North** | 6,062 |
| **Civic Center** | 5,791 |

## METRORAIL RIDERSHIP - BOARDING

Figure 46 displays weekday average boarding ridership at each of the 23 Metrorail stations. On a monthly average, the Metrorail system moves approximately 1,500,000 people. There is a clear concentration of boarding activity at the Dadeland North and South Stations, as well as in Downtown Miami. Table 8 lists the five highest boarding ridership stations for the Metrorail service. The map highlights a 2-mile buffer around the existing Metrorail stations, instead of the individual SMART Plan terminals. This is because it is imperative to examine non-motorized direct connections to existing premium transit in Miami-Dade County as well as future premium transit terminals. This coincides with the SMART Plan, not against it, the Metrorail represents a critical piece to the overall success of the SMART Plan.




**Source:** Department of Transportation and Public Works

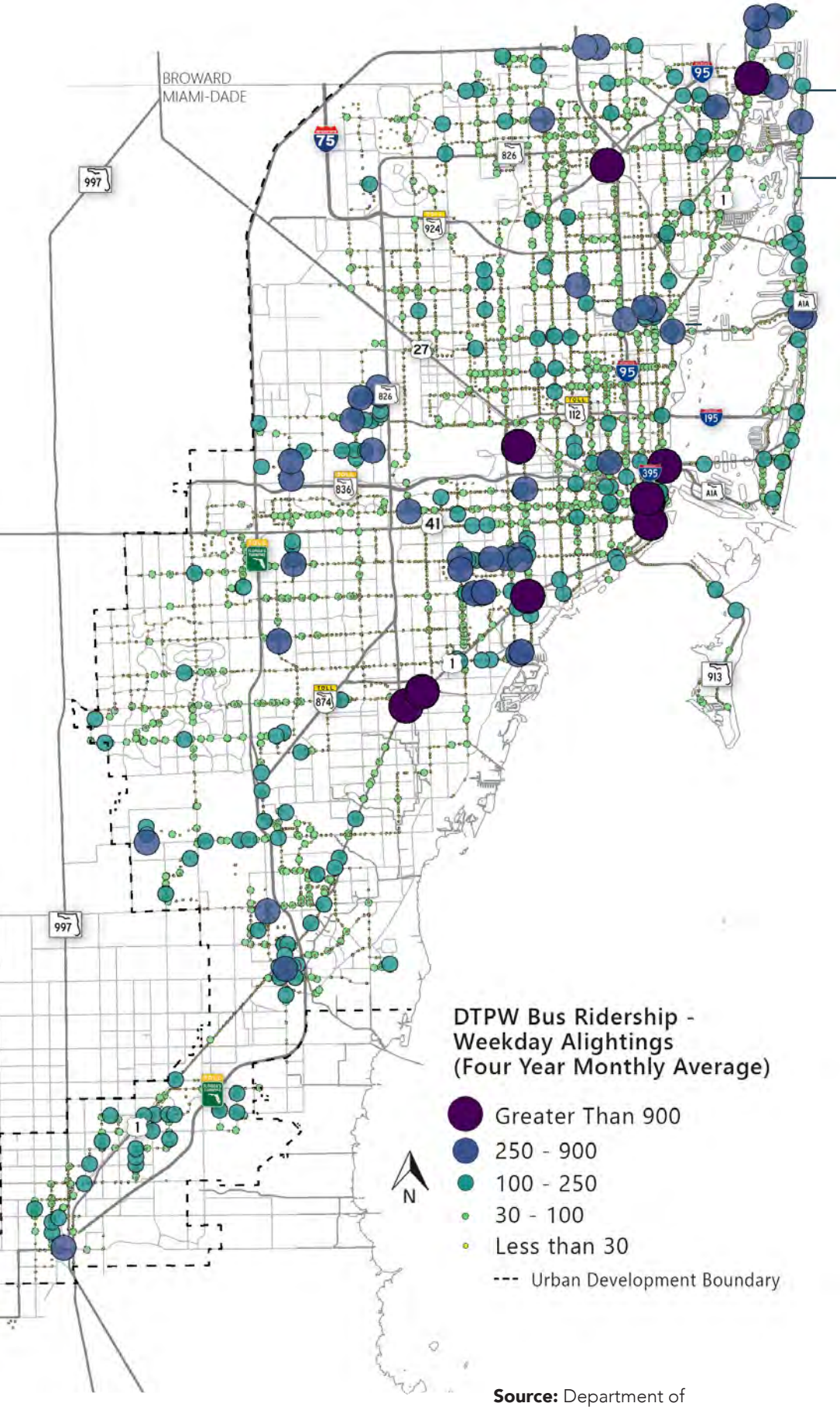
**FIGURE 47** DTPW BOARDING RIDERSHIP MAP

**TABLE 9** HIGHEST AVERAGE WEEKDAY BOARDING PER DTPW BUS STOP

| STOP ID | DTPW STOP NAME | AVERAGE BOARDING |
|---|---|---|
| **104** | STEPHEN P CLARK CENTER | 3,996 |
| **6** | DADELAND SOUTH METRORAIL | 3,968 |
| **34** | BUS TERMINAL AT AVENTURA | 2,946 |
| **39** | OMNI TERMINAL / ARSHT ME | 2,038 |
| **7** | DADELAND NORTH METRORAIL | 1,861 |
| **10493** | AIRPORT STATION | 1,308 |
| **78** | BRICKELL STATION | 1,190 |
| **40** | DOWNTOWN METROBUS TERMINAL | 1,020 |
| **156** | GOLDEN GLADES P&R | 982 |
| **166** | DOUGLAS ROAD METRORAIL S | 949 |

## DTPW BUS RIDERSHIP- WEEKDAY BOARDING PER STOP

Figure 47 highlights the average monthly boarding numbers for each stop from 2015 to 2018. Boarding is when a new passenger gets on a bus from a bus stop. Downtown Miami maintains high ridership within the general area as well as four (4) of the ten (10) most active stops within the county. Of these ten (10) locations with high activity, nine (9) are existing SMART Plan terminals or are within the 2-mile radius of one.




**Source:** Department of Transportation and Public Works

**FIGURE 48** DTPW ALIGHTING RIDERSHIP MAP

**TABLE 10** HIGHEST AVERAGE WEEK-DAY ALIGHTING PER DTPW BUS STOP

| STOP ID | DTPW STOP NAME | AVERAGE BOARDING |
|---|---|---|
| 6 | DADELAND SOUTH METRORAIL | 3997 |
| 34 | BUS TERMINAL AT AVENTURA | 3434 |
| 39 | OMNI TERMINAL / ARSHT ME | 2247 |
| 104 | STEPHEN P CLARK CENTER | 2144 |
| 59 | SW 1 ST & 1 CT | 1680 |
| 7 | DADELAND NORTH METRORAIL | 1606 |
| 10493 | AIRPORT STATION | 1131 |
| 78 | BRICKELL STATION | 1037 |
| 166 | DOUGLAS ROAD METRORAIL S | 931 |
| 156 | GOLDEN GLADES P&R | 925 |

## DTPW BUS RIDERSHIP-WEEKDAY ALIGHTING PER STOP

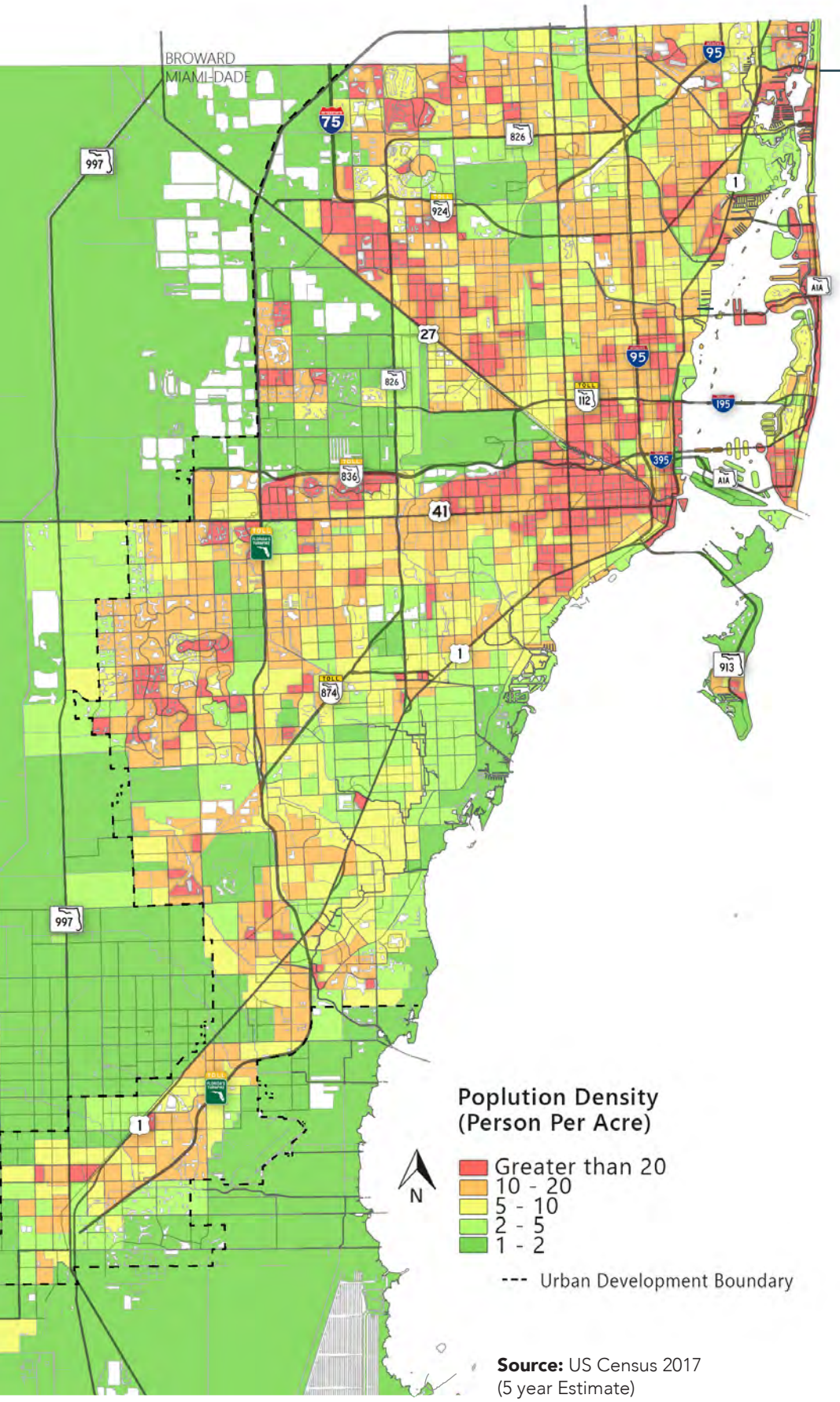
Figure 48 identifies where there is high and low alighting ridership activity per stop within the County from 2015 to 2018. Alighting is when a current passenger on an DTPW bus, upon arrival of a desired stop, exits the bus. Table 10 highlights the ten (10) stops with the highest average alighting with similar results between activity and SMART Plan terminals. Like Metrorail, investing in direct non-motorized connections to locations with high ridership is a reliable strategy to address first/last mile connections.

# POPULATION DATA

The many characteristics that define Miami-Dade, are comprised in socio-economic data. From population to income, socio-economic data describes most aspects of human interaction with the physical environment and surrounding society. When considering transportation improvements, three (3) sociocultural issues are specifically evaluated and include:

- Population Density
- Communities of Concern
- Employment Density

The following subsections document this data to understand where bicycle and pedestrian improvements will be most beneficial for the communities within Miami-Dade County.



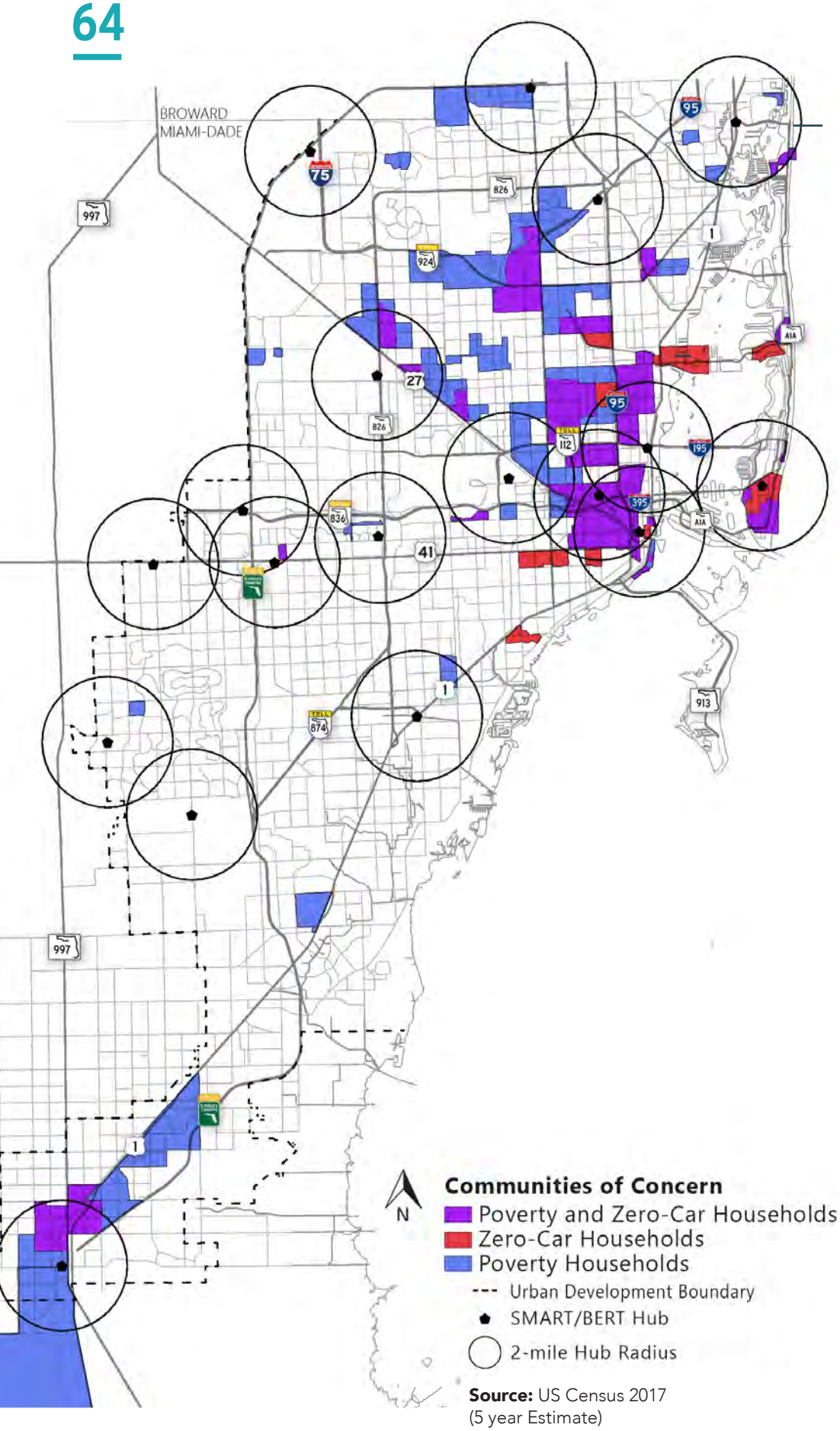

**Source:** US Census 2017
(5 year Estimate)

**FIGURE 49** POPULATION DENSITY MAP

## POPULATION DENSITY

The US Census Bureau indicates Miami-Dade County's population, over the course of 20 years, has increased from 2,176,000 to 2,702,602. Dense population centers (20 or more people per acre) are highlighted in red throughout the County. Noticeable concentrations of high-density areas can be found just north of US-27/Okeechobee Road and just south of SR 836/ Dolphin Expressway, as well as portions of the east coast of Miami Beach. The largest singular concentration of high density is located within the downtown area, just south of the Miami River.

Approximately 1,405,730 or 51% of the entire population of Miami-Dade lives within two (2) miles of the 18 SMART Plan terminals. 61% of all high-density population centers are within that same radii. Each terminal has a clear opportunity to connect with the nearby population centers that are within the ideal bike trip distance. Doing so can contribute towards shifting mode share in the County.




**Source:** US Census 2017
(5 year Estimate)

**FIGURE 50**
COMMUNITIES OF CONCERN

## COMMUNITIES OF CONCERN

The Miami-Dade County Communities of Concern are identified in the Federal Planning Emphasis Areas (PEAs) of a Miami-Dade County study, conducted in 2017 for the Miami-Dade TPO. These areas are identified as census tracts that are at least one standard deviation above the average percentage and/or average density of Families below the Poverty Level or Households with Zero Vehicles. These communities represent some of the most transit reliant populations within the County, therefore maximizing mobility options for them is essential and can help ensure Miami-Dade's transit system places equity at the center of its design.

Downtown Miami represents the largest concentration of transit reliant populations. Other ares in the County that have large transit dependent populations include: north of US-27/Okeechobee Road, the northern section of South Beach, Opa-Locka, Florida City, and Homestead.

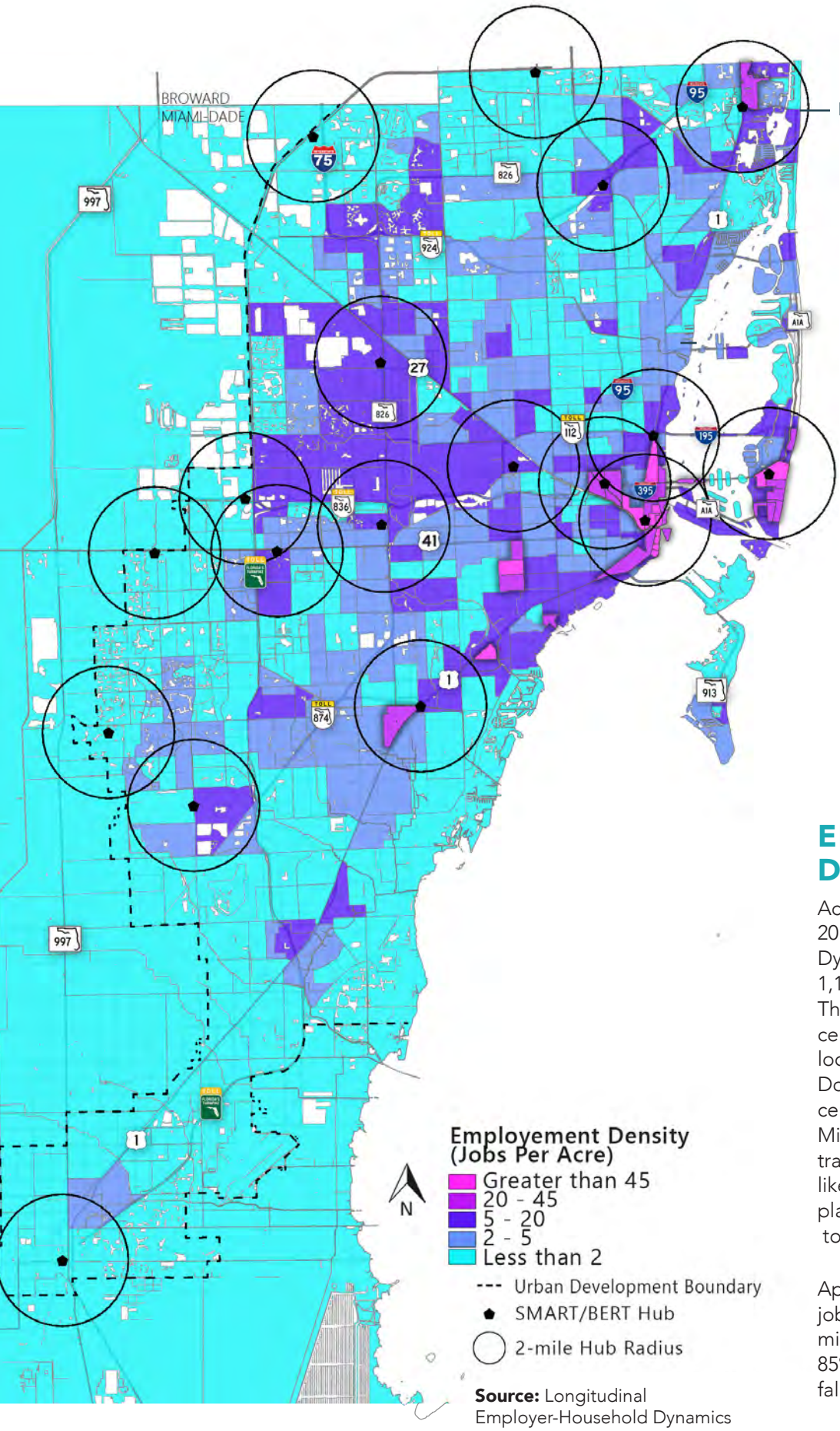



**FIGURE 51** EMPLOYMENT DENSITY MAP

**Source:** Longitudinal Employer-Household Dynamics

## EMPLOYMENT DENSITY

According to the US Census Bureau's 2017 Longitudinal Employer-Household Dynamics, there are approximately 1,193,000 jobs in Miami-Dade County. There are high density employment centers (45 jobs or more per acre) located in Miami Beach, Aventura, Downtown Miami, and there are smaller centers near Coral Gables and South Miami. These locations in terms of a transportation network indicate areas likely to act as "trip generators" or places people want to or will need to travel to as a trip destination.

Approximately 832,705 or 70% of all jobs in the County are within two (2) miles of the SMART Plan terminals. 85% of all high employment centers fall within this 2-mile radius.

# LAND USE CHARACTERISTICS

Where does transportation planning stop and land use in a broader context begin? How do we best steward the resources and demographics in a sensitive and holistic context? To answer these questions, taking a close look at the connectivity between land uses is essential in determining what needs to happen on the roadways. In the following section, various land use characteristics are discussed to give a greater understanding of Miami-Dade County.

- Existing Land Use
- Future Land Use
- Points of Interest (Trip Generators)
- SMART Plan Terminal Potential Demand via Land Use

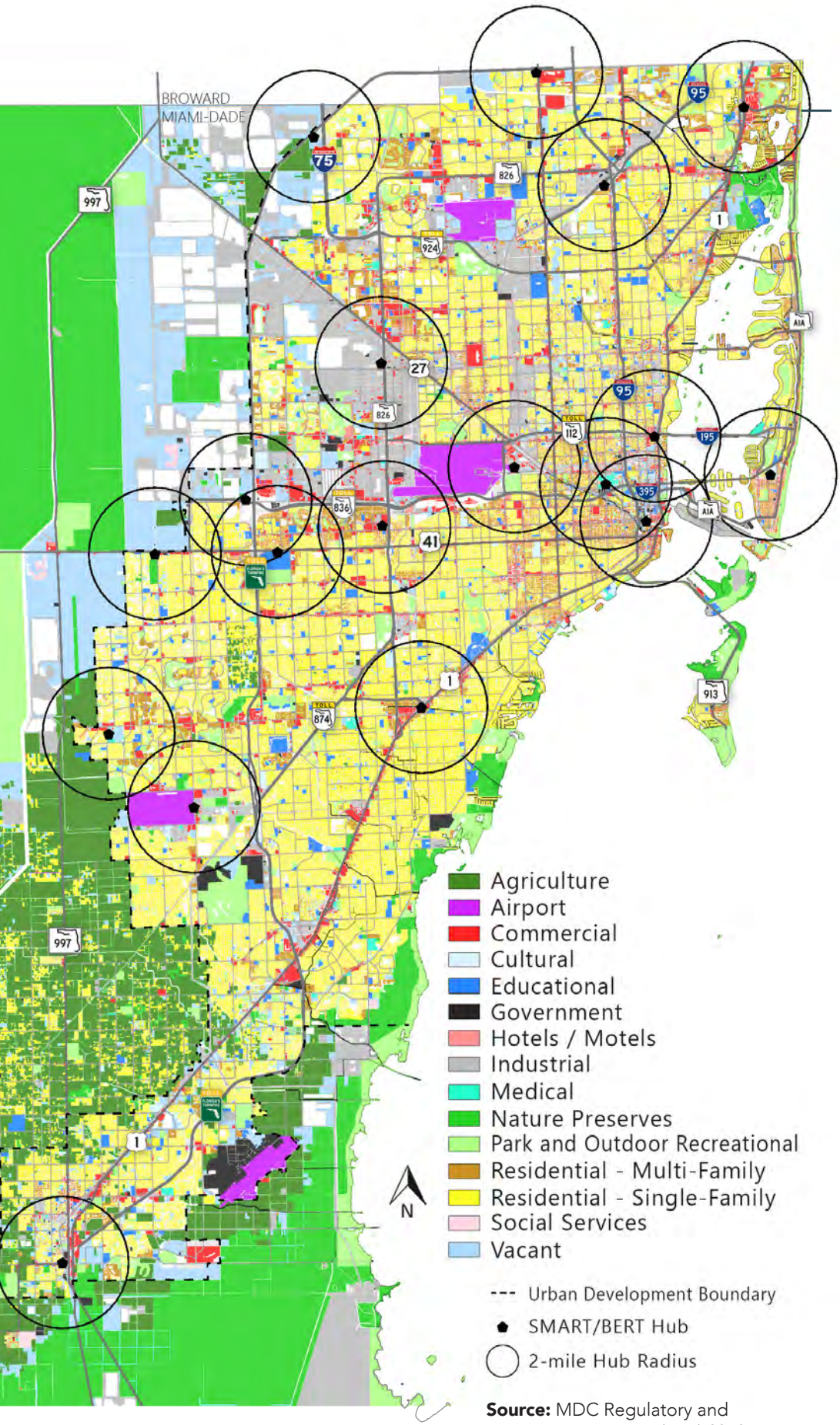



**FIGURE 52** EXISTING LAND USE MAP

**Source:** MDC Regulatory and Economic Resources (RER) 2019

## EXISTING LAND USE

Miami-Dade County, like much of Florida, has a long history of urban sprawl as indicated in the existing land use displayed in Figure 52. The first real estate boom in Miami-Dade occurred in the 1920's which aligned with the widespread availability of personal vehicles. This combination left a lasting legacy of low-density, single-family neighborhoods (marked in yellow) comprising much of the land use with the UDB. Multi-family residential units (marked in orange) are located at various municipal centers and along major roadways. Downtown Miami and South Beach represent the largest concentration of multi-family housing in the county. Commercial land use (marked in red) develops along major arterials and collectors with major industrial land use occurring west of Miami International Airport, between US-27/Okeechobee Road and SR 836/ Dolphin Expressway.

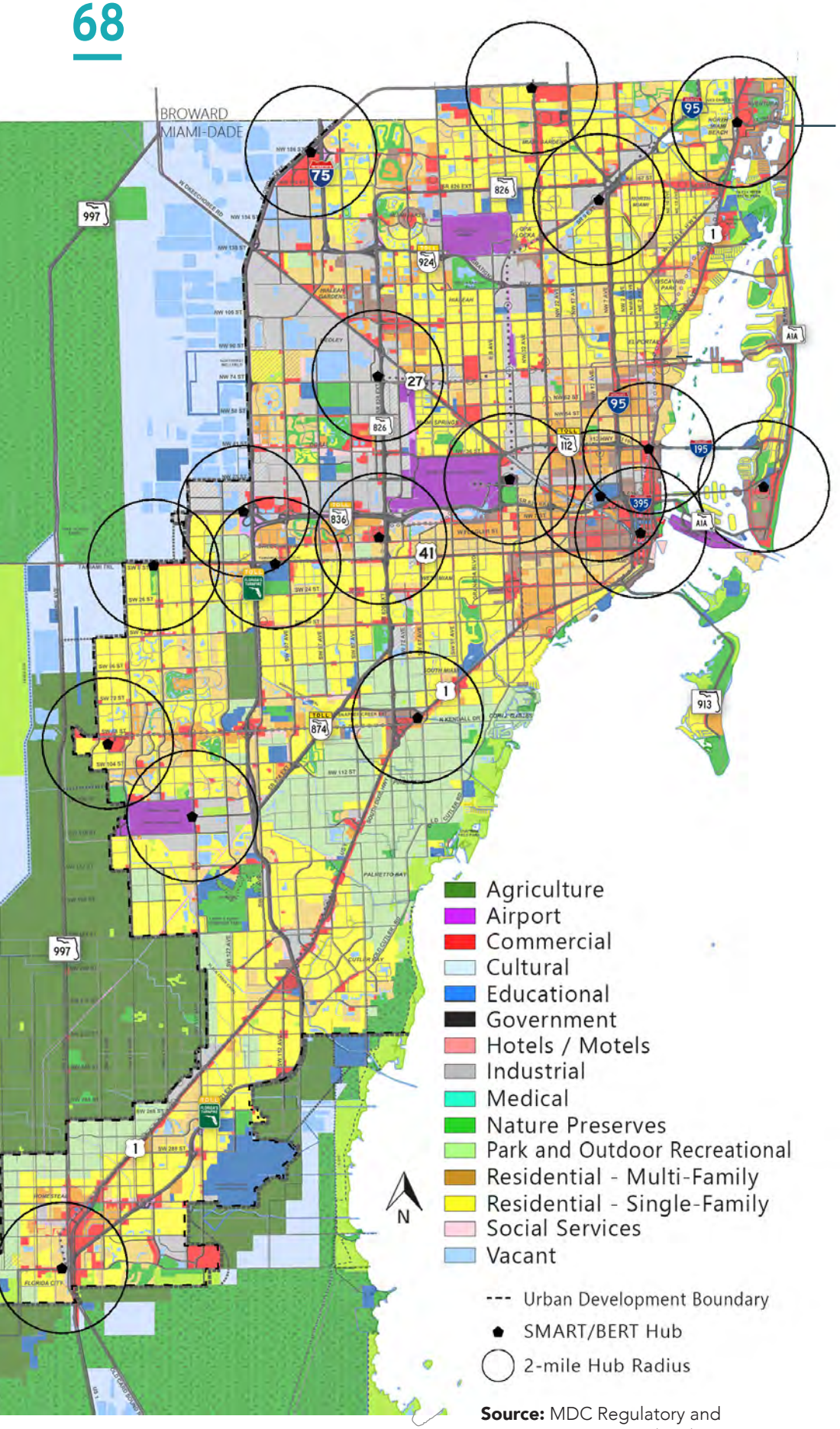



**FIGURE 53** FUTURE LAND USE MAP

**Source:** MDC Regulatory and Economic Resources (RER)

## FUTURE LAND USE

The adopted 2020 Future Land Use plan, displayed in Figure 53, shows the County's focus of increasing density, not further sprawl. Multi-family housing, seen in orange, has noticeably increased in the downtown area, and to the majority of the City of Miami, as well as just south of SR 836/Dolphin Expressway. Another focus is expanding commercial land use at key locations and along major arterial roadways.

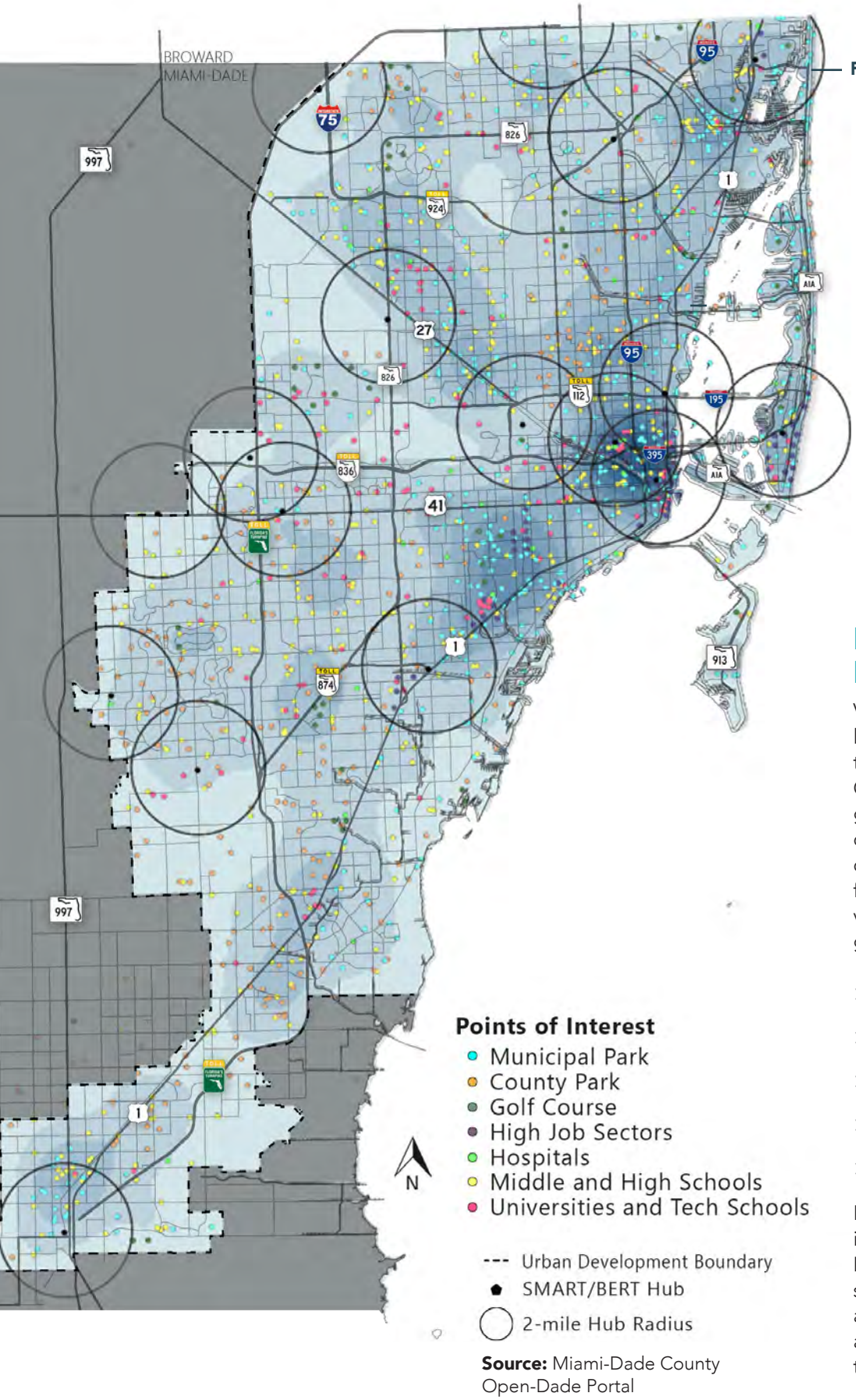



**FIGURE 54** POINTS OF INTEREST MAP

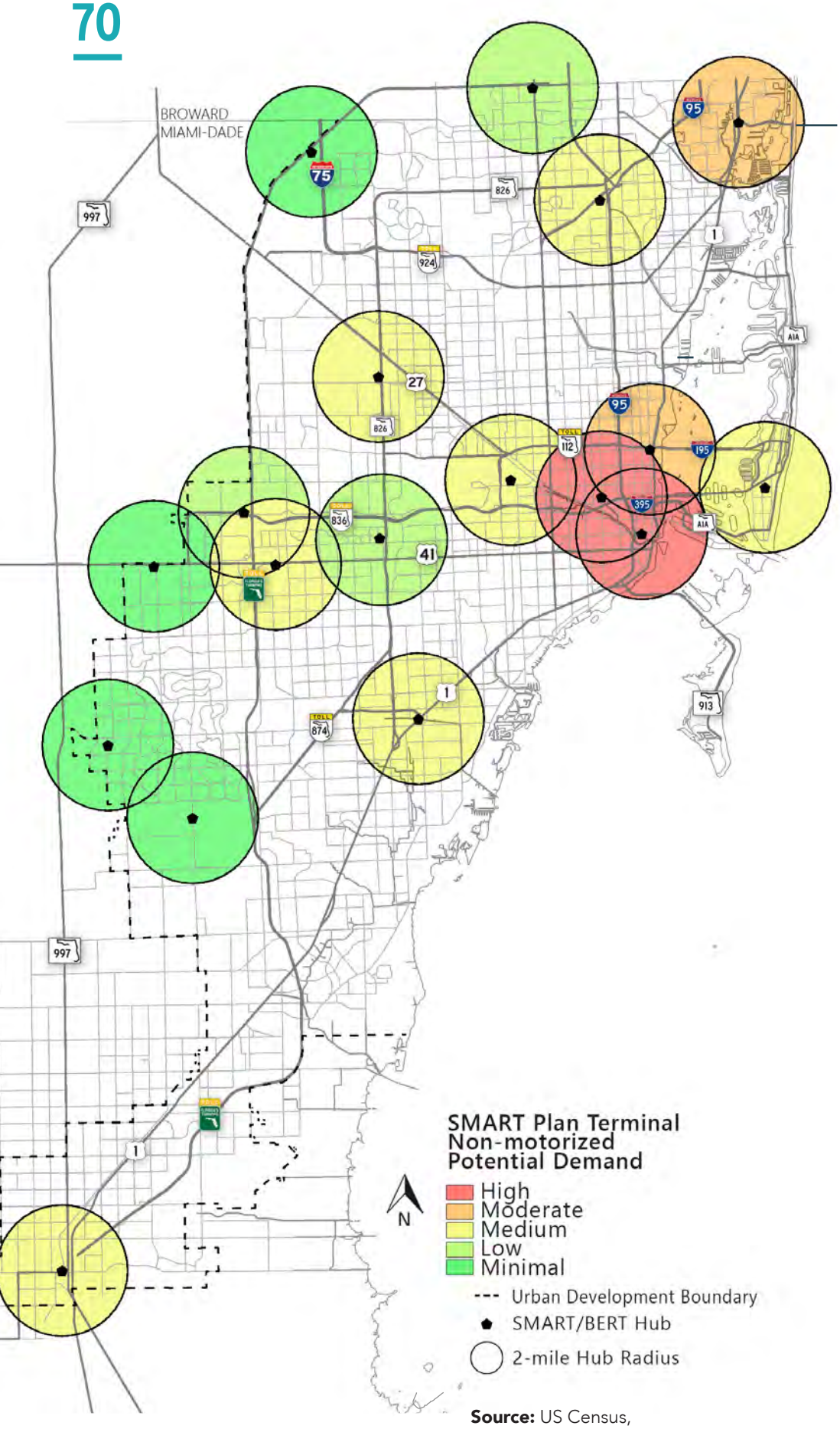
**Source:** Miami-Dade County Open-Dade Portal

## POINTS OF INTEREST

Various areas, institutions, and locations act as points of interest for the daily population of Miami-Dade County. Commonly referred to as trip generators, points of interest will frequently act as the destination point of someone's trip. Figure 54 displays five categories that frequently attract visitors on a daily basis. The five categories are listed below:

- Outdoor Recreational
- High Job Sectors
- Hospitals
- Middle and High Schools
- Universities and Tech Schools

Heavy concentration of points of interest can be found in Downtown Miami, Coral Gables, and Homestead/Florida City. These three areas are all near SMART Plan terminals or are already serviced by Metrorail or the South Dade Transitway.




**Source:** US Census, FDOT, MDC, LEHD

**FIGURE 55** SMART PLAN TERMINALS FIRST MILE/LAST MILE POTENTIAL DEMAND MAP

## SMART PLAN TERMINALS FIRST MILE/ LAST MILE POTENTIAL DEMAND

As a summary of the existing characteristics of the Miami-Dade transportation network, Figure 55 shows the 18 SMART Plan terminals in a color gradient. Terminals in red demonstrate areas that have high potential demand for non-motorized first mile/last mile connections right now. Terminals in green represent locations where present-day potential demand is lower and timing future proposed non-motorized facilities with increased population and land use development would be appropriate.

Data from the previously discussed characteristics of the transportation network was tabulated to give each terminal an individual score. For example, every time a high population center (census block group of 20 people or more per acre), university, or park was located within a terminal's radius, that terminal was awarded one point. Table 11 lists each terminals, rank, and total score.

**TABLE 11** SMART PLAN TERMINAL NON-MOTORIZED POTENTIAL DEMAND SCORING

| RANK | TERMINAL NAME | TOTAL POINTS |
|---|---|---|
| 1 | Civic Center Metrorail Station | 144 |
| 2 | MiamiCentral Station | 130 |
| 3 | Midtown Station | 78 |
| 4 | 192nd Street Station / Aventura | 61 |
| 5 | Miami Beach Convention Center | 51 |
| 6 | Miami Intermodal Center | 49 |
| 7 | 344th Street Station | 48 |
| 8 | Palmetto Metrorail Station | 47 |
| 9 | Dadeland North Metrorail Station | 45 |
| 10 | FIU Panther Station | 41 |
| 11 | Golden Glades Multimodal Transportation Facility | 36 |
| 12 | Unity Station | 32 |
| 13 | Dolphin Station | 31 |
| 14 | Mall of the Americas | 30 |
| 15 | West Kendall Terminal/SW 162nd Avenue | 22 |
| 16 | Miami Executive Airport Station | 22 |
| 17 | Tamiami Station | 9 |
| 18 | I-75/Miami Gardens Station | 9 |


# TRAFFIC DATA

Much of what influences an individual's perception of risk and danger for a potential route extends beyond that user's assessment of the available non-motorized facilities. More often, it is the users' impression of how well-suited the non-motorized facility is within the context of the adjacent roadway. Along with unpleasantries such as noise and exhaust fumes, immediate safety concerns are influenced by:

- Volume of Traffic
- Posted Speeds
- Size of the Roadway (Number of Lanes)
- Volume of Large Vehicles
- Frequency of Intersections

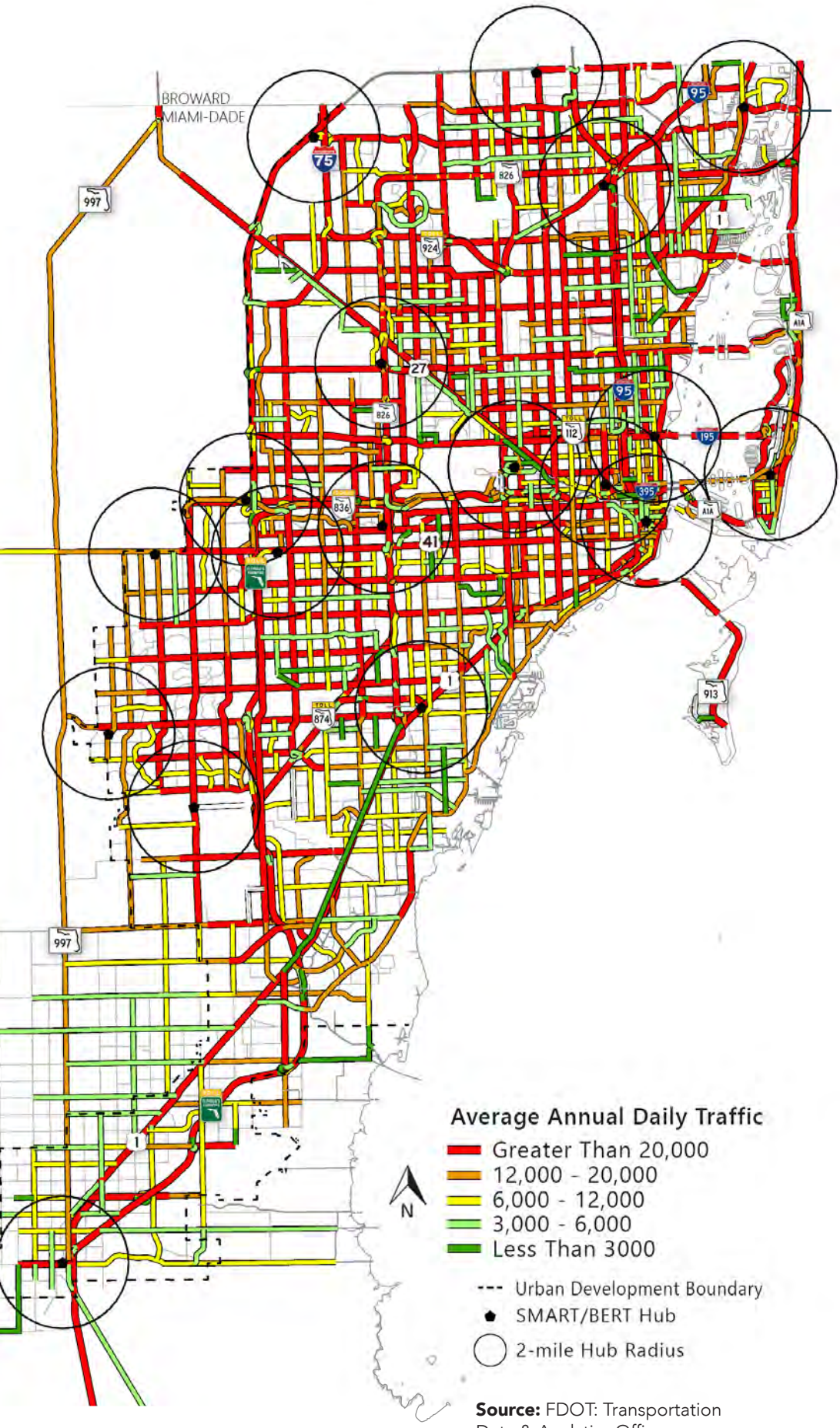


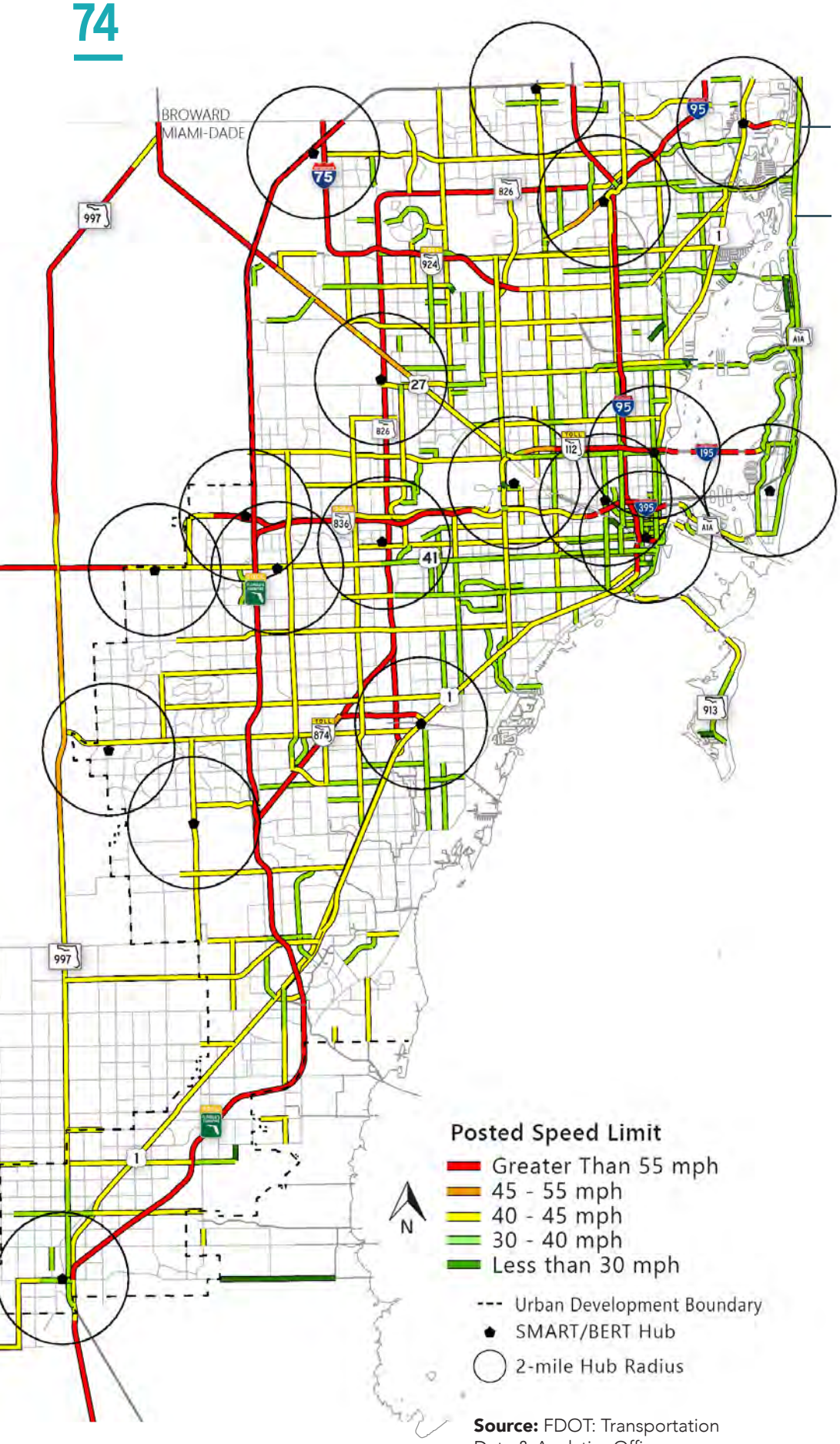

**FIGURE 56** AADT MAP

**Source:** FDOT: Transportation Data & Analytics Office

## AVERAGE ANNUAL DAILY TRAFFIC

Annual Average Daily Traffic (AADT) gives a greater understanding of the traffic volumes along defined segments of roadway. This value is calculated from short-term counts taken along the same segments which are then factored to produce the estimated AADT. Figure 56 represents Miami-Dade County's 2018 AADT data.

All major east-west and north-south roadways are classified as having an AADT greater than 20,000. All 18 of the SMART Plan terminals have high volume roadways as direct connections. South Miami-Dade is the only broad area that shows east-west roadways as having AADT volumes within the low end of the spectrum, 3,000 – 6,000. Increased safety is experienced on low-volume roadways by pedestrians and cyclists alike.




**Source:** FDOT: Transportation Data & Analytics Office

**FIGURE 57** POSTED SPEED MAP

**TABLE 12** MILES PER POSTED SPEED LIMIT RANGE

| SPEED | MILES | PERCENT |
|---|---|---|
| Greater Than 55 | 86.1 | 6% |
| 45 - 55 | 237.9 | 18% |
| 40 - 45 | 678.9 | 50% |
| 30 - 40 | 337.3 | 25% |
| Less Than 30 | 9.8 | 1% |
| **TOTAL** | **1,350** | **100%** |

## POSTED SPEED LIMITS

Figure 57 displays the available speed limit data for Miami-Dade County. The speed at which vehicles travel on roadways is one the most important factors in deciding an appropriate facility type for pedestrians and cyclists. The roadways marked in red are expressways operating at 55 mph or greater. The speed category with the largest amount of miles is the 40–45 mph speed, with 678.9 miles. Downtown and Miami Beach SMART Plan terminals maintain roadway connections within 30–40 mph. All other terminals have 40–45 mph posted speed limits on the roadways that directly connect to them. Some municipalities have taken steps to reduce the speed limits in residential roads to help foster safer non-motorized travel including Miami and Miami Springs. Table 12 breaks down the amount of miles per posted speed limit range.

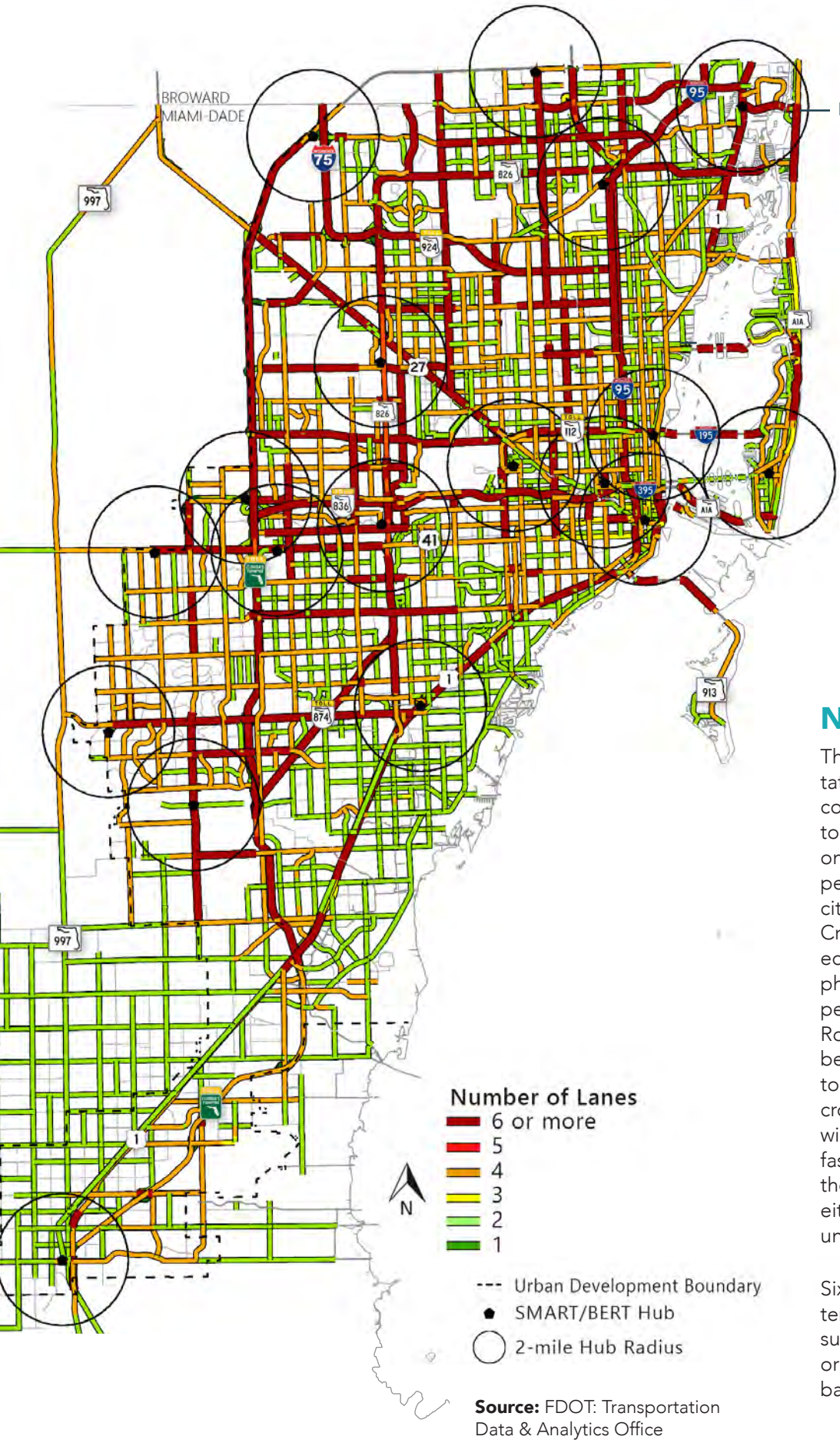



**FIGURE 58** NUMBER OF LANES MAP

**Source:** FDOT: Transportation Data & Analytics Office

## NUMBER OF LANES

The number of lanes within a transportation network is an important factor to consider when planning new non-motorized facilities or reevaluating existing ones. Number of lanes directly affects pedestrian's mobility throughout the city, especially the elderly and youth. Crossing a large roadway at designated crosswalks with insufficient signal phasing can be stressful, and not every pedestrian moves at the same speed. Roadways that have long distances between intersections for pedestrians to cross incentivize unsafe midblock crossings. When volumes are low on a wide roadway, motorists tend to drive faster, which can significantly increase the danger to cyclists forced to use either mixed traffic or unseparated, unprotected bicycle facilities.

Sixteen of the 18 the SMART Plan terminals are either located on, or surrounded by, roadways with six (6) or more lanes, highlighting potential barriers for non-motorized connections.

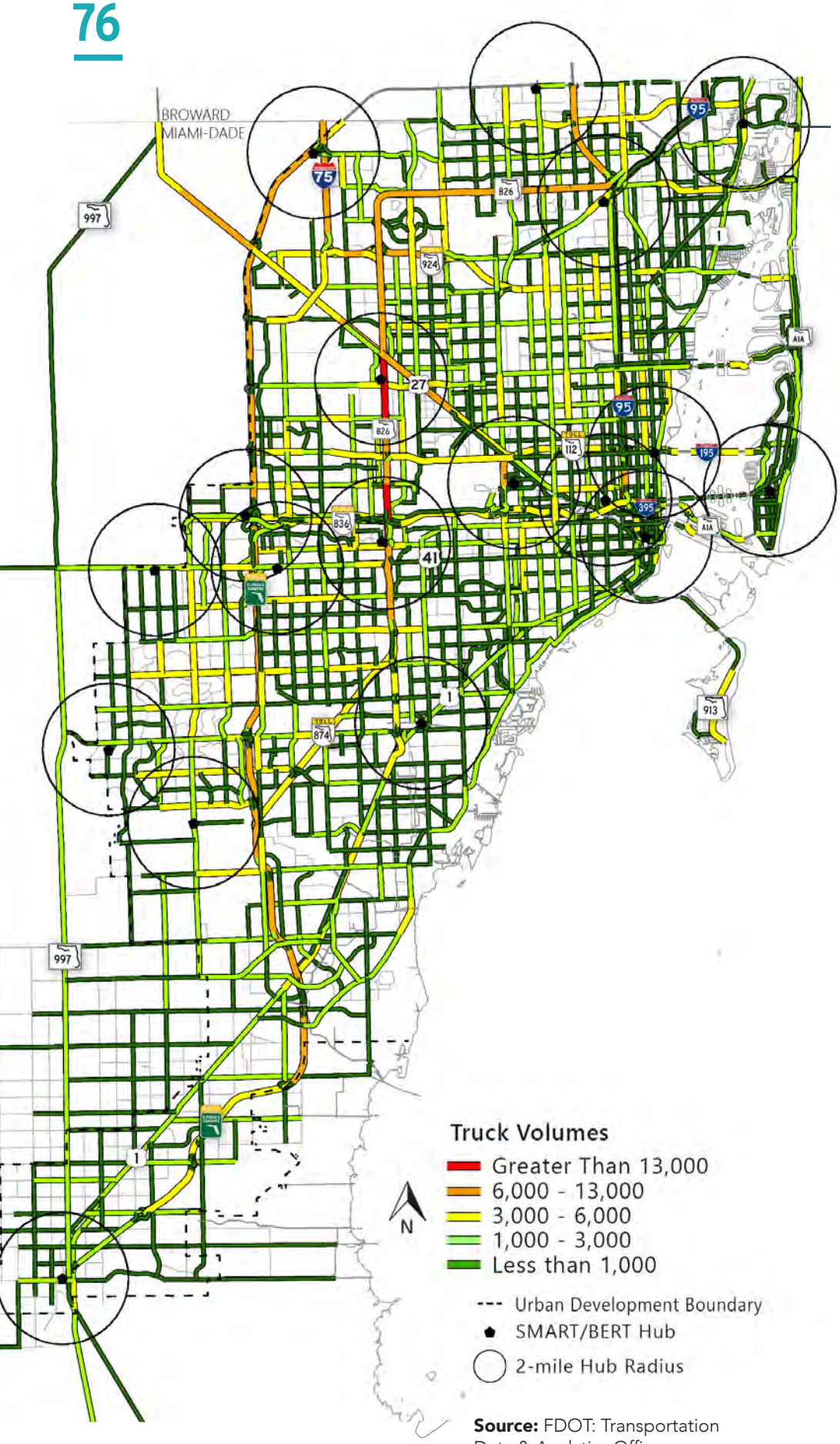



**FIGURE 59** TRUCK VOLUME MAP

**Source:** FDOT: Transportation Data & Analytics Office

## TRUCK VOLUMES

Figure 59 displays the average annual daily truck volumes on state, county, and some local roads. Expressways and major arterials operate as the primary routes for large freight vehicles within the County. SR 826/Palmetto Expressway, US-27/Okeechobee Road, I-75, and the Turnpike represent the highest truck volumes. Any roadway potentially adding non-motorized facilities must take this aspect into consideration. Any vehicle can be dangerous to a pedestrian or cyclist, but large freight vehicles possess unique blind spots that can result in dangerous situations when operating near non-motorized traffic, such as when accessing commercial loading zones along roadways.

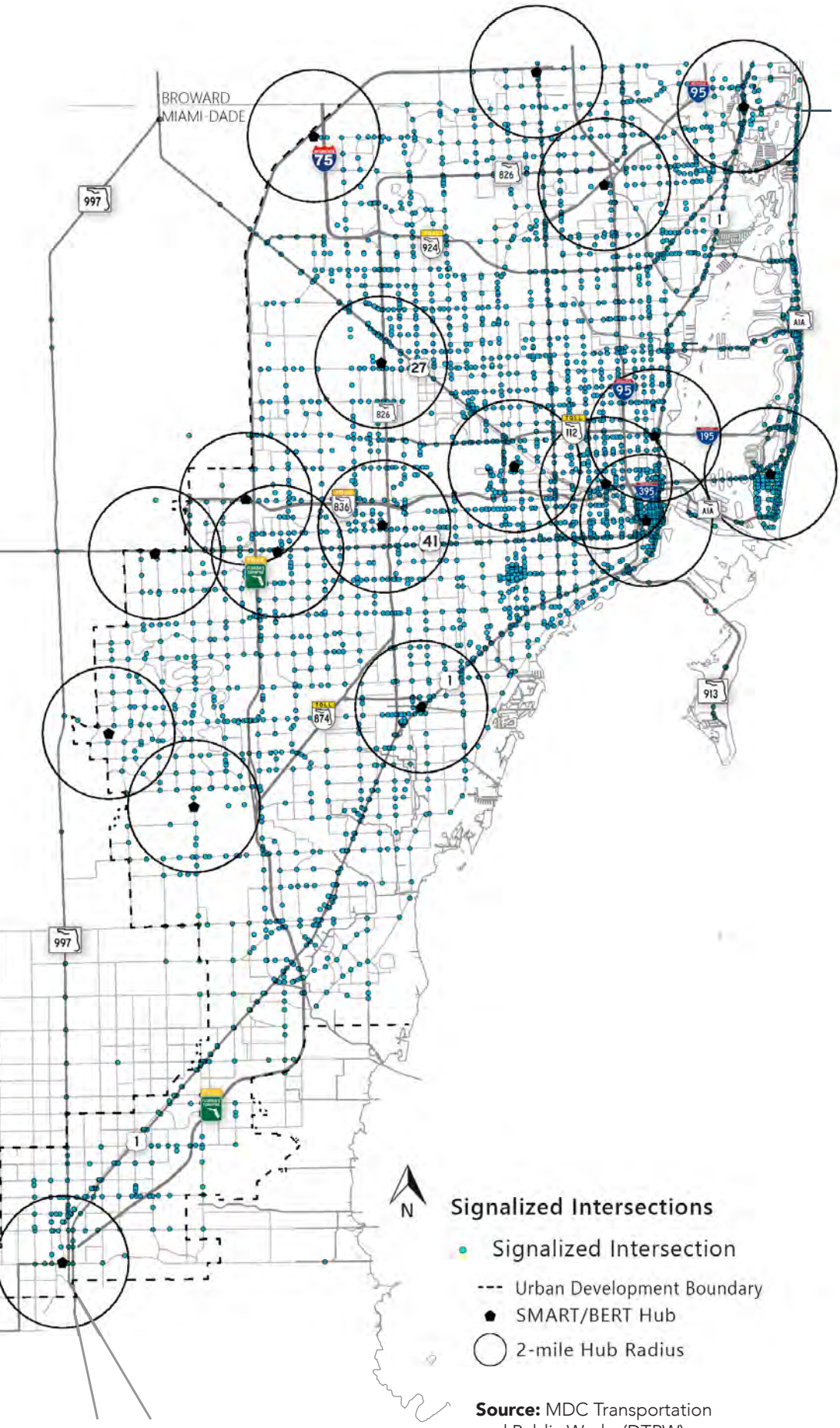
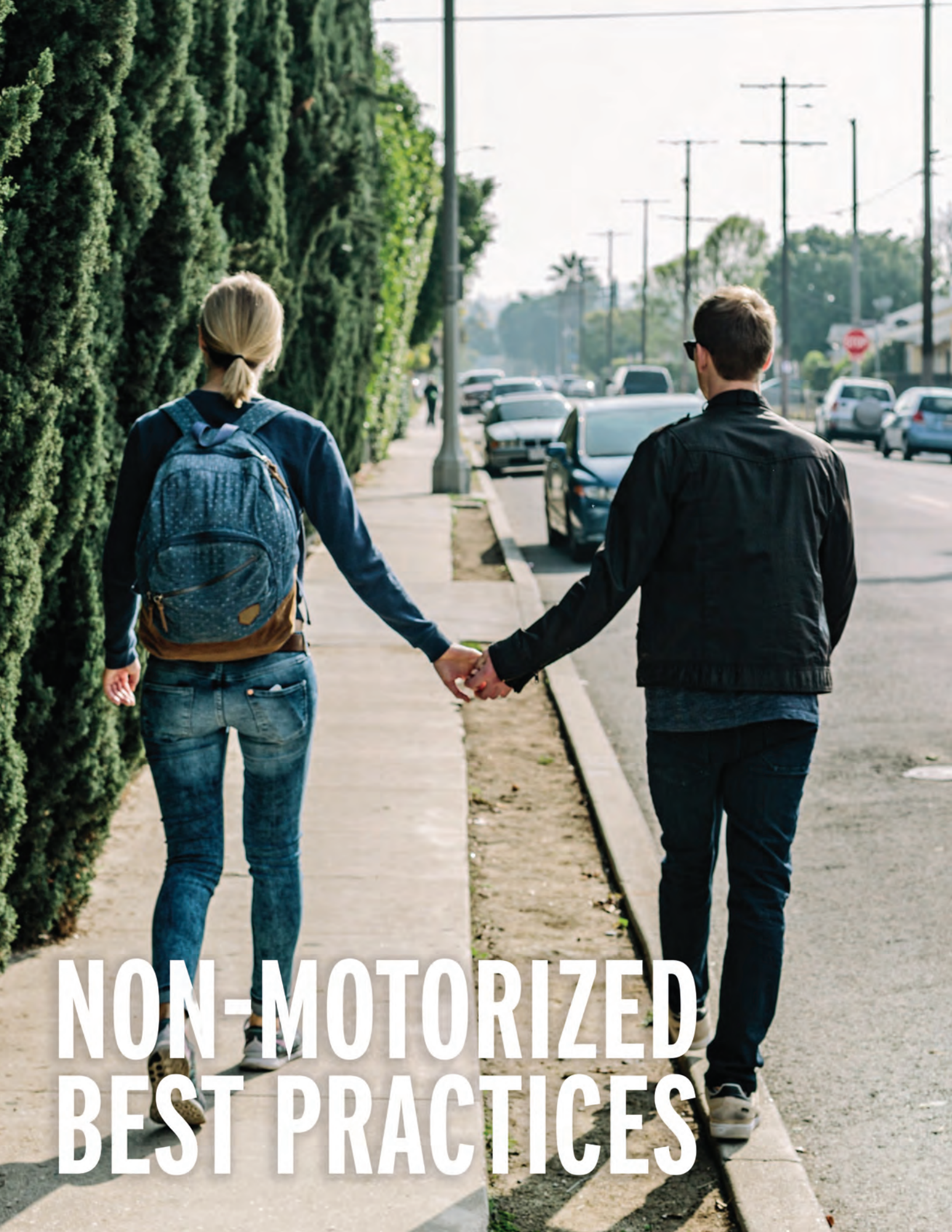



**FIGURE 60** SIGNALIZED INTERSECTIONS

**Source:** MDC Transportation and Public Works (DTPW)

## SIGNALIZED INTERSECTIONS

Signalized intersections for non-motorized travel provide both opportunities and challenges. The controlled movement at intersections, like dedicated bike facilities on roadway segments, increases the predictability of an individual's actions and placement in relation to others when moving through an intersection. However, signalized intersections are more likely to provide dedicated right-turn lanes which challenge a cyclist's normal position and create a weaving conflict between the vehicles that wish to utilize the turn lane and the cyclists transiting to the keyhole bike lane. Density of signalized intersections can also help indicate the land use conditions within the immediate area. Comparing Downtown Miami with the Homestead area is a clear example of how the former is more urbanized than the latter.



# NON-MOTORIZED BEST PRACTICES

This section examines best practices that can be applied to the existing bicycle and pedestrian network of Miami-Dade County to increase the comfort and safety of all users. Through this examination, additional recommendations are made, which are not incorporated into this plan's cost feasible project list, but suggested as future studies, initiatives, and assessments. Five (5) best-practice topics were chosen, which are listed below, that look at transportation networks in different ways to see where there are opportunities to improve and to continue to grow the County's bicycle and pedestrian friendliness.

## 01 COMPLETE STREETS

## 02 CONTEXT CLASSIFICATION

## 03 TYPE OF USERS

## 04 LEVEL OF TRAFFIC STRESS

## 05 TRANSPORTATION EQUITY

# COMPLETE STREETS

Throughout the United States, the Complete Streets approach has been gaining traction as more places realize the benefits of having roadways to safely support all users. In 2014, Miami-Dade County passed resolution R-995-14 to ensure its roadways, rights-of-way, and transportation corridors are safe for users of all ages and abilities. In 2017, FDOT created the Complete Streets Handbook and updated the Florida Design Manual to incorporate context sensitive design. Complete Streets design considers the interaction of many different transportation and non-transportation users, elements of street design, and adjacent and surrounding land uses. Designed to accommodate all users, the Complete Streets approach supplies an ideal space for all street users to coexist, providing facilities for pedestrians, bicyclists, transit users, automobiles, and commercial vehicles. Although Complete Streets projects on a suburban and urban roadway will look different, both designs share the same goal: to balance safety and convenience for everyone using the road.

A Complete Streets implementation arrives in many configurations, shapes, and forms, and typically adheres to the following five (5) overarching Complete Streets principles or tenants:

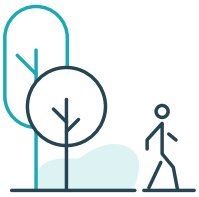
## DESIGN FOR SAFETY

The safety of all street users, especially the vulnerable users (children, the elderly/seniors, and disabled) and modes (pedestrians and bicyclists) should be paramount in any street design. The safety of streets can be dramatically improved through appropriate geometric design, multimodal traffic control devices, lighting, and operations.

## PRIORITIZE PEDESTRIAN MOVEMENT WHERE NEEDED

Complete Streets is built to privilege pedestrian movements to a pedestrian scale, recognizing the critical role pedestrians play in urban vitality and also because all trips include a pedestrian component (e.g., walking to/from, parking, transit). Public infrastructure improvements and spending is typically prioritized based on the following modal hierarchy: universal accessibility, walking, transit, cycling, paratransit, movement of goods, high-occupancy vehicles, and low-occupancy vehicles.

## COMPLEMENT SURROUNDING LAND USES, ENVIRONMENT, AND COMMUNITY



Complete Streets respects the surrounding built and natural environment. Well-designed streets promote travel speeds, modes, and sidewalk activities that are desired and appropriate for the surrounding context. A network of Complete Streets connects important community centers and destinations.

## INCORPORATE GREEN DESIGN

Complete Streets should incorporate green infrastructure, such as street trees and stormwater curb extensions, wherever practicable to simultaneously improve the pedestrian environment. Moreover, to mitigate the environmental impact of runoff and other transportation impacts.

## CREATE & COMPLIMENT PUBLIC SPACES

Complete Streets comprise public spaces and incorporate designs to maximize social and economic activity. Complete Streets create quality places to live, work, dine/eat, drink, shop, socialize, learn, visit, and play.

The Complete Streets implementation in many situations typically involves making some type of trade-off decision regarding priority of travel mode (i.e., reducing space in the travel way cross section for a particular mode or multiple modes and adding space in the travel way cross section for a particular mode or multiple modes) primarily for two (2) reasons:

01 Travel modes compete for limited available public space. Most transportation facilities are not fully complete (referred to as "incomplete"), and have limited public right-of-way that is often constrained by adjacent development. This means that some Complete Streets elements are missing and physical space is limited and essentially fixed, and therefore existing available space must be reallocated; and/or

02 Travel modes compete for customers/users and along most transportation facilities travel modes can conflict with one another. For example, pedestrians crossing streets often compete and conflict with motorized vehicles for signal green time, bicycles compete for on-street space with motorized vehicles, and stopping buses in mixed traffic lanes can impede on-street traffic flow.

With the Complete Streets approach, priority or emphasis of travel mode (modal priority) is typically given based on number of people or amount of goods moved, energy-efficiency of mode, space-efficiency/intensity of mode, and/or vulnerability of users rather than the volume/demand/density and/or speed/delay of motorized vehicles. Not every alley, street, highway, transitway or transportation corridor will necessarily be used by every type of user or mode in the same way, but a Complete Streets approach considers all users and modes, and seeks desirable, practical and affordable transportation improvements that will be accepted by the applicable adjacent and user community (including residents, businesses and visitors).

A Complete Streets Policy is a simple declaration that all future transportation projects (all project phases including new, altered, or maintained facilities) undertaken by an agency or group of agencies within a defined geographic area will seek to accommodate all users of alleys, streets, highways, transitways, or transportation corridors. Often the policy lists the users, including people of all ages and abilities who are walking, riding bicycles, driving, and catching and riding public transportation, and notes the specific modal needs of public transportation and freight vehicles. Policies and resulting public infrastructure should aim to change the mindset of everyday decision-making. It should be assumed all users and all travel modes are present and expected to be safely and effectively accommodated along each transportation corridor from inception, with limited and explicit exceptions. This policy approach is intended to change the everyday decision-making processes and systems of transportation agencies and lead to long-term changes to the built environment.

## COMPLETE STREETS ARE NOT THE FOLLOWING:

- One or a few special street projects
- A specific standard or design recommendation/prescription
- A mandate to immediately retrofit a transportation facility
- All travel modes on all transportation facilities and/or corridors
- A silver bullet solution for all transportation facilities and or modes

# COMPLETE STREET RECOMMENDATIONS

## COMPLETE STREETS

Supporting Complete Street initiatives within the County should be a key goal for the future. Its design strategies should be inclusive and work towards a more sustainable future. To facilitate implementation for more projects, it would be beneficial to create a new Set-Aside pool of funding for projects that incorporate these design principals, similar to Safe Routes to School. Utilizing FHWA's Surface Transportation Block Grant (STBG) program funding for Transportation Alternatives (TA) is a possible source for funding in the future.

A first step of implementing this recommendation is to create a standardized set of criteria for new projects to apply for funding. While each Complete Streets implementation will look different, it's suggested that the criteria place an emphasis on non-motorized factors to incentivize more mobility options. The following is a list of recommended items to be included for the evaluation:

- Proposed in urbanized areas (context classification C4-C6, see pages 84-99 for more detail) whose land use density is more walkable/bikeable.
- Connects to Communities of Concern (Zero Car and Impoverished Households, See page 64) to improve facilities for populations who need mobility options.
- Connects to High Population Centers (20+ people per Acre).
- Connects to High Employment Centers (45+ jobs per Acre).
- Direct Connection to Transit Facilities.

# CONTEXT CLASSIFICATION

The context classification system broadly identifies various built environments and many roadways extend through a variety of context classifications. Context classification systems are based on the characteristics of the land use, development patterns, and connectivity along the roadway, which provide cues to the type of uses and user groups that will utilize the roadway. Complete Streets approach is differentiated based on the context classification and transportation characteristics of the roadway, which are utilized to determine the key design criteria that apply. Context classifications typically span the range from C-1 Natural to C-6 Urban Core, as seen in Figure 61. Lower number classification roadways typically provide higher levels of automobile and truck-based mobility (with less land use activity), while higher number classification roadways provide higher levels of non-motorized travel and transit accessibility within more developed urbanized environments.

**FIGURE 61** FDOT CONTEXT CLASSIFICATION


## THE FDOT COMPLETE STREETS CONTEXT CLASSIFICATION IS BASED ON THE FOLLOWING:

### 01 DISTINGUISHING CHARACTERISTICS

- Broad description of the land use types and street patterns

### 02 PRIMARY MEASURES

- Land Use
- Building Height (floor levels)
- Building Placement
- Fronting Uses
- Location of Off-Street Parking
- Intersection Density (number per square mile)
- Block Perimeters (feet)
- Block Length (feet)

### 03 SECONDARY MEASURES

- Allowed Residential Density (dwelling units per acre)
- Allowed Office/Retail Density (floor area ratio)
- Existing and Future Population Density (persons per acre)
- Existing and Future Employment Density (jobs per acre)

The context classification of a roadway will inform FDOT's planning, PD&E, design, construction, and maintenance approaches to ensure that state roadways are supportive of safe and comfortable travel for anticipated users. Identifying the context classification will be beneficial for planning and design, as different context classifications will have different design criteria and standards. Figure 62 displays three (3) different classifications illustrating how knowing the context of these roadways will help ensure the design criteria applied for each is fine-tuned to be the safest and most inclusive.

**FIGURE 62** CONTEXT CLASSIFICATION EXAMPLES

### C1 NATURAL
### SR 9336/INGRAHAM HIGHWAY

Lands preserved in a natural or wilderness condition, including lands unsuitable for settlement due to natural conditions. Not intended for future development.

### C3C SUBURBAN COMMERCIAL
### SR 94/SW 88TH STREET

Mostly non-residential uses with large building footprints and large parking lots within large blocks and a disconnected or sparse roadway network.


### C6 URBAN CORE
### NE 2ND AVENUE

Areas with the highest densities and building heights. Many are regional centers with mixed uses structures, built up to the roadway, and are within a well-connected roadway network.

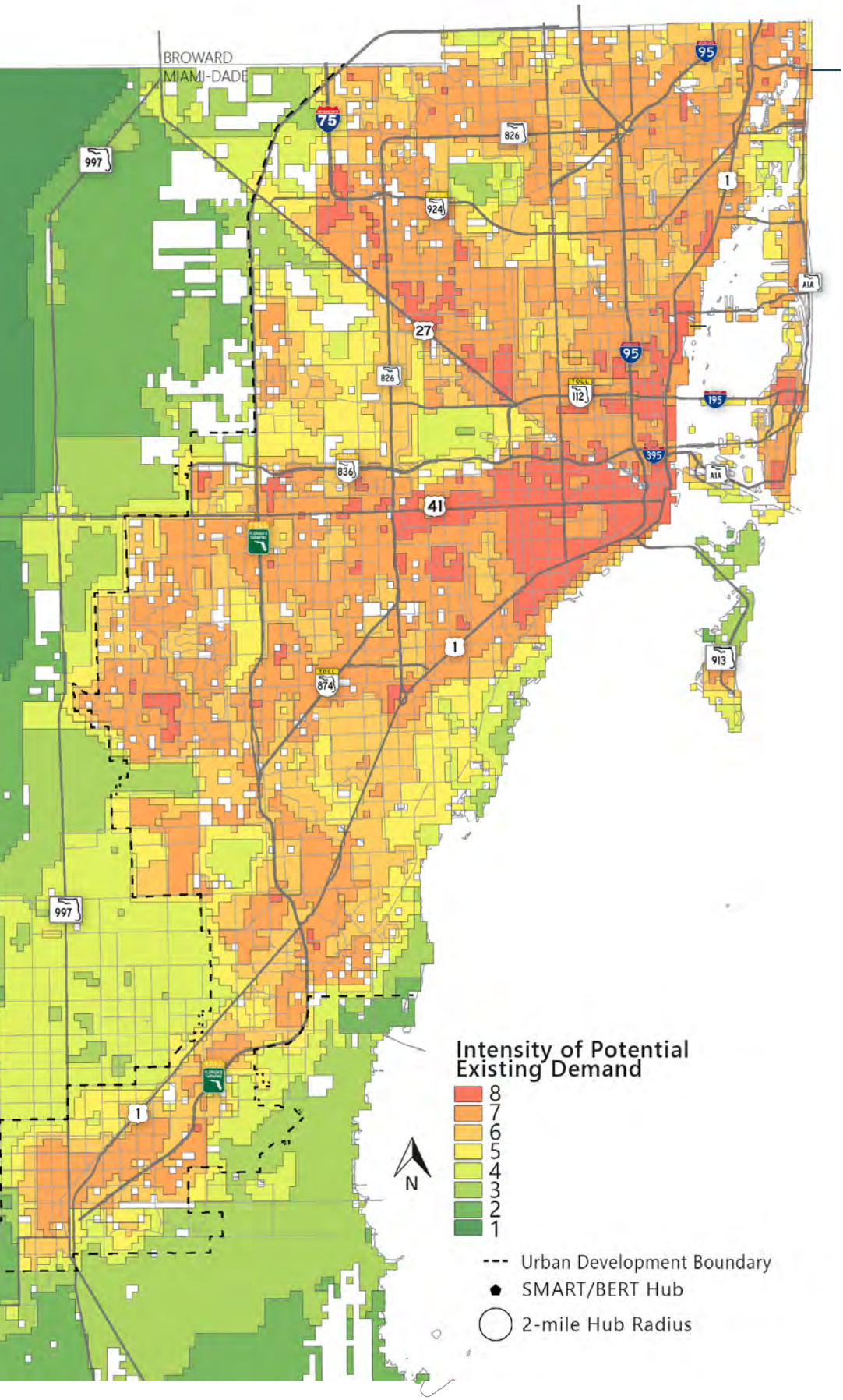
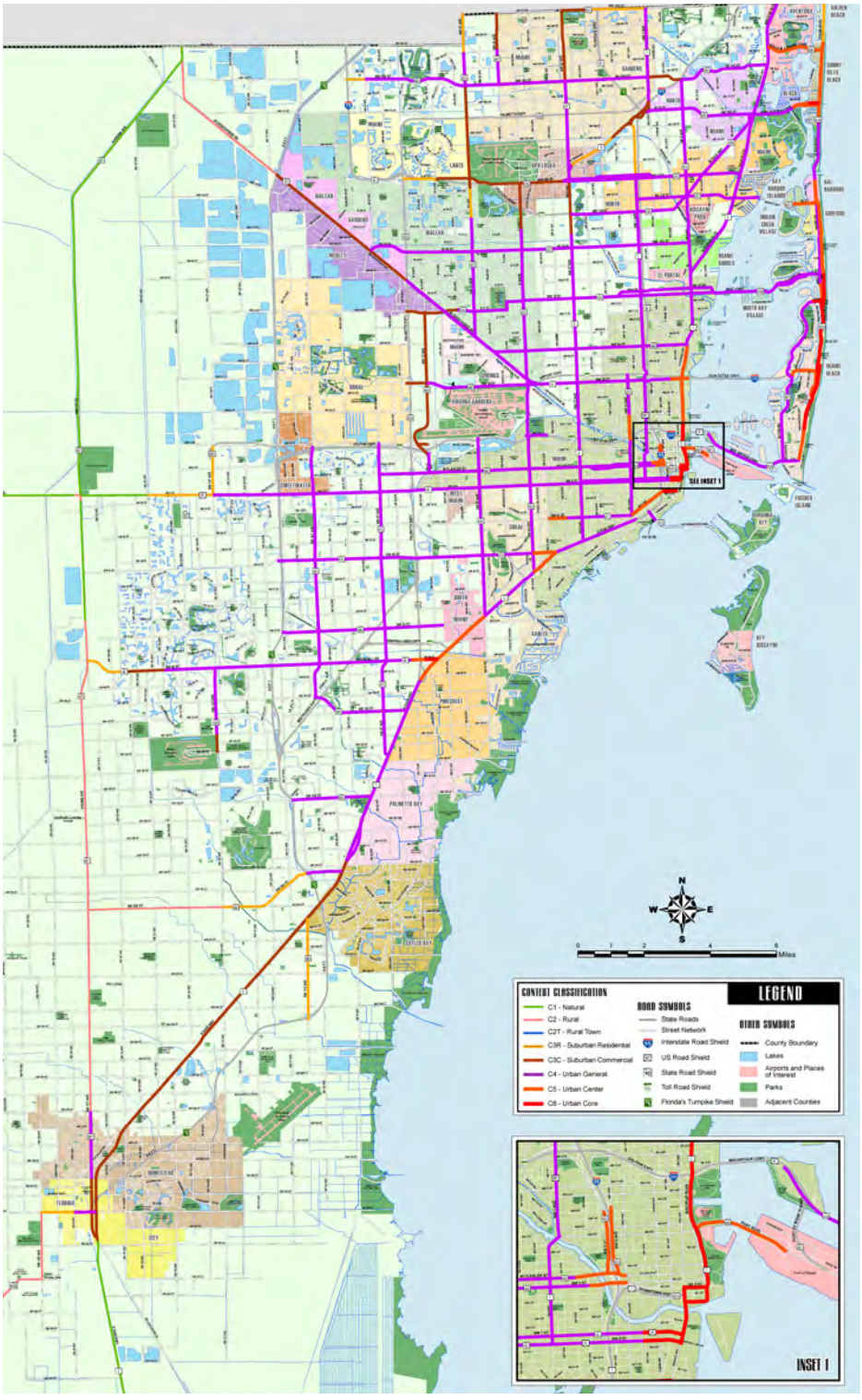



**FIGURE 63** CONTEXT SENSITIVE POTENTIAL DEMAND MAP

## CONTEXT SENSITIVE POTENTIAL DEMAND

Figure 63 translates FDOT context classification to determine land use classification boundaries for Miami-Dade County. This map aids in identifying areas that have the highest level of potential demand and roadways that would benefit from incorporating Complete Streets design. Areas marked in red, in Figure 63, represent the highest concentration of populations and commonly desired destinations in close proximity to one another. Capitalizing on these areas with a propensity for short trips is ideal for biking and walking.

**FIGURE 64** DISTRICT 6 REGIONAL COMPLETE STREET CONTEXT CLASSIFICATION




A methodology was developed for Figure 63 by using the available GIS layers and adopting the FDOT developed context classification scale for roadways. The GIS layers that were used for the context sensitive land use classification boundaries are as follows:

- Building Footprints and Heights
- Street Intersections
- Population Density
- Job Density

The buildings layer was normalized by building heights, street intersections, population density, and job density feature classes were converted into density raster files. A raster file consists of a matrix of cells (or pixels) organized into rows and columns (or a grid) where each cell contains a value representing information. These density raster files were classified into eight (8) categories based on the FDOT context classification scale. This map represents a first step to classify the entire County. As seen in Figure 64, FDOT in 2017 performed a Regional Complete Streets Context Classification for the state highway system. This effort, though focused only on the state highway system, implemented the full criteria for context classification.

Due to this effort we now have specific limits for each classification allowing for effective project recommendations. Applying the same effort for every roadway in the County would be a beneficial tool for the TPO, FDOT, and local municipalities to enhance the effectiveness of the transportation network within Miami-Dade County.

## CONTEXT CLASSIFICATION AS A DESIGN ELEMENT

Context classification as a design element can provide recommended characteristics and amenities for off-road facilities. The following are examples of greenways and sidewalks in Miami-Dade County that can benefit from context classification recommendations.

### GREENWAY TRAILS

A greenway that travels through an urban or rural environment can provide the same quality transportation facility, but feel different and seek to provide amenities/activities that take advantage of its surroundings to create unique experiences. Table 13 groups the eight (8) context classifications into three (3) groups with similar characteristics matched with core design principals/opportunities for the greenways that accompany them. Each "greenway type" aims to provide bicycle and pedestrian facilities, but the "character" can be what defines the experience beyond just traveling from point A to point B. Quite a few of these greenways will travel through different contexts. The Biscayne-Everglades greenway, for example, has an opportunity to draw upon all three (3) context groups as it navigates between the two (2) national parks.

**Source:** MiamiBikeScene.com

**TABLE 13** GREENWAY CONTEXT CLASSIFICATION CHARACTERISTICS

| CONTEXT CLASSIFICATIONS GROUPS | BASIC CHARACTERISTICS OF CONTEXT CLASS GROUP | CORE DESIGN PRINCIPALS FOR GREENWAYS |
|---|---|---|
| **C1, C2, & C2T** | Natural or agricultural rural settings with extremely low population density (1 – 2 persons per acre). These areas of Miami-Dade County are quiet, low activity areas that can go for long stretches between small concentrations of developed areas and historic towns. | "The Great Outdoors Trail." Greenways and greenway sections which preside in this context class group can design themselves around an outdoor experience that would attract residents and visitors hoping to see the more "raw" nature of South Florida and experience a form of ecotourism. Events and amenities such as equestrian trails, long-distance marathons, small activity centers to host educational events to learn about the environment of the world and South Florida are examples to further enhance appeal. |
| **C3R & C3C** | This context class group consists of suburban residential and commercial settings organized in large blocks with a sparse roadway network. Large commercial box-stores and surface parking lots are a common element of this group. | "Neighborhood Family Trail." These Greenways are moving through more spread-out suburban residential blocks that can provide essential non-motorized connections to the key features within these communities such as schools and parks. Greenways can adapt to this environment in providing kid-friendly learning stations along the trail that provide short local, national, and world history lessons, as well as low-maintenance exercise stations. |
| **C4, C5 & C6** | Mixed use urbanized areas which range from mid to high density communities. This category contains the tallest building heights and most well-connected roadway networks in the county. These areas are often identified as part of a civic or economic center of a community, town, or city. | "Cultural Tour Trail." These trails are in close proximity to a large, diverse concentration of people and cultures, typical of the global hub which is Miami-Dade, and can accentuate these with activity centers and learning stations focused around the arts and music from the nations that represent the nationalities that represent the biggest demographic of the county. |

Section 224.4 of the 2019 FDOT Design Manual provides guidance on the widths of these paths, with a set standard of 12-14 feet, ten (10) feet for limited ROW conditions, and allows short eight (8) foot wide sections under constrained conditions. Following the sidewalk information, Figures 65 through 67 visually depict greenways within the context classification groups on three (3) levels, from the recommended bare minimum, to a more ambitious approach to give some idea of incorporating amenities such as furniture, lighting, and landscaping.

**FIGURE 65** C1, C2, AND C2T GREENWAY CONTEXT DESIGN

# "THE GREAT OUTDOORS" TRAIL

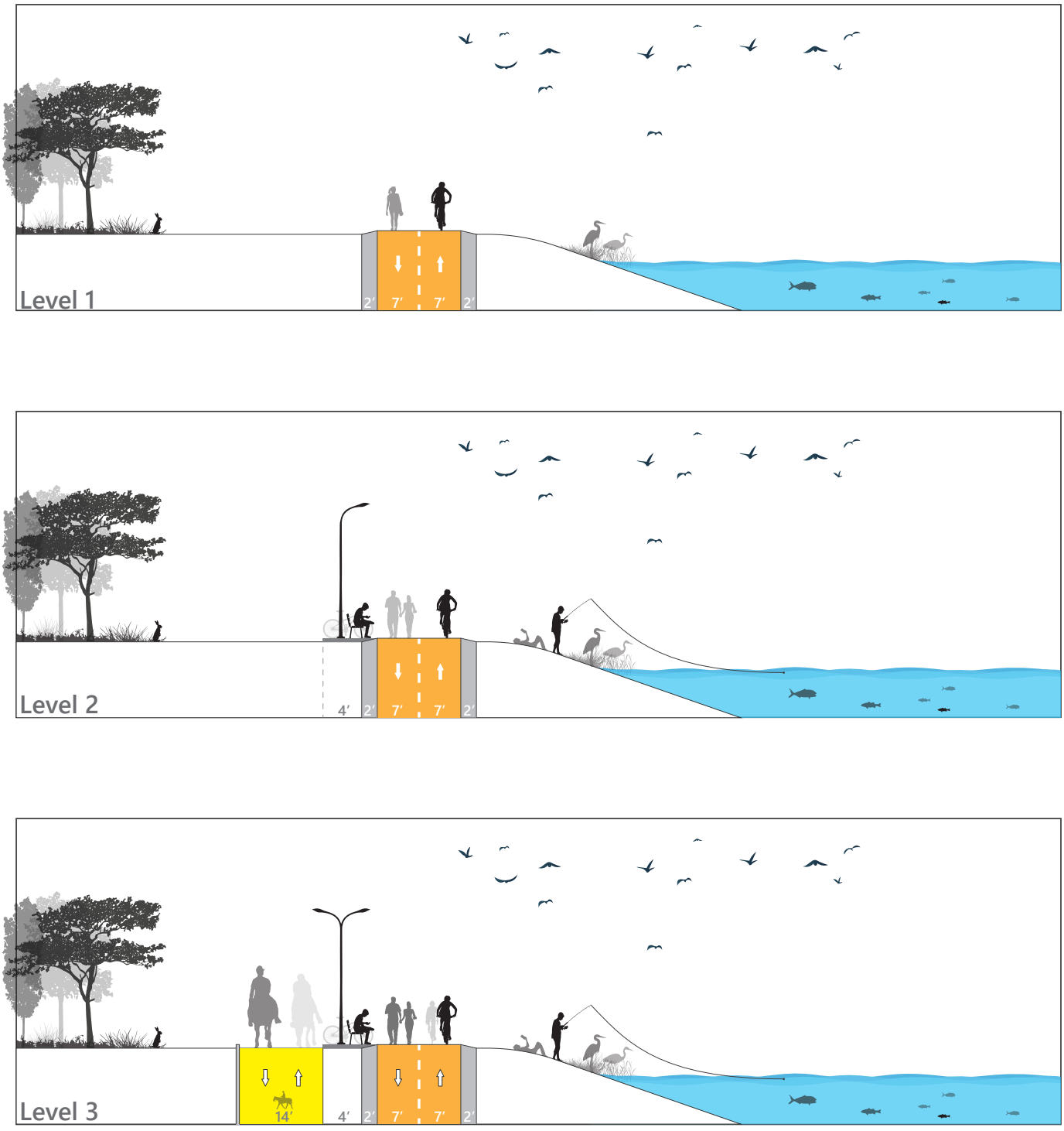


**FIGURE 66** C3R AND C3C GREENWAY CONTEXT DESIGN

# "THE NEIGHBORHOOD FAMILY" TRAIL

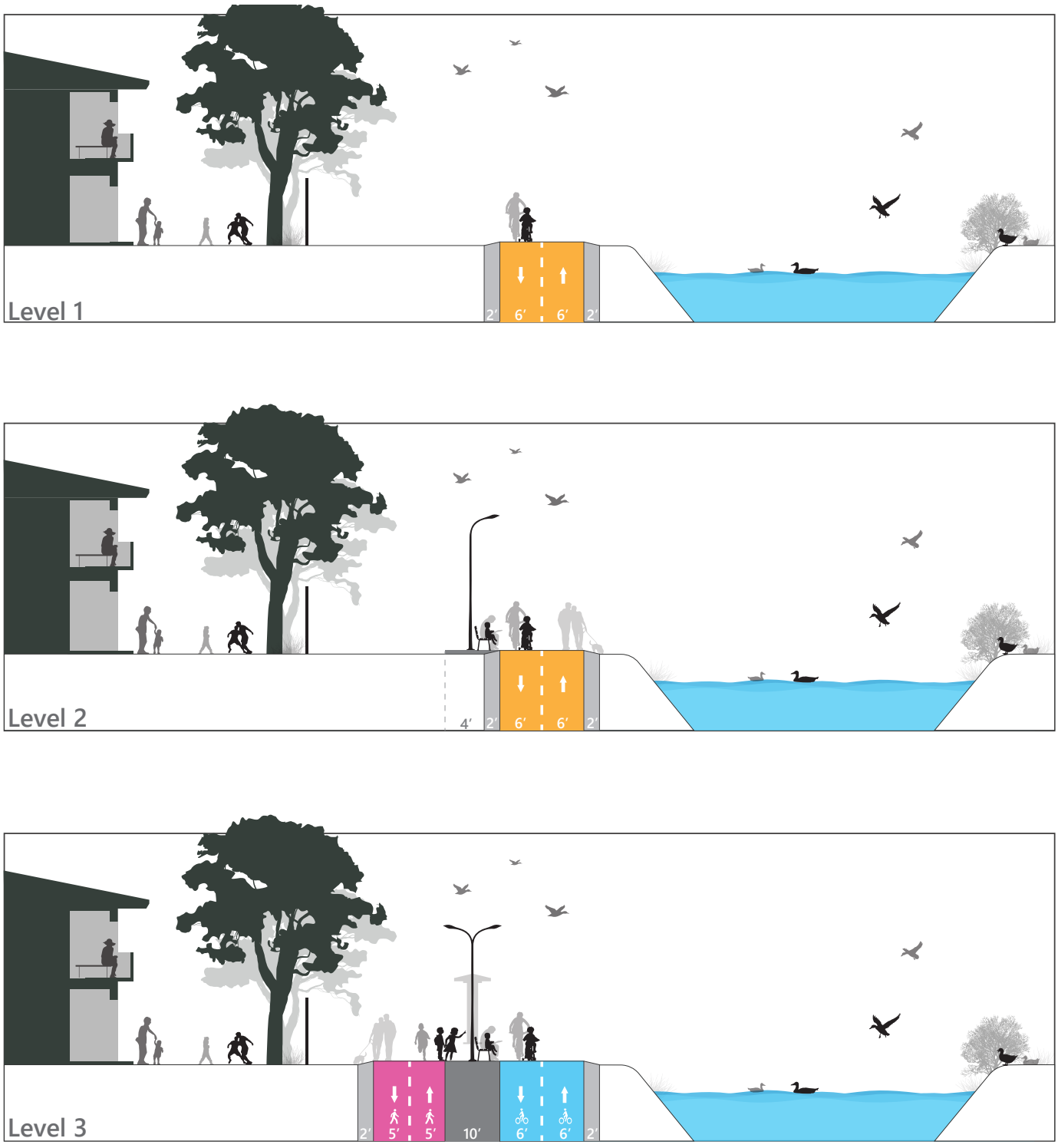
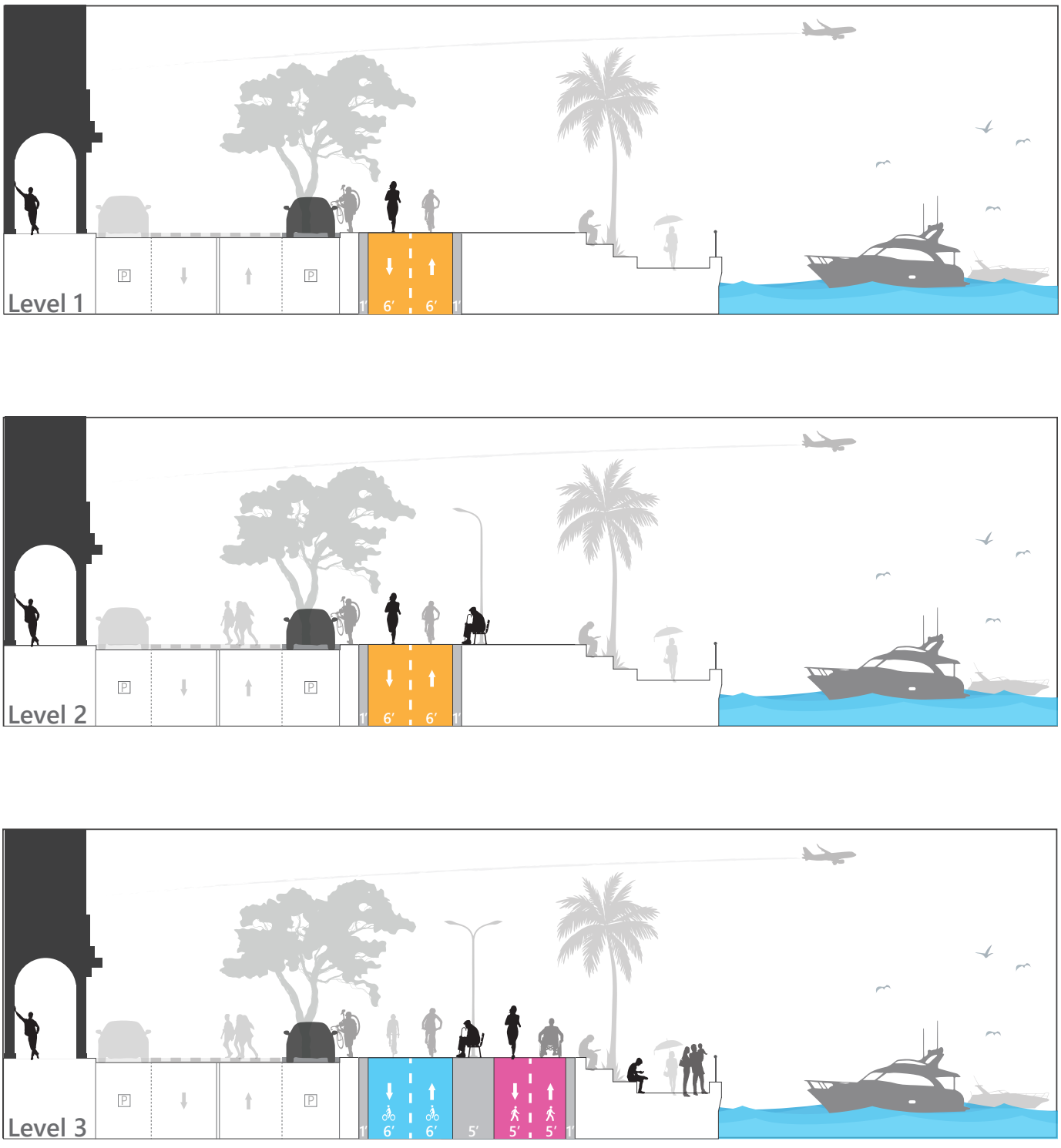


**FIGURE 67** C4, C5, AND C6 GREENWAY CONTEXT DESIGN

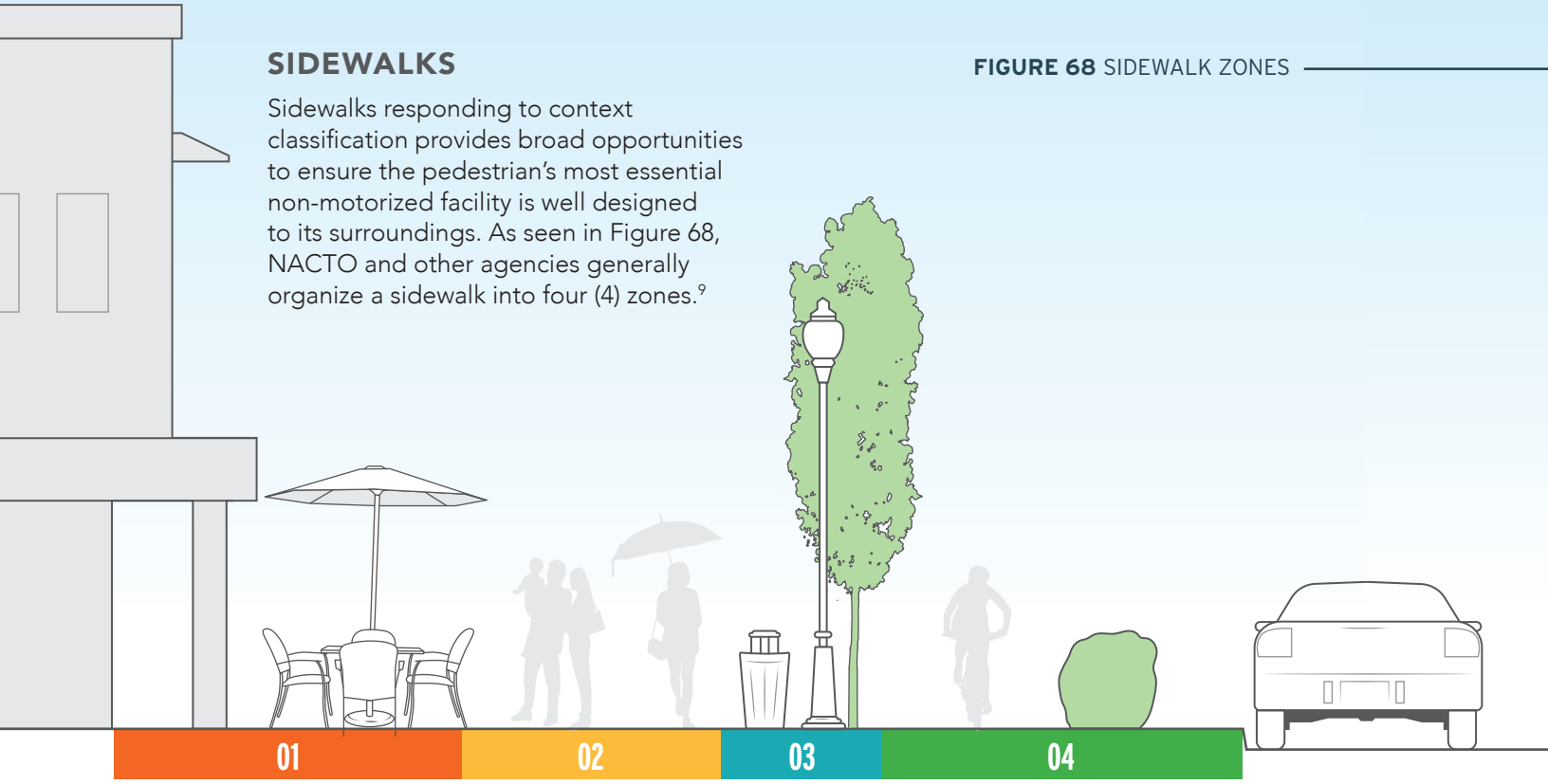
# "THE CULTURAL TOUR" TRAIL



## SIDEWALKS

Sidewalks responding to context classification provides broad opportunities to ensure the pedestrian's most essential non-motorized facility is well designed to its surroundings. As seen in Figure 68, NACTO and other agencies generally organize a sidewalk into four (4) zones.[9]

**FIGURE 68** SIDEWALK ZONES




**01** **FRONTAGE ZONES:** An essential zone for urbanized settings. It functions as an extension of the building, whether it be through entryways and doors or sidewalk cafes and sandwich boards. The frontage zone comprises both the structure and facade of the building fronting the street, as well as the space immediately adjacent to the building.

**02** **PEDESTRIAN THROUGH ZONE:** The essential zone for all sidewalks. It is the primary, accessible pathway that runs parallel to the street. The through zone ensures that pedestrians have a safe and adequate place to walk and should be 5–7 feet wide in residential settings and 8–12 feet wide in downtown or commercial areas.

**03** **FURNITURE ZONE:** An essential zone for most sidewalks. It is defined as the section of the sidewalk between the curb and the through zone in which street utilities and amenities, such as lighting, benches, newspaper kiosks, utility poles, tree pits, and bicycle parking are provided.

**04** **ENHANCEMENT/BUFFER ZONE:** A situational space immediately next to the sidewalk that may comprise a variety of different optional elements. Within Miami-Dade County, this buffer zone is used for vehicular parking, commercial loading zones, or curbside bike lanes, but it can also be/include parklets, stormwater management features, bike racks, bike share stations, and curbside extensions.

[9] https://nacto.org/publication/urban-street-design-guide/street-design-elements/sidewalks/

Table 14 outlines the recommended widths for the three (3) essential zones: Frontage, Pedestrian Through, and Furniture zones by context classification. Depending on the context classification, some zones may not be necessary and/or applicable. For example, the C3C suburban commercial area is defined by land use with large setbacks from the backside of curb, typically with large surface parking lots making the necessity of a defined frontage zone highly unlikely. This table is also represented in a visual format in Figure 69.

**TABLE 14** SIDEWALK WIDTH BY CONTEXT CLASSIFICATION

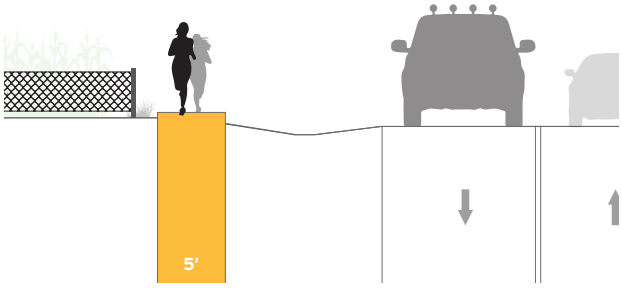
| CONTEXT CLASSIFICATIONS | FRONTAGE ZONE | PEDESTRIAN THROUGH ZONE | FURNITURE ZONE | MINIMUM WIDTH (WITH FRONTAGE ZONE) |
|---|---|---|---|---|
| **C1 – Natural** | - | 5 ft. | Situational. Green buffer set by the maximum distance between edge of ROW and edge of pavement. | 5 ft. |
| **C2 – Rural** | - | 5 ft. | Situational. Green buffer set by the maximum distance between edge of ROW and edge of pavement. | 5 ft. |
| **C2T – Rural Town** | - | 6 ft. | Situational. Green buffer set by the maximum distance between edge of ROW and edge of pavement. | 6 ft. |
| **C3R – Suburban Residential** | - | 6 ft. | - | 6 ft. |
| **C3C – Suburban Commercial** | - | 6 ft. | 2 ft. | 8 ft. |
| **C4 – Urban General** | - | 6 ft. | 3 ft. | 9 ft. |
| **C5 – Urban Center** | ≤ 6 ft. | 6 ft. | 6 ft. | 12 ft. |
| **C6 – Urban Core** | ≤ 6 ft. | 8 ft. | 6 ft. | 14 ft. |

**FIGURE 69** SIDEWALK CONTEXT DESIGN DIAGRAM

# SIDEWALKS BY CONTEXT CLASSIFICATION

## C1 NATURAL


## C2 RURAL




## C2T RURAL TOWN


## C3R SUBURBAN RESIDENTIAL

## C3C SUBURBAN COMMERCIAL


## C4 URBAN GENERAL


## C5 URBAN CENTER


## C6 URBAN CORE

# CONTEXT CLASSIFICATION RECOMMENDATIONS

## CONTEXT CLASSIFICATION

This report recommends that the TPO, FDOT, County, and Local agencies coordinate a county-wide campaign to identify the context classification for every road in the County. This analysis would be an investment that would provide long-term benefits for transportation planning in Miami-Dade County for the foreseeable future. This investment would not only help non-motorized travel within the County, but it would also benefit the planning of future projects of all modes, traffic, transit, and freight. It is highly recommended that any classification of county and local roads adhere to the FDOT criteria or maintain close similarities. Ensuring each classification means the same for state, county, and local is necessary for a cohesive set of data for Miami-Dade.

An outline of an implementation plan would be as follows:

- Preliminary: TPO designates a specific criteria to determine roadway classification (FDOT criteria or similar).
- Phase 1: Utilize the TPO General Planning Contract to issue task work orders to determine the classification of major county roads.
- Phase 2: Issue task work orders for minor county roads.
- Phase 3: Attach context classification obligations to all awarded grants for local/ municipality transportation planning projects. Obligation applies to all corridor specific studies and minimum requirements for municipality-wide studies, such as master plans, or all major local roadways. This phase can occur in tandem with phases 1 and 2.

**Source:** Miami-Dade TPO

# NON-MOTORIZED USER TYPES

## RANGE OF NON-MOTORIZED USER TYPES

Providing access for non-motorized users on a roadway is important, but not every pedestrian or bicyclist is the same. Particularly for cycling, some people would be willing to ride in shared traffic, while many others would not even consider the idea. As seen in Figure 70, FHWA's Bikeway Selection Guide dictates people interested in biking can be categorized into three (3) primary groups: "Interested But Concerned," "Somewhat Confident," and "Highly Confident." Of the three (3), the "interested but concerned" represents the vast majority of individuals interested in biking, but feel that conventional bike lanes are not enough to feel comfortable to make a daily non-motorized trip. "Interested But Concerned," "Somewhat Confident," and "Highly Confident," collectively represent 60 – 72% of the population interested in bicycling, each having distinct preferences and "tolerance for stress." The Bikeway Selection Guide refers to this as a "design user profile." These profiles indicate the facilities each of these groups are willing to use. The 40 – 28% unaccounted for by these three (3) groups are considered the "No Way No How" category. These people do not consider biking as a viable alternative under any condition.

**FIGURE 70** 2018 AASHTO BIKE GUIDE REVIEW OF BIKEWAY SELECTION GUIDANCE

# BICYCLIST DESIGN USER PROFILES

### INTERESTED BUT CONCERNED

**51-56%** OF THE TOTAL POPULATION

Often not comfortable with bike lanes, may bike on sidewalks even if bike lanes are provided; prefer off-street or separated bicycle facilities or quiet or traffic-calmed residential roads. May not bike at all if bicycle facilities do not meet needs for perceived comfort.

### SOMEWHAT CONFIDENT

**5-9%** OF THE TOTAL POPULATION

Generally prefer more separated facilities, but are comfortable riding in bicycle lanes or on paved shoulders if need be.

### HIGHLY CONFIDENT

**4-7%** OF THE TOTAL POPULATION

Comfortable riding with traffic; will use roads without bike lanes.

**LOW STRESS TOLERANCE**

**HIGH STRESS TOLERANCE**

"Highly Confident" Bicyclists represent only 4 – 7% of the population interested in bicycling. Experience and confidence results in this user group avoiding separated bicycle facilities at times to avoid overpopulated non-motorized facilities. This group commonly prefers the most direct route to their destination, regardless of the roadway's characteristics, and are rarely dissuaded by high exposure to heavy traffic. An example of a roadway facility where you would find "Highly Confident" users is SR 968/SW 1st Street. It is a 3-lane roadway offering a direct route to Downtown Miami, with high prevailing speeds (40 mph and above), as well as heavy traffic during peak AM and PM traffic periods. Its non-motorized facility is a mixed traffic sharrow, on-street parking with no buffer between the cyclist and parked cars, and DTPW Routes 11 and 207 performing frequent stops along the roadway.

## “I’D RATHER HAVE A BIKE LANE THAN NOTHING, BUT...

Between 5–9% of cyclists consider themselves “Somewhat Confident” Bicyclists, also known as Enthused and Confident Bicyclists. These individuals are open to the use of on-road dedicated bike lanes with no physical protection. While this category’s tolerance for traffic is lower than the “Highly Confident” group, the use of mixed-traffic facilities, such as the example used in Figure 71, for short segments to avoid large deviations for the intended route is still a viable option. A facility representing this group’s design user profile is SR 968/ West Flagler Street, as seen in Figure 72. Similar to SW 1st Street, West Flagler also deals with high prevailing speeds, on-street parking, and DTPW transit activity, however, it does possess a dedicated five (5) foot bike lane. This defined space for bicyclists gives this group enough confidence to utilize this roadway frequently.

It is frequently said from the enthusiastic cycling public or members of the Bicycle Pedestrian Advisory Committee, “I’d rather have a bike lane than nothing, but…” which is then followed by a stated desire for something more protective/substantial/less stressful. Based off of these user groups defined by FHWA, this can be seen as a need, more than a want. Of all the bike lanes in Miami-Dade, 97% are conventional/unprotected as previously stated in the existing bicycle network section (page 53), yet these facilities would only entice 9–16% of the population, on an active roadway, willing to consider bike as a transportation alternative.

The “Interested But Concerned” group represents the largest category of potential cyclists of a population, 51–56%. These individuals are very apprehensive about using any on-road bicycle facility that does not offer some type of physical barrier for protection and will avoid large intersections. Off-road, or separated dedicated facilities, stand the best chance of attracting this large user category. Within Miami-Dade County SW 152nd Street, from SW 157th Avenue to SW 147th Avenue, is an example of a separated bicycle facility that can attract users of all ages and abilities. Figure 73 highlights SW 152nd Street’s high emphasis crossings at intersections, its landscaped buffer between the bicycle facility and roadway, as well as the defined space within the non-motorized facility itself for pedestrian and bicyclists to share the space.

**FIGURE 71** SR 968/SW 1ST STREET – "HIGHLY CONFIDENT" FACILITY

**FIGURE 72** SR 968/WEST FLAGLER STREET – "SOMEWHAT CONFIDENT" FACILITY


**FIGURE 73** SW 152ND STREET – "INTERESTED BUT CONCERNED" FACILITY

According to the FHWA's Selecting Bikeway Guide, "To maximize the potential for bicycling as a viable transportation option, it's important to design bicycle facilities to meet the needs of the "Interested but Concerned" Bicyclist category. This is generally the recommended design user profile as the resulting bikeway network will serve bicyclists of all ages and abilities, including "Highly Confident" and "Somewhat Confident" Bicyclists."[10]

A challenge for developing a non-motorized network that caters to the "Interested But Concerned" is the space required within rights-of-way. Space is a precious commodity within a heavily developed, urbanized environment and planners, engineers, public officials, and residents weigh in on these potential improvements. As a long-term strategy, Miami-Dade County and Miami-Dade TPO's Typical Roadway Section and Zoned Right-of-Way Update Study developed two (2) major goals to help address the issue of limited ROW availability with context sensitive solutions. The typical sections developed aim to help shift the transportation network towards supporting all modes of travel. The two (2) main goals of FHWA's Selecting Bikeway Guide are:[11]

**01** To identify a list of area types and roadway types representative of the land use and transportation mix within the County and develop typical sections for each roadway type for future application within the County.

**02** To identify and preserve the right-of-way needed for future transportation capacity improvements identified in the TPO's current Long Range Transportation Plan through the County's zoned ROW ordinance.

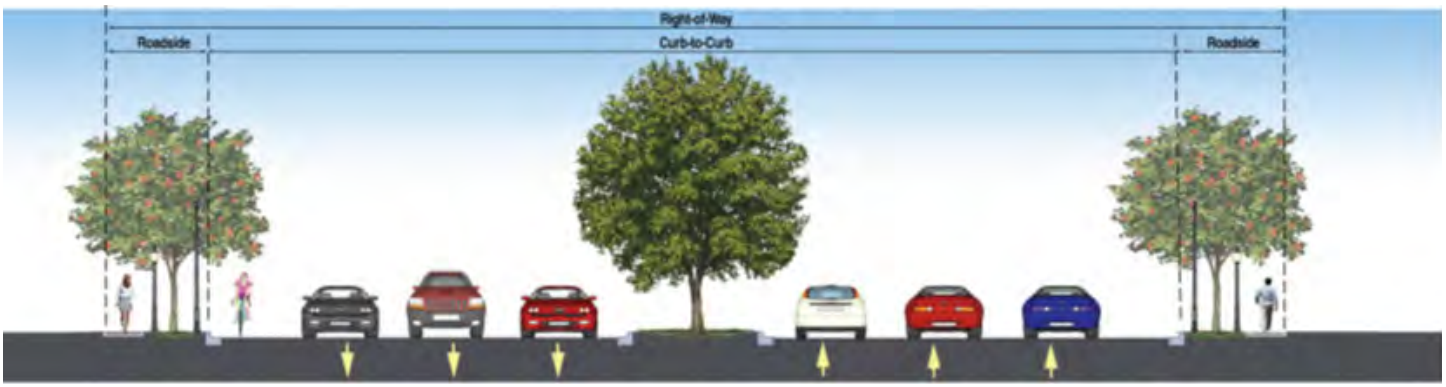
While the proposed typical sections focus on on-road bicycle facilities, this report is forward thinking and takes the necessary steps to prepare the County to embrace a more inclusive transportation future that maximizes its mobility options. Figures 74 and 75 are two (2) examples of the proposed sections for six (6) and four (4) lane roadways. The proposed non-motorized facilities need to be changed to protected or separated bike lanes, but the core principle of the report would be hugely beneficial. This paired with FDOT requiring "bicycle facilities to be provided on all roadways on the State Highway System (SHS), except where its establishment would be contrary to public safety; (e.g., limited access facilities as defined by FDM 211),"[12] will help shift the county away from being so car-centric.

[10] Bikeway Selection Guide - https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf

[11] Typical Roadway Section and Zoned Right-of-Way Update Study - http://miamidadetpo.org/library/studies/typical-roadway-section-and-zoned-right-of-way-update-study-2007-12.pdf.

[12] https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/fdm/2018/2018fdm223bikes.pdf?sfvrsn=b408da05_4

**FIGURE 74** SIX-LANE DIVIDED TYPICAL SECTION



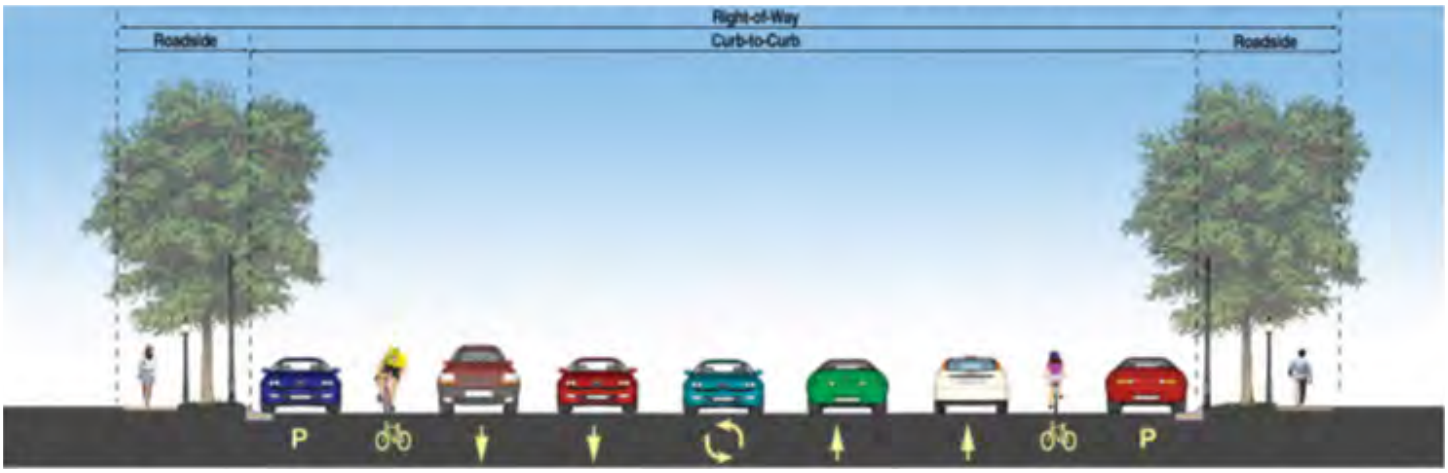

| SIDEWALK | FURNISHING | BIKE* | LANE | LANE | LANE | MEDIAN | LANE | LANE | LANE | BIKE* | FURNISHING | SIDEWALK | CURB TO CURB | ROW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5'-6' | 8' | 5'-6' | 12' | 11'-12' | 11'-12' | 16'-18' | 11'-12' | 11'-12' | 12' | 5'-6' | 8' | 5'-6' | 97'-105' | 123'-133' |

*BIKE LANE WIDTH DOES NOT INCLUDE GUTTER
CURB TO CURB DENOTES FRONT OF CURB TO FRONT OF CURB

**CONSTRAINED ROW**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5' | 6' | | 11' | 11' | 11' | 10' | 11' | 11' | 11' | | 6' | 5' | 79' | 101' |

**FIGURE 75** FOUR-LANE WITH TWO-WAY CENTER TURN LANE TYPICAL SECTION




| FURNISHING | ROAD SIDE | PARKING | BIKE[1] | LANE | LANE | CENTER LANE | LANE | LANE | BIKE[1] | PARKING | ROAD SIDE | CURB TO CURB | ROW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Suburban-Commercial | 14' | 7'-8' | 5'-6' | 10'-11' | 10'-11' | 10'-11' | 10'-11' | 10'-11' | 5'-6' | 7'-8' | 14' | 74'-82' | 102'-110' |
| Suburban-Residential | 10.5' | 7' optional | 4'-6' | 10'-11' | 10'-11' | 10'-11' | 10'-11' | 10'-11' | 4'-6' | 7' optional | 10.5' | 58'-81' | 79'-102' |
| Urban-Commercial | 14' | 7'-8' | 5'-6' | 10'-11' | 10'-11' | 10'-11' | 10'-11' | 10'-11' | 5'-6' | 7'-8' | 14' | 74'-82' | 102'-110' |
| Urban-Residential | 10.5' | 7' optional | 4'-6' | 10'-11' | 10'-11' | 10'-11' | 10'-11' | 10'-11' | 4'-6' | 7' optional | 10.5' | 58'-81' | 79'-102' |
| Urban Center/Core | 16' | 7'-8' | 5'-6' | 10'-11' | 10'-11' | 10'-11' | 10'-11' | 10'-11' | 5'-6' | 7'-8' | 16' | 74'-82' | 106'-114' |

*MINIMUM 7[1] ASSUMES USE OF 1.5[1] GUTTER PAN
** 5[1] REQUIRED WHEN ADJACENT ON-STREET PARKING OR BETWEEN RIGHT TURN LANE AND THROUGH LANE
CURB TO CURB DENOTES FRONT OF CURB TO FRONT OF CURB
[1] FOR AVENUES THAT ARE COLLECTORS WITH TARGET SPEED OF 30 MPH OR LESS CAN BE SUBSTITUTED WITH WIDER CUTER LANES OF 14'-15'

**CONSTRAINED ROW**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9' | | | 10'-11' | 10'-11' | 10'-11' | 10'-11' | 10'-11' | | | 9' | 53'-58' | 71'-76' |

REQUIRED OPTIONAL

**Source:** Andrew Wes News-Press

# LEVEL OF TRAFFIC STRESS

## STRESS FACTORS

The words "stress" or "stress tolerance" have been used in this report to refer to perceived dangers non-motorized users experience when traveling. The Low-Stress Bicycling and Network Connectivity Study, published by the Mineta Transportation Institute in May 2012, and updated in 2017, identifies the factors in the physical world that act as the source of these stressors. It goes further and builds a criteria to evaluate level of traffic stress (LTS) on roadways. These rankings, as seen in Table 15, have a direct relationship with the amount and type of ridership a facility attracts. A non-motorized facility ranked as LTS 4 is likely limited to the "Highly Confident" user group, consisting of less than 10% of the population interested in cycling. While a LTS 1, such as SW 152nd Street, would attract over 50% of the cycling population along with a huge user range of ages and abilities.[13]

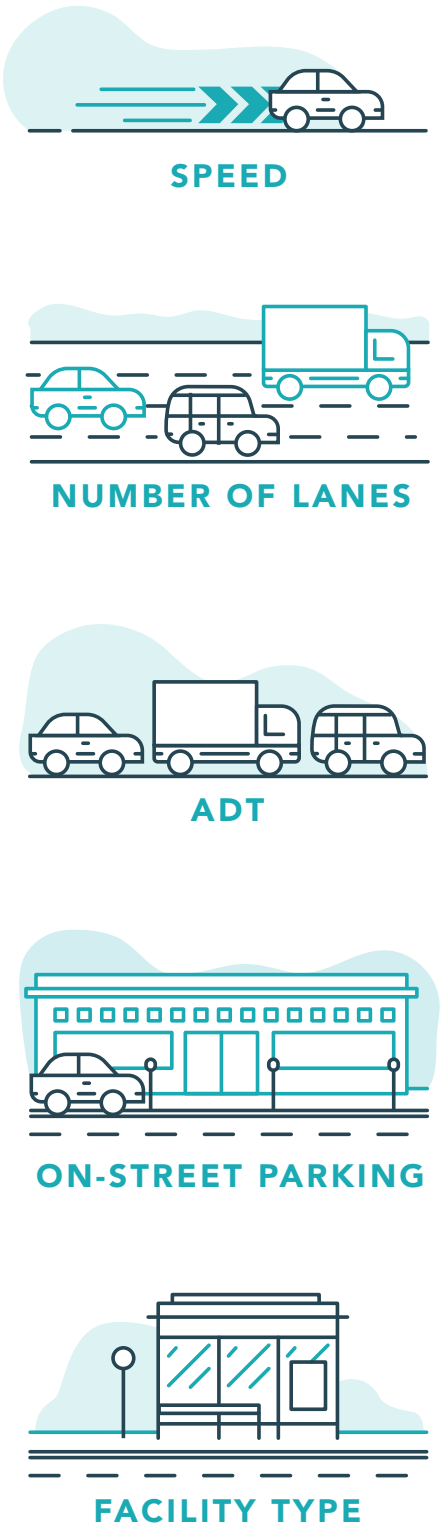
[13] Low-Stress Bicycling and Network Connectivity - http://transweb.sjsu.edu/research/low-stress-bicycling-and-network-connectivity

**TABLE 15** LEVEL OF TRAFFIC STRESS (LTS) RANK DEFINITIONS[14]

| | |
|---|---|
| LTS 1 | Strong separation from all except low speed, low volume traffic. Simple crossings. Suitable for children. |
| LTS 2 | With the exception of low speed, low volume of traffic situations, cyclists have a place to ride that keeps them from having to interact with traffic aside from formal crossings. Physical separation from higher speed and multilane traffic. Crossings that are easy for an adult to negotiate. Corresponds to design criteria for Dutch bicycle route facilities. A level of traffic stress that most adults can tolerate, particularly those sometimes classified as "Interested but Concerned." |
| LTS 3 | Involves interaction with moderate speed (30–35 mph), multilane traffic, or close proximity to higher speed traffic. A level of traffic stress acceptable to those classified as "Enthused and Confident." |
| LTS 4 | Involves interaction with high speed (40 mph and up) traffic or close proximity to high speed traffic. A level of stress acceptable only to those classified as "Strong and Fearless." |

Criteria to determine the LTS of a roadway is first categorized by the non-motorized facility. Shared use paths, sidepaths, and protected bike lanes when assessed strictly on a segment basis (between two intersections) are considered level of stress 1 (LTS 1) facilities. Conventional bike lanes and mixed traffic facilities' LTS are affected by the prevailing speeds, number of lanes, average daily traffic (ADT) volumes, and on-street parking widths. Figure 76 highlights the five (5) primary criteria for segment-based analysis for LTS. Tables 16 through18 provide three (3) examples of how each of the five (5) primary criteria items are used per facility type.

**FIGURE 76** 5 PRIMARY CRITERIA OF LEVEL OF TRAFFIC STRESS (LTS) SEGMENT ANALYSIS




[14] Level of Traffic Stress - http://www.northeastern.edu/peter.furth/criteria for-level-of-traffic-stress/

**TABLE 16** LEVEL OF TRAFFIC STRESS (LTS) FOR MIXED USE FACILITIES

| Number of lanes | Effective ADT* | Prevailing Speed ≤ 20 mph | 25 mph | 30 mph | 35 mph | 40 mph | 45 mph | 50+mph |
|---|---|---|---|---|---|---|---|---|
| Unlaned 2-way street (no centerline) | 0-750 | LTS 1 | LTS 1 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 3 |
| | 751-1500 | LTS 1 | LTS 1 | LTS 2 | LTS 3 | LTS 3 | LTS 3 | LTS 4 |
| | 1501-3000 | LTS 2 | LTS 2 | LTS 2 | LTS 3 | LTS 4 | LTS 4 | LTS 4 |
| | 3000+ | LTS 2 | LTS 3 | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 |
| 1 thru lane per direction (1-way, 1-lane street or 2-way street with centerline) | 0-750 | LTS 1 | LTS 1 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 3 |
| | 751-1500 | LTS 2 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 3 | LTS 4 |
| | 1501-3000 | LTS 2 | LTS 3 | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 |
| | 3000+ | LTS 3 | LTS 3 | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 |
| 2 thru lanes per direction | 0-8000 | LTS 3 | LTS 3 | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 |
| | 8001+ | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 | LTS 4 | LTS 4 |
| 3+ thru lanes per direction | any ADT | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 | LTS 4 | LTS 4 |

* Effective ADT = ADT for two-way roads; Effective ADT = 1.5*ADT for one-way roads

**TABLE 17** LEVEL OF TRAFFIC STRESS (LTS) RANK FOR BIKES WITH NO ADJACENT PARKING

| Number of lanes | Bike lane width | Prevailing Speed ≤ 25 mph | 30 mph | 35 mph | 40 mph | 45 mph | 50+ mph |
|---|---|---|---|---|---|---|---|
| 1 thru lane per direction, or unlaned | 6+ ft | LTS 1 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 3 |
| | 4 or 5 ft | LTS 2 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 4 |
| 2 thru lanes per direction | 6+ ft | LTS 2 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 3 |
| | 4 or 5 ft | LTS 2 | LTS 2 | LTS 2 | LTS 3 | LTS 3 | LTS 4 |
| 3+ lanes per direction | any width | LTS 3 | LTS 3 | LTS 3 | LTS 4 | LTS 4 | LTS 4 |

Notes 1. If bike lane / shoulder is frequently blocked, use mixed traffic criteria.
2. Qualifying bike lane / shoulder should extend at least 4 ft from a curb and at least 3.5 ft from a pavement edge or discontinuous gutter pan seam
3.Bike lane width includes any marked buffer next to the bike lane.

**TABLE 18** LEVEL OF TRAFFIC STRESS (LTS) RANK FOR BIKES WITH ADJACENT PARKING

| Number of lanes | Bike lane reach = Bike + Pkg lane width | Prevailing Speed ≤ 25 mph | 30 mph | 35 mph |
|---|---|---|---|---|
| 1 lane per direction | 15+ ft | LTS 1 | LTS 2 | LTS 3 |
| | 12-14 ft | LTS 2 | LTS 2 | LTS 3 |
| 2 lanes per direction (2-way) | 15+ ft | LTS 2 | LTS 3 | LTS 3 |
| 2-3 lanes per direction (1-way) | | LTS 2 | LTS 3 | LTS 3 |
| other multilane | | LTS 3 | LTS 3 | LTS 3 |

Notes 1. If bike lane is frequently blocked, use mixed traffic criteria.
2. Qualifying bike lane must have reach (bike lane width + parking lane width)≥ 12 ft
3.Bike lane width includes any marked buffer next to the bike lane.

As can been seen in the three tables above, regardless of on-road facility type, speed is always a deciding factor to determine LTS. Motor vehicle speed affects the safety of everyone in various ways. If a vehicle is traveling at 20 mph and a crash occurs involving a bicyclist or pedestrian, there is a 10% chance of the crash being fatal. The chance of a fatality increases to 40% at 30 mph and 80% at 40 mph.[15]

[15] FHWA, "Relationship between Design Speed and Posted Speed" memorandum, October 7, 2015. Sourced from FHWA Achieving Multimodal Networks

Speed also affects a driver's peripheral vision, as well as the distance required to stop a vehicle. Traveling at higher speeds prevents motorists from quickly and accurately assessing the immediate surroundings on the roadway, as represented in Figure 77. This tunnel vision makes for a dangerous situation at intersections and midblock crossings where crashes with pedestrians and bicyclists are most likely to occur. At 10 mph, a typical personal vehicle requires twenty-seven 27 feet (22 feet for perception reaction, five (5) feet for braking deceleration to zero) of distance to come to a complete stop. For every 10 mph added to a vehicle's operating speed, the distance required to stop almost doubles.

**FIGURE 77** SPEED'S EFFECT ON VISION AND STOPPING

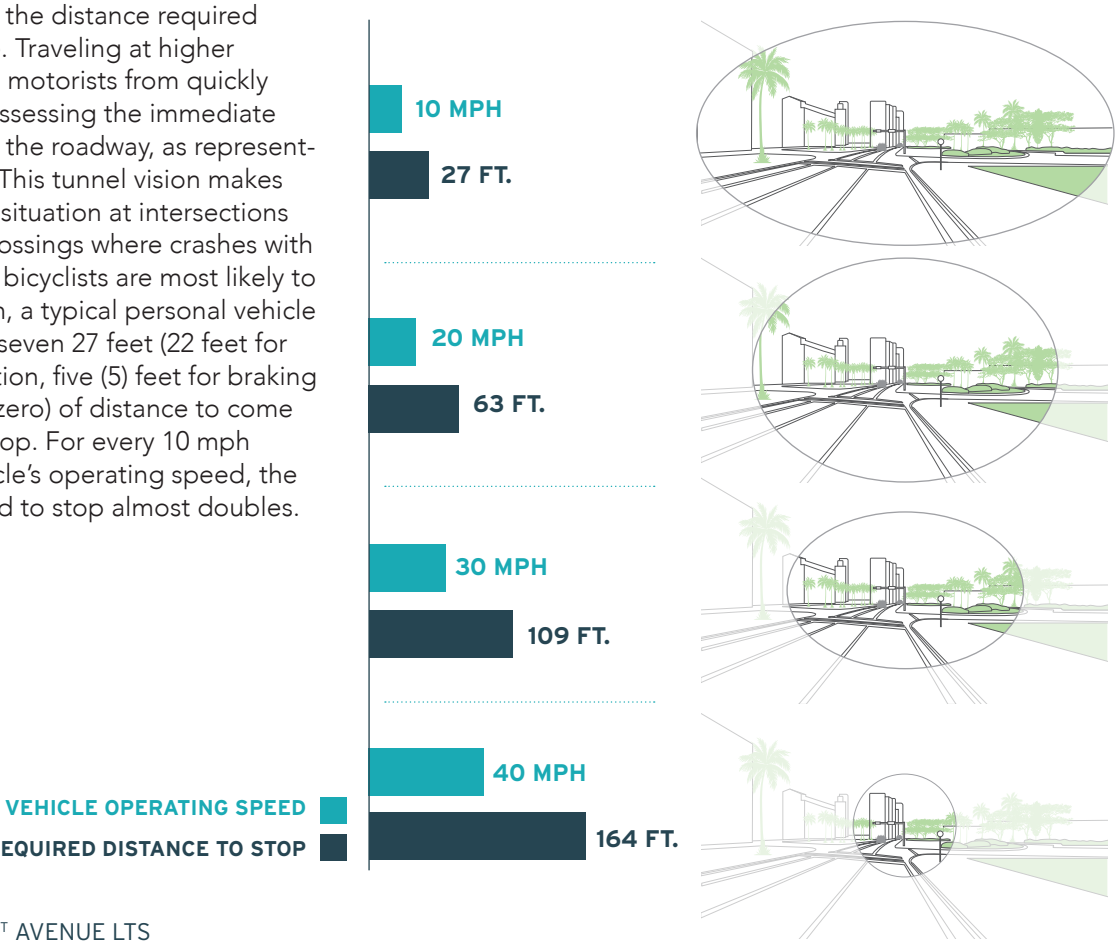



**FIGURE 78** NW 1ST AVENUE LTS


Figure 78 is an example of applying LTS analysis to Miami-Dade County roadway, NW 1st Ave (just north of SR 836). It has a posted speed limit of 30 mph (it is assumed posted and prevailing speeds are similar), an AADT of 6,400, a travel lane in each direction, five (5) feet conventional bike lanes with an on-street parking width of 6.5 feet (from edge of gutter). The bike lanes on this roadway would be classified as LTS 3. While the speed and bike lane width are advantageous for a LTS 2, it's the narrow on-street parking conditions that prevent it from obtaining a lower (better) score.

**FIGURE 79** FEASIBLE BICYCLE FACILITY BY ROADWAY POSTED SPEED LIMIT

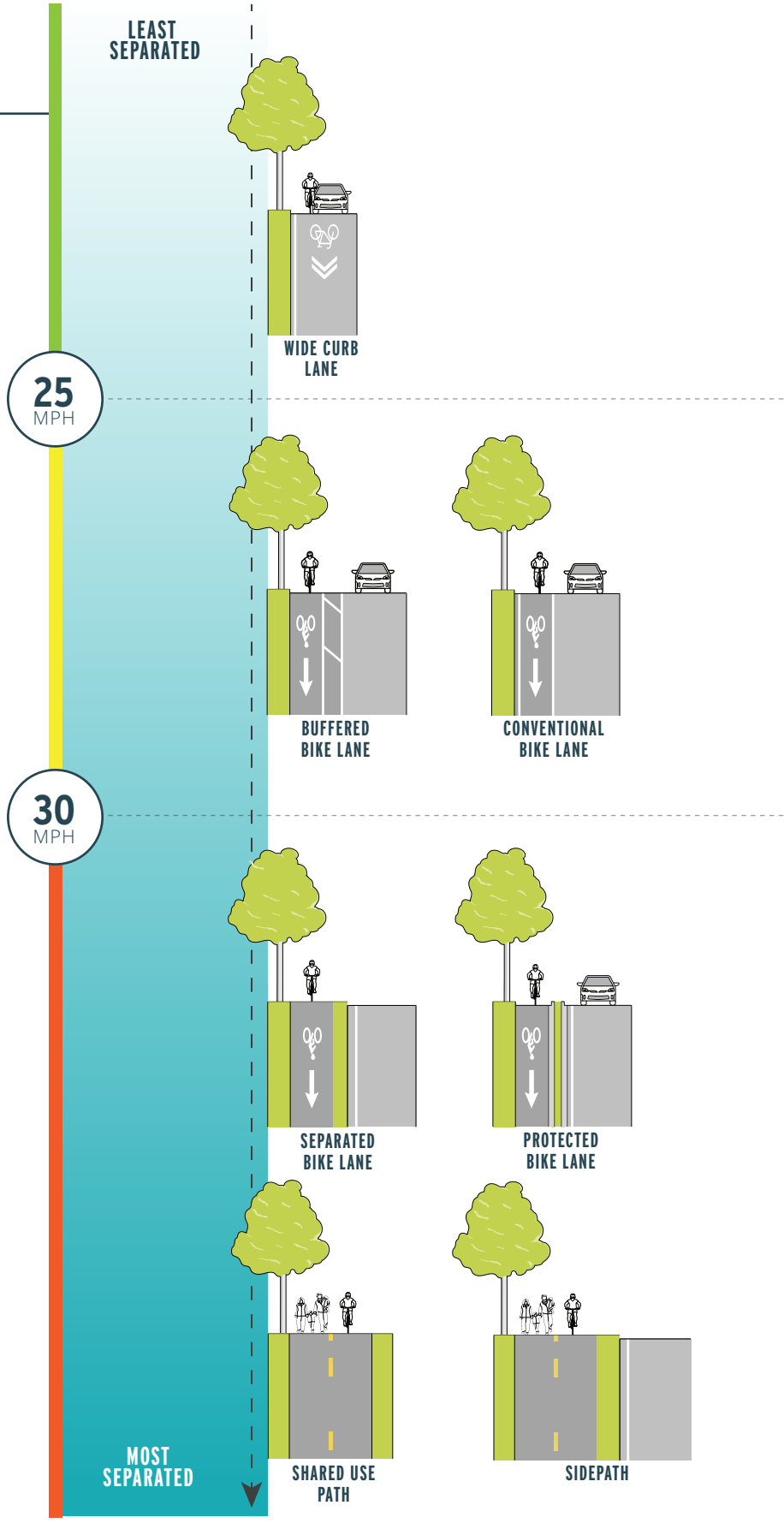
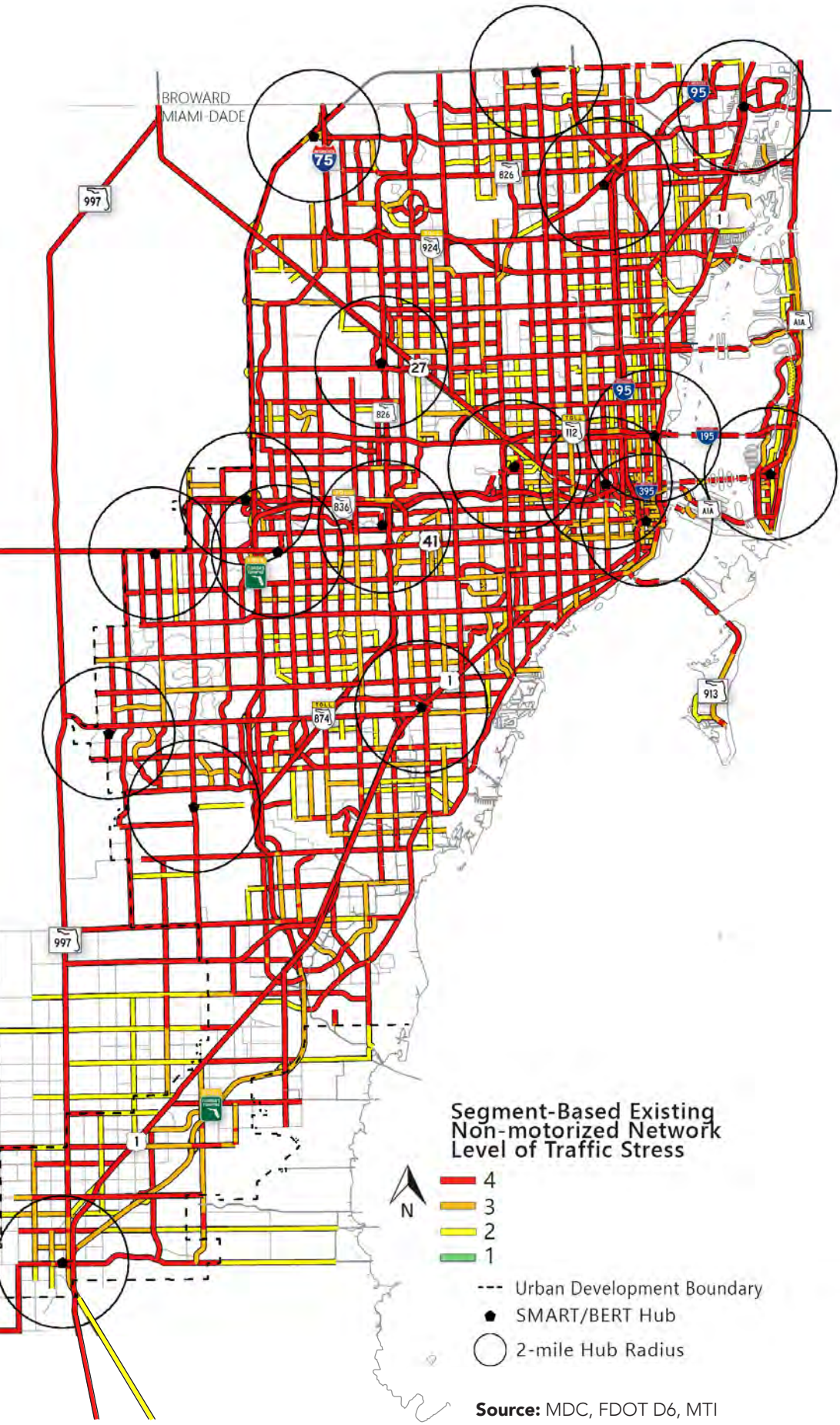



Figure 79 categorizes bicycle facility separation from roadway traffic by posted speed limit. This diagram assumes that prevailing speeds, the speed vehicles actually travel, are the same or similar to the posted speed limits.

Beginning from the top, mixed use facilities such as wide curb lanes and bike boulevards, with sharrow pavement markings best operate on residential roadways with speed limits less than or equal to 25 mph. Between 25 to 30 mph, on road conventional, unprotected bike lanes are ideal. If utilized on roadways with higher speeds, the range of users willing to utilize those facilities begins to narrow rapidly.

Roadways with speed limits above 30 mph require a greater degree of separation from roadway traffic to best serve non-motorized users. Protected and separated bike lanes, sidepaths, and shared use paths fulfill these requirements.




**Source:** MDC, FDOT D6, MTI

**FIGURE 80** MIXED TRAFFIC LEVEL OF TRAFFIC STRESS ANALYSIS MAP

## MIXED TRAFFIC LEVEL OF TRAFFIC STRESS (LTS) ANALYSIS

To emphasize the importance of well-designed on and off road non-motorized facilities, Figure 80 visually depicts an approximation of LTS if no dedicated facilities existed and cyclists were required to use mixed traffic routes. Where speed data was not available, the other criteria (number of lanes and ADT) were used to estimate LTS. LTS 4, represented in red, is the clear majority, leaving only the "Highly Confident" cyclists, 4–7% of the population, willing to navigate the County in mixed traffic conditions. The roadways assessed do not include residential roadways. If residential roadways qualified as a LTS 1, Figure 80 makes it clear that the current conditions create a checkerboard pattern of isolated LTS 1 residential neighborhoods, preventing cyclists from traveling far before encountering a LTS 4 barrier.

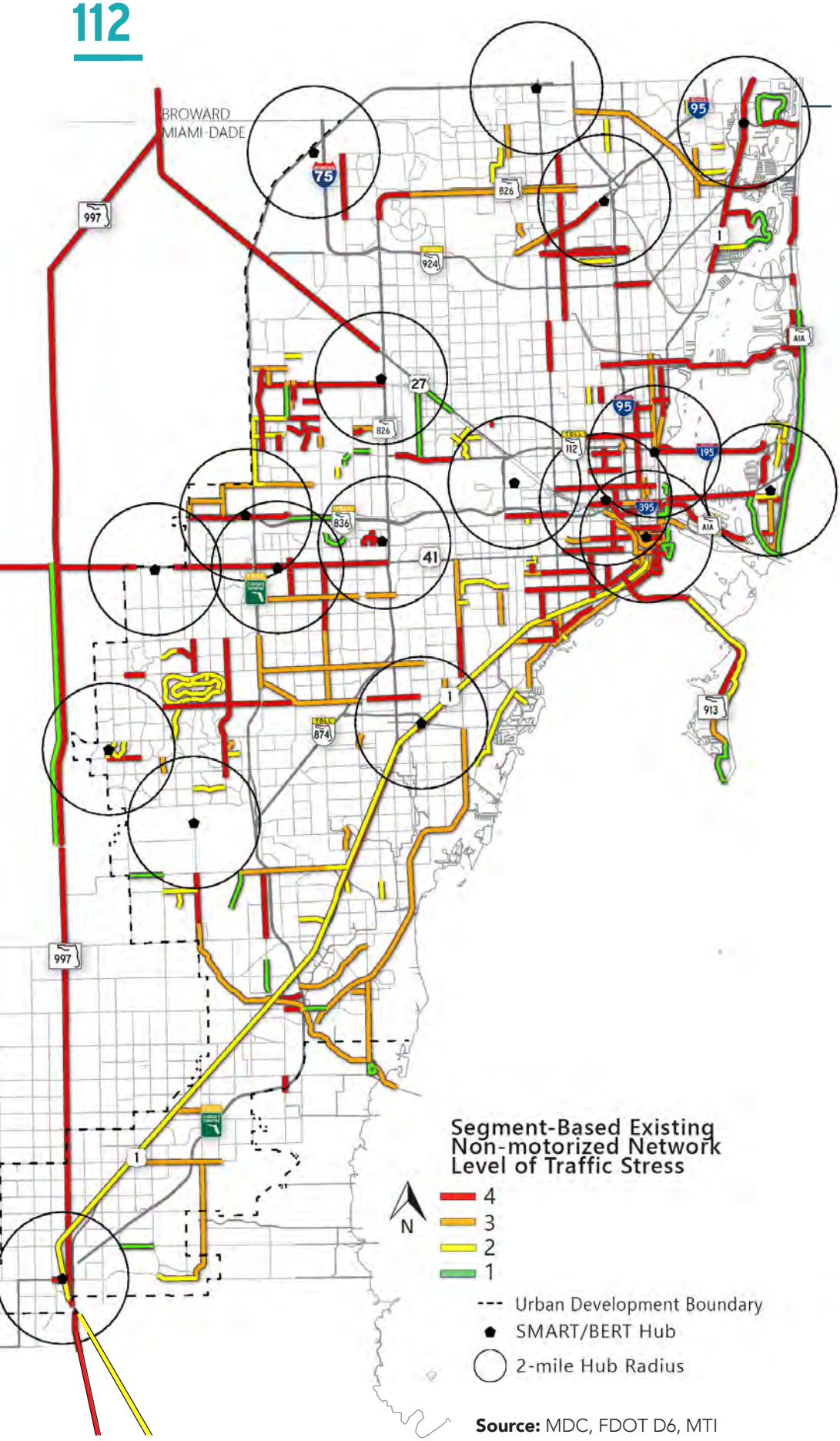



**FIGURE 81** EXISTING BICYCLE NETWORK SEGMENT LEVEL OF TRAFFIC STRESS MAP

**Source:** MDC, FDOT D6, MTI

## EXISTING BICYCLE NETWORK SEGMENT LEVEL OF TRAFFIC STRESS

A segment-based analysis, with spot checks for intersection conditions of the existing non-motorized transportation network was performed. Figure 81 identifies facilities inducing high or low amounts of stress for cyclists using the established LTS criteria. Most facilities that rated LTS 4 are either mixed traffic facilities or conventional four (4) foot bike lanes. The two (2) primary factors that caused bike lanes to generate high stress are posted speed and "bike lane reach" (distance between a parked car and a cyclist) which increases the chance of being "doored."


**FIGURE 82** LTS 4 BIKE LANE US-1/BISCAYNE BOULEVARD

**FIGURE 83** US -1/BISCAYNE BOULEVARD KEYHOLE BIKE LANE

## EXAMPLES OF SEGMENT LEVEL OF TRAFFIC STRESS BY FACILITY

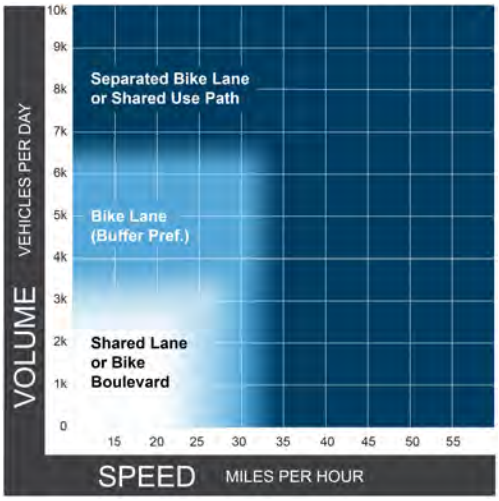
Figure 82 is an example of a LTS 4 bicycle facility in Miami-Dade County. Along US 1/Biscayne Boulevard, just north of NE 183rd Street, is an on-road unprotected bike lane. The bike lane's alignment creates essential connections with numerous desired locations and population centers. Alignments like this are an enhancement to the connectivity of the existing non-motorized network. Providing some improvements to this facility can lower the level of stress to increase the safety and amount of users. The bike lane, operating on a +6 lane roadway with high posted speeds, 35–45 mph, and an AADT of 56,000 provides numerous points of potential conflict with traffic. The level of stress for this facility could improve by providing a protected bike lane.

Intersection conditions for this facility frequently require cyclists to utilize keyhole bike lanes (bike lanes placed in between a dedicated right turn with long queuing capacity and the outside through lane), as seen in Figure 83. This increases a cyclist's exposure to conflict zones with merging traffic. Existing intersections, in many U.S. metropolitan areas, including Miami-Dade County, often act as determinants to a bicycle facility's LTS. According to the National Highway Traffic Safety Administration's (NHSTA) Fatality Analysis Reporting System (FARS), intersections are the place where the most vehicle-bike and vehicle-pedestrian conflicts occur. In 2017, 43% of urban bicyclist fatalities occurred at intersections.

Mixed traffic facilities, such as sharrows and bike boulevards, receive a LTS 3 or 4 rating due to high traffic volumes. Figure 84 from the FHWA Bikeway Selection Guide displays the preferred traffic volumes according to facility type. Mixed traffic facilities operate best at 3,000 vehicles per day (VPD) or less before it becomes unsafe. Bike lanes, preferably buffered lanes, maintain safe conditions up to 6,000 VPD.

The shared use paths on a segment-based analysis will always provide a lower LTS and encourage all users. These facilities are where the intersection spot checking occurred and is the reason why all trails did not consistently score LTS 1 or 2. For example, the Snake Creek Trail is rated LTS 3 due to the roadway and trail intersection conditions.

**FIGURE 84** RECOMMENDED FACILITY BY VOLUME AND SPEED



Snake Creek Trail creates a low-stress pathway for residents and tourists to utilize in the northern area of Miami-Dade County. Schools, grocery stores, and community locations such as the Hard Rock Stadium are an abridged list of connections made by this greenway. Figures 85 and 86 highlight two (2) locations where the Snake Creek Trail can be improved to further enhance the user experience. Figure 85 displays the trail's intersection with the north side of NE 199th Street between N Miami Avenue and NE 2nd Avenue. Pedestrians and cyclists are required to travel to the nearest intersection, N Miami Avenue and NE 199th Street, and may feel inconvenienced by this lack of a direct route across NE 199th Street.

Figure 86 displays the second point along the Snake Creek trail at the SR 7/NW 2nd Avenue intersection. Trail users are required to travel north or south to cross SR 7/NW 2nd Avenue to return to the trail. Figure 88 on the next page displays the current condition of this intersection from a top-down perspective. Route A crosses SR 7/NW 2nd Avenue at NE 202nd Terrace and Route B at NW 199th Street. Given trail users are required to travel approximate 1,500 feet in either direction to return to the trail and continue their trip, the current condition encourages illegal midblock crossings.

Providing signalized crossings at the intersection of trails and roadways would be an ideal minimum improvement for shared use paths and greenways throughout the County. Another alternative is to provide non-controlled midblock crossings equipped with flashing pedestrian crossing signage. This MUTCD compliant crossings already exists at various trail/roadway crossings. However, citizens at the Bicycle Pedestrian Advisory Committee (BPAC) have continuously expressed that traffic does not yield to cyclists/pedestrians at this type of crossing, thus limiting effective safety and level of stress depending on the roadway geometry and traffic conditions. As seen in Figure 87, this Black Creek Trail crossing at SW 112th Avenue has a posted speed limit of 35 mph, four (4) lanes of traffic, and no pedestrian refuge island. This crossing alone makes this trail a level of stress 3 (see page118 for more information regarding level of stress at intersection crossings).

**FIGURE 85** SNAKE CREEK TRAIL AND NE 199TH STREET CONJUNCTION

**FIGURE 86** SNAKE CREEK TRAIL AND SR 7/NW 2ND AVENUE STREET VIEW

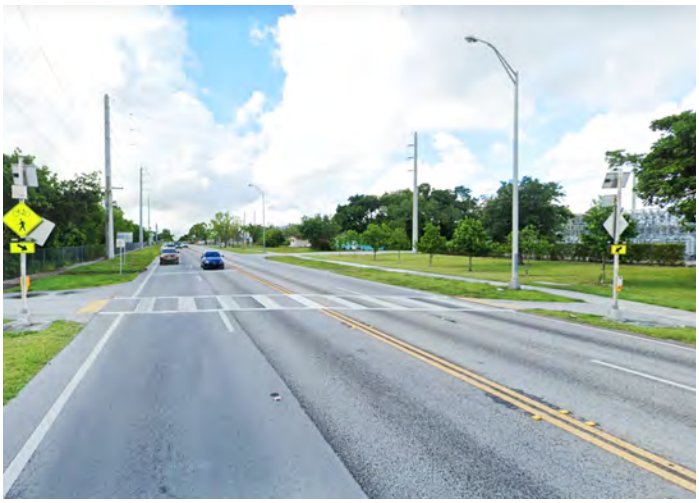


**FIGURE 87** BLACK CREEK TRAIL AND SW 112TH AVENUE STREET VIEW

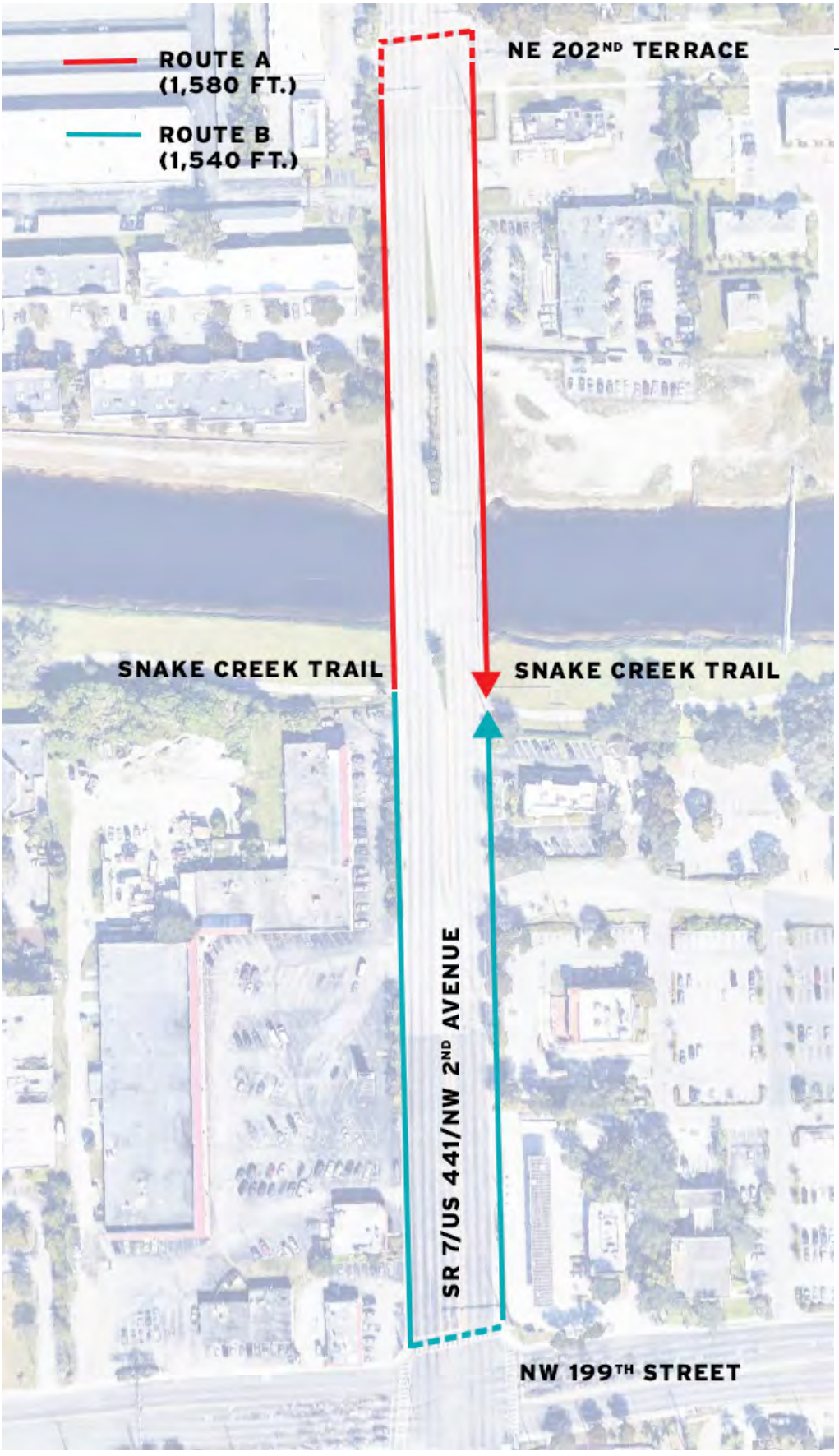



**FIGURE 88** SNAKE CREEK TRAIL AND SR 7/ NW 2ND AVENUE EXISTING CROSSING OPTIONS

**FIGURE 89** US 1/SOUTH DIXIE HIGHWAY PEDESTRIAN OVERPASS

## GRADE SEPARATED CROSSINGS

An approach to ensuring a shared use path maintains a LTS 1 for pedestrians and cyclists is implementing grade separated crossings. These transportation facilities can be elevated walkways, bridges, overpasses, underpasses, or tunnels that allow pedestrians/cyclists and motor vehicle traffic to cross one another at different levels (vertical spatial separation of conflicting travel mode flows). As seen in Figure 89, these structures greatly reduce pedestrian/bicycle-motor vehicle conflicts (and associated delays) and potential crashes. Grade separated pedestrian crossings also provide access to parking garages and/or grade separated transit stations/terminals to origins/destinations. At transit stations and terminals, the preferred crossing connection is directly to/from the primary transit passenger platform(s) (at-grade or grade separated platform) or to/from a common mezzanine level.

Grade separated pedestrian and bicyclist crossing facilities are intended to reduce pedestrian/bicycle-motor vehicle conflicts (and associated delays) and potential crashes. Grade separated pedestrian crossings improve pedestrian and bicycle safety and reduce travel delay, increase highway capacity (particularly at signalized crossings by eliminating pedestrian signal phases), and reduce motor vehicle crashes. Grade separated pedestrian crossings can be effectively utilized to overcome travel obstacles, facilitate non-motorized travel past topographic and other barriers, and/or connect two (2) transportation facilities, buildings, origins/destinations and/or neighborhoods. Some grade separated crossing structures are intentionally designed with unique architecture and lighting to reflect local themes and to bring two (2) areas or communities together (serving as a visual, physical and unifying link). Certain grade separated crossing structures can also be designed to be gateway features. Grade separated pedestrian crossing widths and vertical clearances should accommodate the anticipated user demand (peak travel volumes), travel (two-way flows), and physical characteristics (individual and mobility devices).

**Grade separated pedestrian crossings are typically implemented under one or more of the following conditions:**

- Long pedestrian at-grade crossing distances.
- Turning and/or through vehicles operate with high speeds and/or with continuous (or near continuous) flow (resulting in insufficient crossing gaps).
- Sight distance (vehicular and/or pedestrian/bicyclist) is inadequate.
- Lack of an alternative nearby/adjacent (within 600 feet) and safe crossing.
- School, college, university, hospital, medical center, and/or park crossings exist or will be present, or high volumes of children or young adults cross or will cross.
- High volumes of elderly/seniors, disabled or mobility-impaired individuals cross or will cross.

**Grade separated pedestrian crossings when provided should take into consideration the following:**

- Should completely remove or significantly discourage any at-grade pedestrian/bicycle crossings and conflicts (via pedestrian channelizing barriers and/or fencing with landscaping) at the location in question.
- Should maximize the range of potential users/user groups and travel markets by accommodating those of all ages and abilities, traveling at any and all times, to/from multiple locations, in different directions, utilizing multiple means of mobility, and traveling at different speeds.
- To accommodate people with a variety of abilities/disabilities, ramps and/or elevators with sufficient travel speed and passenger capacity must be installed and adequately maintained.

**Source:** FHWA Pedestrian Safety Improvements — 2018 Countermeasures (Overpasses/Underpasses)

Usually, a warrant or justification for a grade separated pedestrian crossing is based on existing and/or anticipated pedestrian and vehicle volumes (peak and daily), pedestrian and vehicle mix, vehicle speed, intensity of pedestrian and vehicle conflicts, facility type, at-grade roadway/railway crossing distances/number of lanes/tracks crossed, at-grade roadway crossing median provision and width, location of nearest traffic signal (for non-limited access roadways), location of nearest grade separated cross street (for limited access expressways), location of nearest at-grade railroad crossing (for railways), number and length of crossing gaps between vehicles, and area/adjoining land use type. Grade separated crossings have various conditions where implementation is warranted. Above is a sample of the warranted conditions and design elements. For a more comprehensive list, see Appendix A.

**Source:** Miami Herald

## INTERSECTION LEVEL OF TRAFFIC STRESS (LTS)

While the segment analysis improves the conditions for bicyclists, improving the level of traffic stress for intersections has significant benefits for pedestrians as well as cyclists. Much of the criteria for improved intersection LTS is focused on reducing exposure to motor vehicle travel speeds and the number of travel lanes crossed. Tables 19 and 20 identify criteria for assessing intersection LTS.

**TABLE 19** BICYCLE INTERSECTION APPROACH LTS[16]

| BIKE LANE AND MIXED TRAFFIC APPROACHES IN THE PRESENCE OF A RIGHT TURN LANE | |
|---|---|
| CONFIGURATION AND TURNING SPEED | LEVEL OF TRAFFIC STRESS |
| Single right turn (RT) lane up to 150 feet long, starting abruptly while the bike lane continues straight; intersection angle such that turning speed is ≤ 15 mph. | ≥2 |
| Single RT lane longer than 150 feet, starting abruptly while the bike lane continues straight; intersection angle such that turning speed is ≤ 20 mph. | ≥3 |
| Single RT lane in which the bike lane shifts to the left, but intersection angle and curb radius are such that turning speed is ≤ 15 mph. | ≥3 |
| Single RT lane with any other configuration; dual RT lanes; or RT lane plus option (through-right) lane. | 4 |

*Note: "Bike lane" here means either a pocket bike lane (between the RT lane and a through lane), or a bike lane marked within the right turn lane. These criteria do not apply if a segregated bike lane is kept to the right of a right turn lane and provided a safe means of crossing.*

[16] Level of Traffic Stress - http://www.northeastern.edu/peter.furth/research/level-of-traffic-stress/

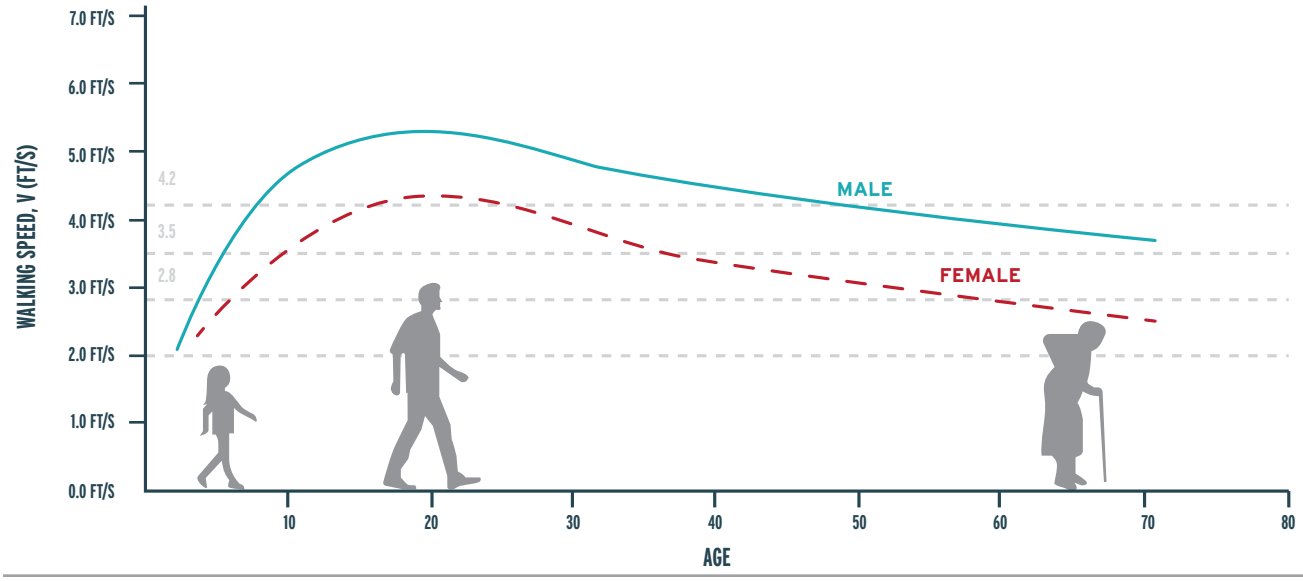
**TABLE 20** INTERSECTION CROSSING LTS CRITERIA[17]

| CRITERIA FOR UNSIGNALIZED CROSSINGS | | | |
|---|---|---|---|
| NO CROSSING ISLAND | WIDTH OF STREET BEING CROSSED | | |
| SPEED LIMIT OR PREVAILING SPEED | UP TO 3 LANES | 4 - 5 LANES | 6 OR MORE LANES |
| Up to 25 mph | 1 | 2 | 4 |
| 30 mph | 1 | 2 | 4 |
| 35 mph | 2 | 3 | 4 |
| 40 mph or Greater | 3 | 4 | 4 |
| WITH CROSSING ISLAND | WIDTH OF STREET BEING CROSSED | | |
| Up to 25 mph | 1 | 1 | 2 |
| 30 mph | 1 | 2 | 3 |
| 35 mph | 2 | 3 | 4 |
| 40 mph or Greater | 3 | 4 | 4 |

Determining the level of traffic stress of cyclists approaching intersections with dedicated right turns and pocket bike lanes requires examination of existing intersection configuration and prevailing speeds of turning vehicles.

While signalized intersections are currently not documented as inducing any traffic stress upon non-motorized crossing traffic, pedestrians stand the potential of experiencing stress when crossing larger intersections. Not all pedestrians move at the same speed, and this needs to be reflected in programmed signal phases for intersections. Refer to Figure 90 to ensure that intersection signal timing, based on number of lanes and slowest user walking speed, 2.0 feet per second, is incorporated.

**FIGURE 90** WALKING SPEED VARIATIONS AS A FUNCTION OF AGE AND GENDER




[17] Level of Traffic Stress - http://www.northeastern.edu/peter.furth/research/level-of-traffic-stress/

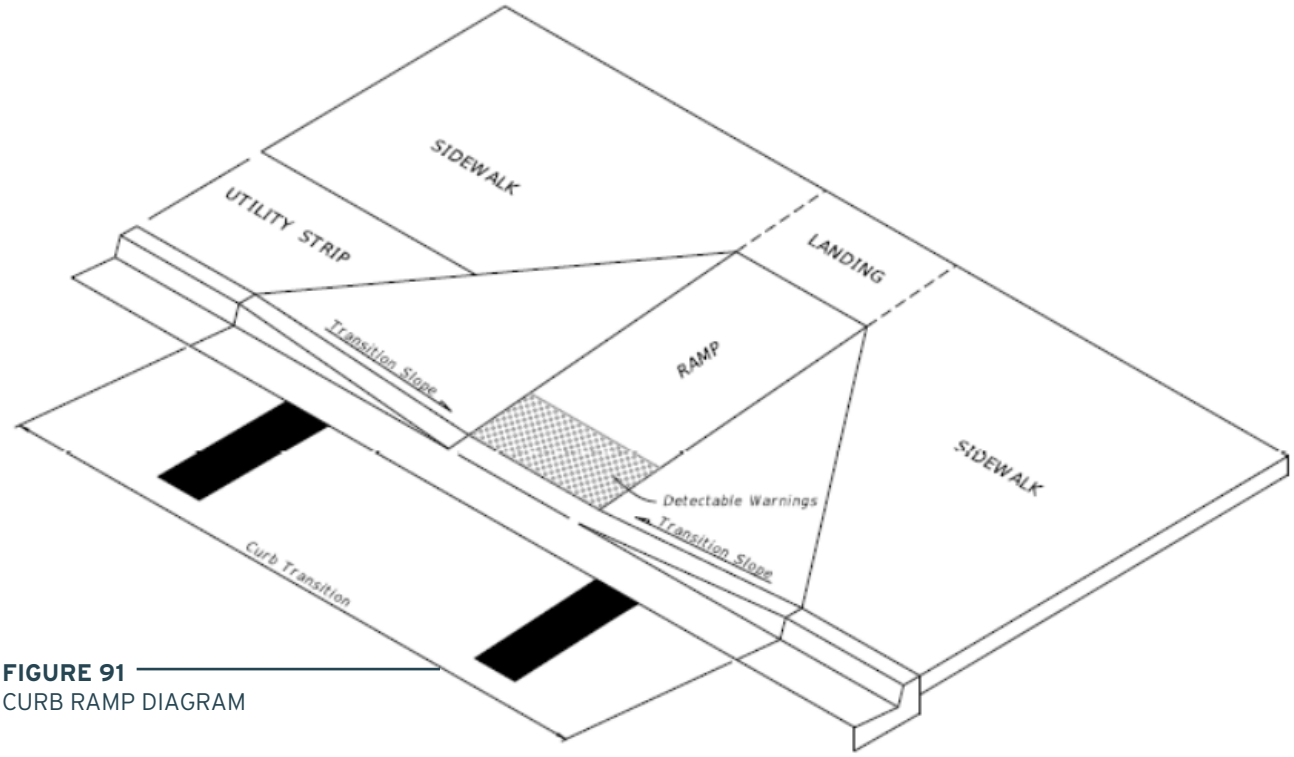



**FIGURE 91**
CURB RAMP DIAGRAM

# INTERSECTION IMPROVEMENTS FOR PEDESTRIANS

## CURB RAMPS

Sidewalk curb ramps should be included at all intersections and turnouts with curbed returns and on curbed roadways between intersections where a crosswalk has been established. FDOT Standard Plans, Index 522-002, provides details for curb ramp landings.

Curb ramps should be provided on both ends and in line with the crossing and must have a maximum slope of 1:12 (8.3%). Crossings are required to meet the same grade and cross slope requirements as sidewalks. When following the profile grade of the roadway, curb ramp slopes should not exceed 15-feet in length.

Transition slopes (flared sides) should be provided where a pedestrian circulation path crosses the curb ramp. The maximum slope of transition slopes is 1:10 as measured parallel with and adjacent to the curb line. New and reconstructed driveways and turnouts are to follow FDOT Standard Plans, Index 000-515 and 000-516.


**FIGURE 92** HIGH EMPHASIS CROSSWALKS AT SR 7/NW 7TH AVENUE AND NW 14TH STREET

## CROSSWALKS

FDOT Standard Plans, Index 711-001, provides details for crosswalk pavement markings. School Zone crosswalks have additional criteria for signing and pavement markings as provided in The Manual on Speed Zoning for Highways, Roads and Streets in Florida, Chapter 15. At all marked legs of a signalized intersection/roundabout and midblock crossings, Special Emphasis crosswalk markings are to be used. Standard crosswalk markings are to be used on stop or yield-controlled intersections. Supplemental marked crosswalks can be provided on an uncontrolled leg of an intersection with other treatments such as beacons, signals, curb extensions, raised medians, raised traffic islands, and enhanced overhead lighting.

Midblock crosswalks should be illuminated, marked, and signed in accordance with the MUTCD, FDOT's Traffic Engineering Manual Section 3.8, and FDM 230.6. An engineering study supporting the need for the installation of midblock crosswalks is required for placement on state roads.


## REFUGE ISLANDS

Refuge islands aid and assist pedestrians crossing a roadway. Raised curb corner islands and center channelizing or divisional islands can provide refuge areas. Refuge islands should be a minimum of six (6) feet wide to be used by bicyclists as well. Pedestrians should have a clear path through the island and should not be obstructed by objects such as poles, signposts, or utility boxes.

Channelization islands should meet the following requirements:

01 Size of the island should be

- 50 square feet or larger within curbed intersections,
- 75 square feet or larger on flush shoulder intersections,
- 100 square feet or larger on all other locations,

02 Triangular islands should be at least 15 feet on a side but not less than 12 feet with round of corner, and

03 Side dimensions should not exceed 100 feet.

The approach and departure noses are to be rounded with radii of at least 3.5 feet. Approach ends of the island should be offset from the edges of the travel way to funnel drivers smoothly into the desired path. The amount that a curbed island is offset from the through traffic lane is influenced by the type of edge treatment and other factors such as island contrast, length of taper, or auxiliary pavement preceding the curbed island. If a bicycle lane is adjacent to an island curb, no offset is needed.

Where there are no curbs on the approach traveled way, the minimum offset of the edge of the curbed island to the through lane should be 1.5 to 3 feet. For intermediate and large-size islands that are uncurbed, offsets are desirable but not required. Fixed objects within the islands areas must meet clear zone and lateral offset criteria found in FDM 215.2.3 and 215.2.4.

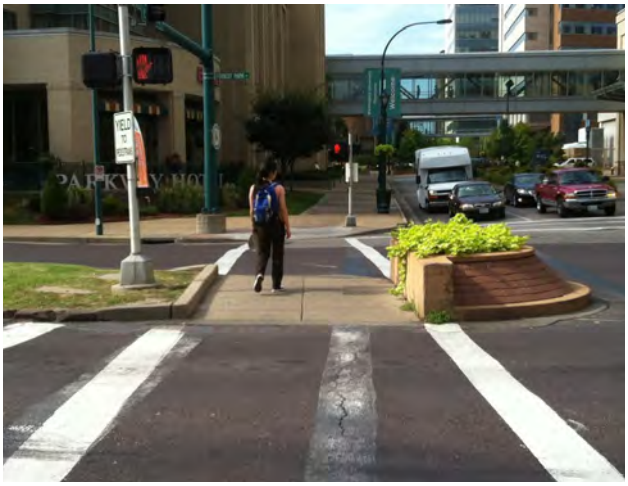


**FIGURE 93** PEDESTRIAN REFUGE ISLANDS

Median islands and traffic separators should meet the following requirements:

- A minimum of four (4) feet and 25 feet long,
- 100 feet or more in length is allowed on high speed roadways when providing high visibility for the islands,
- Approach noses should be offset two (2) to six (6) feet from the through/approach lanes to minimize impacts,
- The shape of the island should be based on design turning paths and the island function,
- The length of the island should be related to the approach speed, and
- Median islands should begin on tangent alignments and on upgrades or beyond crest vertical curves.

## CURB EXTENSIONS

Curb extensions, or bulb-outs, may be used in conjunction with on-street parking at intersections or midblock locations where there is a crosswalk, provided there is adequate width for existing traffic movements. Curb extensions shorten the crossing distance and provide additional space at intersections, allowing pedestrians to see and be seen before entering a crosswalk. The design of curb extensions must take into consideration the needs of transit vehicles, drainage, and bicyclists.

## PEDESTRIAN SIGNALS

The standard for detecting the presence of a pedestrian is the Pedestrian Pushbutton Detector. Pedestrian detector assemblies and pedestrian control signals are detailed in the FDOT Standard Plans, Index 653-001 and 665-001. Additional information on pedestrian signal installation and operation may be found in the Traffic Engineering Manual Section 3.9.


**Source:** Miami Herald

## INTERSECTION IMPROVEMENTS FOR BICYCLES

In May 2019, NACTO released Don't Give Up at The Intersection, a publication illustrating best practices for planners and engineers when designing intersections with document bicycle through traffic. It is meant to work in unison with Urban Bikeway Design Guide and the other released documentation from the agency. NACTO's three (3) primary recommendations for intersection improvements are as follows:

### REDUCE TURN SPEED

Drivers yield more frequently to people walking and biking when speeds are low, making it safer for bikes to pass in front of turning cars. Lower speeds give drivers more time to stop if needed and reduce the severity of collisions. Smaller turn radii, centerline hardening, turn speed bumps, and raised bike crossings can all reduce the speed at which drivers turn.

### MAKE BIKES AND PEDESTRIANS VISIBLE

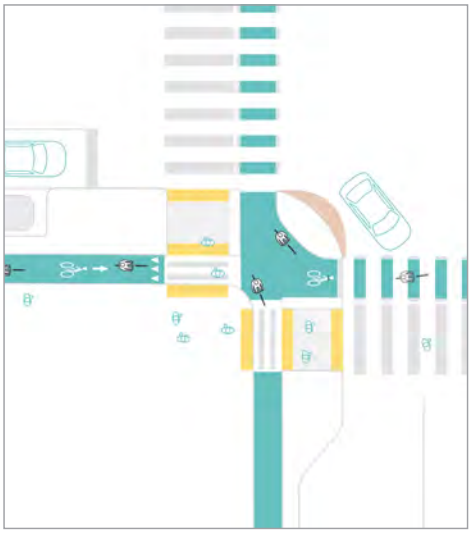
Setting back the bikeway crossing, installing recessed (early) stop lines for motor vehicles, and building raised bikeway crossings all make it easier for drivers to see people using the bikeway. The designer's challenge is to provide good lines of sight without encouraging higher speeds.

### GIVE BIKES THE RIGHT-OF-WAY

People on bikes crossing a busy intersection need clear priority over turning motor vehicles. Formal right-of-way often is not enough, but driver yielding can be improved by prohibiting motor vehicle turns on red, implementing bike-friendly signal strategies, and letting bikes move past stopped vehicles while waiting for a signal.

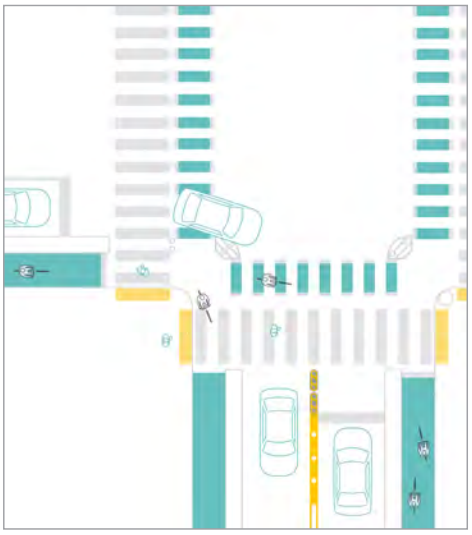
Three (3) intersection archetypes are presented to ensure these objectives of speed, visibility, and right-of-way are achieved. As seen in Figure 94, Protected, Dedicated, and Minor street intersection archetypes vary in space requirement and methods of implementation. Following the description of each of these intersections is a list of design elements that are incorporated into design for consideration for future proposed corridor or site-specific projects. NACTO's recommendations are oriented towards bicyclists, but do provide numerous enhancements for pedestrians as well.

**FIGURE 94** NACTO PROPOSED INTERSECTION IMPROVEMENT TEMPLATES



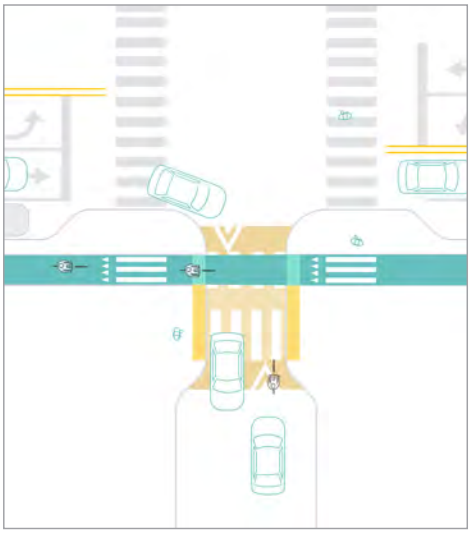
## PROTECTED INTERSECTIONS

Protected intersections can be applied on any street where enhanced bike comfort is desirable. These designs are commonly found on streets with parking-protected bike lanes or buffered bike lanes. Variants can be applied where there is no bike facility on the intersecting street, as well as streets with two-way protected bike lanes. Protected intersections can also be implemented using interim materials. Where no parking lane exists, a setback can be created by shifting the bikeway or motor vehicle lanes away from one another for the intersection approach.



## DEDICATED INTERSECTION

Dedicated intersection geometry should be considered where there is not enough space to set back the bikeway from mixed traffic at the intersection. This condition arises when a protected bike lane runs close to mixed traffic lanes without a parking or loading lane between them. Even where a bikeway generally has a large buffer, some intersections have high enough motor vehicle turn volumes that a dedicated turn lane is preferred over a protected intersection design. The combination of high turn volumes and low turn speeds are common in high-activity, walkable downtown streets, and neighborhood main streets. Dedicated intersections can be implemented at signalized, stop-controlled, and unsignalized locations, with small geometric variations. Specific design elements, such as turn wedges and centerline hardening, are also applicable to protected bike lanes.



## MINOR STREET CROSSING

Minor street crossing can utilize raised bikeway crossings when bikeways cross minor streets, neighborhood streets, driveways, and other small streets. Where the bikeway is not signalized, such as at uncontrolled or stop-on-minor intersections, the raised crossing provides unambiguous priority to bikes in the intersection.

**FIGURE 95** RECESSED STOP LINE - BERGEN STREET & VANDERBILT AVENUE NYC

## BIKEWAY SETBACK (PROTECTED INTERSECTIONS ONLY)

The setback, the distance between the bike lane and outside traffic lane, determines how much room will be available for drivers to wait and yield, as well as the angle to cross the bikeway. Larger setbacks provide better visibility and give bicyclists more time to notice and react to turning vehicles. The bikeway setback distance determines most other dimensions of the protected intersection. A ten (10) foot setback, within the protected intersection example in Figure 94, created in the shadow of the parking/loading lane, is shown. Where practical, a setback of 14–20 feet is preferred. Smaller than 12 feet should be accompanied by longer clear distances and additional signal phasing or speed reduction strategies should be considered. Setbacks larger than 20 feet may increase turn speeds and setbacks larger than 25 feet should be treated as separate intersections.

## RECESSED STOP LINE

At signalized intersections, the vehicle stop line can be moved further back from the pedestrian crosswalk for an improved factor of safety and for improved visibility of pedestrians. In some places, the stop line has been moved back by 10–15 feet relative to the marked crosswalk with considerable safety benefits for pedestrians. Recessed stop lines allow pedestrians and drivers to have a clearer view of each other and more time in which to assess each other's intentions. The effectiveness of this tool depends upon whether motorists are likely to obey the stop line, which varies from place to place. Recessed stop lines are also applicable for non-signalized crosswalks on multi-lane roads to ensure that drivers in all lanes have a clear view of crossing pedestrians.

## NON-MOTORIZED SIGNAL PHASING

There are four (4) signal phases that can be utilized depending on the geometry and traffic through and turning counts to help improve non-motorized traffic traverse a signalized intersection.

### LEADING BIKE INTERVAL (LBI) AND LAGGING LEFT TURN

A leading bike interval gives people on bikes a head start in front of turning vehicles, providing a priority position in the right-of-way. The leading pedestrian interval (LPI), which can accompany the LBI, is a measure to reduce serious crashes and injuries for pedestrians. Bike signal heads or "Bikes Use Pedestrian Signal" plaques may be used to provide LBIs in some jurisdictions. This use of a bike-symbol signal is considered experimental under MUTCD Interim Approval IA-16.22.35

On two-way streets with signalized left turns, bikes and through/right motor vehicles should generally be given the first phase, with right turns yielding to bikes and pedestrians. Left turns are then accommodated in a dedicated phase after oncoming bikes receive a red signal to reduce bike-left turn conflicts and pedestrian-left turn conflicts.

**BIKE SCRAMBLE**

The bicycle all-cross phasing is an option at high bike-volume locations to allow more time to move through the intersection, especially if diagonal movements are in high demand. The bike scramble is compatible with protected intersections since the geometric scheme organizes otherwise conflicting right-angle bike movements. It is also useful at other intersections where an LBI might otherwise be used to mitigate motor vehicle turn conflicts, but where bike turn volumes are also high. Pedestrian signals should be placed on pedestrian islands or corner islands where practical to avoid signalizing the bike-pedestrian and bike-bike interaction.

**PROTECTED-PERMISSIVE BIKE SIGNAL**

The protected-permissive bike signal, also known as the Split LBI, allows through-moving motor vehicles to start at the same time as parallel bikes. Bike and pedestrian movements continue as turning motor vehicles receive a flashing yellow arrow turn phase. Protected-permissive signal phasing can reduce the number of conflicts per turning motor vehicle, even compared with full signal protection. Protected-permissive bicycle signal operations allow riders to decide for themselves whether it is safe to go during the motor vehicle phase or to wait for a fresh protected bike phase. Protected-permissive bicycle signals are most applicable on streets where turn volumes are moderate to high and vehicle storage is needed but prevailing motor vehicle speeds are relatively low, preferably 25 mph or below. This use of a bike-symbol signal is considered experimental under MUTCD Interim Approval IA-16.

**PROTECTED BIKE SIGNAL**

Fully separate signal phases for bikes and turning vehicles provide a green bike phase and pedestrian walk phase during a motor vehicle red arrow phase followed by a motor vehicle turn phase accompanied by a red bike signal. This condition is most applicable at high-volume turn locations (above 150 turns per hour), where prevailing speeds are 30 mph or higher, where motor vehicle yielding is low, or at locations where multiple lanes turn across a bikeway.

**FIGURE 96** 89TH AVENUE & 164TH STREET TURNING WEDGE


**FIGURE 97** 132ND STREET & JAMAICA AVENUE TURNING WEDGE

## TURN WEDGE

Turning wedges perform three (3) tasks regarding improved intersection safety and are as follows:

- Reduce Left-Turning Vehicle Speeds,
- Shortened Conflict Zones Between Crossing Non-Motorized Traffic and Vehicles, and
- Further Increase Pedestrian/Vehicle Visibility.

Figures 96 and 97 display two (2) examples of turning wedges in New York City. Turning wedges are solid yellow pavement markings placed at the corners of intersections to specify proper turning movements for vehicles. Flexible delineators or modular speed bumps provide visual and/or haptic feedback to enforce correct channelization. An advantage to modular speed bumps is the ability to allow large trucks to turn while keeping car turns slow.

## VERTICAL SEPARATION ELEMENTS

Vertical separation elements provide clear, defined spaces for various modes of travel to operate. Examples of vertical separation elements include:

- **Raised Buffers or Curbs –** Provides people on bikes with a defined travel zone at the approach to an intersection.
- **Crosswalk Separators –** A mountable curb or a pair of flexible delineator posts discourages turning vehicles from cutting across the bikeway when turning right.
- **Bollards and Flexible Delineators –** Locations such as pedestrian islands or turn wedges can be made easier for drivers to see and can make non-visual navigation easier.

## RAISED BIKE CROSSING

Raised crossings improve bicyclists' visibility and reduce the speed at which vehicles turn by bringing the vehicle crossing up to (or near) the sidewalk level. In addition, the raised crossing is a signal to turning cars that through-moving bikes and pedestrians have the right-of-way.


## EXAMINING NON-MOTORIZED SMART PLAN TERMINAL CONNECTIONS

As seen in the existing bicycle network segment level of traffic stress map, Figure 81, the 18 SMART Plan terminals currently maintain an inconsistent presence of non-motorized facilities within a 2-mile radius. Terminals either completely lack connections (typically a proposed facility) or facilities are rated a LTS 3 or 4 (high stress). If a terminal possesses a low stress facility connecting to it, it will lack a similar perpendicular non-motorized connection to other areas within its 2-mile radius. Figure 98 illustrates three (3) examples of the SMART Plan terminals and the existing non-motorized network. These existing transit facilities, which are meant to represent key locations within the SMART Plan, are missing or have limited directional options for safe, comfortable non-motorized connections. It is recommended that each terminal in the SMART Plan has north-south and east-west LTS 1 or 2 connections. These LTS 1 or 2 facilities should create connections to population, job centers, and/or other logical termini for optimal first/last mile travel. NACTO's Three (3) primary recommendations for intersection improvements are shown on the right.

**FIGURE 98** SMART PLAN TERMINAL EXISTING NON-MOTORIZED CONNECTIONS

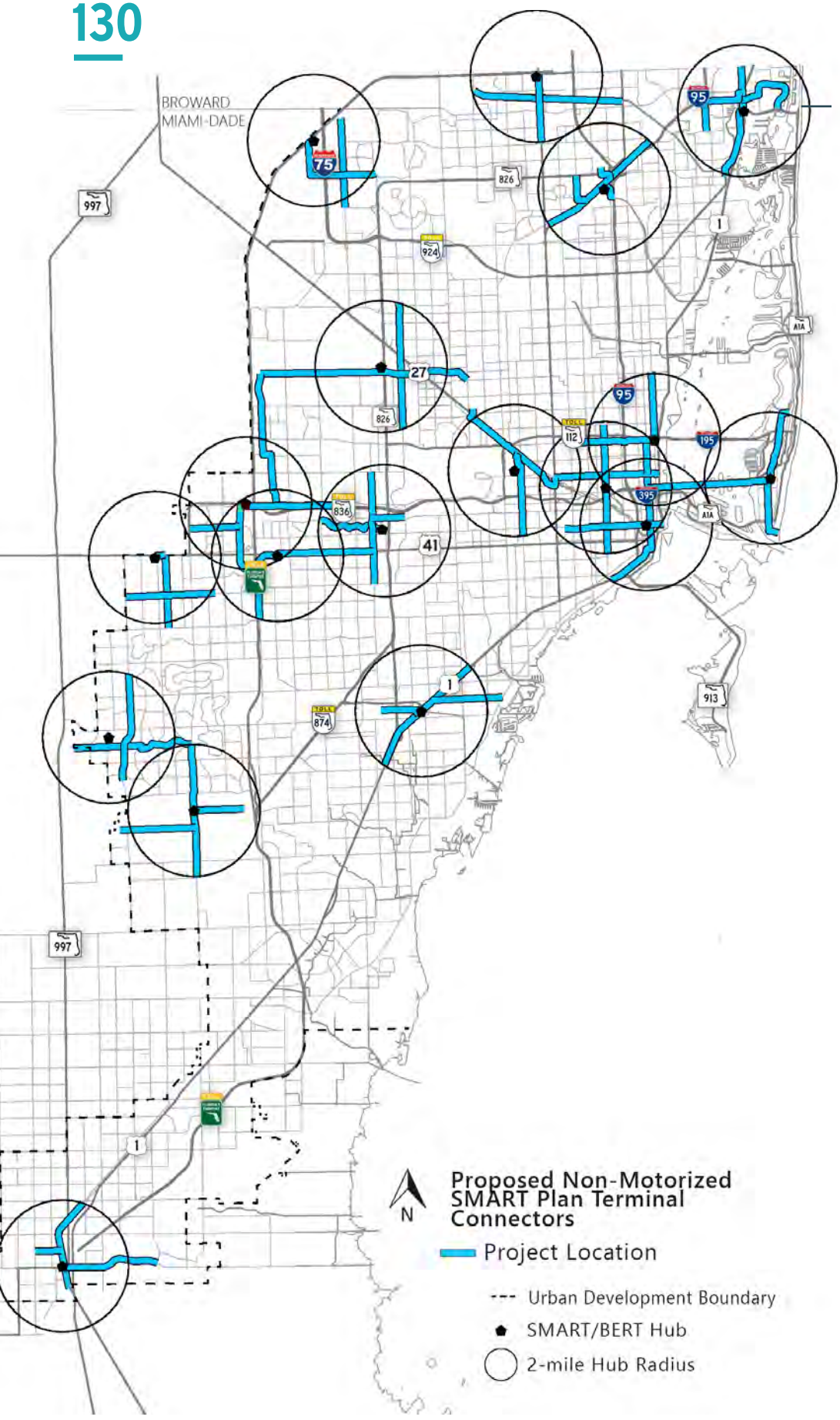



**FIGURE 99** PROPOSED NON-MOTORIZED SMART PLAN TERMINAL CONNECTORS

## PROPOSED LOW-STRESS NON-MOTORIZED SMART PLAN CONNECTORS

Figure 99 represents the proposed north–south and east–west alignments for recommended low-stress non-motorized facilities to and from the SMART Plan terminals in Miami-Dade County. Table 21 lists these terminal connectors' roadways facilities, limits, and other pertinent information. As can be seen in the map, some proposed alignments travel far beyond the 2-mile ideal bicycle trip distance radius and others end short of it. This is due to the process of seeking advantageous and logical points to maximize the facility's utility for the surrounding community, rather than arbitrarily ending at the 2-mile radius. High density population (+20 per acre) and job (+45 per acre) centers, as previously stated, are sought after for ideal connection points to bring welcoming, safe non-motorized facilities as close as possible to places where residents live and work to encourage multimodal travel. When no population or job center for a specific direction is obtainable, other locations are used, such as universities, high schools, and local commercial centers.


**Source:** Miami Herald

When determining the alignments for each proposed facility, the following is a set of characteristics of the existing transportation network that were examined and/or sought after which are conducive with a lower-stress environment for non-motorized travel:

### PAVED PATHS

If possible, utilize off-road proposed or existing paved paths as a method of connection. A proposed alignment on an existing path does not immediately imply a reconstruction of that paved path segment, rather an examination of its current conditions to ensure it would attract at least the user group "Interested but Concerned," but preferable to the all user/all ability Level of Stress 1 rating. Improvements would include adding pedestrian lighting if lacking or intersection improvements in roadways to increase safety.

### LOW AADT AND SPEED

If the surrounding area of a terminal requires on-road facilities, utilizing roadways with lower AADT and posted speed limits is always prioritized. Lower AADT and speeds have a direct relation to the increased safety of cyclists and pedestrians. Higher AADT and speed also significantly lower the options available to roadway designers when attempting to achieve a LTS 1 or 2 non-motorized terminal connector, forcing them to use protected bike lanes or design new paved paths.

### MINIMAL NUMBER OF LANES

Another safety related aspect of roadways. Drivers on wider roadways tend to have a much higher prevailing speed than the maximum limit posted on the roadway.

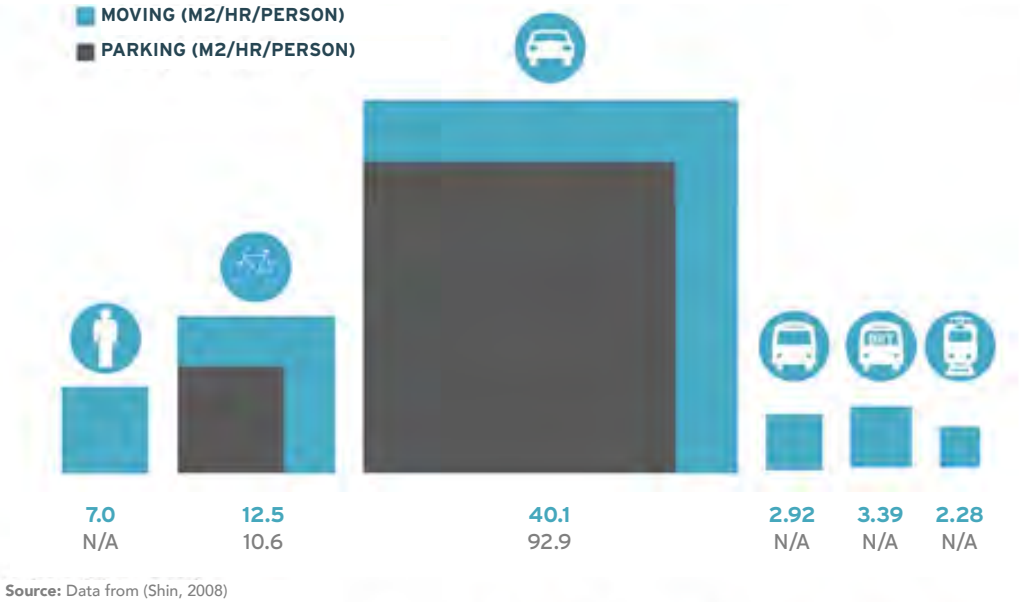
### DIRECT ALIGNMENTS

Proposed alignments aim for direct connections to the SMART Plan terminals. This criteria aims to avoid forcing bicyclists from "zigzagging" through an area in order to reach a destination. This can be at odds with the two (2) prior criteria (low AADT, speed, and minimal lanes) and result in not using the absolute lowest AADT, slowest speed roadway with minimal number of lanes, but this process is a balancing act to find an ideal connector for each terminal. At times, due to a complete lack of options for a proposed alignment, more significant roadways are proposed with higher speeds and AADT. These roadways will require either further examination for potential alignment or consideration for more substantial non-motorized facilities, such as protected bike lanes or shared use paths.

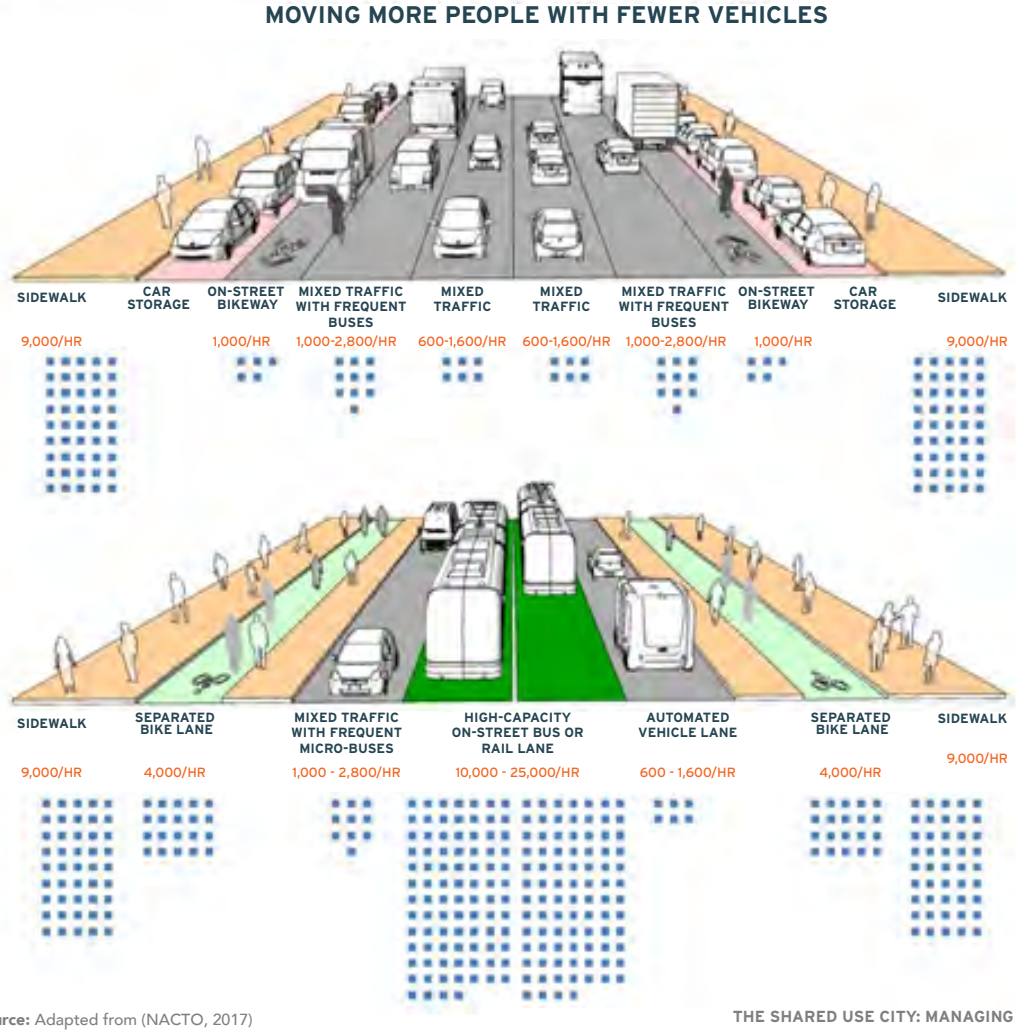

**Source:** Miami-Dade DTPW

Some SMART Plan terminal connectors are proposed in urbanized portions of Miami-Dade County. A common challenge in urbanized areas is finding the space to make feasible recommendations. Road dieting and repurposing on-street parking or travel lanes in urbanized areas are viable options. Transforming urban roadways into multimodal Complete Streets may enhance the amount of people that are able to effectively travel through metropolitan areas. Figure 100 (from the International Transport Forum's Shared Use City: Managing the Curb Report) illustrates higher roadway occupation and the ability to move more people per hour per mode of transportation when design shifts away from catering to the personal vehicle. Miami-Dade County's focus on enhancing transit through the SMART Plan and emerging technologies such as ride-hailing or autonomous vehicles may further reduce the demand for roadway design that is preferential to personal vehicles.

**FIGURE 100** STREET OCCUPATION AND UTILIZATION




**Source:** Data from (Shin, 2008)




**Source:** Adapted from (NACTO, 2017)

Table 21 lists the proposed LTS 1 and 2 alignments per terminal along with limits. Full feasibility studies and traffic divergent studies will be required for these facilities.

**TABLE 21** SMART PLAN TERMINAL LTS 1 AND 2 CONNECTOR PROPOSED ALIGNMENTS

| FACILITY TYPE | DIRECTION | FACILITY | LIMITS FROM | LIMITS TO |
|---|---|---|---|---|
| 192nd Street/Aventura | East/West | NE 199th Street & Country Club Drive | US 1/Biscayne Boulevard | NE 192nd Street |
| 192nd Street/Aventura | East/West | NE 18th Avenue & NE 199th Street | SR 860/NE Miami Gardens Drive | W Dixie Highway |
| 192nd Street/Aventura | North/South | W. Dixie Highway | SR 826/NE 153rd Street | NE 214th Terrace |
| Civic Center | East/West | NW 20th Street | NW 27th Avenue | US 1/Biscayne Boulevard |
| Civic Center | North/South | SW 12th Avenue | SW 13th Street | NW 46th Street |
| Dolphin | East/West | NW 12th Street | NW 123rd Avenue | NW 87th Avenue |
| Dolphin | East/West | NW 6th Street | NW 137th Avenue | NW 122nd Avenue |
| Dolphin | North/South | NW 122nd Avenue & SW 14th Street | SW 117th Avenue | NW 12th Street |
| Dolphin | North/South | NW 112th Avenue & NW 114th Avenue | NW 12th Street | SR 934/NW 74th Street |
| FIU | North/South | SW 117th Avenue | SR 976/SW 40th Street | US 41/SW 8th Street & SW 117th Avenue |
| FIU | East/West | US 41/SW 8th Street & SW 117th Avenue | SR 976/SW 40th Street | SW 82nd Avenue |
| Golden Glades | East/West | SR 9 Extension Frontage Road | NW 27th Avenue | SR 860/NE Miami Gardens Drive |
| Golden Glades | North/South | US 441/NW 7th Avenue | NW 156th Street | NW 7th Avenue |
| Golden Glades | North/South | NW 167th Street & NW 9th Avenue | SR 9/NW 7th Avenue | NW 170 Terrace |
| Homestead | East/West | W Davis Parkway | SW 187th Avenue | South Transitway |
| Homestead | East/West | SW 344th Street | South Transitway | SW 152nd Avenue |
| Homestead | North/South | South Transitway | SR 997/S Krome Avenue | SW 312th Street |
| I-75/Miami Gardens Station | North/South | NW 87th Avenue | NW 154th Street | NW 197th Terrace |
| I-75/Miami Gardens | East/West | NW 170th Street | NW 97th Avenue | NW 78th Avenue |
| Mall of the Americas | East/West | Fontainebleau Boulevard & Park Boulevard | NW 97th Avenue | NW 79th Avenue |
| Mall of the Americas | East/West | NW 7th Street | NW 82nd Avenue | NW 72nd Avenue |
| Mall of the Americas | North/South | SW 82nd Avenue | SW 24th Street | NW 25th Street |
| Miami Beach | East/West | Venetian Causeway & 17th Street | N Miami Avenue | Convention Center Drive |

| FACILITY TYPE | DIRECTION | FACILITY | LIMITS FROM | LIMITS TO |
|---|---|---|---|---|
| Miami Beach | North/South | Convention Center Drive & Prairie Dr | 17th Street | W 47th Street |
| Miami Beach | North/South | Meridian Avenue & 1st Street | Miami Beach Beachwalk | 17th Street |
| Miami Central | East/West | SR 968/SW 1st Street | SW 24th Avenue | US 1/S Biscayne Boulevard |
| Miami Central | North/South | Underline/M-Path & Miami Avenue | SE 32nd Road | NE 17th Street |
| Miami Executive Airport | East/West | SW 128th Street | SR 825/SW 137th Avenue | SW 122nd Avenue |
| Miami Executive Airport | East/West | SW 136th Street | SW 157th Avenue | SW 137th Avenue |
| Miami Executive Airport | North/South | SR 825/ SW 137th Avenue | SW 160th Street | SW 96th Street |
| MIC | East/West | NW South River Drive & Delaware Parkway | NW 27th Avenue | Hook Square/ SE 1st Avenue |
| MIC | East/West | SW 37th Avenue | Fonseca Avenue | NW South River Drive |
| Midtown | East/West | US 27/NW 36th Street | NW 19th Avenue | US 1/Biscayne Boulevard |
| Midtown | North/South | NE 2nd Avenue | NE 36th Street | NE 71st Street |
| Midtown | North/South | N Miami Avenue | NE 14th Street | US 27/NW 36th Street |
| North Dadeland | East/West | Snapper Creek Canal | SW 81st Avenue | US 1/S Dixie Highway |
| North Dadeland | East/West | SW 80th Street | Old Cutler Road | US 1/S Dixie Highway |
| North Dadeland | North/South | Underline/M-Path/ South Transitway | SW 110th Street | S Alhambra Circle |
| Palmetto Station | East/West | SR 934/NW 74th Street | NW 114th Avenue | Palm Avenue |
| Palmetto Station | | SR 969/NW 72nd Avenue/W 16th Avenue | NW 47th Street | NW 53rd Terrace |
| Tamiami | East/West | SW 26th Street | SW 157th Avenue | SW 129th Avenue |
| Tamiami | North/South | SW 144th Avenue | SW 42nd Street | US 41/SW 8th Street |
| Unity Station | North/South | NW 27th Avenue | NW 183rd Street | NW 215th Street |
| Unity Station | East/West | Snake Creek Trail | NW 47th Avenue | NW 2nd Avenue |
| West Kendall | East/West | SW 96th Street & SW 96th Street | SW 172nd Avenue | SR 825/SW 137th Avenue |
| West Kendall | North/South | SW 157th Avenue | Black Creek Canal No. C-1W | SW 61st Street |

## SMART TRAILS

The SMART Trails Master Plan was developed as a multifaceted SMART Plan implementation effort and identifies potential first/last mile (FLM) connections between the SMART Plan corridors and the regional non-motorized trail system. Additionally, this report presents an evaluation process for assessing FLM non-motorized connections to existing and future SMART Plan stations.

## BICYCLE PARKING AT TRANSIT FACILITIES

To increase the number of cyclists, Multiple Class I (long-term) and II (short-term) bicycle parking areas should be provided at key locations within transit facilities. Miami-Dade County requires bicycle parking facilities at nearly all commercial retail, restaurants, and parks. Some land uses have specific requirements for bicycle parking facilities based on the number of spaces provided for users. Bicycle parking areas are split between Class I and Class II amenities. See Appendix B for more detailed implementation guidelines for Class I and II bicycle parking.

### CLASS I PARKING

Long-term Class I bicycle parking is used for major office and transit areas for commuters using bicycle transportation. Class I parking ranges from bike lockers to climate controlled locked/ guarded storage areas.

**FIGURE 101** CLASS I PARKING - BIKE LOCKER

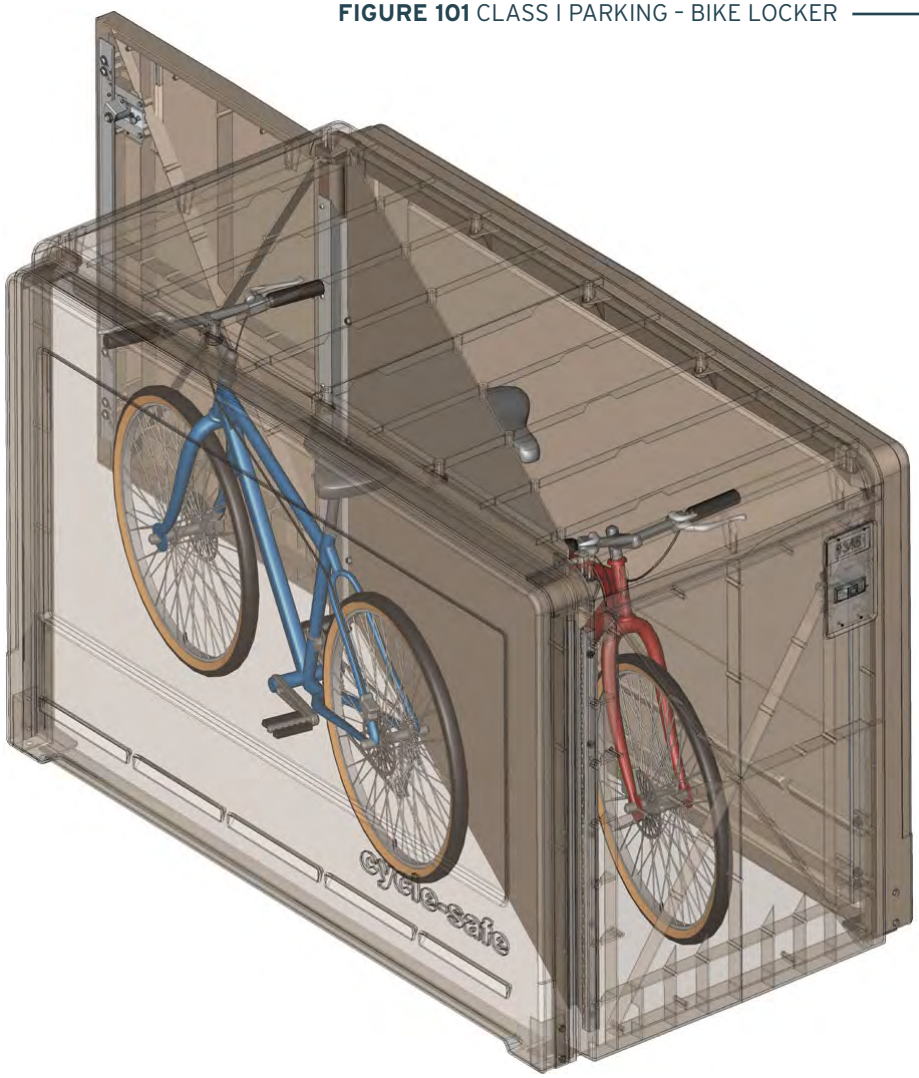


**FIGURE 102** EXAMPLES OF CLASS I PARKING

**Source:** nacto.org - BeyondDC


**Source:** nacto.org — Natalie Stiffler

**Source:** soundtransit.org

## CLASS II PARKING

Class II parking is used for shorter durations. These parking areas should be located within close proximity to a building's entrances. Typically, inverted-U racks are the common short-term bicycle parking structure.

**FIGURE 103** CLASS II PARKING - INVERTED-U RACK

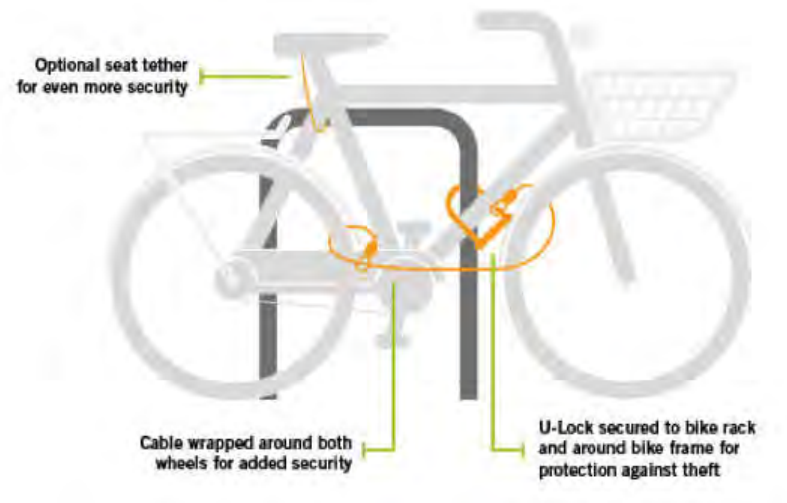



**FIGURE 104** EXAMPLES OF CLASS II PARKING

**Source:** nacto.org - Teresa Boyle

**Source:** nacto.org - Teresa Boyle

**Source:** cyclesafe.com

## LEVEL OF TRAFFIC STRESS RECOMMENDATIONS

Evaluating a non-motorized network through the eyes of "Stress" is to build a base for that network to grow from and to ultimately increase its accessibility. Increasing Miami-Dade's non-motorized accessibility increases its ability to accommodate independent travel for all users, regardless of ability/disability, age, or height/stature (all-ages-and-abilities, barrier-free, inclusive, and 8-80 age-friendly). Children as young as eight (8) years old or less can walk and bike independently from their parents or other adults. It means that older adults as old as eighty (80) years old or more can get around comfortably without having to drive or ride in a personal automobile. Transportation facilities need to accommodate for the varying ages of users and there is no "one size fits all" solution. All abilities means that people of all statures, including those using mobility devices or people with limited vision or hearing, are not faced with barriers or impediments to travel.

It is this report's recommendation that all future non-motorized facilities be evaluated for level of stress either by the Mineta Transportation Institute 2017 methodology or by a similar agreed upon set of criteria. All non-motorized facilities should be designed to meet a level of traffic stress rating of 1 or 2 to encourage use by the "Interested but Concerned" user group and therefore maximize the potential ridership market for that facility.

# TRANSPORTATION EQUITY

## TYPES OF EQUITY

Equity, (also known as justice and fairness), refers to the distribution of impacts (benefits, disbenefits and costs) and whether that distribution is considered fair and appropriate. Horizontal equity refers to the impartial treatment of individuals in similar circumstances and vertical equity refers to the distribution of benefits between different groups or types of individuals.

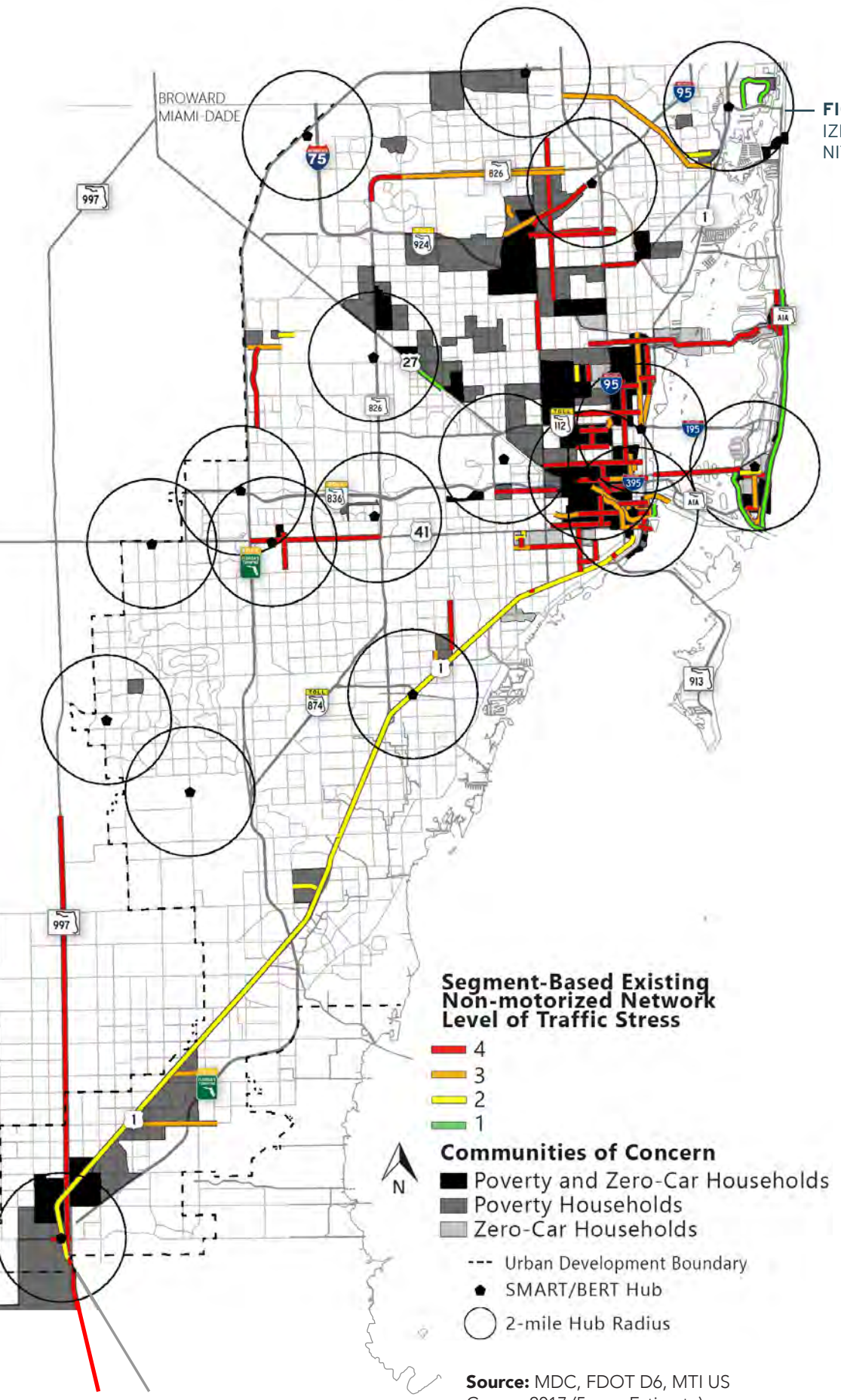
There are three (3) major categories of transportation equity:

**01** Horizontal

**02** Income and Social Class Vertical Equity

**03** Mobility Need and Ability/Disability Vertical Equity

These three (3) types of equity often overlap or conflict. For example, horizontal equity requires that users bear the costs of transportation facilities and services, but vertical equity requires subsidies for disadvantaged people; hence, transportation planning and engineering often involve making tradeoffs between different equity objectives. To learn more about the three (3) types of transportation equities, see Appendix C.




**Source:** MDC, FDOT D6, MTI US Census 2017 (5 year Estimate)

**FIGURE 105** EXISTING NON-MOTORIZED STRESS LEVELS IN COMMUNITIES OF CONCERN

## EXISTING NON-MOTORIZED STRESS LEVELS IN COMMUNITIES OF CONCERN

Social equity intends to implement a transportation system that can provide multiple options in how people access jobs, schools, grocery/drug stores, health care services, faith entities, social gatherings, and other destinations.

Figure 105 highlights the existing non-motorized facilities' level of traffic stress within communities of concern that people rely on for part of daily errands. Other than a few facilities that provide a LTS of 1 or 2, these facilities are often a LTS 4, the most stressful. Low-income working families rely on alternate modes of transportation not only to get to work, but also to access the many activities that are required to maintain employment, such as traveling to childcare providers, health care facilities, and job training sites.

According to the study, Impacts of Neighborhoods on Intergenerational Mobility, households with greater access to transportation options can significantly impact social mobility and ability to escape poverty "more so than many other typically-assumed factors such as crime, test scores of elementary students or total number two-parent families in a community."[18] Late-evening, early-morning, and weekend transit service is usually needed by many low-income workers along with further options to fulfill the first/last mile connection for daily trips.

As suggested by the stress levels of non-motorized facilities in Figure 105, traffic speeds in many low-income neighborhoods are generally high, making streets dangerous for pedestrians and bicyclists. Inadequate or substandard infrastructure that cannot safely accommodate a wide range of users in low-income communities can prevent people from using active transportation (walking, biking and public transit). It can also make walking and bicycling unsafe for those who do rely on these modes to get around, leading to higher incidences of collisions involving pedestrians and cyclists.

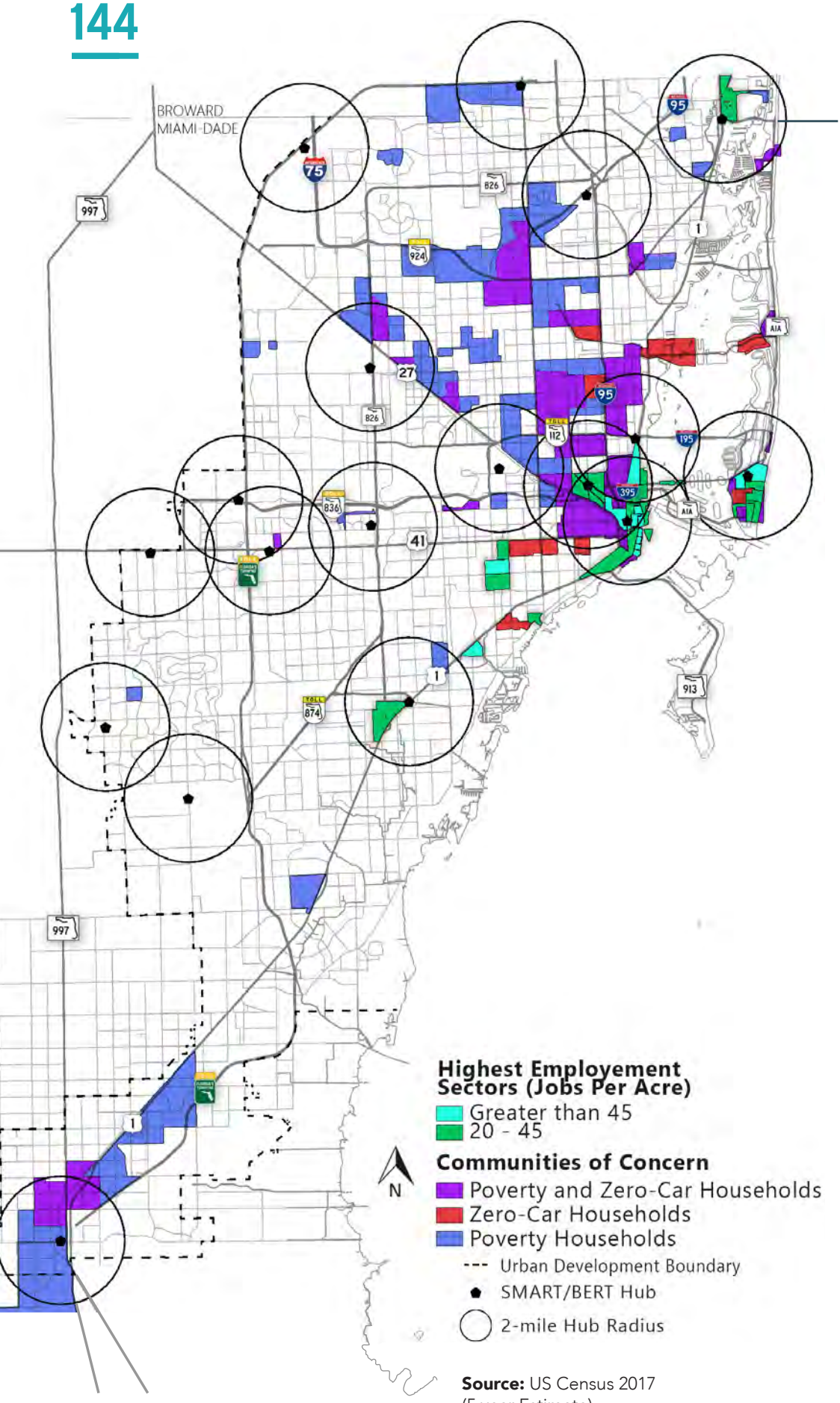
Transportation planning and engineering involve trade-offs between economic efficiency objectives (reducing traffic and parking congestion, facility cost savings, transit system productivity and efficiency, crash and pollution emission reductions, etc.), which tend to favor transportation infrastructure and services on major urban corridors favoring the auto mode that supports more affluent commuters, and social (vertical) equity objectives (basic mobility for non-drivers), which tend to favor transportation infrastructure and services used by physically, economically, and socially disadvantaged groups. Similarly, transportation planning and engineering decisions frequently involve trade-offs between maximizing utilization (so that transportation infrastructure and services are concentrated on the highest travel demand corridors, including times and locations when and where travel demand is high) and wide spatial coverage/geographic (horizontal) equity (so that transportation infrastructure and services are dispersed throughout an area, including times and locations when and where travel demand is low).

Social (vertical) equity in transportation involves the provision of basic or enhanced mobility, accessibility (including reliability and affordability with infrastructure and services that are geared to those individuals with the greatest or most severe needs), and connectivity for non- or minimal-drivers and in particular for individuals that may be physically, economically, and/or socially disadvantaged and reside within communities of concern (see page 64 for more details). Social equity typically considers the following groups:

- Low-Income Households
- Minority Households
- Immigrant or Limited English Proficiency (LEP)
- Zero-Car/Vehicle Households
- Indigenous/Native
- Elderly/Seniors
- Children/Youth/Students
- Disabled Veterans

Individuals from these categories may have limited mobility options, particularly complex travel needs (e.g., trip-chaining and transit transfers), and/or have excessively difficult commutes with regards to time or risks to personal safety to reach jobs, education, or other opportunities.

[18] "Impacts of Neighborhoods on Intergenerational Mobility" Raj Chetty, Nathaniel Hendren, National Bureau of Economic Research, 2015




**Source:** US Census 2017 (5 year Estimate)

**FIGURE 106** SPATIAL MISMATCH

## SPATIAL MISMATCH

As seen in Figure 106, high job concentration sectors and low-income and/or limited mobility households have become increasingly decentralized and dispersed, and multimodal services at fewer Central Business District (CBD) oriented corridors are no longer adequate to support the transit needs for these households. Dispersed housing, employment, and other destinations important for daily activities strain the limited resources of transit agencies, requiring frequent stops at a multitude of dispersed destinations (wide spatial coverage) and preventing them from providing rapid or high-level transit services to all destinations at all times. This, in turn, reduces accessibility for low-income workers to jobs as well as accessibility for low-income families to services and other activities. This spatial mismatch of home and job locations for low-income families is a major challenge of many locations and transit systems. Spatial mismatch is a mismatch between where low-income households reside and where the jobs are located. In essence, spatial mismatch is an imbalance between demand of low-income populations to work and the supply of available jobs. For public transportation there is both a spatial (distance or how far or how long) and temporal (time or is public transportation service available when necessary) component to the mismatch that should be considered.

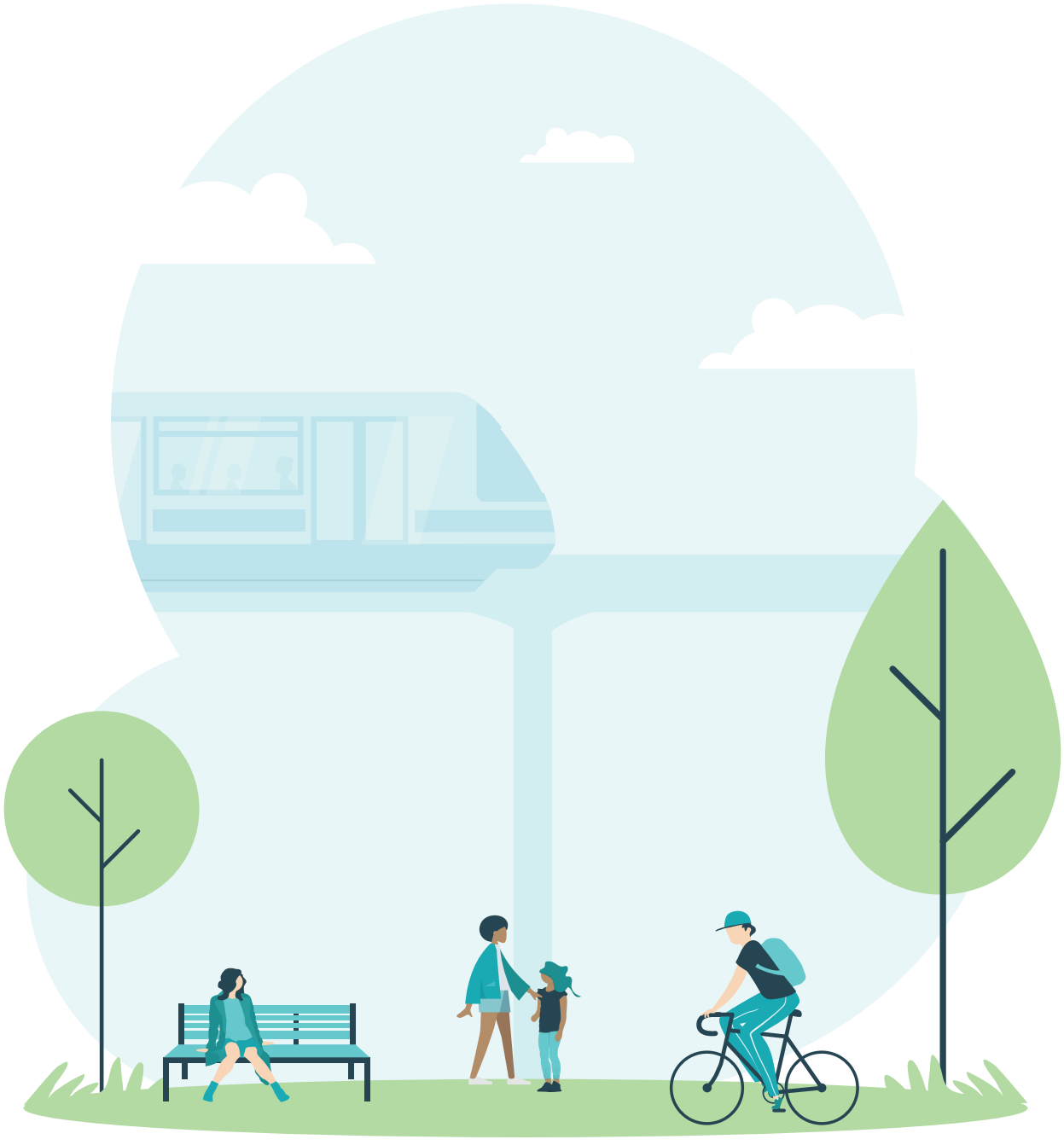
## TRANSPORTATION EQUITY RECOMMENDATIONS

To keep recommendations specific to non-motorized travel within Miami-Dade County, an initial step that can be taken for transportation equity is the examination of existing non-motorized facilities located in communities of concern, which are areas with high concentration of low-income households, zero-car households, or both. Factors to be accessed for these facilities are as follows:

- **A COMPLETE LEVEL OF STRESS ANALYSIS** – Perform a LTS analysis for segments and intersections for each non-motorized facility to determine how current designs are operating in existing traffic conditions. If facilities are rated as high stress (LTS 3 – 4), then these facilities are not capable of providing service to all users of all abilities and require redesign. This, paired with the level of traffic stress recommendation of all future non-motorized facilities to be built for a 1 or 2 LTS (see page 106), will ensure existing and future projects in the area will be all-inclusive and safe.
- **ALL USERS OF ALL ABILITIES, AT ALL TIMES** – Assess the conditions of these facilities at night to determine lighting adequacy. Without proper lighting, individuals who use non-motorized travel as a necessity during early morning and evening hours, increase their exposure to crashes and personal danger.
- **PUBLIC OUTREACH** – Workshops with these specific communities to determine specific transportation needs. Discuss needed connections to local areas such as commercial centers, schools, etc.
- **HIGH CRASH LOCATIONS** – Examine the conditions at high crash locations to determine the predominant causes.

# SHOWCASE PROJECTS

Showcase projects are endeavors that represent ambitious efforts to enhance or expand the ability to use non-motorized travel. These projects range from existing facilities to projects currently undergoing preliminary engineering to projects in a conceptual state illustrating best practices.



# LUDLAM TRAIL

The proposed Ludlam Trail provides a unique opportunity to develop a 6.2-mile multi-use trail through the heart of Miami-Dade County within the former Florida East Coast Railway right-of-way. The trail will provide a safe, dedicated, and direct route for cyclists and pedestrians to schools, parks, work, and shopping. The trail can connect more than 34,000 people within a ½-mile, walkable service area to five (5) greenways, five (5) schools, four (4) parks and two (2) transit terminals.

# RICKENBRAKER CAUSEWAY

The proposed Rickenbacker Causeway Plan Z has seen multiple proposed design solutions. The design aims to transform the bicycle and pedestrian facilities traveling to and from Key Biscayne on SR 913/Rickenbacker Causeway into a world-renowned experience.

# UNDERLINE

The Underline will connect communities, improve pedestrian and bicyclist safety, create over 120 acres of open space with restored natural habitats, encourage a healthy lifestyle, provide an easily accessible place to exercise, create a mobility corridor that integrates transit, car, biking and walking, provide a 10-mile canvas for artistic expression, attract development along US-1, and generate significant economic impact.

# NEEDS ASSESSMENT

The non-motorized transportation needs assessment process began by reviewing the needs identified in the 2040 Bicycle and Pedestrian Plan. Projects that have been built within the last five (5) years were removed from the needs assessment list. Projects that have moved up to the Transportation Improvement Program (TIP) were noted and placed within the TIP project grouping. In addition, prior area-wide plans and studies conducted by the TPO and other governmental bodies were reviewed to identify non-motorized transportation needs. Feedback from BPAC members and Miami-Dade County residents regarding potential projects and methods of evaluation were obtained and implemented during the development of this plan. These projects were analyzed to identify projects that would fit best in the proposed non-motorized system that represent additional needs. A critical review was conducted to identify projects that connect to transit, fill in gaps, and provide non-motorized access to key destinations.

Evaluation criteria and weights were used to conduct a needs assessment analysis for proposed non-motorized facilities. It was determined that these projects represent an unmet need. The highest priority projects are represented in the Cost Feasible Plan. The unmet needs for which revenue is not anticipated to be available can be reviewed in the unfunded section.

**552**

TOTAL NUMBER OF PROJECTS ASSESSED

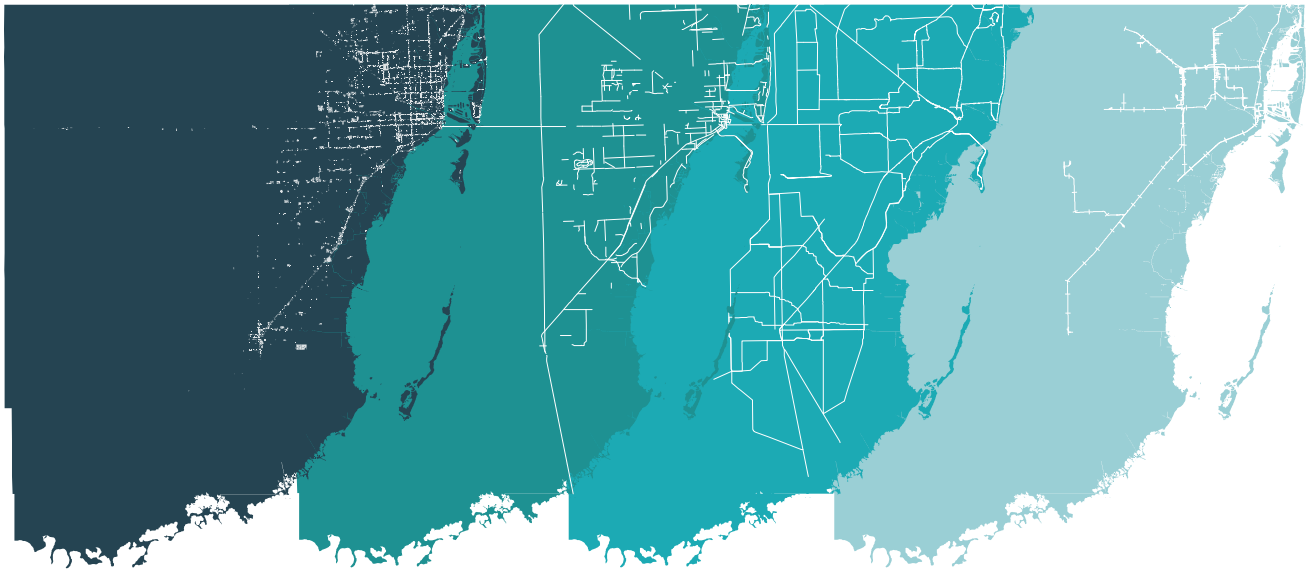
**189**

TOTAL MILES OF OFF-ROAD PROJECTS ASSESSED

**317**

TOTAL MILES OF ON-ROAD PROJECTS ASSESSED

**58** TOTAL MILES OF PEDESTRIAN FACILITIES ASSESSED



## DATA GATHERING AND GEO-SPATIAL ANALYSIS RECOMMENDATION

Physical information for proposed and existing facilities obtained from the various Miami-Dade County sources was used to create a comprehensive needs assessment. It is recommended a standardization of ArcGIS data and its attributes be developed and applied from this point forward. Creating a "core" set of data for existing networks and proposed facilities will assist in the accuracy and efficiency of future analyses.

Table 22 outlines a recommended set of required or "core" attributes and descriptions for GIS shapefiles that act as a bank of existing or proposed non-motorized projects created for TPO studies. It is recommended that this set of data also be applied for studies performed by FDOT, municipalities, and county-wide agencies for the sake of data working interchangeably with other sources with ease. Lastly as a note, it is highly recommended all shapefiles' Projected Coordinate System be set to NAD_1983_2011_StatePlane_Florida_East_FIPS_0901_Ft_US.

**TABLE 22** REQUIRED NON-MOTORIZED GIS ATTRIBUTE DATA

| | LENGTH (MILES) | TYPE | WIDTH (FT.) | BUFFER TYPE | BUFFER WIDTH (FT.) | ON SITE PARKING | ON SITE PARKING WIDTH (FT.) |
|---|---|---|---|---|---|---|---|
| **GIS Attribute Type** | Float | Text | Float | Text | Float | Text | Float |
| **Description** | Length of Facility Segment in Miles. | This column is to identify the specific facility type. Be specific about the facility, for example, avoid labeling a segment "Bike Lane" when it is actually a "Buffered Bike Lane." | Facility Type Width. This relates specifically to the space in which users travel in. ie the bike lane in a buffered bike lane facility. | Specify the buffer type for off-road and dedicated on-road facilities. This will only be applicable for sidepaths, buffered, and protected bike lanes | Buffer width. | Indicate if a non-motorized facilities' segments run parallel with on-street parking with Yes, No, or Not Applicable. Mark a facility as Yes, even if on-street parking does not parallel for a the entire non-motorized segment. | Width of on street parking. This data is important to know to make assessments, such as Level of Traffic Stress, if adequate space between cyclists and parked vehicles has been provided. |
| **Example 1** | 0.7 | Bike Lane | 5 | Not Applicable | 0 | Yes | 7.5 |
| **Example 2** | 3.5 | Buffered Bike Lane | 5 | Pavement Marking | 2 | No | 0 |
| **Example 3** | 6.2 | Shared Use Path | 12. | Not Applicable | 0 | Not Applicable | 0 |
| **Example 4** | 2.8 | Sidepath | 8 | Landscaping | 2 | Not Applicable | 0 |
| **Example 5** | 1.0 | Protected Bike Lane | 5 | Delineators | 2 | Yes | 9 |
| **Example 6** | 2.1 | Protected Bike Lane | 5 | Concrete Raise Separator | 2 | No | 0 |
| **Example 7** | 0.9 | Bike Boulevard | 0 | Not Applicable | 0 | Yes | 7.5 |


# EVALUATION CRITERIA

The following 12 data points represent the project bank evaluation criteria. These are added to the intention of aligning the future of cyclists and pedestrians with the future of premium transit via the SMART plan. This evaluation process is geared towards connecting the most people, to the most places, that need mobility options, on a day-to-day basis. The maximum number of points a project can score is 69. Developed in consultation with the TPO's BPAC, these criteria incentivize non-motorized facility use which creates transit connections with population centers, provides new facilities to address social injustice, safety, connectivity/ filling gaps, and increased accessibility to desired destinations.

**TABLE 23** FINAL EVALUATION CRITERIA

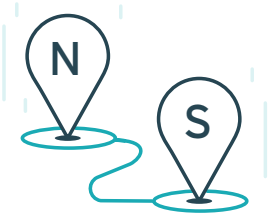
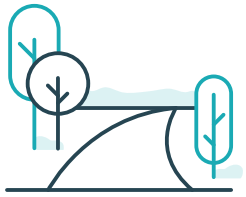
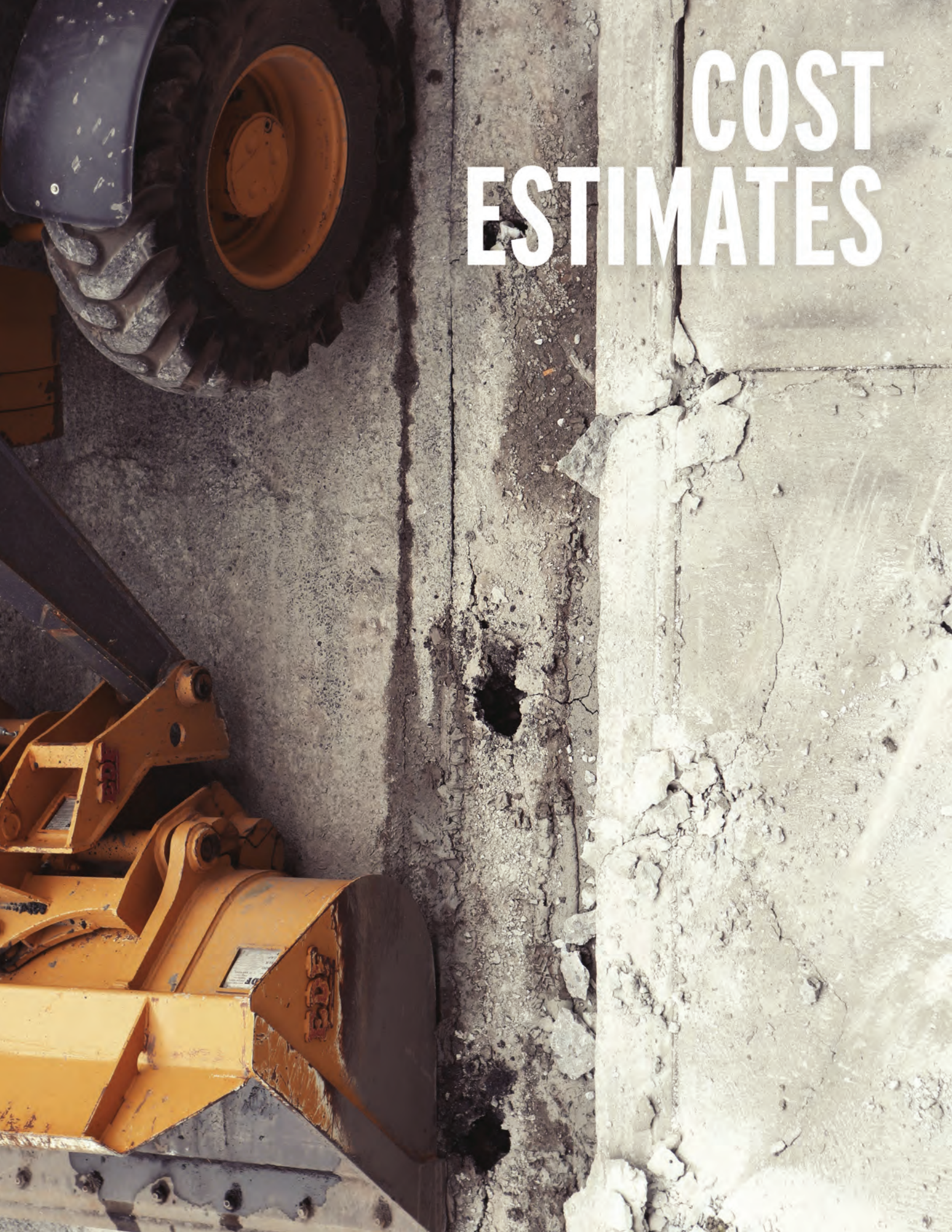
| SPATIAL ANALYSIS | DESCRIPTION | WEIGHTED POINTS |
|---|---|---|
|  | **SMART Plan Terminal Connections**<br>Points are awarded to projects making direct connections to SMART plan terminals to encourage non-motorized opportunities to these transit hubs in the county. 8 points are awarded for a direct connection, and 4 points are awarded for projects within the ½-mile vicinity of a terminal hub. | 8 OR 4 |
|  | **North/South SMART Plan Corridor Connections**<br>Based on Miami Dade County's TPO resolution 47-17, to take necessary steps to move forward with the North and South corridors of the SMART plan, points are awarded towards projects proposed within a ½-mile of either corridor. Eight (8) points are awarded for a non-motorized direct connection to a corridor station and 4 points for projects within the ½-mile vicinity. | 8 OR 4 |
|  | **Metrorail Connections**<br>It is important to connect to existing Metrorail stations to further support Miami Dade's existing premium transit facilities servicing high population and job sectors. A non-motorized facility is awarded 8 points for a direct Metrorail Station connection or 4 points if within a ½-mile radius to encourage further non-motorized development near the station. | 8 OR 4 |
|  | **High Ridership Bus Stop Connections**<br>If a non-motorized facility is not connecting to a dedicated form of transit, it still may provide a direct connection to a DTPW bus stop with +50 average daily boarding and alighting ridership. | 4 |

**TABLE 23** FINAL EVALUATION CRITERIA CONTINUED

| SPATIAL ANALYSIS | DESCRIPTION | WEIGHTED POINTS |
|---|---|---|
|  | **High Potential Demand Areas**<br>Points are awarded if the project is proposed in a high potential demand area (based on FDOT's Context Classification System). The included factors act as good indicators of Population and Job centers, as well as land use conditions typically associated with urbanized areas. The awarded points are based on the eight (8) sections of the FDOT Context Classification System. Zones comparable to C1 - Nature receive 1 point, and zones comparable to C6 - Urban Core receive 8 points. | 1 - 8 |
|  | **Transportation Equity**<br>Miami-Dade County Communities of Concern are identified in the Federal PEAs as part of a Miami-Dade County study conducted in 2017 for the Miami-Dade TPO. These areas are identified as census tracts that are at least one standard deviation above the average percentage and/or average density of Families below the Poverty Level or Households with Zero Vehicles. Non-motorized facilities are awarded 8 points if located in a community with a high concentration of Zero-Car Households that also operate under the poverty level. Non-motorized facilities awarded 4 points are proposed in communities that have a distinct concentration of either Zero-Car Households or Low-Income Households. | 8 OR 4 |
|  | **High Density Trip Generator Areas**<br>Examining Trip Generator Density (locations per square mile) helps identify where the greatest concentration of trip destinations is located. Incentivizing non-motorized facilities that connect to these areas moves the County closer to addressing first mile/last mile connections. Eight (8) categories were determined by density of trip generators. | 1 - 8 |
|  | **Future Commercial Land Use Connections**<br>Non-motorized projects that will serve future commercial land uses are awarded 1 point. | 1 |

| SPATIAL ANALYSIS | DESCRIPTION | WEIGHTED POINTS |
|---|---|---|
|  | **Existing and Proposed Non-Motorized Connections**<br>Two (2) points are awarded to a project if it connects to an existing non-motorized facility. An additional two (2) points are allocated if the project's alignment will create a future connection to another proposed facility. | 2 OR 4 |
|  | **Off-Road Facilities (Greenways, Shared Use Paths, Sidepaths)**<br>Four (4) points are awarded to each project proposing low-stress off-road non-motorized facilities. Based off the Mineta Transportation Institute's Low-Stress Bicycling and Network Connectivity report, off-road facilities have the highest probability of attracting users of all ages and abilities. | 4 |
|  | **Safety – Bicycle Crashes**<br>Proposed projects located within high bicycle crash zones (crashes per mile) are awarded points to help address dangerous locations with improved facilities. Points are awarded based on four crash categories: Low, Medium, High, and Severe. | 1 - 4 |
|  | **Safety – Pedestrian Crashes**<br>Proposed projects located within high pedestrian crash zones (crashes per mile) are awarded points to help address dangerous locations with improved facilities. Points are awarded based on four crash categories: Low, Medium, High, and Severe. | 1 - 4 |



# COST ESTIMATES

Preliminary costs-per-mile (CPM) were estimated for the following six (6) typical bicycle facilities and two (2) sidewalk expansion scenarios that represent most project types found within the 2045 Bicycle and Pedestrian Master Plan project bank. Bicycle and Pedestrian lighting CPM are listed in Table 25 with the corresponding facility type. The 552 projects assessed in this report come from numerous sources, which vary in date of publication and methods/assumptions used for cost estimates. To ensure a standardization of anticipated financial requirements for all proposed projects, the following cost estimates were applied. The deviation of a few projects from this standardized cost estimate outlined within this report is due to direct feedback and up-to-date, detailed costs received from interagency coordination during the development of this report. Each typical facility's dimensions and assumed costs are based on recommendations from FHWA, in combination with FDOT's Area 13 Miami-Dade historical average construction costs. The CPM was calculated based on total cost (rounded to the nearest hundredth) and the proposed project's estimated length.

Itemized costs were developed based on the type of work expected to construct each proposed typical section (i.e. restriping, milling/resurfacing, and/or roadway reconstruction). Of the total cost, 50% was added for:

- Mobilization (10%)
- MOT (10%)
- Drainage (10%)
- Signalization (10%)
- Design (10%)

**TABLE 24** NON-MOTORIZED FACILITY COST PER MILE

| FACILITY | COST PER MILE ESTIMATE (2019 $) |
|---|---|
| Shared Use Path | $336,900 |
| Sidepath | $324,800 |
| Separated/Protected Bike Lane | $841,500 |
| Buffered Bike Lane | $758,700 |
| Conventional Bike Lane | $696,600 |
| Bike Boulevard/Mixed Traffic | $27,800 |
| Sidewalk Expansion (2 ft.) | $137,800 |
| Sidewalk Expansion (3 ft.) | $206,700 |

**TABLE 25** NON-MOTORIZED LIGHTING PER FACILITY

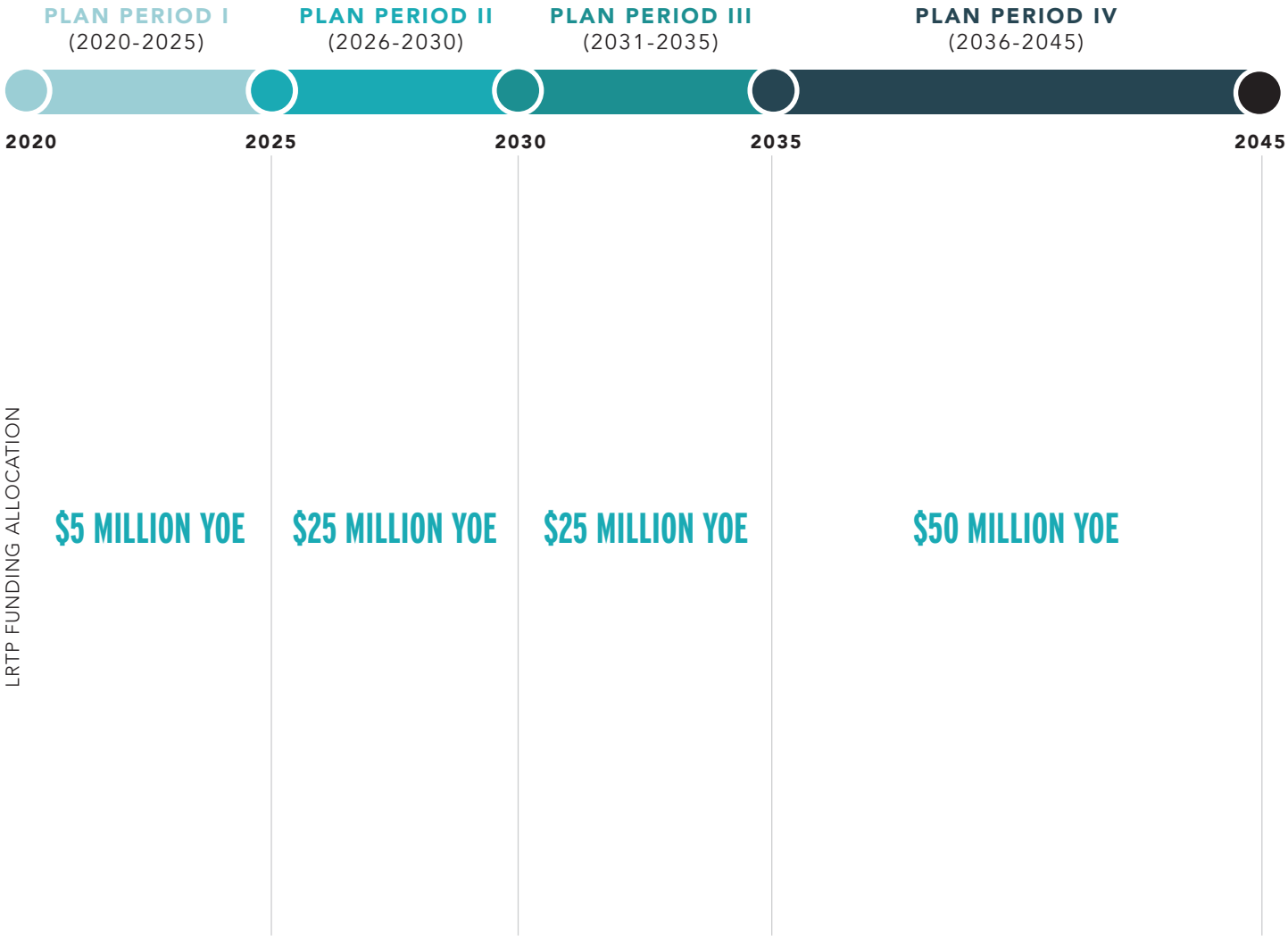
| FACILITY | COST ESTIMATE (2019 $) |
|---|---|
| Shared Use Path and Sidepath | $1,109,500 |
| Protected, Buffered, and Conventional Bike Lane | $2,050,800 |
| Bike Boulevard/Mixed Traffic | $1,960,200 |


# FUNDING

## LONG RANGE TRANSPORTATION PLAN FUNDING

The Miami Dade 2045 LRTP has specific sources of funding which can be utilized for projects within its planning process. The LRTP includes $105 million in set aside funding for bicycle and pedestrian projects for the next 21 years (2025 – 2045). This total originates from the Transportation Alternatives (TALU) funding, and from the TMA/SU funds. These funds have been organized within four (4) planning periods. The Transportation Improvement Program (TIP) funds projects from 2020–2024. The LRTP Planning Periods and available funding by Plan Period are depicted in Table 26.

**TABLE 26** FUNDING AND INFLATION MULTIPLIERS PER PLAN PERIOD




*Amounts shown are in YOE (Year of Expenditure) dollars*

## ALTERNATIVE SOURCES OF FUNDING

There are funding sources outside the LRTP that can be utilized at the time of construction for each non-motorized project. These additional funding sources for to-be-built projects include, but are not limited to, the FTA Metropolitan & Statewide and Non-Metropolitan Transportation Planning Program and other FTA grant programs. Table 27 identifies several funding sources that could be used for the implementation of bicycle and pedestrian projects within the County.

**TABLE 27** POTENTIAL BICYCLE AND PEDESTRIAN FUNDING OPPORTUNITIES

| SOURCE | ELIGIBLE ACTIVITIES APPLICABLE TO THIS PLAN |
|---|---|
| **Safe Routes to School (SRTS)** | The US DOT's Safe Routes to School (SRTS) program offers funding for the development of bicycle and pedestrian plans, bicycle lanes on road, separated bicycle lanes, bicycle parking, crosswalks, curb cuts and ramps, lighting, paved shoulders, signed bicycle and pedestrian routes, traffic calming, bridges/overcrossing for pedestrians and/or bicyclists. |
| **Metropolitan & Statewide Non-Metropolitan Transportation Planning** | FTA's Metropolitan & Statewide Non-Metropolitan Transportation Planning Program provides funding for planning for the incorporation of bicycle facilities in a state or metropolitan transportation network. |
| **Urbanized Area Formula Program** | FTA's Urbanized Areas Formula Program funds the incorporation of bicycle routes to transit, bike racks, shelters, and equipment for public transportation vehicles. |
| **TOD Planning Pilot Grants** | FTA offers funding for projects that facilitate multimodal connectivity and accessibility or increase access to transit hubs for pedestrian and bicycle traffic. |
| **Better Utilizing Investments to Leverage Development (BUILD)** | The US DOT's Better Utilizing Investments to Leverage Development (BUILD) program offers funding to intermodal transportation initiatives, including the incorporation of bicycle and pedestrian infrastructure along roadways. This program is meant to replace the TIGER grant program that was previously funded by US DOT. |
| **Federal Lands Access Program (FLAP)** | The US DOT's Federal Lands Access Program (FLAP) was created to improve access to transportation facilities that provide connectivity to, are next to, or are located within Federal Lands. Eligible activities include: bicycle lanes on road/separated bicycle lanes, bicycle parking, bicycle racks on transit, bicycle share, bicycle storage or service centers, crosswalks, curb cuts and ramps, paved shoulders, bicycle and pedestrian plans, road diets, recreational trails, shared use paths, sidewalks, and traffic calming. |
| **Surface Transportation Block Grant (STBG) Program** | The US DOT's Surface Transportation Block Grant (STBG) Program provides funding for access enhancements to public transportation, bicycle and pedestrian plans, bicycle lanes on road, separated bicycle lanes, bicycle parking, bicycle share, bridges/overcrossing for pedestrians and/or bicyclists, crosswalks, curb cuts and ramps, lighting, paved shoulders, road diets, recreational trails, sidewalks, signs, signals, signal improvements, traffic calming, trailside, and trailhead facilities. |
| **Shared Use Non-Motorized (SUN) Trail Network** | FDOT's Shared Use Non-Motorized (SUN) Trial Network provides funding to shared use non-motorized paved paths that are included in the Florida Greenways and Environmental Protection's Office of Greenways and Trails. Trails System Plan developed by the Florida Department of Transportation. |
| **People 4 Bikes Community Grant Program** | People 4 Bikes is a nationwide organization that advocates for biking and walking. They offer the Community Grant Program which offers grant funding for local bicycle and pedestrian projects through a competitive grant application process. The program is funded by the organization's industry partners. |
| **Community Redevelopment Areas** | Community Redevelopment Areas (CRAs) are created to provide funding to revitalize areas that are designated as slum or blight. They operate on a budget generated by the increase in property taxes in these areas, known as Tax Increment Financing (TIF). These areas are overseen and administered by Miami-Dade County. Eligible projects include neighborhood parks, sidewalks, streetscapes, and roadway improvements. |

**Source:** Pedestrian and Bicycle Funding Opportunities, U.S. Department of Transportation Transit, Highway, and Safety Funds. U.S. Department of Transportation, Federal Highway Administration. Revised August 9, 2018; Source: Miami-Dade County.

# SUMMARY OF RECOMMENDATIONS

The following summarizes recommendations made throughout this report for future assessment and investment. These recommendations primarily come from the Non-motorized Best Practices section, but also other areas of the plan. These recommendations are strategies to further enhance the planning process for future non-motorized facilities. Pursuing these recommendations to enhance the future of non-motorized travel in Miami-Dade County may help increase the safety of all users, reduce crashes and/or fatalities, and reach the targets for non-motorized performance measures.

01

## ESTABLISH A NEW COMPLETE STREETS SET-ASIDE FOR FUTURE TRANSPORTATION PROJECTS

Complete Street design practices help the County's efforts to ensure its roadways, right-of-way (ROW), and transportation corridors are safe for all users, of all ages and abilities. This investment is aimed at facilitating the process of bringing the more Complete Streets projects to fruition by providing a source of "seed" money to be matched by other sources of funding. No two Complete Street projects look alike, therefore the first action item is the development of a criteria to determine the merits of each proposed Complete Streets project and therefore which project receives funding from this new set-side.

(SEE PAGES 80 - 83 FOR MORE DETAILS)

02

## DETERMINE THE CONTEXT CLASSIFICATION OF ALL COUNTY AND LOCAL ROADWAYS

This assessment is to generate a database to help transportation engineers and planners of all projects, including non-motorized, assess the surrounding conditions for each of the roadways they design for and to provide context sensitive solutions. Its recommended that the method used to determine the context class follows the established criteria from FDOT. Their Complete Street implementation plan and Florida Design Manual has been praised by SMART Growth America as one of the most progressive efforts to provide methods of travel for all users.

(SEE PAGES 84 - 99 FOR MORE DETAILS)

03

## MIAMI-DADE COUNTY AND MIAMI-DADE TPO'S TYPICAL ROADWAY SECTION AND ZONED RIGHT-OF-WAY UPDATE STUDY

This recommendation is centered around committing the County to a long-term strategy to address limited ROW and ensure when new ROW is acquired, it is used to provide mobility options for alternate modes of travel. This report is from 2007 and a reexamination of its methods of phasing out adjacent private land use to expand public ROW is required. The goal of updating this report or other reports like it, is to eventually pass a county-wide resolution that sets a long-term strategy in motion.

(SEE PAGES 100 - 105 FOR MORE DETAILS)

04

## ALL FUTURE ROADWAY CONSTRUCTION WHICH INCLUDES BICYCLE FACILITIES SHALL DESIGN FOR A LEVEL OF TRAFFIC STRESS RATING OF 2 OR LESS

Bicycle facilities can be built to provide optimal connections from high density population centers to highly desired destinations. A level of traffic stress analysis is recommended for proposed roadway projects and incorporate design features to achieve a LTS rating of 1 or 2. Ensuring all future bicycle facilities are low stress would place the County at the forefront of this nation for bike friendly environments and would play a significant role in achieving "Vision Zero" within the State.

(SEE PAGES 106 - 139 FOR MORE DETAILS)

05

## EXAMINE THE SAFETY AND STRESS OF EXISTING BICYCLE FACILITIES IN UNREPRESENTED AND IMPOVERISHED COMMUNITIES FOR REDESIGN

Existing non-motorized facilities within communities of concern are predominately level of traffic stress 4. This rating indicates these facilities possess sub-par design characteristics that make them unsafe and limit their success in providing an adequate alternative to a personal vehicle in areas that need transportation options the most. It is recommended to perform assessments of these facilities and public outreach to provide lists of improvements to existing facilities for the local residents and growth of their community.

(SEE PAGES 140 - 145 FOR MORE DETAILS)

06

## COUNTYWIDE STANDARDIZATION OF GEO-SPATIAL DATABASE OF NON-MOTORIZED NETWORK

It is recommended to create a mandatory standardization of GIS data for all future non-motorized studies. All studies by municipalities, the County, FDOT, MDX, the TPO and other transportation partners are to provide a GIS shapefile as part of a final deliverable that adheres to a determined set of "core" attributes to create a detailed list of either existing or proposed non-motorized facilities.

(SEE PAGES 156 - 157 FOR MORE DETAILS)

# COST FEASIBLE PLAN

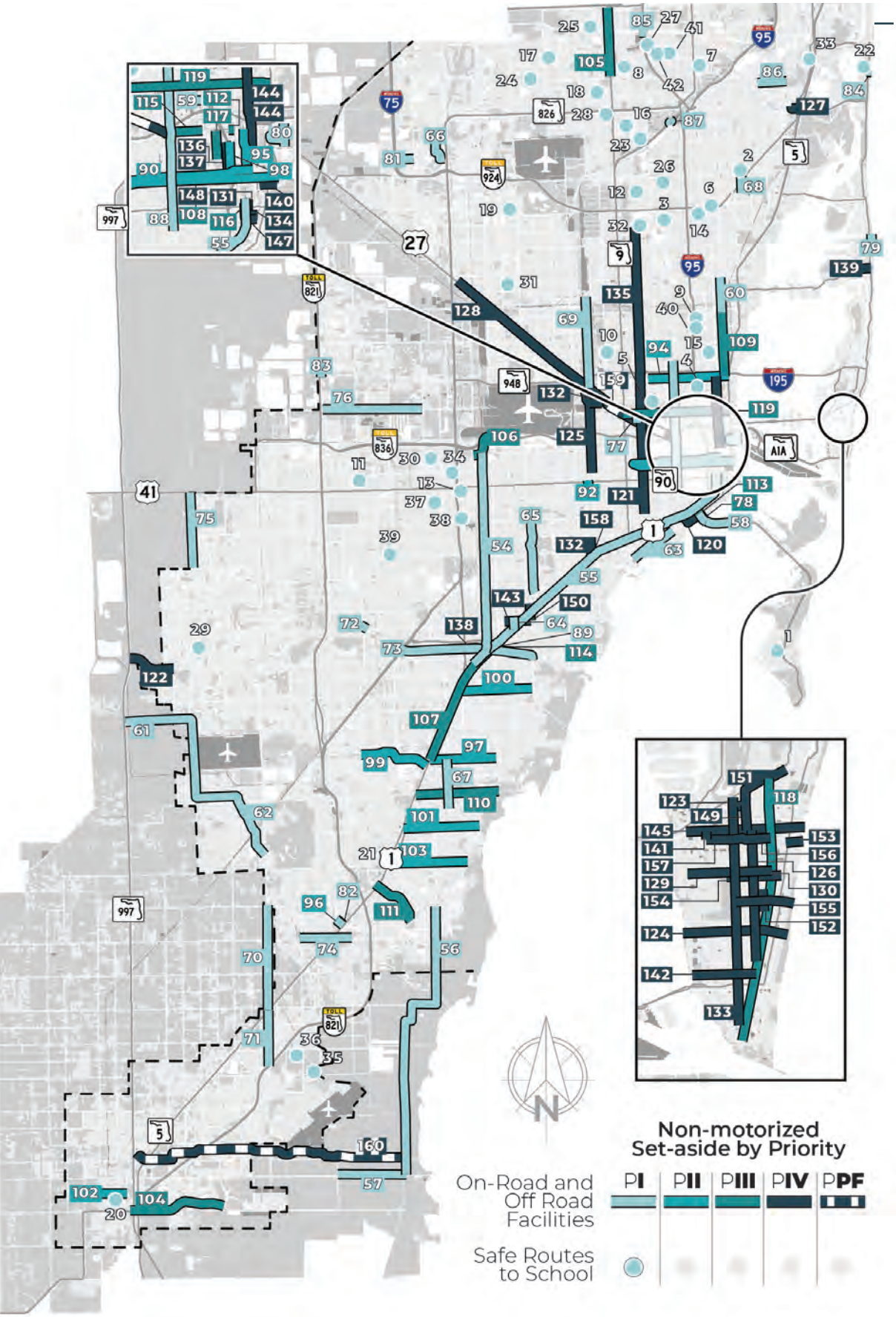



**FIGURE 107** 2045 BICYCLE AND PEDESTRIAN COST FEASIBLE PLAN MAP

The 2045 Bicycle and Pedestrian Master Plan is incorporated into the 2045 Long Range Transportation Plan (LRTP). Figure 107 and Table 28 represent the evaluation of the 552 projects stated in the needs assessment. Based on the available set-aside funding and prioritized projects, 73 projects have been programmed from 2025 to 2045. These projects range in facility type and location within the County. The final cost feasible list is comprised of 159 projects (86 TIP projects and 73 long range programmed projects) all with the aim to better serve the County's sustainable future.

**FIGURE 107** 2045 BICYCLE AND PEDESTRIAN COST FEASIBLE PLAN MAP

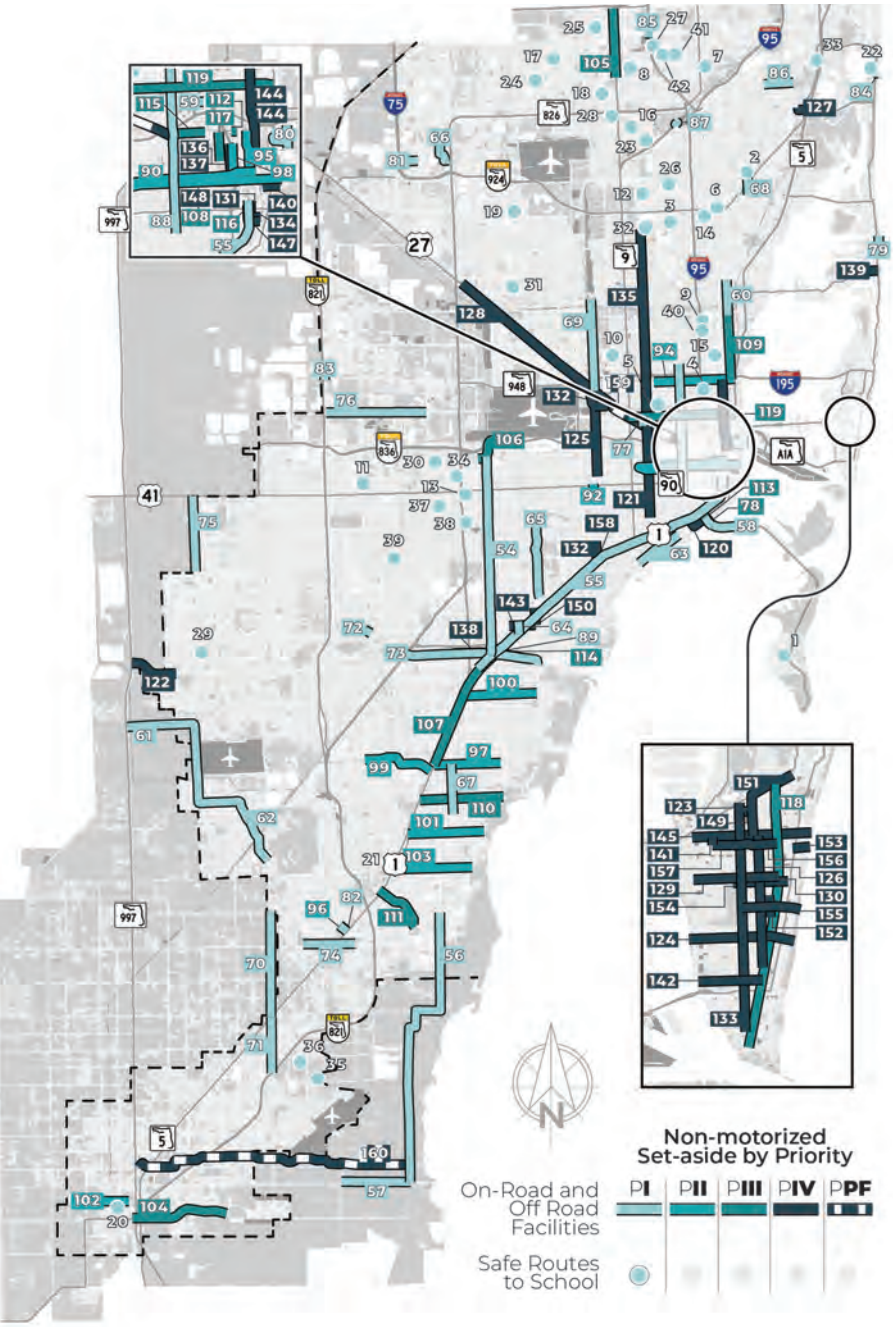



**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| MAP ID | FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION |
|---|---|---|---|---|
| **PLAN PERIOD I (CONTINUED)** | | | | |
| 1 | Key Biscayne K-8 | | | Safe Routes to School |
| 2 | Arch Creek Elementary School | | | Safe Routes to School |
| 3 | Lakeview Elementary School | | | Safe Routes to School |
| 4 | Jose De Diego Middle School | | | Safe Routes to School |
| 5 | Comstock Elementary School | | | Safe Routes to School |
| 6 | Gratigny Elementary School | | | Safe Routes to School |
| 7 | Hibiscus Elementary School | | | Safe Routes to School |
| 8 | Crestview Elementary School | | | Safe Routes to School |
| 9 | Edison Park K-8 Center | | | Safe Routes to School |
| 10 | Lorah Park Elementary School | | | Safe Routes to School |
| 11 | Sweetwater Elementary School | | | Safe Routes to School |
| 12 | Carrie P. Meek/ Westview K-8 Center | | | Safe Routes to School |
| 13 | Flagami Elementary School | | | Safe Routes to School |
| 14 | Hubert O. Sibley Elementary School | | | Safe Routes to School |
| 15 | Shadowlawn Elementary School | | | Safe Routes to School |
| 16 | Bunche Park Elementary School | | | Safe Routes to School |

Values in Thousands YOE $
YOE: Year of Expenditure

| | | | | PLAN PERIOD I: 2020-2025 | | PLAN PERIOD II: 2026-2030 | | PLAN PERIOD III: 2031-2035 | | PLAN PERIOD IV: 2036-2045 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL PROJECT COST (2018 $) | 2020-2024 TIP FUNDING | TOTAL 2045 PLAN (YOE $) | PRE-ENG | CON/DB | PRE-ENG | CON/DB | PE/PDE | CON/DB | PE/PDE | CON/DB |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |

**BOLD PHASE FUNDS ARE INCLUDED IN THE 2019/2024 MIAMI-DADE TIP**

** Safe Routes to School - funded as a program 2020/2024 Miami-Dade County TIP

**FIGURE 107** 2045 BICYCLE AND PEDESTRIAN COST FEASIBLE PLAN MAP

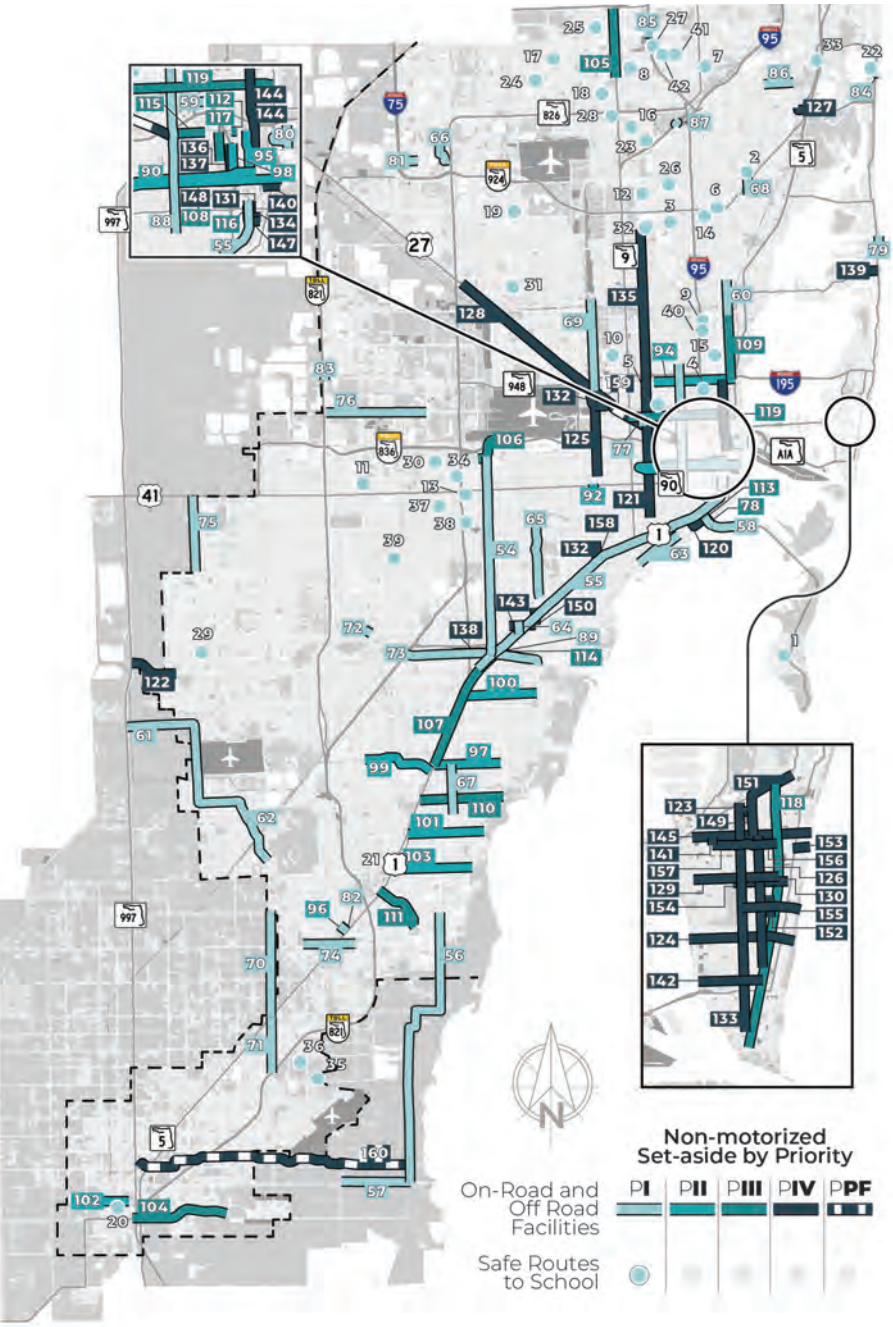



**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| MAP ID | FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION |
|---|---|---|---|---|
| **PLAN PERIOD I (CONTINUED)** | | | | |
| **17** | Miami Gardens Elementary School | | | Safe Routes to School |
| **18** | Myrtle Grove Elementary School | | | Safe Routes to School |
| **19** | Twin Lakes Elementary School | | | Safe Routes to School |
| **20** | Florida City Elementary School | | | Safe Routes to School |
| **21** | Robert Russa Moton Elementary School | | | Safe Routes to School |
| **22** | Norman S. Edelcup Sunny Isles Beach K-8 | | | Safe Routes to School |
| **23** | Rainbow Park Elementary School | | | Safe Routes to School |
| **24** | Lake Stevens Elementary School | | | Safe Routes to School |
| **25** | North County K-8 | | | Safe Routes to School |
| **26** | Benjamin Franklin K-8 | | | Safe Routes to School |
| **27** | Norwood Elementary School | | | Safe Routes to School |
| **28** | Golden Glades Elementary School | | | Safe Routes to School |
| **29** | Dante B. Fascell Elementary School | | | Safe Routes to School |
| **30** | Charles R. Hadley Elementary School | | | Safe Routes to School |
| **31** | Mae M. Walters Elementary School | | | Safe Routes to School |
| **32** | Henry E.S. Reeves Elementary School | | | Safe Routes to School |

Values in Thousands YOE $
YOE: Year of Expenditure

| | | | | PLAN PERIOD I: 2020-2025 | | PLAN PERIOD II: 2026-2030 | | PLAN PERIOD III: 2031-2035 | | PLAN PERIOD IV: 2036-2045 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL PROJECT COST (2018 $) | 2020-2024 TIP FUNDING | TOTAL 2045 PLAN (YOE $) | PRE-ENG | CON/DB | PRE-ENG | CON/DB | PE/PDE | CON/DB | PE/PDE | CON/DB |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |

**BOLD PHASE FUNDS ARE INCLUDED IN THE 2019/2024 MIAMI-DADE TIP**

** Safe Routes to School - funded as a program 2020/2024 Miami-Dade County TIP

**FIGURE 107** 2045 BICYCLE AND PEDESTRIAN COST FEASIBLE PLAN MAP

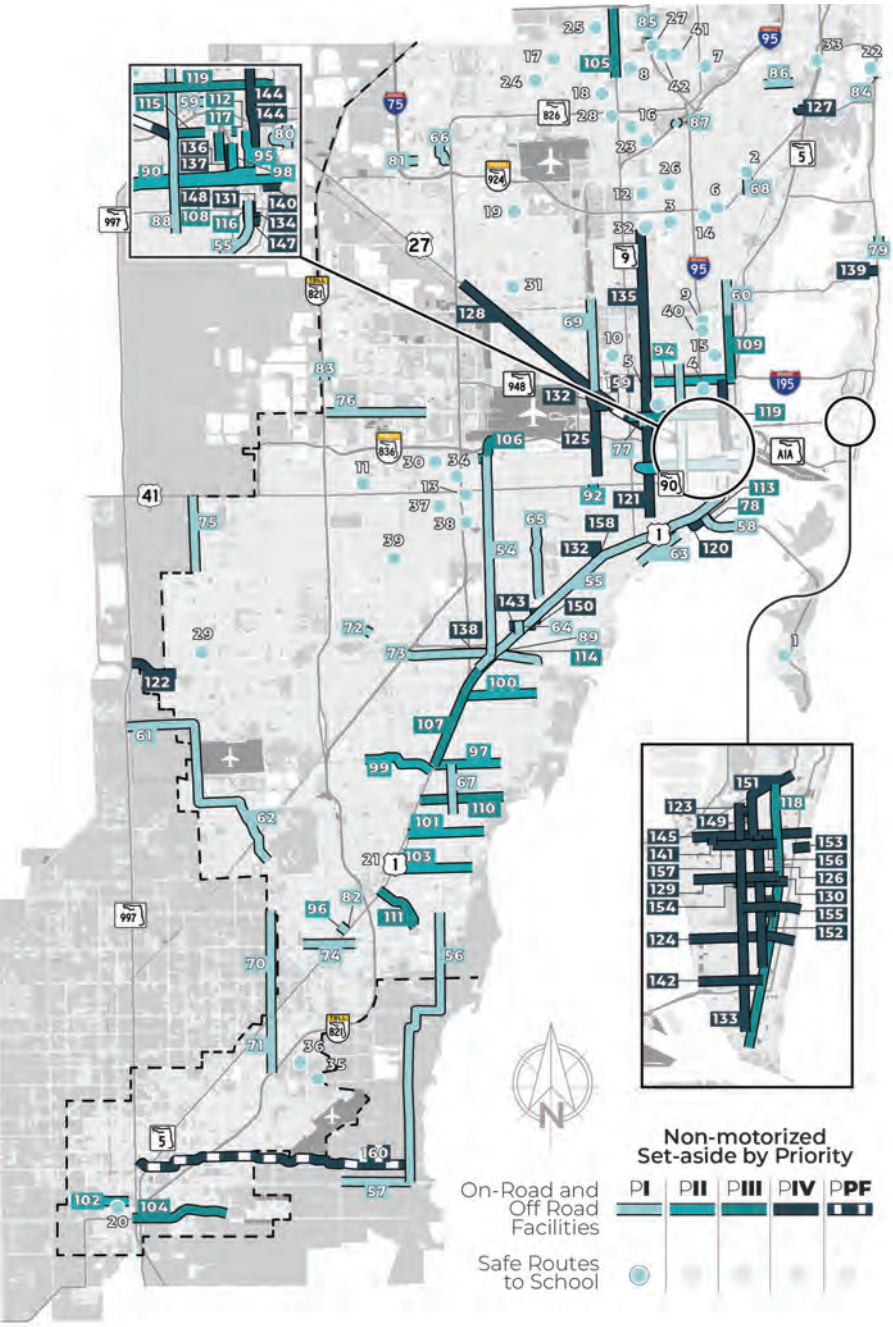



**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| MAP ID | FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION |
|---|---|---|---|---|
| **PLAN PERIOD I (CONTINUED)** | | | | |
| 33 | Ojus Elementary | | | Safe Routes to School |
| 34 | Seminole Elementary | | | Safe Routes to School |
| 35 | Mandarin Lakes K-8 | | | Safe Routes to School |
| 36 | Airbase K-8 Center | | | Safe Routes to School |
| 37 | Everglades K-8 | | | Safe Routes to School |
| 38 | Miami Middle School | | | Safe Routes to School |
| 39 | Olympia Heights Elementary | | | Safe Routes to School |
| 40 | Miami Edison High School | | | Safe Routes to School |
| 41 | Norland Elementary School | | | Safe Routes to School |
| 42 | Norland Middle School | | | Safe Routes to School |
| 43 | District-wide Traffic Operations - Safety Studies | | | Areawide Improvements |
| 44 | District-wide Traffic Operations - Studies | | | Areawide Improvements |
| 45 | District-wide Community Safety | | | Areawide Improvements |
| 46 | District-wide (ADA) Compliance | | | Areawide Improvements |
| 47 | District-wide (ADA) Pushbutton Construction | | | Areawide Improvements |
| 48 | Village of Pinecrest Citywide Bicycling Improvements | | | Areawide Improvements |

Values in Thousands YOE $
YOE: Year of Expenditure

| | | | | PLAN PERIOD I: 2020-2025 | | PLAN PERIOD II: 2026-2030 | | PLAN PERIOD III: 2031-2035 | | PLAN PERIOD IV: 2036-2045 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL PROJECT COST (2018 $) | 2020-2024 TIP FUNDING | TOTAL 2045 PLAN (YOE $) | PRE-ENG | CON/DB | PRE-ENG | CON/DB | PE/PDE | CON/DB | PE/PDE | CON/DB |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | | ** | | | | | | | | | |
| | $1,135.000 | ** | $0.825 | | | **$825.000** | | | | | |
| | $453.000 | ** | $0.100 | | | **$100.000** | | | | | |
| | $849.000 | ** | $0.150 | | | **$150.000** | | | | | |
| | $5,223.000 | ** | $1.250 | | | **$1,250.000** | | | | | |
| | $878.000 | ** | $0.878 | | | **$878.000** | | | | | |
| | $1,305.000 | ** | $1.305 | | **$50.000** | **$1,255.000** | | | | | |

**BOLD PHASE FUNDS ARE INCLUDED IN THE 2019/2024 MIAMI-DADE TIP**

** Safe Routes to School - funded as a program 2020/2024 Miami-Dade County TIP

**FIGURE 107** 2045 BICYCLE AND PEDESTRIAN COST FEASIBLE PLAN MAP

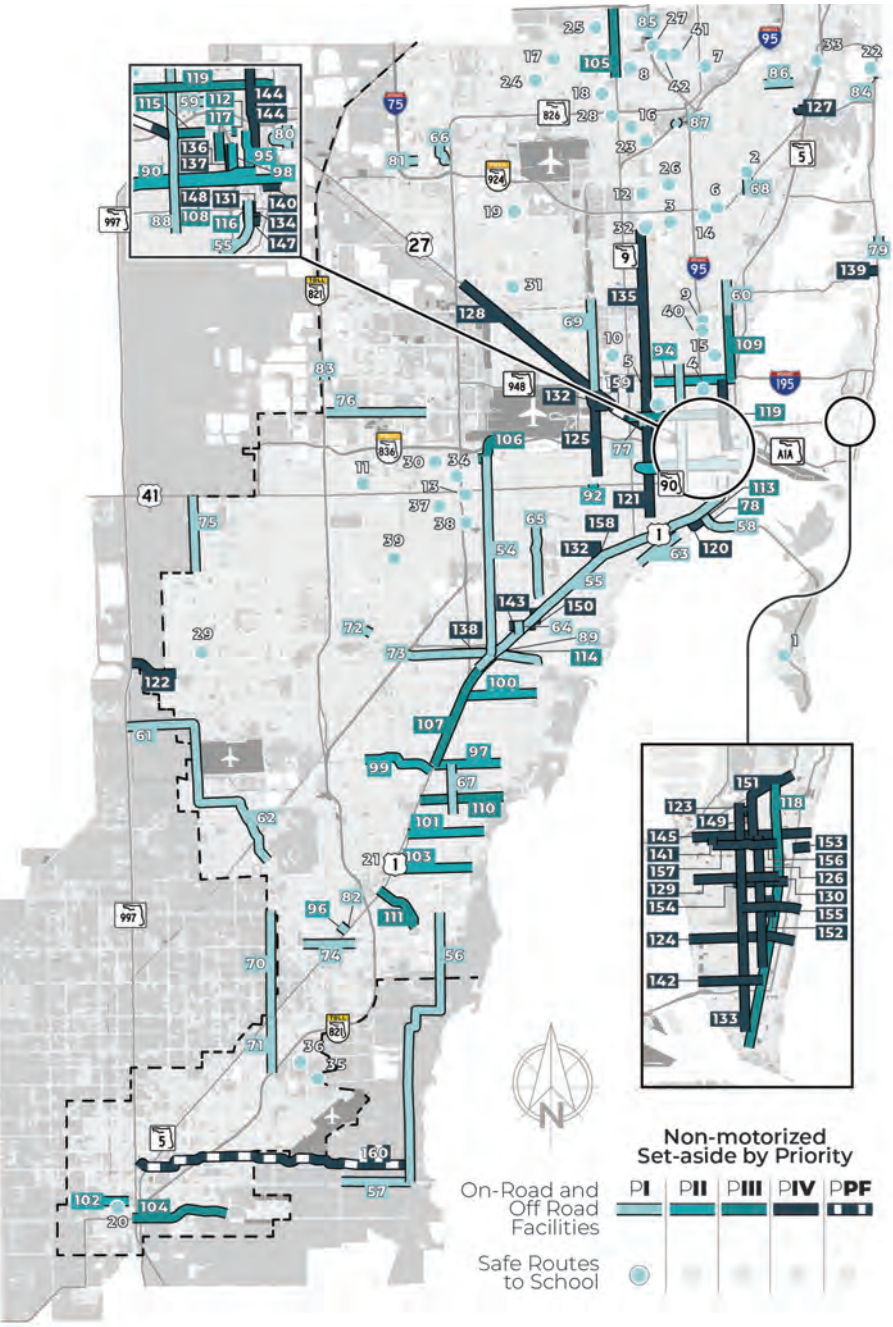



**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| MAP ID | FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION |
|---|---|---|---|---|
| **PLAN PERIOD I (CONTINUED)** | | | | |
| 49 | City of Miami Shores - Multi-modal Mobility Improvements | | | Areawide Improvements |
| 50 | Town of Cutler Bay Bike/ Ped Facility improvements | | | Areawide Improvements |
| 51 | City of Coral Gables - Last Mile Transit Stop Improvements | | | Areawide Improvements |
| 52 | Safety St Light Retrofits | | | Areawide Improvements |
| 53 | Village Of Virginia Gardens – Community Bicycle & Pedestrian Improvements | | | Areawide Improvements |
| 54 | Ludlam Bikepath | Dadeland North | NW 7 St (Luis Sabines Way) | Trail Improvements |
| 55 | The Underline | Dadeland South | Miami River | Trail Improvements |
| 56 | Biscayne Trail Segment "D" | SW 328 St/ SW 117 Ave | Homestead Bayfront Park | Trail Improvements |
| 57 | Biscayne Trail Segment "D" Phase II | SW 117 Ave | SW 137 St | Trail Improvements |
| 58 | Hobie Island Beach Park | Island Western Limit | Island Eastern Limit | Dedicated On-Road Bicycle Facility |
| 59 | NW 17 St | NW 7 Ave (SR 7/ US 441) | NW 7 Ct | Off-Road Bicycle and Pedestrian Facility Improvement |
| 60 | NE 2 Ave | NE 69 St | West Little River Canal | Dedicated On-Road Bicycle Facility |
| 61 | Black Creek Trail Segment "B" Phase I | Krome Path | SW 160 St | Trail Improvements |
| 62 | Black Creek Trail Segment "B" Phase II | Krome Path | SW 160 St | Trail Improvements |

Values in Thousands YOE $
YOE: Year of Expenditure

| | | | PLAN PERIOD I: 2020-2025 | | PLAN PERIOD II: 2026-2030 | | PLAN PERIOD III: 2031-2035 | | PLAN PERIOD IV: 2036-2045 | |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL PROJECT COST (2018 $) | 2020-2024 TIP FUNDING | TOTAL 2045 PLAN (YOE $) | PRE-ENG | CON/DB | PRE-ENG | CON/DB | PE/PDE | CON/DB | PE/PDE | CON/DB |
| $2.103 | $2.103 | | **$267.000** | **$1,836.000** | | | | | | |
| $524.000 | $0.524 | | **$100.000** | **$424.000** | | | | | | |
| $2,003.000 | $2.003 | | **$164.000** | **$1,839.000** | | | | | | |
| $5,918.000 | $0.806 | | | **$806.000** | | | | | | |
| $1,403.000 | $1.403 | | **$40.000** | **$1,363.000** | | | | | | |
| $94,000.000 | $8.713 | | **$713.000** | **$8,000.000** | | | | | | |
| $120,450.000 | $80.115 | | **$17,205.000** | **$62,910.000** | | | | | | |
| $1,850.000 | $1.850 | | | **$1,850.000** | | | | | | |
| $1,675.000 | $1.675 | | **$150.000** | **$1,525.000** | | | | | | |
| $2,010.000 | $2,010.000 | | | **$2,010.000** | | | | | | |
| $203.000 | $0.203 | | | **$203.000** | | | | | | |
| $7,526.000 | $6.985 | | | **$6,985.000** | | | | | | |
| $1,247.000 | $0.816 | | | **$816.000** | | | | | | |
| $1,005.000 | $1,005.000 | | | **$1,005.000** | | | | | | |

**BOLD PHASE FUNDS ARE INCLUDED IN THE 2019/2024 MIAMI-DADE TIP**

** Safe Routes to School - funded as a program 2020/2024 Miami-Dade County TIP

**FIGURE 107** 2045 BICYCLE AND PEDESTRIAN COST FEASIBLE PLAN MAP

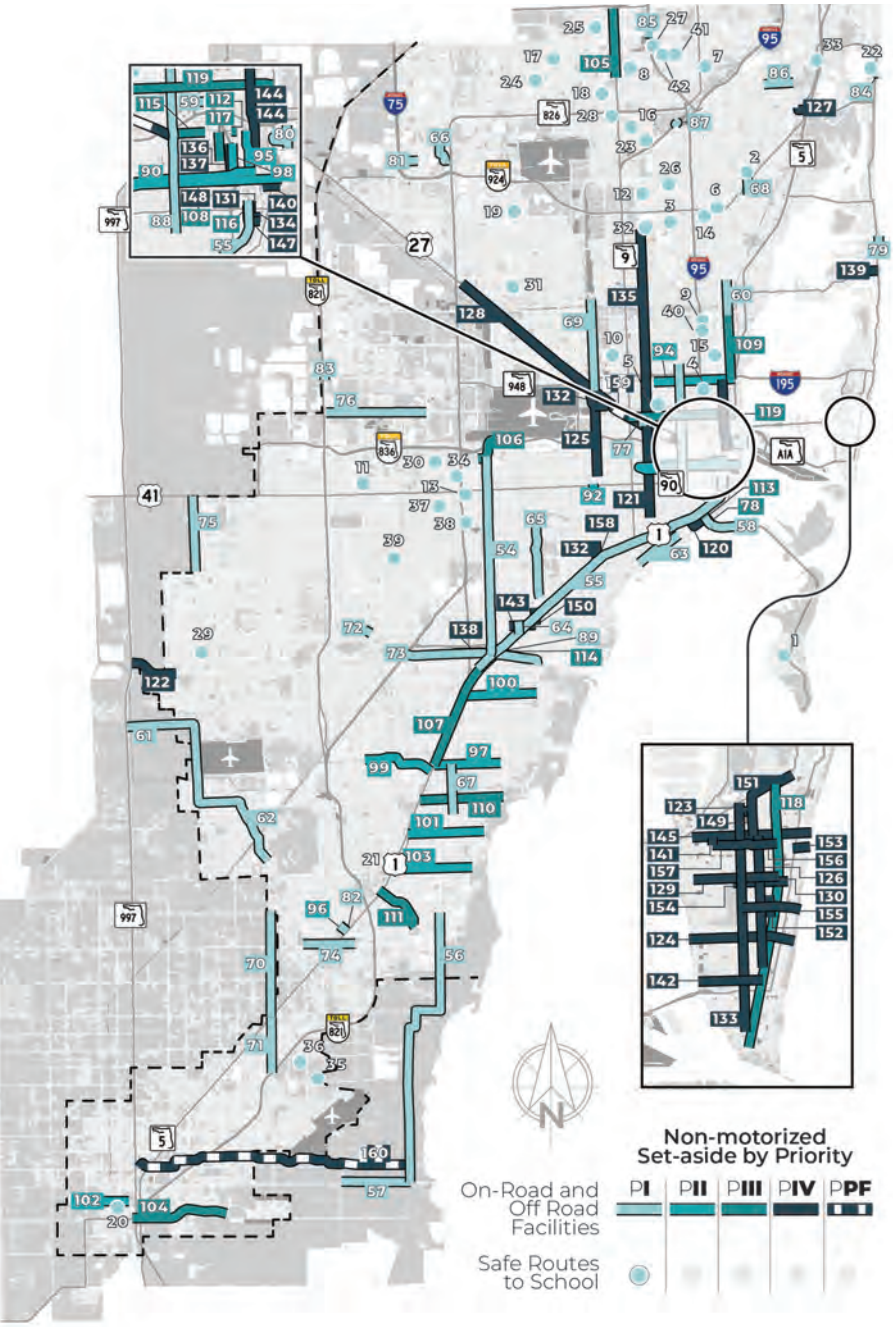



**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| MAP ID | FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION |
|---|---|---|---|---|
| **PLAN PERIOD I (CONTINUED)** | | | | |
| **64** | SW 62 Ave | SW 76 St | SW 70 St | Off-Road Bicycle and Pedestrian Facility Improvement |
| **65** | Alhambra Circle | San Armo Dr | Coral Way (SR 972) | Dedicated On-Road Bicycle Facility Improvement |
| **66** | Town of Miami Lakes - NW 79 CT Transportation Improv. | NW 154 St/ Miami Lakes Dr | NW 77 Ct | Off-Road Bicycle and Pedestrian Facility Improvement |
| **67** | SW 82 Ave | SW 160 St | SW 136 St (Howard Dr) | Dedicated On-Road Bicycle Facility Improvement |
| **68** | City of North Miami - NE 8 Ave Green Trail | NE 125 St | NE 135 St | Dedicated On-Road Bicycle Facility Improvement |
| **69** | NW 37 Ave | North River Dr | NW 79 St | Dedicated On-Road Bicycle Facility Improvement |
| **70** | SW 137 Ave | US 1(South Dixie Hwy/ SR 5) | SW 184 St (Eureka Dr) | Dedicated On-Road Bicycle Facility Improvement |
| **71** | SW 137 Ave | SR 821 (HEFT) | US 1 (South Dixie Hwy/ SR 5) | Dedicated On-Road Bicycle Facility Improvement |
| **72** | Snapper Creek Trail Segment "A" SW 107 Ave Gap | Westwood Lakes Canal (K) | East Side of SR 985 (SW 107 Ave) | Trail Improvements |
| **73** | Snapper Creek Trail Segment "B" Phase 1 | SR 874 (Don Shula Expy) | SW 56 Ave | Trail Improvements |
| **74** | SW 216 St (Hainlin Mill Dr) | SW 127 Ave | SW 112 Ave | Dedicated On-Road Bicycle Facility Improvement |
| **75** | SW 157 Ave | SW 42 St | SW 8 St (Tamiami Trail/SR 90/ US 41) | Dedicated On-Road Bicycle Facility Improvement |
| **76** | NW 25 St | NW 117 Ave | NW 87 Ave | Off-Road Bicycle and Pedestrian Facility Improvement |

Values in Thousands YOE $
YOE: Year of Expenditure

| | | | PLAN PERIOD I: 2020-2025 | | PLAN PERIOD II: 2026-2030 | | PLAN PERIOD III: 2031-2035 | | PLAN PERIOD IV: 2036-2045 | |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL PROJECT COST (2018 $) | 2020-2024 TIP FUNDING | TOTAL 2045 PLAN (YOE $) | PRE-ENG | CON/DB | PRE-ENG | CON/DB | PE/PDE | CON/DB | PE/PDE | CON/DB |
| $604.000 | $0.604 | | **$100.000** | **$504.000** | | | | | | |
| $783.000 | $0.783 | | **$90.000** | **$693.000** | | | | | | |
| $1,899.000 | $1.899 | | **$205.000** | **$1,694.000** | | | | | | |
| $2,866.000 | $2.866 | | **$303.000** | **$2,563.000** | | | | | | |
| $1,409.000 | $1.399 | | **$100.000** | **$1,299.000** | | | | | | |
| $18,198.000 | $16.582 | | **$350.000** | **$16,232.000** | | | | | | |
| $20,565.000 | $16.509 | | **$505.000** | **$16,004.000** | | | | | | |
| $8,610.000 | $5.837 | | **$88.000** | **$5,749.000** | | | | | | |
| $1,121.000 | $1.121 | | **$182.000** | **$939.000** | | | | | | |
| $638.000 | $0.638 | | **$121.000** | **$517.000** | | | | | | |
| $12,222.000 | $10.376 | | **$115.000** | **$10,261.000** | | | | | | |
| $17,393.000 | $4,215.000 | | | **$4,215.000** | | | | | | |
| $51,750.000 | $31,600.000 | | | **$31,600.000** | | | | | | |

**BOLD PHASE FUNDS ARE INCLUDED IN THE 2019/2024 MIAMI-DADE TIP**

** Safe Routes to School - funded as a program 2020/2024 Miami-Dade County TIP

**FIGURE 107** 2045 BICYCLE AND PEDESTRIAN COST FEASIBLE PLAN MAP

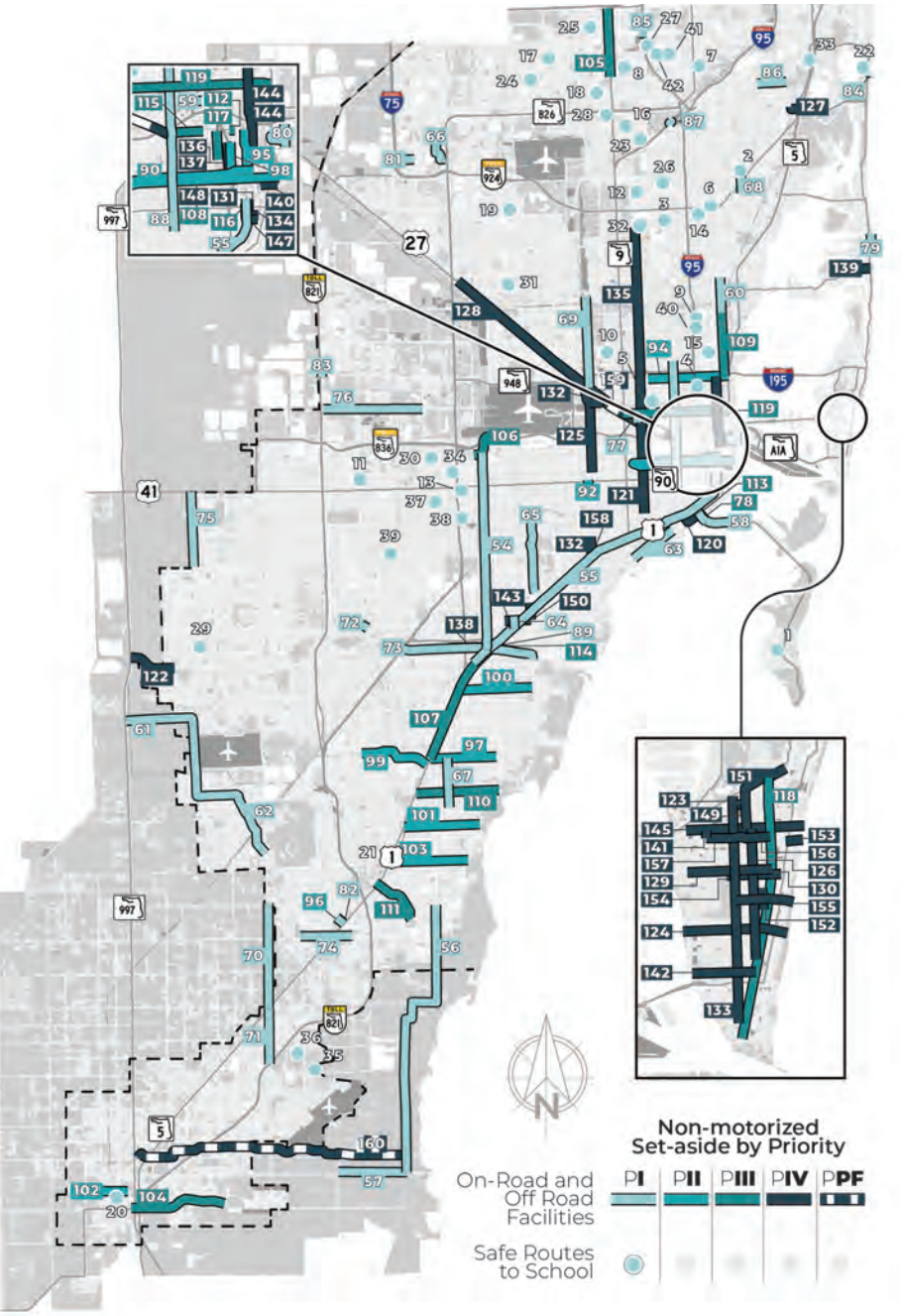



**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| MAP ID | FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION |
|---|---|---|---|---|
| **PLAN PERIOD I (CONTINUED)** | | | | |
| **75** | SW 157 Ave | SW 42 St | SW 8 St (Tamiami Trail/ SR 90/US 41) | Dedicated On-Road Bicycle Facility Improvement |
| **76** | NW 25 St | NW 117 Ave | NW 87 Ave | Off-Road Bicycle and Pedestrian Facility Improvement |
| **77** | Miami River Greenway - City of Miami Curtis Park East | NW 20 St | NW North River Dr | Pedestrian Facility Enhancement or Expansion |
| **78** | Rickenbacker Causeway Green Bike lanes Segment A - Phase I | Brickell Ave | Hobie Island | Dedicated On-Road Bicycle Facility Improvement |
| **79** | City of Miami Beach - Northshore Open Space Beachwalk | 79 St | 87 St | Off-Road Bicycle and Pedestrian Facility Improvement |
| **80** | North Bay Village - Baywalk Plaza Area Phase I | NE 6 St | NE 11 St | Off-Road Bicycle and Pedestrian Facility Improvement |
| **81** | Town of Miami Lakes - Green 2.0 | NW 87 Ave | NW 89 Ave | Off-Road Bicycle and Pedestrian Facility Improvement |
| **82** | Roberta Hunter Park - South Dade Trail Connection | SW 208 St | South Transitway | Off-Road Bicycle and Pedestrian Facility Improvement |
| **83** | City of Doral - Bicycle/ Pedestrian Bridge Over Doral Blvd | South Side of NW 41 St | North Side of NW 41 St | Pedestrian Bridge/ Overpass |
| **84** | City of Sunny Isles Beach – Government Ctr/ Beach Access Pedestrian Bridge | Govern-ment Center | East Side of SR A1A (Collins Ave) | Pedestrian Bridge/ Overpass |
| **85** | Snake Creek Trail Underpass Preliminary Engineering Study | West Side of Florida Turnpike | East Side of Florida Turnpike | Areawide Improvements |
| **86** | Snake Creek Trail Extension to Greynolds Park | C-9 Snake Creek Canal | Greynolds Park | Off-Road Bicycle and Pedestrian Facility Improvement |

Values in Thousands YOE $
YOE: Year of Expenditure

| | | | PLAN PERIOD I: 2020-2025 | | PLAN PERIOD II: 2026-2030 | | PLAN PERIOD III: 2031-2035 | | PLAN PERIOD IV: 2036-2045 | |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL PROJECT COST (2018 $) | 2020-2024 TIP FUNDING | TOTAL 2045 PLAN (YOE $) | PRE-ENG | CON/DB | PRE-ENG | CON/DB | PE/PDE | CON/DB | PE/PDE | CON/DB |
| $17,393.000 | $4,215.000 | | | **$4,215.000** | | | | | | |
| $51,750.000 | $31,600.000 | | | **$31,600.000** | | | | | | |
| $1,005.000 | $1,005.000 | | | **$1,005.000** | | | | | | |
| $961.000 | $961.000 | | | **$961.000** | | | | | | |
| $1,005.000 | $1,005.000 | | | **$1,005.000** | | | | | | |
| $1,005.000 | $1,005.000 | | | **$1,005.000** | | | | | | |
| $546.000 | $546.000 | | | **$546.000** | | | | | | |
| $109.000 | $109.000 | | **$109.000** | | | | | | | |
| $5.000 | $5.000 | | | **$5.000** | | | | | | |
| $505.000 | $505.000 | | | **$505.000** | | | | | | |
| $305.000 | $0.305 | | | **$305.000** | | | | | | |
| $781.000 | $0.781 | | **$144.000** | **$637.000** | | | | | | |

**BOLD PHASE FUNDS ARE INCLUDED IN THE 2019/2024 MIAMI-DADE TIP**

** Safe Routes to School - funded as a program 2020/2024 Miami-Dade County TIP

**FIGURE 107** 2045 BICYCLE AND PEDESTRIAN COST FEASIBLE PLAN MAP

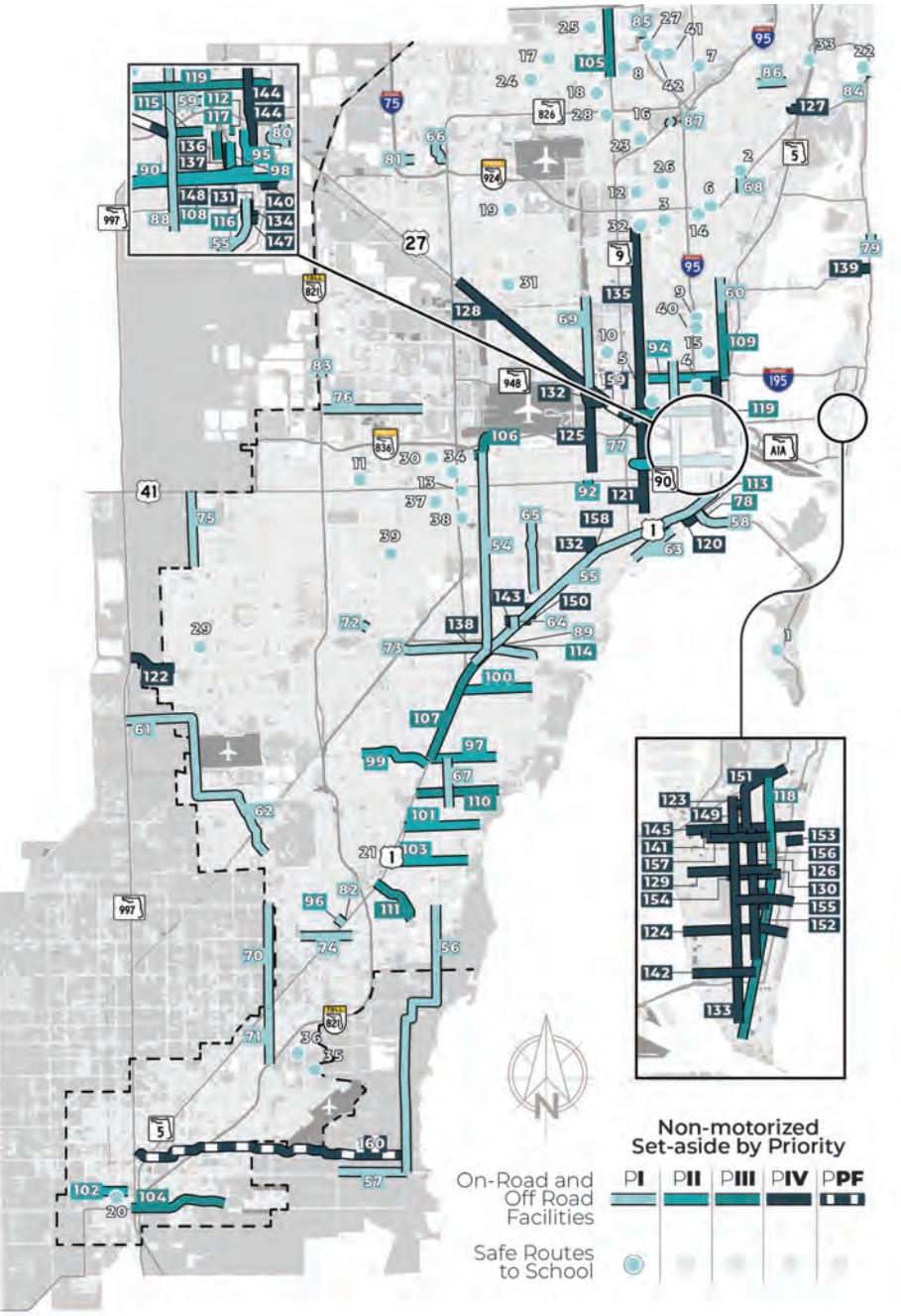



**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| MAP ID | FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION |
|---|---|---|---|---|
| **PLAN PERIOD I (CONTINUED)** | | | | |
| **87** | Golden Glades Bicycle-Ped Connector to Sunshine State Industrial Park | Golden Glades Multimodal Transportation Facility (GGMTF) | Sunshine State Industrial Park | Pedestrian Bridge/ Overpass |
| **88** | SMART Terminal Connector - SW 12 Ave (SR 933) | SW 13 St | NW 46 St | Protected On-Road Bicycle Facility and Pedestrian Improvements |
| **89** | SMART Trails - South of Snapper Creek Expy | Ludlam Trail | Underline | Off-Road Bicycle and Pedestrian Facility Improvement |
| **PLAN PERIOD II** | | | | |
| **90** | SMART Terminal Connector - SR 968/SW 1 St | SW 24 Ave | US 1 (South Biscayne Blvd/SR 5) | Protected On-Road Bicycle Facility and Pedestrian Improvements |
| **91** | County-wide Complete Streets Future Projects | Various Locations | Various Locations | Areawide Improvements Facilitation |
| **92** | Improve Safety by Public Outreach Initiatives | Various Locations | Various Locations | Areawide Public Outreach |
| **93** | Non-Motorized Facility Improvements | Various Locations | Various Locations | Areawide Existing Facility Improvements |
| **94** | SMART Terminal Connector - US 27 /Okeechobee Rd (SR 25)/NW 36 St | NW 19 Ave | US 1 (Biscayne Blvd/SR 5) | Protected On-Road Bicycle Facility and Pedestrian Improvements |
| **95** | SW/NW 1 Ave | SW 2 St | SW 11 St | Dedicated On-Road Bicycle Facility Improvement |
| **96** | SMART Trails - SW Side of SW 117 Ave | Roberta Hunter Park | South Dade Trail & Black Creek Trail Junction | Off-Road Bicycle and Pedestrian Facility Improvement |
| **97** | SW 136 St (Howard Dr) | US 1 (South Dixie Hwy/SR 5) | Old Cutler Rd | Dedicated On-Road Bicycle Facility Improvement |
| **98** | SR 925/NW 3 Ave | NW 1 St | NW 8 St | Dedicated On-Road Bicycle Facility Improvement |
| **99** | SMART Trails - FPL Easement | SW 107 Ave (SR 985) | South Dade Transitway | Off-Road Bicycle and Pedestrian Facility Improvement |

Values in Thousands YOE $
YOE: Year of Expenditure

| | | | | PLAN PERIOD I: 2020-2025 | | PLAN PERIOD II: 2026-2030 | | PLAN PERIOD III: 2031-2035 | | PLAN PERIOD IV: 2036-2045 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL PROJECT COST (2018 $) | 2020-2024 TIP FUNDING | TOTAL 2045 PLAN (YOE $) | PRE-ENG | CON/DB | PRE-ENG | CON/DB | PE/PDE | CON/DB | PE/PDE | CON/DB |
| | | | | | | | | | | | |
| | $17,582.000 | $7.594 | | **$626.000** | **$6,968.000** | | | | | | |
| | $3,273.148 | | $3,895.047 | $399.492 | $3,495.555 | | | | | | |
| | $682.080 | | $811.675 | $111.955 | $699.720 | | | | | | |
| | | | | | | | | | | | |
| | $2,524.479 | | $3,299.181 | $303.278 | | | $2,995.903 | | | | |
| | $10.455 | | $10,455.000 | | | | $1,980.000 | | $2,325.000 | | $6,150.000 |
| | $1.320 | | $1,320.000 | | | | $1,320.000 | | | | |
| | $1.320 | | $1,320.000 | | | | $1,320.000 | | | | |
| | $2,033.758 | | $2,684.560 | | | $275.339 | $2,409.221 | | | | |
| | $602.516 | | $795.322 | | | $81.571 | $713.750 | | | | |
| | $232.000 | | $306.240 | | | $42.240 | $264.000 | | | | |
| | $1,382.784 | | $1,825.275 | | | $187.208 | $1,638.067 | | | | |
| | $331.687 | | $437.827 | | | $44.905 | $392.922 | | | | |
| | $992.960 | | $1,310.707 | | | $180.787 | $1,129.920 | | | | |

**BOLD PHASE FUNDS ARE INCLUDED IN THE 2019/2024 MIAMI-DADE TIP**

** Safe Routes to School - funded as a program 2020/2024 Miami-Dade County TIP

**FIGURE 107** 2045 BICYCLE AND PEDESTRIAN COST FEASIBLE PLAN MAP

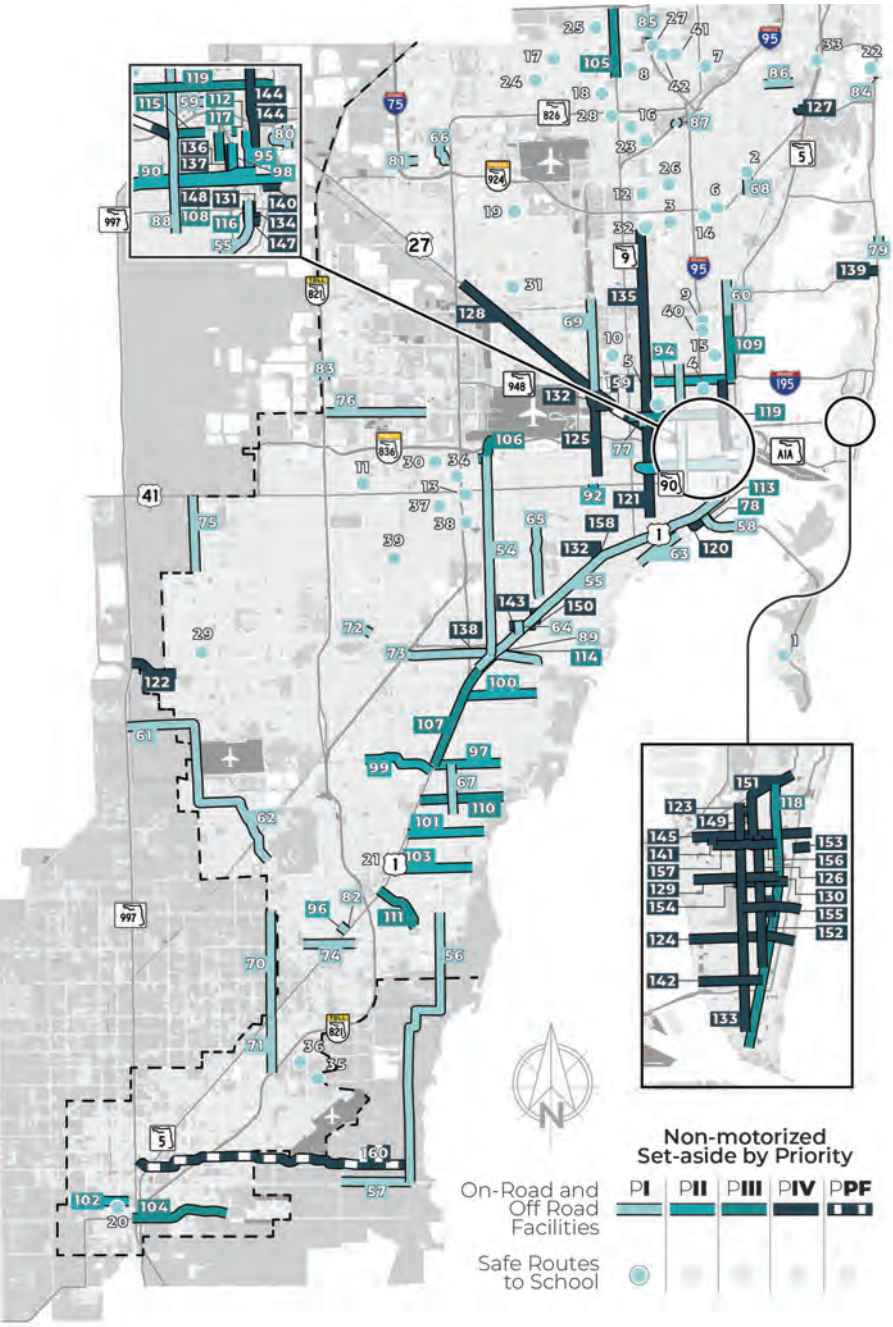



**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| MAP ID | FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION |
|---|---|---|---|---|
| **PLAN PERIOD II (CONTINUED)** | | | | |
| **100** | SW 104 St (Killian Pkwy) | SW 77 Ave | SW 57 Ave (Red Rd) | Dedicated On-Road Bicycle Facility Improvement |
| **101** | SW 168 St (Richmond Dr) | US 1 (South Dixie Hwy/ SR 5) | Old Cutler Rd | Dedicated On-Road Bicycle Facility Improvement |
| **102** | SMART Terminal Connector - West Davis Pkwy | SW 187 Ave | South Transitway | Protected On-Road Bicycle Facility and Pedestrian Improvements |
| **103** | SW 184 St (Eureka Dr) | US 1 (South Dixie Hwy/SR 5) | Old Cutler Rd | Dedicated On-Road Bicycle Facility Improvement |
| **PLAN PERIOD III** | | | | |
| **104** | SMART Terminal Connector - SW 344 St | South Transitway | SW 152 Ave | Protected On-Road Bicycle Facility and Pedestrian Improvements |
| **105** | SMART Terminal Connector - NW 27 Ave | NW 183 St | SR 852 (NW 215 St) | Protected On-Road Bicycle Facility and Pedestrian Improvements |
| **106** | SMART Trails - CSX Rail Corridor | NW 7 St (Luis Sabines Way) | Perimeter Greenway | Off-Road Bicycle and Pedestrian Facility Improvement |
| **107** | US 1 (South Dixie Hwy/SR 5) | SW 136 St (Howard Dr) | Dadeland North Station | Pedestrian Facility Enhancement or Expansion |
| **108** | SW 1 St | SW 5 Ave | SW 2 Ave | Dedicated On-Road Bicycle Facility Improvement |
| **109** | SMART Terminal Connector - NE 2 Ave | NE 36 St | NE 71 St | Protected On-Road Bicycle Facility and Pedestrian Improvements |
| **110** | SW 152 St (Coral Reef Dr) | US 1 (South Dixie Hwy/ SR 5) | SW 67 Ave | Dedicated On-Road Bicycle Facility Improvement |
| **111** | Marlin Rd | US 1 (South Dixie Hwy/ SR 5) | Old Cutler Rd | Off-Road Bicycle and Pedestrian Facility Improvement |
| **112** | NW 11 St | NW 12 Ave (SR 933) | SW 2 Ave | Dedicated On-Road Bicycle Facility Improvement |

Values in Thousands YOE $
YOE: Year of Expenditure

| | | | | PLAN PERIOD I: 2020-2025 | | PLAN PERIOD II: 2026-2030 | | PLAN PERIOD III: 2031-2035 | | PLAN PERIOD IV: 2036-2045 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL PROJECT COST (2018 $) | 2020-2024 TIP FUNDING | TOTAL 2045 PLAN (YOE $) | PRE-ENG | CON/DB | PRE-ENG | CON/DB | PE/PDE | CON/DB | PE/PDE | CON/DB |
| | | | | | | | | | | | |
| | $1,484.549 | | $1,959.605 | | | $200.985 | $1,758.620 | | | | |
| | $1,590.182 | | $2,099.041 | | | $215.286 | $1,883.754 | | | | |
| | $666.050 | | $879.186 | | | $90.173 | $789.013 | | | | |
| | $1,641.661 | | $2,166.993 | | | $222.256 | $1,944.737 | | | | |
| | | | | | | | | | | | |
| | $2,437.478 | | $3,264.190 | | | $329.997 | $2,619.346 | | $314.848 | | |
| | $1,738.212 | | $2,694.228 | | | | | $276.331 | $2,417.897 | | |
| | $928.000 | | $1,438.400 | | | | | $198.400 | $1,240.000 | | |
| | $426.173 | | $660.569 | | | | | $91.113 | $569.456 | | |
| | $205.238 | | $318.119 | | | | | $32.628 | $285.492 | | |
| | $1,714.639 | | $2,657.691 | | | | | $272.584 | $2,385.107 | | |
| | $1,731.441 | | $2,683.734 | | | | | $275.255 | $2,408.479 | | |
| | $578.077 | | $896.019 | | | | | $123.589 | $772.430 | | |
| | $62.109 | | $96.269 | | | | | $9.874 | $86.395 | | |

**BOLD PHASE FUNDS ARE INCLUDED IN THE 2019/2024 MIAMI-DADE TIP**

** Safe Routes to School - funded as a program 2020/2024 Miami-Dade County TIP

**FIGURE 107** 2045 BICYCLE AND PEDESTRIAN COST FEASIBLE PLAN MAP

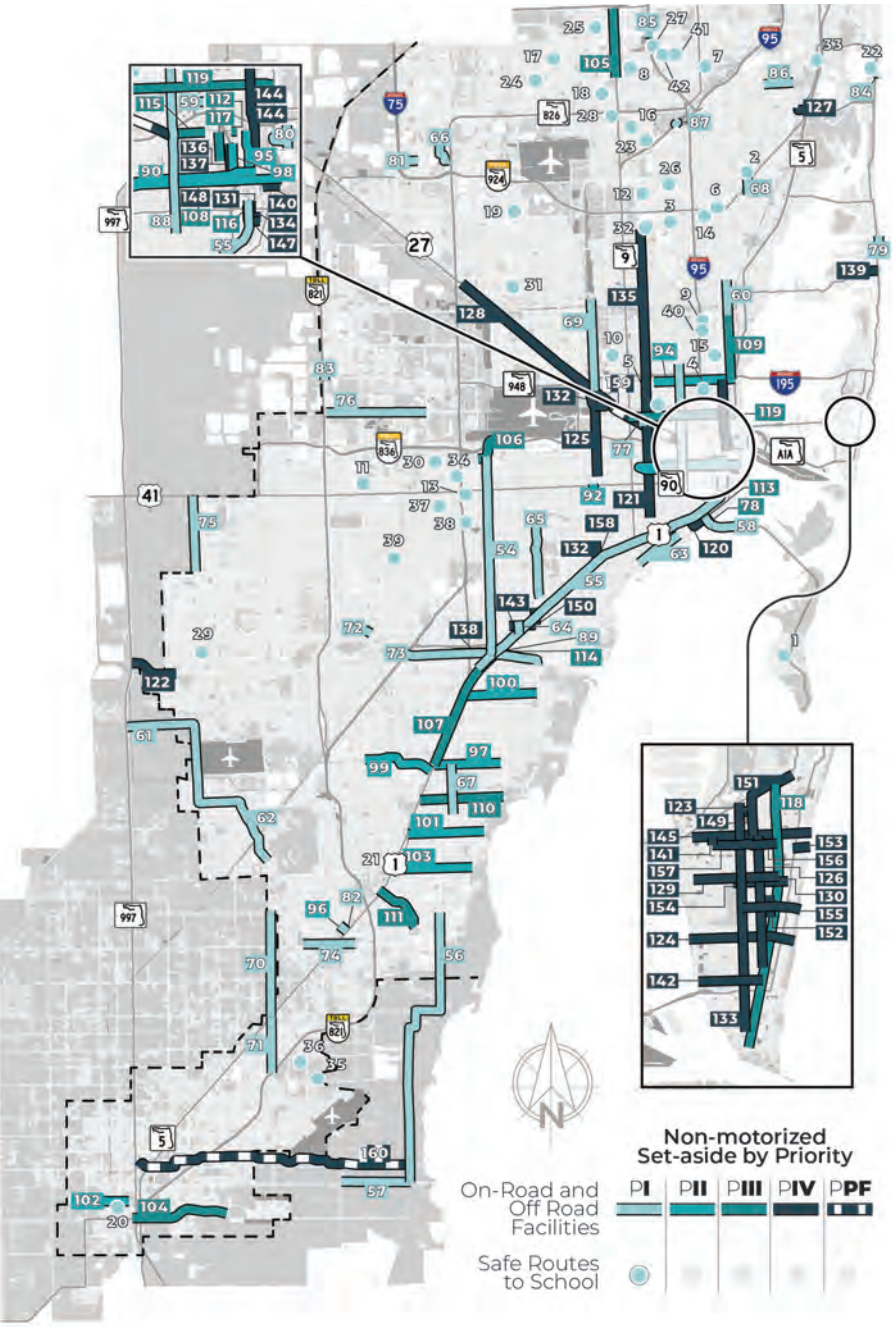



**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| MAP ID | FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION |
|---|---|---|---|---|
| **PLAN PERIOD III (CONTINUED)** | | | | |
| **113** | SMART Trails - SE/SW 26 Rd - Route B | SR 913 (Ricken-backer Causeway) | Underline | Off-Road Bicycle and Pedestrian Facility Improvement |
| **114** | Coral Gables Canal | SW 62 Ave | SW 69 Ave | Off-Road Bicycle and Pedestrian Facility Improvement |
| **115** | NW 11 St | NW 12 Ave (SR 933) | SW 2 Ave | Dedicated On-Road Bicycle Facility Improvement |
| **116** | SW 1 Ct | SW 11 St | SW 7 St (Tamiami Trail/ SR 90/ US 41) | Dedicated On-Road Bicycle Facility Improvement |
| **117** | NW 5 Ave | NW 4 St | NW 11 St | Dedicated On-Road Bicycle Facility Improvement |
| **118** | Washington Ave | South Pointe Dr | Dade Blvd | Protected On-Road Bicycle Facility Improvement |
| **119** | SMART Terminal Connector - NW 20 St | NW 27 Ave | US 1(Biscayne Blvd/SR 5) | Protected On-Road Bicycle Facility and Pedestrian Improvements |
| **PLAN PERIOD IV** | | | | |
| **120** | SMART Trails - SE 32 Rd/Brickell Ave - Route A | Underline | SR 913 (Ricken-backer Causeway) | Off-Road Bicycle and Pedestrian Facility Improvement |
| **121** | NW 22 Ave | SW 22 St | SR 112 (Airport Expy) | Dedicated On-Road Bicycle Facility Improvement |
| **122** | SMART Trails - SW 88 St (Kendall Dr/ SR 94) | SR 997 (Krome Ave) | SW 162 Ave | Off-Road Bicycle and Pedestrian Facility Improvement |
| **123** | Meridian Ave | 16 St | 19 St | On-Road Bicycle Facility Improvement |
| **124** | 10 St | Washington Ave | Biscayne Bay Path | On-Road Bicycle Facility Improvement |
| **125** | SMART Terminal Connector - SW 37 Ave | Fonseca Ave | NW South River Dr | Trail Improvements |
| **126** | Pennsylvania Ave | Washington Ave | 17 St | On-Road Bicycle Facility Improvement |
| **127** | SMART Trails - NE 21 Ave/NE 164 St | Snake Creek Greenway | NE 23 Ave | Off-Road Bicycle and Pedestrian Facility Improvement |

Values in Thousands YOE $
YOE: Year of Expenditure

| | | | | PLAN PERIOD I: 2020-2025 | | PLAN PERIOD II: 2026-2030 | | PLAN PERIOD III: 2031-2035 | | PLAN PERIOD IV: 2036-2045 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL PROJECT COST (2018 $) | 2020-2024 TIP FUNDING | TOTAL 2045 PLAN (YOE $) | PRE-ENG | CON/DB | PRE-ENG | CON/DB | PE/PDE | CON/DB | PE/PDE | CON/DB |
| | | | | | | | | | | | |
| | $837.520 | | $1,298.156 | | | | | $179.056 | $1,119.100 | | |
| | $267.716 | | $414.960 | | | | | $57.236 | $357.724 | | |
| | $349.287 | | $541.395 | | | | | $55.528 | $485.867 | | |
| | $183.050 | | $283.727 | | | | | $29.100 | $254.627 | | |
| | $319.821 | | $495.722 | | | | | $50.843 | $444.879 | | |
| | $1,740.960 | | $2,698.489 | | | | | $276.768 | $2,421.721 | | |
| | $2,703.255 | | $4,190.046 | | | | | $429.748 | $3,760.298 | | |
| | | | | | | | | | | | |
| | $957.000 | | $1,631.970 | | | | | $204.600 | $818.029 | | $609.341 |
| | $2,945.689 | | $6,038.662 | | | | | | | $619.350 | $5,419.312 |
| | $677.440 | | $1,388.752 | | | | | | | $191.552 | $1,197.200 |
| | $11.203 | | $22.965 | | | | | | | $2.355 | $20.610 |
| | $23.054 | | $47.261 | | | | | | | $4.847 | $42.413 |
| | $2,122.257 | | $4,350.627 | | | | | | | $446.218 | $3,904.409 |
| | $28.811 | | $59.062 | | | | | | | $6.058 | $53.005 |
| | $242.136 | | $496.379 | | | | | | | $68.466 | $427.913 |

**BOLD PHASE FUNDS ARE INCLUDED IN THE 2019/2024 MIAMI-DADE TIP**

** Safe Routes to School - funded as a program 2020/2024 Miami-Dade County TIP

**FIGURE 107** 2045 BICYCLE AND PEDESTRIAN COST FEASIBLE PLAN MAP

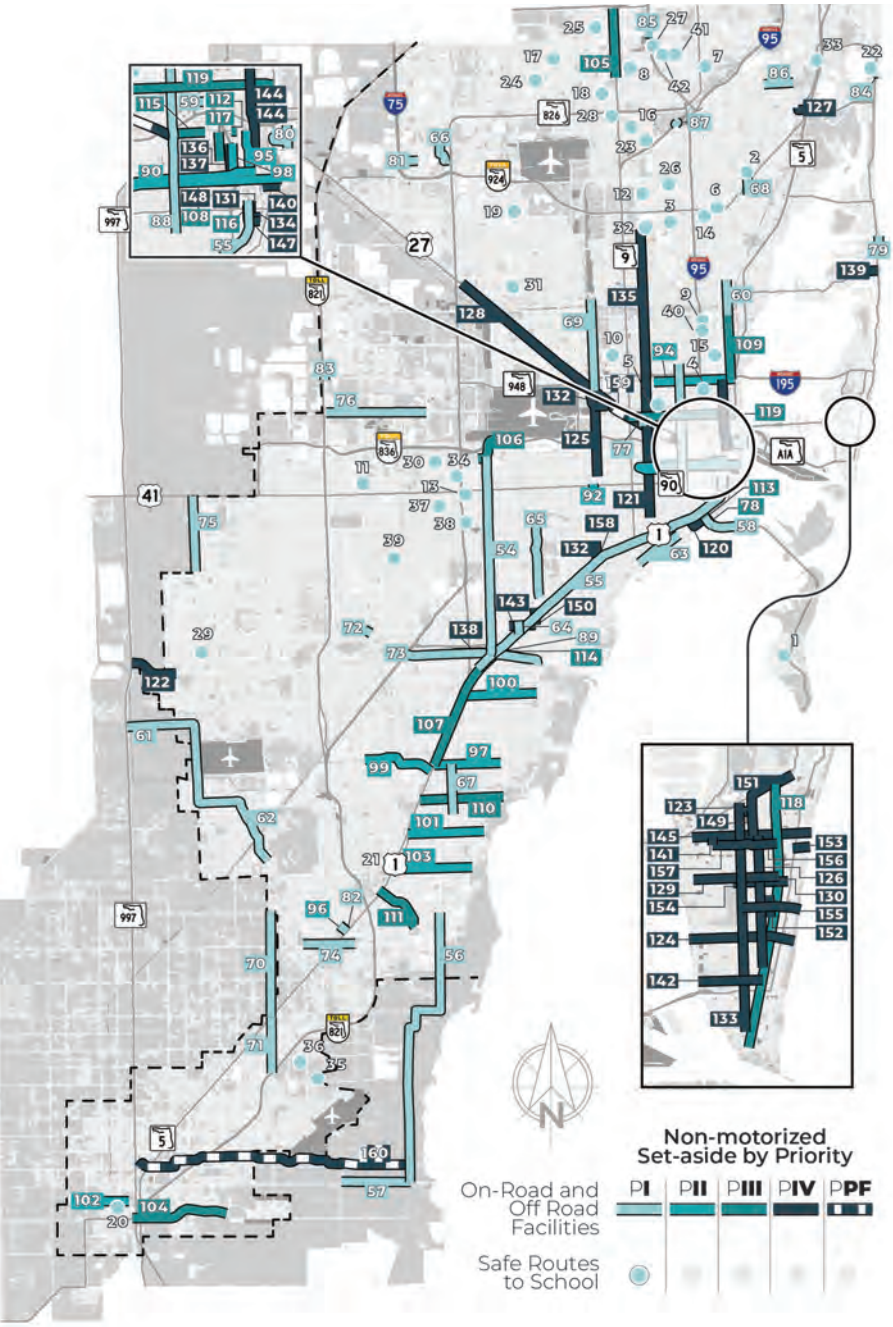



**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| MAP ID | FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION |
|---|---|---|---|---|
| **PLAN PERIOD IV (CONTINUED)** | | | | |
| **128** | West Okeechobee Rd | NW 103 St | West 18 Ave | Pedestrian Facility Enhancement or Expansion |
| **129** | 15 St | Washington Avenue | SR 907/ Alton Road | On-Road Bicycle Facility Improvement |
| **130** | 15 St | SR 907/ Alton Road | Bay Road | On-Road Bicycle Facility Improvement |
| **131** | 6 St | Washington Ave | West Ave | On-Road Bicycle Facility Improvement |
| **132** | SMART Trails - NW 25 St - Route B | NW 37 Ave | NW South River Dr | Off-Road Bicycle and Pedestrian Facility Improvement |
| **133** | Meridian Ave | 1 St | 16 St | On-Road Bicycle Facility Improvement |
| **134** | SW 10 St | Brickell Plaza | SW 1 Ave | On-Road Bicycle Facility Improvement |
| **135** | NW 22 Ave | NW 36 St (SR 948/ Doral Blvd) | NW 111 St | Dedicated On-Road Bicycle Facility Improvement |
| **136** | SR 925/NW 3 Ct | NW 1 St | NW 8 St | Dedicated On-Road Bicycle Facility Improvement |
| **137** | NW 3 Ct | NW 2 St | NW 8 St | Pedestrian Facility Enhancement or Expansion |
| **138** | SMART Terminal Connector - Snapper Creek Canal | SW 81 Ave | US 1 (South Dixie Hwy/ SR 5) | Protected On-Road Bicycle Facility and Pedestrian Improvements |
| **139** | 72 St | SR A1A (Collins Ave) | Dickens Ave | Protected On-Road Bicycle Facility Improvement |
| **140** | SE 3 St | South US 1 (Biscayne Blvd/SR 5) | SE 1 Ave | On-Road Bicycle Facility Improvement |
| **141** | Lenox Ave | Lincoln Ln North | 17 St | On-Road Bicycle Facility Improvement |
| **142** | M-Path Greenlink | SW 67 Ave | Miami River Greenway | Off-Road Bicycle and Pedestrian Facility Improvement |
| **143** | SW 72 St (Sunset Dr) | SW 57 Ave (Red Rd) | SW 64 Ct | On-Road Bicycle Facility Improvement |

Values in Thousands YOE $
YOE: Year of Expenditure

| | | | PLAN PERIOD I: 2020-2025 | | PLAN PERIOD II: 2026-2030 | | PLAN PERIOD III: 2031-2035 | | PLAN PERIOD IV: 2036-2045 | |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL PROJECT COST (2018 $) | 2020-2024 TIP FUNDING | TOTAL 2045 PLAN (YOE $) | PRE-ENG | CON/DB | PRE-ENG | CON/DB | PE/PDE | CON/DB | PE/PDE | CON/DB |
| $648.518 | | $1,329.461 | | | | | | | $183.374 | $1,146.087 |
| $18.376 | | $37.670 | | | | | | | $3.864 | $33.807 |
| $3.168 | | $37.670 | | | | | | | $0.665 | $5.828 |
| $13.759 | | $28.207 | | | | | | | $2.893 | $25.314 |
| $399.040 | | $818.032 | | | | | | | $112.832 | $705.200 |
| $36.552 | | $74.931 | | | | | | | $7.685 | $67.245 |
| $4.604 | | $9.438 | | | | | | | $0.968 | $8.470 |
| $3,093.894 | | $6,342.483 | | | | | | | $650.511 | $5,691.972 |
| $331.658 | | $679.899 | | | | | | | $69.733 | $610.166 |
| $45.094 | | $92.443 | | | | | | | $12.751 | $79.692 |
| $1,033.454 | | $2,118.582 | | | | | | | $217.290 | $1,901.291 |
| $240.234 | | $492.481 | | | | | | | $50.511 | $441.970 |
| $7.961 | | $16.320 | | | | | | | $1.674 | $14.646 |
| $1.831 | | $3.754 | | | | | | | $0.385 | $3.369 |
| $141.045 | | $289.142 | | | | | | | $39.882 | $249.261 |
| $21.650 | | $44.382 | | | | | | | $4.552 | $39.830 |

**BOLD PHASE FUNDS ARE INCLUDED IN THE 2019/2024 MIAMI-DADE TIP**

** Safe Routes to School - funded as a program 2020/2024 Miami-Dade County TIP

**FIGURE 107** 2045 BICYCLE AND PEDESTRIAN COST FEASIBLE PLAN MAP

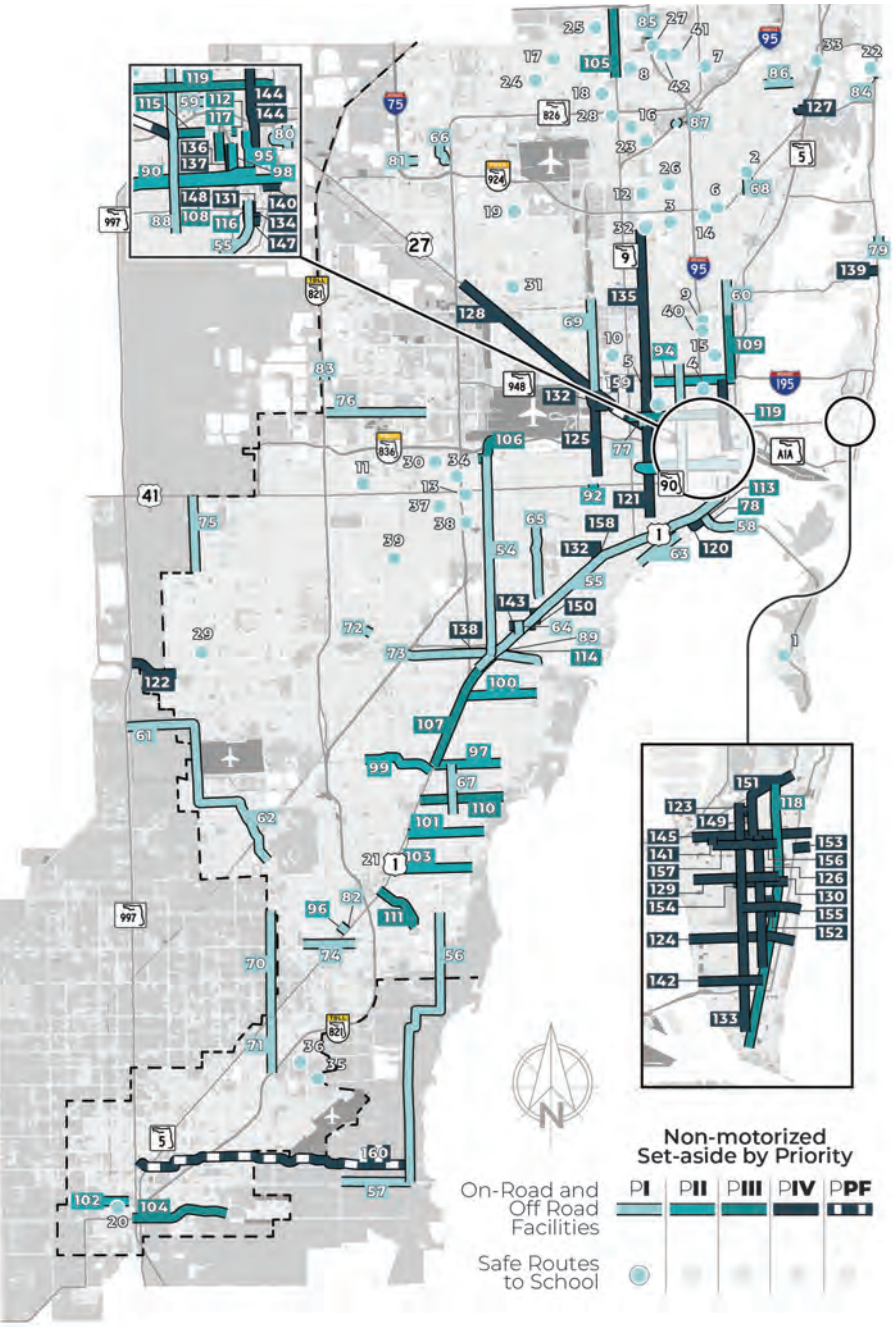



**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| MAP ID | FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION |
|---|---|---|---|---|
| **PLAN PERIOD IV (CONTINUED)** | | | | |
| **144** | SMART Terminal Connector - North Miami Ave | NE 14 St | US 27/ Okeecho-bee Rd (SR 25) /NW 36 St | Protected On-Road Bicycle Facility and Pedestrian Improvements |
| **145** | 17 St | Washington Ave | West Ave | On-Road Bicycle Facility Improvement |
| **146** | North Miami Ave/ NE 1 Ave | NW 5 St | NW 17 St | Dedicated On-Road Bicycle Facility Improvement |
| **147** | SW 11 St | Brickell Plaza | SW 1 Ave | On-Road Bicycle Facility Improvement |
| **148** | SR 968/SW 1 St | SW 6 Ave | SW 2 Ave | Dedicated On-Road Bicycle Facility Improvement |
| **149** | Convention Center Dr | 17 St | Dade Blvd | Dedicated On-Road Bicycle Facility Improvement |
| **150** | SW 57 Ave (Red Rd) | SR 986 (Sunset Dr/ SW 72 St) | SW 64 St | On-Road Bicycle Facility Improvement |
| **151** | 19 St/Dade Blvd | Meridian Ave | 23 St | Off-Road Bicycle and Pedestrian Facility Improvement |
| **152** | Drexel Ave | 12 St | 14 St | On-Road Bicycle Facility Improvement |
| **153** | Lincoln Rd | Beachwalk | SR A1A (Collins Ave) | On-Road Bicycle Facility Improvement |
| **154** | Espanola Way | SR A1A (Collins Ave) | Jefferson Ave | On-Road Bicycle Facility Improvement |
| **155** | 13 St | Beachwalk | Meridian Ave | On-Road Bicycle Facility Improvement |
| **156** | Lincoln Ln North | Washington Ave | Meridian Ave | On-Road Bicycle Facility Improvement |
| **157** | Lincoln Ln North | Meridian Ave | Lenox Ave | On-Road Bicycle Facility Improvement |
| **158** | SMART Trails - SW 38 Ave | Underline | Cadima Ave | Off-Road Bicycle and Pedestrian Facility Improvement |
| **PARTIALLY FUNDED PROJECTS** | | | | |
| **159** | Miami River Greenway (Missing Segements) | NW 36 St (SR 948/ Doral Blvd) | NW 12 Ave (SR 933) | Trail Improvements |
| **160** | BiscayneEver-glades Green-way (Seg 6) | South Transitway | Biscayne National Park | Trail Improvements |

Values in Thousands YOE $
YOE: Year of Expenditure

| | | | | PLAN PERIOD I: 2020-2025 | | PLAN PERIOD II: 2026-2030 | | PLAN PERIOD III: 2031-2035 | | PLAN PERIOD IV: 2036-2045 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL PROJECT COST (2018 $) | 2020-2024 TIP FUNDING | TOTAL 2045 PLAN (YOE $) | PRE-ENG | CON/DB | PRE-ENG | CON/DB | PE/PDE | CON/DB | PE/PDE | CON/DB |
| | $1,296.083 | | $2,656.969 | | | | | | | $272.510 | $2,384.460 |
| | $25.734 | | $52.754 | | | | | | | $5.411 | $47.343 |
| | $595.371 | | $1,220.510 | | | | | | | $125.180 | $1,095.329 |
| | $4.081 | | $8.366 | | | | | | | $0.858 | $7.508 |
| | $72.831 | | $149.303 | | | | | | | $15.313 | $133.990 |
| | $130.628 | | $267.787 | | | | | | | $27.465 | $240.322 |
| | $13.699 | | $28.084 | | | | | | | $2.880 | $25.203 |
| | $250.748 | | $514.034 | | | | | | | $70.901 | $443.133 |
| | $4.728 | | $9.692 | | | | | | | $0.994 | $8.698 |
| | $3.579 | | $7.337 | | | | | | | $0.753 | $6.584 |
| | $12.020 | | $24.641 | | | | | | | $2.527 | $22.114 |
| | $12.718 | | $26.072 | | | | | | | $2.674 | $23.398 |
| | $8.114 | | $16.633 | | | | | | | $1.706 | $14.927 |
| | $5.934 | | $12.165 | | | | | | | $1.248 | $10.917 |
| | | | $1,006.384 | | | | | | | $138.812 | $867.572 |
| | $11,966.034 | | $8,595.142 | | | | | | | $3,924.859 | $4,670.283 |
| | $12,282.396 | | $3,972.953 | | | | | | | $3,472.953 | $454.400 |

**BOLD PHASE FUNDS ARE INCLUDED IN THE 2019/2024 MIAMI-DADE TIP**

** Safe Routes to School - funded as a program 2020/2024 Miami-Dade County TIP

**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS** | | | | |
| SMART Terminal Connector - Venetian Causeway & 17 St | North Miami Ave | Convention Center Dr | Protected On-Road Bicycle Facility and Pedestrian Improvements | $3,147.198 |
| SR A1A (Collins Ave) | South Pointe Dr | 26 St | Protected On-Road Bicycle Facility Improvement | $2,028.228 |
| SMART Terminal Connector - NW South River Dr & Delaware Pkwy | NW 27 Ave | Hook Square/SE 1 Ave | Protected On-Road Bicycle Facility and Pedestrian Improvements | $3,269.507 |
| SR A1A/5 St | Lenox Ave | SR 907 (Alton Rd) | Protected On-Road Bicycle Facility Improvement | $63.443 |
| SMART Terminal Connector - Convention Center Dr & Hi-Tide Dr & Prairie Dr | 17 St | West 47 St | Protected On-Road Bicycle Facility and Pedestrian Improvements | $1,943.088 |
| Biscayne-Everglades Greenway (Seg 4) | South Transit Way | Biscayne National Park | Trail Improvements | $12,239.189 |
| Dade Blvd Bike Path | Meridian Ave | Atlantic Trail/Beachwalk | Off-Road Bicycle and Pedestrian Facility Improvement | $280.345 |
| South 13 St/ Coral Way (SR 972) | SW 3 Ave | Brickell Ave | Dedicated On-Road Bicycle Facility Improvement | $330.318 |
| Biscayne-Everglades Greenway (Seg 8) | C-111 Canal | North Flagler Ave | Trail Improvements | $8,803.966 |
| NW 2 Ave | NW 17 St | NW 20 St | Pedestrian Facility Enhancement or Expansion | $27.795 |
| Biscayne-Everglades Greenway (Seg 7) | SW 328 St | East Mowry Dr | Trail Improvements | $838.596 |
| Biscayne Canal (C-8) | South of Biscayne Canal | North of Biscayne Canal | Pedestrian Bridge/Overpass | $1,443.852 |
| NW 17 St | NW 3 Ave | NW 7 Ave (SR 7/ US 441) | Dedicated On-Road Bicycle Facility Improvement | $302.523 |
| SMART Terminal Connector - SR 969 (NW 72 Ave /Milam Dairy Rd)/W 16 Ave | NW 47 St | NW 53 Ter | Protected On-Road Bicycle Facility and Pedestrian Improvements | $3,215.040 |

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| 11 St | Washington Ave | West Ave | On-Road Bicycle Facility Improvement | $21.530 |
| NW 2 Ave | NW 20 St | NW 79 St | Dedicated On-Road Bicycle Facility Improvement | $3,193.743 |
| NW 29 St | North Miami Ave | NW 7 Ave (SR 7/ US 441) | Dedicated On-Road Bicycle Facility Improvement | $530.152 |
| West Dixie Hwy (SR 909) | Miami Gardens Dr (SR 860/NW 186 St) | NW 199 St/NE 203 St (Ives Dairy Rd) | Dedicated On-Road Bicycle Facility Improvement | $776.403 |
| NW 344 St | SW 192 Ave | NW 6 Ave | Dedicated On-Road Bicycle Facility Improvement | $982.309 |
| SMART Trails - Telemundo Way/NW 25 St- Route A | Dolphin Park-and-Ride | NW 112 Ave | Off-Road Bicycle and Pedestrian Facility Improvement | $571.648 |
| Salzedo St | SW 40 St (Bird Rd/SR 976) | SW 8 St (Tamiami Trail/SR 90/US 41) | On-Road Bicycle Facility Improvement | $56.829 |
| 81 St | North Shore Open Space Park | Tatum Waterway Dr | On-Road Bicycle Facility Improvement | $5.296 |
| SMART Terminal Connector - NE 199 St & Country Club Dr | US (Biscayne Blvd/SR 5) | NE 192 St | Protected On-Road Bicycle Facility and Pedestrian Improvements | $1,953.454 |
| Atlantic Trail | 4 St | 5 St | Trail Improvements | $144.420 |
| Dade Blvd | Bay Rd | Meridian Ave | Off-Road Bicycle and Pedestrian Facility Improvement | $187.164 |
| 16 St | SR 907 (Alton Rd) | Bay Rd | Protected On-Road Bicycle Facility Improvement | $126.169 |
| Michigan Ave | 2 St | 11 St | On-Road Bicycle Facility Improvement | $20.478 |
| SW 67 Ave | SW 85 St | SW 39 St | Dedicated On-Road Bicycle Facility Improvement | $2,060.049 |

**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| 5 St | Beachwalk | SR A1A (Collins Ave) | Protected On-Road Bicycle Facility Improvement | $118.984 |
| SMART Terminal Connector - SR 9 Extension Frontage Rd | NW 27 Ave | NE Miami Gardens Dr (SR 860/NW 186 St) | Protected On-Road Bicycle Facility and Pedestrian Improvements | $3,362.871 |
| SMART Terminal Connector - West Dixie Hwy (SR 909) | SR 826 (Palmetto Expy)/NE 153 St | NE 214 Ter | Protected On-Road Bicycle Facility and Pedestrian Improvements | $2,240.846 |
| North Miami Ave | NW 17 St | NW 29 St | Dedicated On-Road Bicycle Facility Improvement | $606.122 |
| 77 St | Atlantic Way | Dickens Ave | On-Road Bicycle Facility Improvement | $10.941 |
| 13 St | Michigan Ave | Biscayne Bay Path | On-Road Bicycle Facility Improvement | $8.715 |
| SMART Terminal Connector - Meridian Ave & 1 St | Miami Beach Beachwalk | 17 St | Protected On-Road Bicycle Facility and Pedestrian Improvements | $1,520.599 |
| 6 St | Beachwalk | Washington Ave | On-Road Bicycle Facility Improvement | $5.687 |
| 13 St | 12 St | 14 St | On-Road Bicycle Facility Improvement | $4.728 |
| SMART Terminal Connector - Fontainebleau Blvd & Park Blvd | NW 97 Ave | NW 79 Ave | Protected On-Road Bicycle Facility and Pedestrian Improvements | $1,760.542 |
| Atlantic Trail | Haulover Park | Broward County Line | Off-Road Bicycle and Pedestrian Facility Improvement | $1,161.587 |
| SR 9/NW 27 Ave | NW 122 St | NW 135 St | Dedicated On-Road Bicycle Facility Improvement | $566.249 |
| SMART Terminal Connector - NW 7 Ave (SR 7/US 441) | NW 156 St | NW 7 Ave (SR 7/US 441) | Protected On-Road Bicycle Facility and Pedestrian Improvements | $387.965 |
| SW 1 Ave | SW 13 St | SW 7 St (Tamiami Trail/SR 90/ US 41) | Dedicated On-Road Bicycle Facility Improvement | $272.944 |

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| Biscayne Elementary Park | 75 St | 77 St | Off-Road Bicycle and Pedestrian Facility Improvement | $135.986 |
| Dade Blvd/Pine Tree Dr | Convention Center Dr | Beachwalk | Off-Road Bicycle and Pedestrian Facility Improvement | $2,496.320 |
| SR A1A/Harding Ave | 75 St | 87 Ter | Protected On-Road Bicycle Facility Improvement | $694.069 |
| SW 72 St (Sunset Dr) | SW 57 Ave (Red Rd/SR 959) | SR 953/SW 42 Ave | Protected On-Road Bicycle Facility Improvement | $1,273.939 |
| SR 7(US 441/NW 7 Ave) | NW 36 St (SR 948/Doral Blvd) | NW 43 St | Dedicated On-Road Bicycle Facility Improvement | $271.542 |
| SW 80 St | SW 55 Ave | SW 71 Ave | Dedicated On-Road Bicycle Facility Improvement | $1,037.755 |
| SW 57 Ave (Red Rd/SR 959) | SW 88 St (Kendall Dr) | SW 74 St | Dedicated On-Road Bicycle Facility Improvement | $665.756 |
| 21 St | Beachwalk | Washington Ave | Protected On-Road Bicycle Facility Improvement | $291.113 |
| SR A1A (Collins Ave) | 73 St | 87 Ter | Protected On-Road Bicycle Facility Improvement | $821.328 |
| Liguria Ave | San Amaro Dr | SW 57 Ave (Red Rd/SR 959) | Protected On-Road Bicycle Facility Improvement | $132.551 |
| NE 20 St | North Miami Ave/FEC RR | NE 2 Ave | Pedestrian Facility Enhancement or Expansion | $25.210 |
| SR A1A (Collins Ave) | West 63 St | 73 St | Protected On-Road Bicycle Facility Improvement | $805.605 |
| SR A1A (MacArthur Causeway) | Terminal Island | Biscayne Bay Path | Protected On-Road Bicycle Facility Improvement | $336.859 |
| West Ave | SR A1A/5 St | 17 St | Protected On-Road Bicycle Facility Improvement | $1,022.992 |

**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| Ocean Dr | 5 St | 15 St | Dedicated On-Road Bicycle Facility Improvement | $629.324 |
| South Miami Ave | SW 7th St | SW 3 St | Dedicated On-Road Bicycle Facility Improvement | $207.637 |
| NW 5 Ave | NW 22 St | NW 36 St (SR 948/Doral Blvd) | Dedicated On-Road Bicycle Facility Improvement | $612.597 |
| Ponce De Leon Blvd | Brooker St | San Amaro Dr | Off-Road Bicycle and Pedestrian Facility Improvement | $831.606 |
| SMART Terminal Connector - SR 934 (SW 74 St/ Hialeah Expy) | NW 114 Ave | Palm Ave | Protected On-Road Bicycle Facility and Pedestrian Improvements | $5,355.584 |
| SR 7 (US 441/NW 7 Ave) | Little River Dr | Little River Dr | Dedicated On-Road Bicycle Facility Improvement | $1,300.886 |
| South Miami Ave | South 15 Rd | South 5 St | Dedicated On-Road Bicycle Facility Improvement | $97.461 |
| SW 64 St | SW 69 Ave | SW 57 Ave (Red Rd/SR 959) | Dedicated On-Road Bicycle Facility Improvement | $913.394 |
| SR A1A/5 St | Biscayne Bay Path | SR 907 (Alton Rd) | Off-Road Bicycle and Pedestrian Facility Improvement | $27.452 |
| SMART Terminal Connector - Snake Creek Canal | NW 47 Ave | NW 2 Ave | Protected On-Road Bicycle Facility and Pedestrian Improvements | $2,592.610 |
| Dade Blvd | Convention Center Dr | Meridian Ave | Off-Road Bicycle and Pedestrian Facility Improvement | $44.931 |
| NW 28 St/NW SouthRiver Dr - Route A | NW 37 Ave | NW North River Dr | Off-Road Bicycle and Pedestrian Facility Improvement | $7,826.745 |
| NW 79 Pl/NW 79 Ave | Palmetto Metrorail Station | US-27 (Okeechobee Rd) | Dedicated On-Road Bicycle Facility Improvement | $607.478 |
| South Florida Rail Corridor | NW 159 Dr | Tri-Rail Station/GGMTF | Pedestrian Bridge/Overpass | $15,045.084 |

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| San Amaro Dr | SW 57 Ave (Red Rd/SR 959) | University Dr | Off-Road Bicycle and Pedestrian Facility Improvement | $603.274 |
| Andalusia Ave | SW 37 Ave | De Soto Blvd | Protected On-Road Bicycle Facility Improvement | $892.754 |
| University Dr | SW 40 St (Bird Rd/SR 976) | Ponce De Leon Blvd | Dedicated On-Road Bicycle Facility Improvement | $848.324 |
| SR 972/24 St | North Greenway | SW 37 Ave | Off-Road Bicycle and Pedestrian Facility Improvement | $279.555 |
| SMART Terminal Connector - SW 8 St (Tamiami Trail/SR 90/ US 41) & SW 117 Ave | SW 40 St (Bird Rd/SR 976) | SW 82 Ave | Protected On-Road Bicycle Facility and Pedestrian Improvements | $4,501.982 |
| SR 916 (Opa-locka Blvd)/NW 135 St | NW 17 Ave | US 1(Biscayne Blvd/SR 5) | Bicycle Facility Improvement | $2,910.703 |
| NW 32 Ave | NW 199 St/NE 203 St (Ives Dairy Rd) | NW 151 St | Dedicated On-Road Bicycle Facility Improvement | $2,286.956 |
| Beachwalk | 3 St | 5 St | Off-Road Bicycle and Pedestrian Facility Improvement | $63.050 |
| 73 St | Ocean Ter | Dickens Ave | Protected On-Road Bicycle Facility Improvement | $298.120 |
| Beachwalk | 6 St | 18 St | Off-Road Bicycle and Pedestrian Facility Improvement | $581.337 |
| Krome Trail | SW 296 St | SW 136 St (Howard Dr) | Off-Road Bicycle and Pedestrian Facility Improvement | $4,016.944 |
| Beachwalk Greenway/ 5 St | Ocean Dr | Atlantic Trail/Beachwalk | Off-Road Bicycle and Pedestrian Facility Improvement | $47.609 |
| NW 103 St | West 28 Ave | West 24 Ave | Pedestrian Facility Enhancement or Expansion | $35.431 |
| Atlantic Trail | North Shore Park | Haulover Park | Off-Road Bicycle and Pedestrian Facility Improvement | $1,943.083 |

**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| SW 12 St | South Miami Ave | SW 1 Ave | On-Road Bicycle Facility Improvement | $3.380 |
| NE 1 Ave | NE 13 St | NE 17 St | Dedicated On-Road Bicycle Facility Improvement | $229.311 |
| SMART Terminal Connector - NW 7 St (Luis Sabines Way) | NW 82 Ave | NW 72 Ave (Milam Dairy Rd) | Protected On-Road Bicycle Facility and Pedestrian Improvements | $829.451 |
| Perimeter Trail | CSX Rail/NW 12 St Intersection | Miami River | Off-Road Bicycle and Pedestrian Facility Improvement | $2,158.768 |
| NW 7 Ave (SR 7/US 441) | NW 119 St | Biscayne Canal | Dedicated On-Road Bicycle Facility Improvement | $1,616.957 |
| 73 St | Dickens Ave | Wayne Ave | Off-Road Bicycle and Pedestrian Facility Improvement | $16.686 |
| Biscayne Bay Path | Lincoln Rd | South Point Park | Off-Road Bicycle and Pedestrian Facility Improvement | $803.082 |
| 71 St | 71 St Terminus | Abbott Ave | Protected On-Road Bicycle Facility Improvement | $140.065 |
| Federal Hwy | NE 36 St | NE 38/39 St | Dedicated On-Road Bicycle Facility Improvement | $83.011 |
| SW 32 Rd | Vizcaya Metrorail Station | Coral Way (SR 972) | Dedicated On-Road Bicycle Facility Improvement | $129.045 |
| NW 11 St | NW 27 Ave | NW 22 Ave | Dedicated On-Road Bicycle Facility Improvement | $362.261 |
| NW 23 Ave | NW 7 St (Luis Sabines Way) | NW 11 St | Dedicated On-Road Bicycle Facility Improvement | $162.588 |
| SW 40 St (Bird Rd/SR 976) | Segovia St | SW 42Ave | Pedestrian Facility Enhancement or Expansion | $27.735 |
| SR 826 (Palmetto Expy)/ I-95 (SR 9) Connectors | GGMTF | NW 8 Ave | Pedestrian Bridge/Overpass | $10,634.184 |

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| Madeira Ave | SW 37 Ave | SW 57 Ave (Red Rd/SR 959) | On-Road Bicycle Facility Improvement | $56.671 |
| SE 9 St | Brickell Plaza | South Miami Ave | On-Road Bicycle Facility Improvement | $1.723 |
| SW 9 St | South Miami Ave | SW 1 Ave | Dedicated On-Road Bicycle Facility Improvement | $86.554 |
| SW 1 Ave | Broadway | SW 13 St | On-Road Bicycle Facility Improvement | $4.226 |
| Brescia Ave | San Amaro Dr | SW 57 Ave (Red Rd/SR 959) | Dedicated On-Road Bicycle Facility Improvement | $89.126 |
| SR 915 (NE 6 Ave) | NE 121 St | NE 147 St | Bicycle Facility Improvement | $1,137.550 |
| SR 909 (West Dixie Hwy) | SR 924/NW 119 St | NE 143 St | Bicycle Facility Improvement | $1,438.981 |
| Flaming Park | 11 St | 14 St | Off-Road Bicycle and Pedestrian Facility Improvement | $94.822 |
| Tatum Waterway Dr | 77 St | 81 St | On-Road Bicycle Facility Improvement | $9.754 |
| SW 40 St (Bird Rd/SR 976) | University Dr | Segovia St | Pedestrian Facility Enhancement or Expansion | $52.272 |
| Hialeah Expy | West Okeechobee Rd | West 10 Ave | Pedestrian Facility Enhancement or Expansion | $13.540 |
| SW 137 Ave | SW 152 St (Coral Reef Dr) | SW 72 St (Sunset Dr) | On-Road Bicycle Facility Improvement | $140.287 |
| NW 12 St | NW 136 Ave | Telemundo Way | Off-Road Bicycle and Pedestrian Facility Improvement | $3,911.961 |
| Miller Dr (SW 56 St ) | San Amaro Dr | SW 57 Ave (Red Rd/SR 959) | Dedicated On-Road Bicycle Facility Improvement | $184.451 |

**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| Ponce De Leon Blvd | US 1 (South Dixie Hwy/SR 5) | University Dr | Protected On-Road Bicycle Facility Improvement | $883.209 |
| Galiano St | Alhambra Circle | SW 8 St (Tamiami Trail/ SR 90/US 41) | Dedicated On-Road Bicycle Facility Improvement | $565.146 |
| SMART Terminal Connector - SW 82 Ave | SW 24 St | NW 25 St | Protected On-Road Bicycle Facility and Pedestrian Improvements | $2,858.814 |
| SMART Terminal Connector - SR 825/SW 137 Ave | SW 160 St | SW 96 St | Protected On-Road Bicycle Facility and Pedestrian Improvements | $3,436.235 |
| Miller Dr (SW 56 St ) | SW 57 Ave (Red Rd/SR 959) | SW 69 Ct | Dedicated On-Road Bicycle Facility Improvement | $929.574 |
| SW 62 St | SW 64 St | SW 39 St | Dedicated On-Road Bicycle Facility Improvement | $1,131.540 |
| Miller Dr (SW 56 St ) | SW 57 Ave (Red Rd/SR 959) | SW 67 Ave | Off-Road Bicycle and Pedestrian Facility Improvement | $372.559 |
| SW 68 Ct | SW 89 Ter | US 1 (South Dixie Hwy/SR 5) | Pedestrian Facility Enhancement or Expansion | $29.084 |
| Meridian Ave | Dade Blvd | Pine Tree Dr | Off-Road Bicycle and Pedestrian Facility Improvement | $353.299 |
| Dickens Ave | 73 St | 75 St | Off-Road Bicycle and Pedestrian Facility Improvement | $58.169 |
| Flamingo Park | Meridian Ave | Michigan Ave | Off-Road Bicycle and Pedestrian Facility Improvement | $51.179 |
| NW 79 Pl | NW 74 St | Palmetto Metrorail Station | Dedicated On-Road Bicycle Facility Improvement | $149.987 |
| SW 32 Rd | Brickell Ave | Vizcaya Pedestrian Bridge | Dedicated On-Road Bicycle Facility Improvement | $195.064 |
| NE 12 Ave | NE 8 St (Campbell Dr) | NE 15 St | Pedestrian Facility Enhancement or Expansion | $54.835 |

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| North Greenway Dr | Coral Way (SR 972) | South Greenway Dr | Off-Road Bicycle and Pedestrian Facility Improvement | $422.094 |
| Sevilla Ave | Ponce De Leon Blvd | San Domingo St | On-Road Bicycle Facility Improvement | $41.925 |
| Mariposa Ct | Mariposa Ave | US 1 (South Dixie Hwy/SR 5) | On-Road Bicycle Facility Improvement | $3.143 |
| Mariposa Ave/Maynada St | US 1 (South Dixie Hwy/SR 5) | US 1 (South Dixie Hwy/SR 5) | On-Road Bicycle Facility Improvement | $18.768 |
| SMART Terminal Connector - NE 18 Ave & NE 199 St | NE Miami Gardens Dr (SR 860/NW 186 St) | West Dixie Hwy (SR 909) | Protected On-Road Bicycle Facility and Pedestrian Improvements | $1,883.447 |
| SR 112 (Airport Expy)/41 St | SR 907 (Alton Rd) | SR A1A (Collins Ave) | On-Road Bicycle Facility Improvement | $22.638 |
| SW 57 Ave (Red Rd/SR 959) | SW 74 St | SW 72 St (Sunset Dr) | Dedicated On-Road Bicycle Facility Improvement | $84.843 |
| NW 175 St | SR 847 (NW 47 Ave) | NW 12 Ave (SR 933) | Dedicated On-Road Bicycle Facility Improvement | $2,456.438 |
| NW 191 St | SR 847 (NW 47 Ave) | SR 817 (NW 27 Ave) | On-Road Bicycle Facility Improvement | $55.568 |
| SR 997 (Krome Ave) Trail | SW 8 St (Tamiami Trail/ SR 90/US 41) | US 27/Okeechobee Rd (SR 25) | Off-Road Bicycle and Pedestrian Facility Improvement | $7,241.550 |
| North Bay Rd | 20 St | SR 907 (Alton Rd) | On-Road Bicycle Facility Improvement | $29.394 |
| Snapper Creek Trail "A" | K-Land Park/ SW 88 St (Kendall Dr) | SW 72 St (Sunset Dr) | Off-Road Bicycle and Pedestrian Facility Improvement | $3,003.405 |
| Snapper Creek Trail "A" | SW 72 St (Sunset Dr) | SW 8 St (Tamiami Trail/ SR 90/US 41)/FIU | Off-Road Bicycle and Pedestrian Facility Improvement | $3,326.530 |
| West Okeechobee Rd | West 8 Ave | West 4 Ave | Pedestrian Facility Enhancement or Expansion | $76.165 |

**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| SMART Terminal Connector - NW 167 St & NW 9 Ave | I-95 (SR 9)/NW 7 Ave (SR 7/ US 441) | NW 170 Ter | Protected On-Road Bicycle Facility and Pedestrian Improvements | $489.897 |
| NW 17 Ave Canal | NW 17 Ave | NW 155 Ter | Pedestrian Bridge/Overpass | $1,238.184 |
| Alhambra Circle | Madeira Ave | SW 42 Ave | Protected On-Road Bicycle Facility Improvement | $528.504 |
| Valencia Ave | SR 953/SW 42 Ave | De Soto Blvd | Dedicated On-Road Bicycle Facility Improvement | $425.931 |
| Madruga Ave | US 1 (South Dixie Hwy/SR 5) | SW 57 Ave (Red Rd/SR 959) | On-Road Bicycle Facility Improvement | $11.338 |
| Biscayne Blvd Way | SE 3 St | SE 3 Ave | Dedicated On-Road Bicycle Facility Improvement | $108.820 |
| South Miami Ave | US 1 (South Dixie Hwy/SR 5) | SW 25 Rd | Dedicated On-Road Bicycle Facility Improvement | $143.248 |
| SW 56 St (Miller Dr) | SW 58 Ave | SW 65 Ave | Pedestrian Facility Enhancement or Expansion | $86.830 |
| SW 72 Ave (Milam Dairy Rd) | SW 136 St (Howard Dr) | US 1 (Biscayne Blvd/SR 5) | Dedicated On-Road Bicycle Facility Improvement | $2,009.861 |
| SW 164 St and SW 89 Ave | SW 168 St (Richmond Dr) | US 1 (South Dixie Hwy/SR 5) | Off-Road Bicycle and Pedestrian Facility Improvement | $271.901 |
| Miami Dr | NE 159 St | NE 15 Ave | Dedicated On-Road Bicycle Facility Improvement | $229.963 |
| NE 172 St | NE 22 Ave | East Greynolds Park | Off-Road Bicycle and Pedestrian Facility Improvement | $355.830 |
| NW 37 Ave | SR 852 (NW 215 St) | NW 199 St/NE 203 St (Ives Dairy Rd) | Dedicated On-Road Bicycle Facility Improvement | $787.023 |
| NW 22 Ave | Miami Gardens Dr (SR 860/NW 186 St) | NW 195 St | On-Road Bicycle Facility Improvement | $20.832 |

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| 85 St | SR A1A (Collins Ave) | Hawthorne Ave | On-Road Bicycle Facility Improvement | $12.623 |
| 20 St | Sunset Dr | Purdy Ave | On-Road Bicycle Facility Improvement | $5.325 |
| Hialeah Dr | East 4 St | East 8 St | Dedicated On-Road Bicycle Facility Improvement | $170.424 |
| Granada Blvd | Ponce De Leon Blvd | Blue Rd | Pedestrian Facility Enhancement or Expansion | $59.451 |
| Granada Blvd | Hardee Rd | South Dixie Hwy | Pedestrian Facility Enhancement or Expansion | $61.199 |
| Blue Rd | SW 67 Ave | SW 42 Ave | Dedicated On-Road Bicycle Facility Improvement | $1,792.322 |
| Pine Tree Dr/La Gorce | 23 St | 6 St | Dedicated On-Road Bicycle Facility Improvement | $2,183.749 |
| Hialeah Dr | East 4 St | East 8 St | Dedicated On-Road Bicycle Facility Improvement | $88.094 |
| NW 71 St | NE 32 Ave | NE 27 Ave | Pedestrian Facility Enhancement or Expansion | $57.119 |
| South Alhambra Circle | Granada Blvd | South Dixie Hwy | Protected On-Road Bicycle Facility Improvement | $999.099 |
| Valencia Ave | SW 37 Ave | SR 953/SW 42 Ave | Protected On-Road Bicycle Facility Improvement | $427.092 |
| SW 16 St/Milan Ave | SW 37 Ave | SW 57 Ave (Red Rd/SR 959) | On-Road Bicycle Facility Improvement | $59.790 |
| SW 3 Ave | SW 22 St | SW 16 Ave | Dedicated On-Road Bicycle Facility Improvement | $291.900 |
| Biscayne-Everglades Greenway (Seg 2) | Old Ingraham Hwy | SW 344 St (Palm Dr/ SR 9336) | Off-Road Bicycle and Pedestrian Facility Improvement | $2,887.695 |

**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| SMART Terminal Connector - SW 157 Ave | Black Creek Canal No. C-1W | SW 61 St | Protected On-Road Bicycle Facility and Pedestrian Improvements | $2,780.371 |
| SMART Terminal Connector - SW 80 St | Old Cutler Rd | US 1 (South Dixie Hwy/SR 5) | Protected On-Road Bicycle Facility and Pedestrian Improvements | $1,778.085 |
| SW 40 St (Bird Rd/SR 976) | SW 57 Ave (Red Rd/SR 959) | San Amaro Dr | Dedicated On-Road Bicycle Facility Improvement | $127.843 |
| SW 80 St | SW 57 Ave (Red Rd/SR 959) | US 1(South Dixie Hwy/SR 5) | Pedestrian Facility Enhancement or Expansion | $95.617 |
| SR 913 (Rickenbacker Causeway) | South Miami Ave | Crandon Blvd | Off-Road Bicycle and Pedestrian Facility Improvement | $95,444.583 |
| SW 96 St | SW 72 Ave (Milam Dairy Rd) | SW 57 Ave (Red Rd/SR 959) | Dedicated On-Road Bicycle Facility Improvement | $1,142.873 |
| SW 112 St (Killian Dr) | US 1 (Biscayne Blvd/SR 5) | SW 57 Ave (Red Rd/SR 959) | Dedicated On-Road Bicycle Facility Improvement | $1,689.821 |
| Cutler Drain Canal (C-100c) | US 1 (South Dixie Hwy/SR 5) | SW 148 St | Off-Road Bicycle and Pedestrian Facility Improvement | $565.602 |
| Cutler Drain Canal | US 1 (South Dixie Hwy/SR 5) | SW 77 Ave | Off-Road Bicycle and Pedestrian Facility Improvement | $841.734 |
| NE 164 St & Miami Dr | NE 15 Ave | South Glades Dr | Dedicated On-Road Bicycle Facility Improvement | $186.493 |
| SR 826 (Palmetto Expy)/ NE 167 St and NE 167 St | North Miami Ave | South Glades Dr | Dedicated On-Road Bicycle Facility Improvement | $1,415.883 |
| NE 20 Ave & NE 179 St and NE 22nd Ave | NE 167 St | NE 185 St | On-Road Bicycle Facility Improvement | $38.348 |
| North Michigan Ave | Dade Blvd | SR 907 (Alton Rd) | Off-Road Bicycle and Pedestrian Facility Improvement | $49.179 |
| SR 934 (Normandy Dr/ 71 St) | Rue Versailles | Rue Notre Dame | Protected On-Road Bicycle Facility Improvement | $169.661 |

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| West Ave | Dade Blvd | 20 St | Protected On-Road Bicycle Facility Improvement | $168.515 |
| Snake Creek Trail | West of SR 411/NW 2 Ave | East of SR 411/NW 2 Ave | Off-Road Bicycle and Pedestrian Facility Improvement | $7,540.000 |
| South Pointe Dr | Beachwalk | Ocean Dr | Protected On-Road Bicycle Facility Improvement | $93.460 |
| SR 856 (William Lehman Causeway) | US 1 (Biscayne Blvd/SR 5) | SR A1A (Collins Ave) | Off-Road Bicycle and Pedestrian Facility Improvement | $923.086 |
| NW 103 St | West 24 Ave | West 49 St (SR 932) | Pedestrian Facility Enhancement or Expansion | $61.777 |
| Blue Rd | SW 57 Ave (Red Rd/SR 959) | Ponce De Leon | Pedestrian Facility Enhancement or Expansion | $170.955 |
| Hialeah Expy | West 8 Ave | West 4 Ave | Pedestrian Facility Enhancement or Expansion | $57.301 |
| Hialeah Expy | West 10 Ave | West 8 Ave | Pedestrian Facility Enhancement or Expansion | $28.414 |
| Ali Baba Ave | NW 151 St | I-95 (SR 9) | Pedestrian Bridge/Overpass | $6,926.940 |
| North Greenway Dr | SR 972/SW 24 St | South Greenway Dr | Off-Road Bicycle and Pedestrian Facility Improvement | $435.125 |
| Galiano St | Ponce De Leon Blvd | Alhambra Circle | On-Road Bicycle Facility Improvement | $19.962 |
| South Greenway Dr | North Greenway Dr | SW 57 Ave (Red Rd/SR 959) | Dedicated On-Road Bicycle Facility Improvement | $151.141 |
| NE 190 St & NE 191 St & West Country Club Dr | US 1 (Biscayne Blvd/SR 5) | SR 856/William Lehman Causeway | Dedicated On-Road Bicycle Facility Improvement | $505.463 |
| SMART Terminal Connector - NW 12 St | NW 123 Ave | NW 87 Ave | Protected On-Road Bicycle Facility and Pedestrian Improvements | $2,854.396 |

**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| SMART Terminal Connector - NW 122 Ave and SW 14 St | SW 117 Ave | NW 12 St | Protected On-Road Bicycle Facility and Pedestrian Improvements | $1,969.784 |
| SW 90 St | US 1 (South Dixie Hwy/SR 5) | SW 86 Pl | Pedestrian Facility Enhancement or Expansion | $22.533 |
| SW 98 St | US 1 (South Dixie Hwy/SR 5) | SW 72 Ave (Milam Dairy Rd) | Pedestrian Facility Enhancement or Expansion | $41.316 |
| Griffing Blvd | NE 121 St | SR 916 (Opa-locka Blvd)/ NW 135 St | Bicycle Facility Improvement | $655.388 |
| SR A1A (Collins Ave) | West 41 St | 69 St | Protected On-Road Bicycle Facility Improvement | $2,428.638 |
| Royal Palm Ave | West 28 St | West 42 St | On-Road Bicycle Facility Improvement | $20.856 |
| Purdy Ave | Dade Blvd | 20 St | On-Road Bicycle Facility Improvement | $7.109 |
| 2 St | Beachwalk | SR 907 (Alton Rd) | Dedicated On-Road Bicycle Facility Improvement | $304.089 |
| Granada Blvd | Blue Rd | SW 40 St (Bird Rd/SR 976) | Pedestrian Facility Enhancement or Expansion | $59.163 |
| SW 40 St (Bird Rd/SR 976) | SW 117 Ave | SW 57 Ave (Red Rd/SR 959) | Dedicated On-Road Bicycle Facility Improvement | $4,225.689 |
| SMART Terminal Connector - SW 96 St and SW 96 St | SW 172 Ave | SR 825/SW 137 Ave | Protected On-Road Bicycle Facility and Pedestrian Improvements | $3,167.183 |
| SW 72 St (Sunset Dr) | SW 64 Ct | SW 70 Ave | Dedicated On-Road Bicycle Facility Improvement | $411.728 |
| NE 167 St | NE 20 Ave | NE 22 Ave | Dedicated On-Road Bicycle Facility Improvement | $173.583 |
| NW 67 Ave | SR 924 (Gratigny Pkwy) | SR 826 (Palmetto Expy) | Off-Road Bicycle and Pedestrian Facility Improvement | $653.314 |

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| Miami Lakes Dr/NW 154 St | SR 823/NW 57 Ave | NW 87 Ave | Off-Road Bicycle and Pedestrian Facility Improvement | $1,199.062 |
| NW 7 Ave (SR 7/ US 441) | NW 175 St | Miami Gardens Dr (SR 860/NW 183 St) | On-Road Bicycle Facility Improvement | $14.038 |
| Chase Ave | SR 907 (Alton Rd) | West 34 St | Off-Road Bicycle and Pedestrian Facility Improvement | $127.081 |
| Hi-Tide Rd | West 24 Ter | West 28 St | Off-Road Bicycle and Pedestrian Facility Improvement | $64.361 |
| Maurice Gibbs Memorial Park | Venetian Causeway | 18 St | Off-Road Bicycle and Pedestrian Facility Improvement | $49.904 |
| Hawthorne Ave | 77 St | 86 St | On-Road Bicycle Facility Improvement | $15.947 |
| West 42 St | Pine Tree Dr | Sheridan Ave | On-Road Bicycle Facility Improvement | $1.959 |
| NE 10 Ave | NE 82 St | NE 95 St | Pedestrian Facility Enhancement or Expansion | $100.790 |
| I-95 (SR 9) | NW 155 Dr | Southside of I-95 (SR 9) | Pedestrian Bridge/Overpass | $9,232.092 |
| Pisano Ave | Granada Blvd | Campo Sano Ave | Off-Road Bicycle and Pedestrian Facility Improvement | $86.102 |
| Granada Blvd | SW 72 St (Sunset Dr) | US 1 (South Dixie Hwy/SR 5) | Dedicated On-Road Bicycle Facility Improvement | $809.649 |
| Riviera Dr | South Dixie Hwy | Segovia St | Protected On-Road Bicycle Facility Improvement | $1,126.118 |
| Columbus Blvd | North Greenway Dr | SW 8 St (Tamiami Trail/SR 90/ US 41) | On-Road Bicycle Facility Improvement | $21.371 |
| University Dr | Pisano Ave | SW 40 St (Bird Rd/SR 976) | Dedicated On-Road Bicycle Facility Improvement | $563.074 |

**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| SMART Terminal Connector - NW 170 St | NW 97 Ave | NW 78 Ave | Protected On-Road Bicycle Facility and Pedestrian Improvements | $2,616.256 |
| SW 80 St | SW 57 Ave (Red Rd/SR 959) | US 1 (South Dixie Hwy/SR 5) | Pedestrian Facility Enhancement or Expansion | $72.807 |
| SW 62 Ave | SW 80 St | NW 78 St | Pedestrian Facility Enhancement or Expansion | $11.757 |
| SW 62 Ave | SW 80 St | SW 78 St | Pedestrian Facility Enhancement or Expansion | $11.039 |
| SR 916 (Opa-locka Blvd) | NW 17 Ave | SR 916 (Opa-locka Blvd)/ NW 135 St | Bicycle Facility Improvement | $1,075.988 |
| NW 79 Ct | NW 87 Ave | NW 154 St | Dedicated On-Road Bicycle Facility Improvement | $1,023.527 |
| NW 42 Ave (LeJeune Rd) | NW 178 Dr | NW 199 St/NE 203 St (Ives Dairy Rd) | Dedicated On-Road Bicycle Facility Improvement | $856.823 |
| Beachwalk | South Point Park | 3 St | Off-Road Bicycle and Pedestrian Facility Improvement | $200.643 |
| Pine Tree Dr | 24 Ter | West 26 St | Off-Road Bicycle and Pedestrian Facility Improvement | $54.044 |
| West 63 St | SR 907 (Alton Rd) | SR A1A (Collins Ave) | Protected On-Road Bicycle Facility Improvement | $373.161 |
| 69 St | North Shore Park | Indian Creek Dr | On-Road Bicycle Facility Improvement | $7.746 |
| SW 77 Ave | SW 104 St (Killian Pkwy) | SW 136 St (Howard Dr) | Dedicated On-Road Bicycle Facility Improvement | $1,411.864 |
| SW 22 Ave | US 1 (South Dixie Hwy/SR 5) | Coral Way (SR 972) | Dedicated On-Road Bicycle Facility Improvement | $364.590 |
| SW 117 Ave | SW 17 St | SW 8 St (Tamiami Trail/ SR 90/US 41) | Pedestrian Facility Enhancement or Expansion | $82.930 |

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| NW/NE 131 St | NW 22 Ave | NE 16 Ave | Off-Road Bicycle and Pedestrian Facility Improvement | $157.107 |
| SW 67 Ave | SW 72 St (Sunset Dr) | SW 67 St | Pedestrian Facility Enhancement or Expansion | $54.530 |
| SW 48 St | SW 117 Ave | SW 82 Ave | Dedicated On-Road Bicycle Facility Improvement | $2,461.328 |
| SW 137 Ave | SW 288 St | SR 821 (HEFT) | Dedicated On-Road Bicycle Facility Improvement | $488.573 |
| SW 32 Rd | Brickell Ave | Coral Way (SR 972) | Dedicated On-Road Bicycle Facility Improvement | $306.066 |
| Caribbean Blvd | US 1 (South Dixie Hwy/SR 5) | SR-821 (Florida's Turnpike) | Dedicated On-Road Bicycle Facility Improvement | $201.758 |
| County Club Prado (West) | San Marco Ave | Sevilla Ave | Protected On-Road Bicycle Facility Improvement | $1,083.784 |
| Cadiz Ave | Alhambra Circle | SW 57 Ave (Red Rd/SR 959) | Dedicated On-Road Bicycle Facility Improvement | $189.288 |
| Granada Blvd | SW 40 St (Bird Rd/SR 976) | Sevilla Ave | Dedicated On-Road Bicycle Facility Improvement | $522.767 |
| SW 40 St (Bird Rd/SR 976) | Granada Blvd | University Dr | Off-Road Bicycle and Pedestrian Facility Improvement | $35.276 |
| Country Club Prado (East) | San Marco Ave | SR 972/SW 24 St | Protected On-Road Bicycle Facility Improvement | $851.333 |
| De Soto Blvd | Anastasia Ave | Andalusia Ave | On-Road Bicycle Facility Improvement | $17.877 |
| SW 22 Ave | SW 22 Ter | SW 22 St | Dedicated On-Road Bicycle Facility Improvement | $42.008 |
| SW 62 Ave | Miller Dr (SW 56 St) | SW 50 St | Pedestrian Facility Enhancement or Expansion | $45.185 |

**TABLE 28** BICYCLE AND PEDESTRIAN PROJECTS

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| SW 62 Ave | Miller Dr (SW 56 St) | SW 50 St | Pedestrian Facility Enhancement or Expansion | $44.723 |
| SW 80 St | SW 63 Pl | SW 65 Ave | Pedestrian Facility Enhancement or Expansion | $18.164 |
| SR 997 (South Krome Ave) | SW 177 Ct | US 1 (South Dixie Hwy/SR 5) | Off-Road Bicycle and Pedestrian Facility Improvement | $164.406 |
| SW 132 St | US 1 (South Dixie Hwy/SR 5) | SW 34 Ave | Pedestrian Facility Enhancement or Expansion | $15.272 |
| SW 120 St | US 1 (South Dixie Hwy/SR 5) | SW 57 (Red Rd) | Dedicated On-Road Bicycle Facility Improvement | $1,856.404 |
| Princeton Trail | SR 997 (Krome Ave) | Moody Rd Eastern Terminus | Off-Road Bicycle and Pedestrian Facility Improvement | $17,577.394 |
| SR 826 (Palmetto Expy) | US 1 (South Dixie Hwy/SR 5) | Biscayne Bay Bridge | Bicycle Facility Improvement | $1,043.682 |
| NE 159 St | NE 8 Ave | NE 18 Ave | Dedicated On-Road Bicycle Facility Improvement | $879.397 |
| NE 19 Ave | SR 826 (Palmetto Expy)/ NE 163 St | Snake Creek Canal | Dedicated On-Road Bicycle Facility Improvement | $120.012 |
| NW 13 Ave | NW 135 Dr | NW 175 St | Dedicated On-Road Bicycle Facility Improvement | $798.771 |
| Allison Park | Beachwalk | SR A1A (Collins Ave) | Off-Road Bicycle and Pedestrian Facility Improvement | $25.581 |
| SR 907 (Alton Rd) | North Bay Rd | NW 34 St | Off-Road Bicycle and Pedestrian Facility Improvement | $22.353 |
| West 41 St | SR A1A (Indian Creek Dr) | Pine Tree Dr | Off-Road Bicycle and Pedestrian Facility Improvement | $57.965 |
| North Michigan Ave | SR 907 (Alton Rd) | West 47 St | On-Road Bicycle Facility Improvement | $18.206 |

| FACILITY | LIMITS FROM | LIMITS TO | DESCRIPTION | TOTAL PROJECT COSTS (MILLIONS 2018 $) |
|---|---|---|---|---|
| **UNFUNDED PROJECTS (CONTINUED)** | | | | |
| West 44 St | Pine Tree Dr | Chase Ave | On-Road Bicycle Facility Improvement | $7.515 |
| SW 128 St | SW 77 Ave | South Dixie Hwy | Dedicated On-Road Bicycle Facility Improvement | $503.367 |
| SW 124 St (Chapman Field Dr) | SW 77 Ave | South Dixie Hwy | Dedicated On-Road Bicycle Facility Improvement | $451.322 |
| SW 72 Ave (Milam Dairy Rd) | SW 4 St | West Flagler St (SR 968) | Dedicated On-Road Bicycle Facility Improvement | $176.043 |
| Tamiami Canal Rd | SW 8 St (Tamiami Trail/ SR 90/US 41) | West Flagler St (SR 968) | Dedicated On-Road Bicycle Facility Improvement | $463.745 |
| NW 36 St (SR 948/Doral Blvd) | East Dr | North Le Jeune Rd | Pedestrian Facility Enhancement or Expansion | $58.136 |
| NW 37 Ave | NW 71 St | NW 79 St | Pedestrian Facility Enhancement or Expansion | $62.260 |
| Hialeah Expy | NW 72 Ave (Milam Dairy Rd) | North Royal Poinciana Blvd | Pedestrian Facility Enhancement or Expansion | $58.721 |
| SW 72 St (Sunset Dr) | SW 72 Ave (Milam Dairy Rd) | SW 67 Ave | Pedestrian Facility Enhancement or Expansion | $64.110 |
| West 4 Ave | West 33 St | West 37 St | Pedestrian Facility Enhancement or Expansion | $24.994 |
| NE 2 Ave | NW 111 St | West Dixie Hwy (SR 909) | Pedestrian Facility Enhancement or Expansion | $58.654 |
| NE 12 Ave | NE 159 St | North Miami Beach Blvd (SR 826) | Pedestrian Facility Enhancement or Expansion | $28.580 |
| NE 16 Ave | NE 159 St | NE 163 St | Pedestrian Facility Enhancement or Expansion | $30.595 |
| NW 81 St | NW 37 Ave | NW 36 Ave | Pedestrian Facility Enhancement or Expansion | $11.887 |

# APPENDIX

# APPENDIX A

## GRADE SEPARATED CROSSING REQUIREMENTS

# GRADE SEPARATED CROSSINGS

## Implementation Conditions and Necessary Amenities

Grade-separated pedestrian crossings are typically implemented under one or more of the following conditions:

1. Limited access expressway with pedestrian/bicyclist crossing demand beyond a through cross street.
2. Active railway (typically multi-track) with pedestrian/bicyclist crossing demand and with a policy to reduce at-grade crossings (no new crossings without removal).
3. Rail tracks with frequent and/or high-speed train crossings or where trains frequently stop and block pedestrian/bicyclist crossings.
4. Undivided multilane highway with pedestrian/bicyclist crossing demand beyond a signalized intersection (midblock crossing).
5. Transit station or terminal with large volumes in pedestrian/bicyclist crossing demand.
6. Long pedestrian at-grade crossing distances.
7. Physical or natural barrier with pedestrian/bicyclist crossing demand.
8. Extremely high number of pedestrian/vehicle or bicyclist/vehicle conflicts or collisions are occurring or are anticipated to occur at the crossing location.
9. Turning and/or through vehicles operate with high speeds and/or with continuous (or near continuous) flow (resulting in insufficient crossing gaps).
10. Sight distance (vehicular and/or pedestrian/bicyclist) is inadequate.
11. Lack of an alternative nearby/adjacent (within 600 ft) and safe crossing.
12. School, college, university, hospital, medical center and/or park crossings exist or will be present, or high volumes of children or young adults cross or will cross.
13. High volumes of elderly/seniors, disabled or mobility-impaired individuals cross or will cross.
14. Locations near where periodic special events are held (e.g., theaters, arenas, stadiums, etc.) that result in high volumes of pedestrian crossings.
15. A crossing that has been determined to be a high-risk location for pedestrians and/or bicyclists.

16. A crossing that can be coordinated or integrated with an adjacent pedestrian and/or bicycle facility such as a shared use path, trail, greenway or walkway system making it multi-use/purpose.

Grade-separated pedestrian crossings when provided should take into consideration the following:

- Should completely remove or significantly discourage any at-grade pedestrian/bicycle crossings and conflicts (via pedestrian channelizing barriers and/or fencing with landscaping) at the location in question.
- Should maximize the range of potential users/user groups and travel markets by accommodating those of all ages and abilities, traveling at any and all times, to/from multiple locations, in different directions, utilizing multiple means of mobility, and traveling at different speeds.
- They and their access approaches should be as linear/straight and direct as possible (no or minimal out-of-direction travel to minimize perceived effort and travel time), along the most logical and intuitive route/path (aligned with natural desire lines and connecting infrastructure), connecting to logical termini, with minimal grade changes. Many pedestrians will not use overpasses or underpasses if they can cross at ground/street level in about the same amount of time, or if the grade-separated pedestrian crossing takes them significantly out of their way.
- To accommodate people with a variety of abilities/disabilities, ramps and/or elevators with sufficient travel speed and passenger capacity must be installed and adequately maintained.
- In tunnels and semi-enclosed overpasses, a feeling of openness (avoidance of dimensions or components that create the perception of being narrow, enclosed or confining) with adequate overhead protection, drainage (roof, floor and approach areas), visibility, lighting (well lit), ventilation (natural), and sight lines (long) for security should be designed and adequately maintained.
- Entrances and exits to overpasses and underpasses should be clearly visible from approaches and surrounding uses, and connect to separate and/or protected areas.
- Pedestrian bridges and tunnels should be integrated into the surrounding infrastructure such as

transit stations/terminals, parking garages, office buildings and/or retail shopping centers.

- Pedestrian bridges should maintain a relatively flat (not significantly arched with minimal longitudinal grades sufficient for roof and deck drainage) vertical alignment surface.
- Should provide safe and relatively smooth walking/riding surfaces with minimal lateral joints, no longitudinal joints, and no drainage inlets or utility covers.
- Approach grades should be minimized and should comply with all ADA requirements.
- Elevation changes should be minimized and/or worked into the normal path of pedestrian movement.
- Natural grades should be used to eliminate or reduce the need for or length of ramps.
- Should provide wayfinding and guide signs to alert and direct users to crossing access locations.
- Should provide regulatory signs to legally prohibit unwanted at-grade crossings.
- Should provide heavy-duty, durable, vandal-resistant and graffiti-resistant components and materials.
- Should interconnect residential areas, employment areas, healthcare facilities, educational facilities, recreational facilities, shopping/retail establishments, transit stations/terminals, shared use paths/trails/greenways, and a wide range of other land use types.

# APPENDIX B

## BICYCLE PARKING REQUIREMENTS AND AMENITIES

# BICYCLE PARKING AT TRANSIT FACILITIES

## Implementation and Necessary Amenities

A minimum number of designated signed Class I and Class II () bicycle parking spaces shall be provided within transit platforms in all transit facilities.

- Class I Bicycle Parking – Bike lockers or locked/ guarded storage areas that provide high-security protection
- Class II Bicycle Parking – Bicycle racks that secure both wheels and bicycle frame, which usually have moving parts and provide medium security

Class I bicycle parking on or near bus platforms and rail platforms shall be limited to bicycle enclosures only and as described in the subsequent section. Multiple Class I and II bicycle parking areas shall be provided at key locations within the transit facility.

Bicycle parking areas shall:

- be located near (within 50 feet) of transit hub building(s) entrances, bus transit terminal bays, intercity bus terminal bays, and rail station platform(s) or access,
- be placed in highly visible locations,
- be placed in a location that provides sufficient clear space to facilitate ease of use and that does not impede pedestrian traffic or disabled accessibility,
- have adequate lighting/illumination and security, and
- be fully covered, and the pavement/floor below bicycle parking areas shall be concrete slab-on-grade with a minimum thickness of six (6) inches and shall be designed in compliance with the 2017 Florida Building Code under Section 1820, for High-Velocity Hurricane Zones-Concrete Slabs on fill. The slab-on-grade shall have a minimum reinforcement equivalent to 0.03 square inches per linear foot of slab in each direction. All concrete shall be reinforced cast in place minimum of 4000 PSI compressive strength at 28 days and all reinforcing steel shall be grade 60, or approved equal.

Existing designated bicycle parking areas and facilities when present shall at a minimum be maintained during construction, at a minimum shall be permanently upgraded and/or modified to allow future addition and/or expansion, and shall ideally be permanently improved and expanded/enlarged. It is the Design, Build or Design-Build Firm's responsibility

to coordinate with transit agencies or other owning entities in order to determine if the existing or proposed site design requires relocation, modification, improvement, addition and/or expansion of existing bicycle facilities and associated infrastructure. Existing bicycle facilities shall not be taken out of service, relocated, modified or improved in any way without review and written approval from the owning transit agency or other owning entity and the Department. Space for future bicycle parking expansion shall be provided at all transit facilities.

### Bicycle Enclosures (Class I)

The Design, Build or Design-Build Firm shall provide a minimum of one (1) bicycle enclosure per bus platform (including public transit bus and intercity bus). Additional bicycle enclosure(s) shall also be provided at each rail/mover station platform based on anticipated demand. Bicycle enclosures shall be a manufactured "bicycle cage" with horizontal storage with inverted "U" type or "A" type (U-type with a crossbar) racks. Post and loop, ring, comb, grid, wave or toast type bicycle racks shall not be allowed.

Rack geometric characteristics and placement within bicycle enclosures shall be as described in the Bicycle Racks section of this document. The bicycle cage enclosure side panels shall be hot-dipped galvanized steel wire mesh, 80% open, with the color to be determined by the Department. The roof glazing shall be structural polycarbonate sheets, or approved equal and shall be partially translucent (approximately 20% translucent (clear or colored) by roof area). Exposed bicycle enclosure roofs shall have a final coating with high initial and maintained solar reflectance and high initial and maintained thermal emissivity. Each bicycle cage enclosure shall have interior lighting and interior and exterior CCTV coverage. Each bicycle cage enclosure shall be placed on a reinforced concrete pad as per the manufacture's specifications. The Design, Build or Design-Build Firm shall verify that the bicycle enclosure structure and reinforced concrete slab design meets or exceeds the Florida Building Code and has Miami-Dade County approval Notice of Acceptance (NOA). All concrete shall be reinforced cast in place minimum of 4000 PSI compressive strength at 28 days and all reinforcing steel shall be grade 60, or approved equal.

A total minimum of one (1) Class I bicycle parking space per every 150 total vehicle spaces for facilities with motor vehicle parking.

### Bicycle Racks (Class II)

Bicycle racks shall be placed in clusters at each bus, intercity bus and/or rail transit platform. The distribution of bicycle rack clusters shall be logical, functional and convenient for users. Bicycle racks shall be direct burial inverted "U" type or "A" type (U-type with a crossbar). Post and loop, ring, comb, grid, wave or toast type bicycle racks shall not be allowed. A total

minimum of one (1) bicycle rack per every 85 total vehicle spaces for facilities with motor vehicle parking or for facilities with no or limited motor vehicle parking shall be provided and dispersed proportionally to each proposed bus transit terminal platform (including public transit bus and intercity bus) based on anticipated demand. Additional bicycle racks shall be provided at each rail/mover station platform.

Inverted "U" or "A" bicycle racks shall have the following characteristics:

- The top of the rack shall extend thirty-six (36) inches above grade.
- The width of the rack shall be thirty (30) inches outside dimension.
- The rack tubing shall be embedded into a reinforced concrete footing at least ten (10) inches below grade. Reinforced concrete footing shall be six (6) inches square by twelve (12) inches deep. A twelve (12) inch long quarter (¼) inch diameter hot-dipped galvanized steel rod shall be provided at the base of each tube leg embedded into the concrete footing. All concrete shall be reinforced cast in place minimum of 4000 PSI compressive strength at 28 days and all reinforcing steel shall be grade 60, or approved equal.
- Inverted "U" or "A" type bicycle racks shall be stainless steel (grade 316) or zinc coated (hot-dipped galvanized steel) two (2) inch square, schedule 80, structural steel tubing.

The placement of bicycle racks shall be as follows:

- Racks aligned end-to-end shall be placed a minimum of sixty (60) inches apart.
- Racks aligned side-by-side shall be placed a minimum of forty-eight (48) inches apart.
- Racks located perpendicular to a curb shall be placed a minimum of thirty-six (36) inches from the back of curb.
- Racks located parallel to a curb shall be placed a minimum of thirty (30) inches from the back of curb.
- Racks located perpendicular to a wall shall be placed a minimum of thirty-six (36) inches from the wall.
- Racks located parallel to a wall shall be placed a minimum of thirty (30) inches from the wall.
- Racks shall be located a minimum of seventy-two (72) inches from infrastructure elements and other fixed objects such as: signs, light poles, utility poles, utility pull boxes, utility vaults, benches, bus canopy

support structures, telephones, trees, etc.

- Racks shall be installed a minimum of fifteen (15) feet from fire hydrants.

The placement of a heavy duty commercial-grade all-in-one surface-mounted ADA compliant bicycle repair service or "fixit" stations (bicycle stand and mount, tools, air pump, etc.) and vending machines (emergency bicycle repair parts and accessories) with essential bicycle-related items shall be provided in areas near bicycle parking (near enclosures and/or rack clusters). Freestanding floor-mounted heavy-duty exterior bi-level bicycle hydration stations with water fountain (non-refrigerated) and bottle filler shall also be provided in areas near bicycle parking (near enclosures and/or rack clusters). Selected products and finish options shall be approved by the agency which has jurisdiction of the transit facility.

PAGE LEFT BLANK INTENTIONALLY

# APPENDIX C

## TYPES OF TRANSPORTATION EQUITY

# Types of Transportation Equity

## A more extensive definition of the three (3) types

Horizontal Equity - Horizontal equity (also called fairness and egalitarianism) concerns the distribution of impacts between individuals and groups considered equal in ability and need. According to this definition, equal individuals and groups should be treated the same in the distribution of transportation resources/benefits and costs. It means that public policies, infrastructure and/or services should avoid favoring one individual or group over others, and that consumers should "get what they pay for and pay for what they get" from fees and taxes unless subsidies are specifically justified.

Horizontal equity requires that public resources be allocated equally to each individual or group unless a subsidy is specifically justified. Exactly what constitutes an equal share depends on which resources are considered and how they are measured. For example, comparisons can be made per household, per resident, per adult or per vehicle per geographic area.

Vertical Equity With Regard to Income and Social Class
Vertical equity (also called social justice, environmental justice and social inclusion) is concerned with the distribution of impacts between individuals and groups that differ (disparate impacts), in this case, by income or social class. By this definition, transportation policies, facilities and services are equitable if they favor economically and socially disadvantaged groups and protected classes in order to compensate for overall inequities. Policies, facilities and services are called progressive if they favor disadvantaged groups and regressive if they harm such groups. This definition supports affordable mode improvements and facilities (pedestrians, bicyclists, public transit), special services and discounts for lower income groups, and efforts to ensure that disadvantaged groups do not bear excessive external costs (pollution, accident risk, financial costs, etc.) (disproportionate burdens). Measures typically include income (low versus high), age (child/youth/student, elderly/senior), sex/gender (male, female) race/color/ethnicity, religion, family status, national origin, Limited English Proficiency (LEP), and car ownership (car-less).

Vertical Equity With Regard to Mobility Need and Ability/Disability
This is concerned with the distribution of impacts between individuals and groups that differ in mobility ability/disability and need, and therefore the degree to which the transportation system meets the needs of travelers with mobility impairments. This definition is used to support universal design (also called accessible and inclusive design), which means that transportation facilities and services accommodate all users, including those with special needs. Measures include disabled populations.

Vertical equity requires that disadvantaged people be identified and given special consideration in planning, and design to ensure that they are not made worse off, and that their needs are accommodated.
sit facility.

PAGE LEFT BLANK INTENTIONALLY

# APPENDIX D

## COST PER MILE ESTIMATES

# Cost Per Mile Estimates

## Shared Use Path

| PAY ITEM | DESCRIPTION | UNITS | UNIT COST | QUANTITY | TOTAL (ROUNDED TO NEAREST HUNDRED) |
|---|---|---|---|---|---|
| | **Roadway and Hardscape** | | | | |
| 110-1-1 | Clearing and Grubbing | AC | $13,299.74 | 1.94 | $25,793.44 |
| 160-4 | Type B Stabilization | SY | $0.38 | 7,040 | $2,675.20 |
| 285-701 | Optional Base, Base Group 01 | SY | $11.78 | 7,040 | $82,931.20 |
| 334-1-11 | Superpave Asphaltic Concrete, Traffic A | TN | $180.00 | 576 | $103,688.64 |
| 337-7-83 | Asphaltic Concrete Friction Course, Traffic C,FC-12.5, PG 76-22 | TN | $129.16 | - | $0.00 |
| 520-1-10 | Concrete Curb and Gutter, Type F | LF | $18.48 | - | $0.00 |
| 522-1 | Concrete Sidewalk 4" Thick | SY | $34.50 | - | $0.00 |
| 570-1-2 | Performance Turf, Sod | SY | $3.89 | 2,347 | $9,128.53 |
| | | | | TOTAL ROADWAY AND HARDSCAPE ITEMS | $224,217.01 |
| | **Signing & Pavement Markings** | | | | |
| 710-11-231 | Painted Pavement Marking, Standard, Yellow, Skip, 6" (3-9) | GM | $349.00 | 1.00 | $349.00 |
| 711-14-160 | Thermoplastic Preformed Bike Message | EA | $164.99 | - | $0.00 |
| 711-14-170 | Thermoplastic Preformed Bike Arrow | EA | $105.25 | - | $0.00 |
| 711-16-101 | Thermoplastic, Standard-Other, White, Solid, 6" | GM | $3,430.06 | - | $0.00 |
| | | | | TOTAL SIGNING AND PAVEMENT MARKINGS ITEMS | $349.00 |
| | | | | SUBTOTAL | $224,566.01 |
| | MOBILIZATION | | LS | 10% | $ 22,456.60 |
| | MOT | | LS | 10% | $ 22,456.60 |
| | DRAINAGE | | LS | 10% | $ 22,456.60 |
| | SIGNALIZATION | | LS | 10% | $ 22,456.60 |
| | DESIGN | | LS | 10% | $ 22,456.60 |
| | | | | TOTAL COST | $336,849.01 |

## Sidepath

| PAY ITEM | DESCRIPTION | UNITS | UNIT COST | QUANTITY | TOTAL (ROUNDED TO NEAREST HUNDRED) |
|---|---|---|---|---|---|
| | **Roadway and Hardscape** | | | | |
| 110-1-1 | Clearing and Grubbing | AC | $13,299.74 | 1.70 | $22,569.26 |
| 160-4 | Type B Stabilization | SY | $0.38 | 7,040 | $2,675.20 |
| 285-701 | Optional Base, Base Group 01 | SY | $11.78 | 7,040 | $82,931.20 |
| 334-1-11 | Superpave Asphaltic Concrete, Traffic A | TN | $180.00 | 574 | $103,403.52 |
| 337-7-83 | Asphaltic Concrete Friction Course, Traffic C,FC-12.5, PG 76-22 | TN | $129.16 | - | $0.00 |
| 520-1-10 | Concrete Curb and Gutter, Type F | LF | $18.48 | - | $0.00 |
| 522-1 | Concrete Sidewalk 4" Thick | SY | $34.50 | - | $0.00 |
| 570-1-2 | Performance Turf, Sod | SY | $3.89 | 1,173 | $4,564.27 |
| | | | | TOTAL ROADWAY AND HARDSCAPE ITEMS | $216,143.44 |
| | **Signing & Pavement Markings** | | | | |
| 710-11-231 | Painted Pavement Marking, Standard, Yellow, Skip, 6" (3-9) | GM | $349.00 | 1.00 | $349.00 |
| 711-14-160 | Thermoplastic Preformed Bike Message | EA | $164.99 | - | $0.00 |
| 711-14-170 | Thermoplastic Preformed Bike Arrow | EA | $105.25 | - | $0.00 |
| 711-16-101 | Thermoplastic, Standard-Other, White, Solid, 6" | GM | $3,430.06 | - | $0.00 |
| | | | | TOTAL SIGNING AND PAVEMENT MARKINGS ITEMS | $349.00 |
| | | | | SUBTOTAL | $216,492.44 |
| | MOBILIZATION | | LS | 10% | $ 21,649.24 |
| | MOT | | LS | 10% | $ 21,649.24 |
| | DRAINAGE | | LS | 10% | $ 21,649.24 |
| | SIGNALIZATION | | LS | 10% | $ 21,649.24 |
| | DESIGN | | LS | 10% | $ 21,649.24 |
| | | | | TOTAL COST | $324,738.66 |

# Cost Per Mile Estimates

## Protected Bike Lane

| PAY ITEM | DESCRIPTION | UNITS | UNIT COST | QUANTITY | TOTAL (ROUNDED TO NEAREST HUNDRED) |
|---|---|---|---|---|---|
| | **Roadway and Hardscape** | | | | |
| 110-1-1 | Clearing and Grubbing | AC | $13,299.74 | 2.18 | $29,017.61 |
| 160-4 | Type B Stabilization | SY | $0.38 | 8,213.33 | $3,121.07 |
| 285-701 | Optional Base, Base Group 01 | SY | $11.78 | 8,213.33 | $96,753.07 |
| 520-70 | Concrete Traffic Separator, SP - Var. Width | SY | $62.75 | 880.00 | $55,200.00 |
| 334-1-11 | Superpave Asphaltic Concrete, Traffic A | TN | $180.00 | 428.12 | $77,061.60 |
| 337-7-83 | Asphaltic Concrete Friction Course, Traffic C,FC-12.5, PG 76-22 | TN | $129.16 | 451.73 | $58,345.68 |
| 520-1-10 | Concrete Curb and Gutter, Type F | LF | $18.48 | 10,560.00 | $195,148.80 |
| 522-1 | Concrete Sidewalk 4" Thick | SY | $34.50 | 18.00 | $621.00 |
| 570-1-2 | Performance Turf, Sod | SY | $3.89 | - | $0.00 |
| | | | | **TOTAL ROADWAY AND HARDSCAPE ITEMS** | **$515,269.03** |
| | **Signing & Pavement Markings** | | | | |
| 710-11-231 | Painted Pavement Marking, Standard, Yellow, Skip, 6" (3-9) | GM | $349.00 | - | $0.00 |
| 711-14-160 | Thermoplastic Preformed Bike Message | EA | $164.99 | 108 | $17,800.00 |
| 711-14-170 | Thermoplastic Preformed Bike Arrow | EA | $105.25 | 108 | $11,400.00 |
| 711-16-101 | Thermoplastic, Standard-Other, White, Solid, 6" | GM | $3,430.06 | 4.80 | $16,500.00 |
| | | | | **TOTAL SIGNING AND PAVEMENT MARKINGS ITEMS** | **$45,700.00** |
| | | | | **SUBTOTAL** | **$560,969.03** |
| | MOBILIZATION | | LS | 10% | $ 56,096.90 |
| | MOT | | LS | 10% | $ 56,096.90 |
| | DRAINAGE | | LS | 10% | $ 56,096.90 |
| | SIGNALIZATION | | LS | 10% | $ 56,096.90 |
| | DESIGN | | LS | 10% | $ 56,096.90 |
| | | | | **TOTAL COST** | **$841,453.54** |

## Buffered Bike Lane

| PAY ITEM | DESCRIPTION | UNITS | UNIT COST | QUANTITY | TOTAL (ROUNDED TO NEAREST HUNDRED) |
|---|---|---|---|---|---|
| | **Roadway and Hardscape** | | | | |
| 110-1-1 | Clearing and Grubbing | AC | $13,299.74 | 2.18 | $29,017.61 |
| 160-4 | Type B Stabilization | SY | $0.38 | 8,213.33 | $3,121.07 |
| 285-701 | Optional Base, Base Group 01 | SY | $11.78 | 8,213.33 | $96,753.07 |
| 334-1-11 | Superpave Asphaltic Concrete, Traffic A | TN | $180.00 | 428.12 | $77,061.60 |
| 337-7-83 | Asphaltic Concrete Friction Course, Traffic C,FC-12.5, PG 76-22 | TN | $129.16 | 451.73 | $58,345.68 |
| 520-1-10 | Concrete Curb and Gutter, Type F | LF | $18.48 | 10,560.00 | $195,148.80 |
| 522-1 | Concrete Sidewalk 4" Thick | SY | $34.50 | 18.00 | $621.00 |
| 570-1-2 | Performance Turf, Sod | SY | $3.89 | - | $0.00 |
| | | | | **TOTAL ROADWAY AND HARDSCAPE ITEMS** | **$460,069.03** |
| | **Signing & Pavement Markings** | | | | |
| 710-11-231 | Painted Pavement Marking, Standard, Yellow, Skip, 6" (3-9) | GM | $349.00 | - | $0.00 |
| 711-14-160 | Thermoplastic Preformed Bike Message | EA | $164.99 | 108 | $17,800.00 |
| 711-14-170 | Thermoplastic Preformed Bike Arrow | EA | $105.25 | 108 | $11,400.00 |
| 711-16-101 | Thermoplastic, Standard-Other, White, Solid, 6" | GM | $3,430.06 | 4.80 | $16,500.00 |
| | | | | **TOTAL SIGNING AND PAVEMENT MARKINGS ITEMS** | **$45,700.00** |
| | | | | **SUBTOTAL** | **$505,769.03** |
| | MOBILIZATION | | LS | 10% | $ 50,576.90 |
| | MOT | | LS | 10% | $ 50,576.90 |
| | DRAINAGE | | LS | 10% | $ 50,576.90 |
| | SIGNALIZATION | | LS | 10% | $ 50,576.90 |
| | DESIGN | | LS | 10% | $ 50,576.90 |
| | | | | **TOTAL COST** | **$758,653.54** |

# Cost Per Mile Estimates

## Conventional Bike Lane

| PAY ITEM | DESCRIPTION | UNITS | UNIT COST | QUANTITY | TOTAL (ROUNDED TO NEAREST HUNDRED) |
|---|---|---|---|---|---|
| | **Roadway and Hardscape** | | | | |
| 110-1-1 | Clearing and Grubbing | AC | $13,299.74 | 1.70 | $22,589.26 |
| 160-4 | Type B Stabilization | SY | $0.38 | 5,867 | $2,229.33 |
| 285-701 | Optional Base, Base Group 01 | SY | $11.78 | 7,543 | $88,854.86 |
| 334-1-11 | Superpave Asphaltic Concrete, Traffic A | TN | $180.00 | 429 | $77,299.20 |
| 337-7-83 | Asphaltic Concrete Friction Course, Traffic C,FC-12.5, PG 76-22 | TN | $129.16 | 323 | $41,675.63 |
| 520-1-10 | Concrete Curb and Gutter, Type F | LF | $18.48 | 10,560 | $195,148.80 |
| 522-1 | Concrete Sidewalk 4" Thick | SY | $34.50 | 14 | $483.00 |
| 570-1-2 | Performance Turf, Sod | SY | $3.89 | - | $0.00 |
| | | | | **TOTAL ROADWAY AND HARDSCAPE ITEMS** | **$428,260.07** |
| | **Signing & Pavement Markings** | | | | |
| 710-11-231 | Painted Pavement Marking, Standard, Yellow, Skip, 6" (3-9) | GM | $349.00 | - | $0.00 |
| 711-14-160 | Thermoplastic Preformed Bike Message | EA | $164.99 | 108 | $17,800.00 |
| 711-14-170 | Thermoplastic Preformed Bike Arrow | EA | $105.25 | 108 | $11,400.00 |
| 711-16-101 | Thermoplastic, Standard-Other, White, Solid, 6" | GM | $3,430.06 | 2.00 | $6,900.00 |
| | | | | **TOTAL SIGNING AND PAVEMENT MARKINGS ITEMS** | **$36,100.00** |
| | | | | **SUBTOTAL** | **$464,360.07** |
| | MOBILIZATION | | LS | 10% | **$ 46,436.01** |
| | MOT | | LS | 10% | **$ 46,436.01** |
| | DRAINAGE | | LS | 10% | **$ 46,436.01** |
| | SIGNALIZATION | | LS | 10% | **$ 46,436.01** |
| | DESIGN | | LS | 10% | **$ 46,436.01** |
| | | | | **TOTAL COST** | **$696,540.11** |

## Mixed Traffic

| PAY ITEM | DESCRIPTION | UNITS | UNIT COST | QUANTITY | TOTAL (ROUNDED TO NEAREST HUNDRED) |
|---|---|---|---|---|---|
| | **Roadway and Hardscape** | | | | |
| 110-1-1 | Clearing and Grubbing | AC | $13,299.74 | - | $0.00 |
| 160-4 | Type B Stabilization | SY | $0.38 | - | $0.00 |
| 285-701 | Optional Base, Base Group 01 | SY | $11.78 | - | $0.00 |
| 334-1-11 | Superpave Asphaltic Concrete, Traffic A | TN | $180.00 | - | $0.00 |
| 337-7-83 | Asphaltic Concrete Friction Course, Traffic C,FC-12.5, PG 76-22 | TN | $129.16 | - | $0.00 |
| 520-1-10 | Concrete Curb and Gutter, Type F | LF | $18.48 | - | $0.00 |
| 522-1 | Concrete Sidewalk 4" Thick | SY | $34.50 | - | $0.00 |
| 570-1-2 | Performance Turf, Sod | SY | $3.89 | - | $0.00 |
| | | | | **TOTAL ROADWAY AND HARDSCAPE ITEMS** | **$0.00** |
| | **Signing & Pavement Markings** | | | | |
| 710-11-231 | Painted Pavement Marking, Standard, Yellow, Skip, 6" (3-9) | GM | $349.00 | - | $0.00 |
| 711-14-160 | Thermoplastic Preformed Bike Message | EA | $164.99 | 112 | $18,500.00 |
| 711-14-170 | Thermoplastic Preformed Bike Arrow | EA | $105.25 | - | $0.00 |
| 711-16-101 | Thermoplastic, Standard-Other, White, Solid, 6" | GM | $3,430.06 | - | $0.00 |
| | | | | **TOTAL SIGNING AND PAVEMENT MARKINGS ITEMS** | **$18,500.00** |
| | | | | **SUBTOTAL** | **$18,500.00** |
| | MOBILIZATION | | LS | 10% | **$ 1,850.00** |
| | MOT | | LS | 10% | **$ 1,850.00** |
| | DRAINAGE | | LS | 10% | **$ 1,850.00** |
| | SIGNALIZATION | | LS | 10% | **$ 1,850.00** |
| | DESIGN | | LS | 10% | **$ 1,850.00** |
| | | | | **TOTAL COST** | **$27,750.00** |

# Cost Per Mile Estimates

## 2 ft. Sidewalk Expansion

| PAY ITEM | DESCRIPTION | UNITS | UNIT COST | QUANTITY | TOTAL (ROUNDED TO NEAREST HUNDRED) |
|---|---|---|---|---|---|
| | **Roadway and Hardscape** | | | | |
| 110-1-1 | Clearing and Grubbing | AC | $13,299.74 | 0.48 | $6,446.36 |
| 160-4 | Type B Stabilization | SY | $0.38 | 2,347 | $891.73 |
| 285-701 | Optional Base, Base Group 01 | SY | $11.78 | - | $0.00 |
| 334-1-11 | Superpave Asphaltic Concrete, Traffic A | TN | $180.00 | - | $0.00 |
| 337-7-83 | Asphaltic Concrete Friction Course, Traffic C,FC-12.5, PG 76-22 | TN | $129.16 | - | $0.00 |
| 520-1-10 | Concrete Curb and Gutter, Type F | LF | $18.48 | - | $0.00 |
| 522-1 | Concrete Sidewalk 4" Thick | SY | $34.50 | 2,450 | $84,529.00 |
| 570-1-2 | Performance Turf, Sod | SY | $3.89 | - | $0.00 |
| | TOTAL ROADWAY AND HARDSCAPE ITEMS | | | | $91,869.09 |
| | **Signing & Pavement Markings** | | | | |
| 710-11-231 | Painted Pavement Marking, Standard, Yellow, Skip, 6" (3-9) | GM | $349.00 | - | $0.00 |
| 711-14-160 | Thermoplastic Preformed Bike Message | EA | $164.99 | - | $0.00 |
| 711-14-170 | Thermoplastic Preformed Bike Arrow | EA | $105.25 | - | $0.00 |
| 711-16-101 | Thermoplastic, Standard-Other, White, Solid, 6" | GM | $3,430.06 | - | $0.00 |
| | TOTAL SIGNING AND PAVEMENT MARKINGS ITEMS | | | | $0.00 |
| | SUBTOTAL | | | | $91,869.09 |
| | MOBILIZATION | | LS | 10% | $ 9,186.91 |
| | MOT | | LS | 10% | $ 9,186.91 |
| | DRAINAGE | | LS | 10% | $ 9,186.91 |
| | SIGNALIZATION | | LS | 10% | $ 9,186.91 |
| | DESIGN | | LS | 10% | $ 9,186.91 |
| | TOTAL COST | | | | $137,803.64 |

## 3 ft. Sidewalk Expansion

| PAY ITEM | DESCRIPTION | UNITS | UNIT COST | QUANTITY | TOTAL (ROUNDED TO NEAREST HUNDRED) |
|---|---|---|---|---|---|
| | **Roadway and Hardscape** | | | | |
| 110-1-1 | Clearing and Grubbing | AC | $13,299.74 | 0.73 | $9,672.54 |
| 160-4 | Type B Stabilization | SY | $0.38 | 3,520 | $1,337.60 |
| 285-701 | Optional Base, Base Group 01 | SY | $11.78 | - | $0.00 |
| 334-1-11 | Superpave Asphaltic Concrete, Traffic A | TN | $180.00 | - | $0.00 |
| 337-7-83 | Asphaltic Concrete Friction Course, Traffic C,FC-12.5, PG 76-22 | TN | $129.16 | - | $0.00 |
| 520-1-10 | Concrete Curb and Gutter, Type F | LF | $18.48 | - | $0.00 |
| 522-1 | Concrete Sidewalk 4" Thick | SY | $34.50 | 3,675 | $126,793.50 |
| 570-1-2 | Performance Turf, Sod | SY | $3.89 | - | $0.00 |
| | TOTAL ROADWAY AND HARDSCAPE ITEMS | | | | $137,803.64 |
| | **Signing & Pavement Markings** | | | | |
| 710-11-231 | Painted Pavement Marking, Standard, Yellow, Skip, 6" (3-9) | GM | $349.00 | - | $0.00 |
| 711-14-160 | Thermoplastic Preformed Bike Message | EA | $164.99 | - | $0.00 |
| 711-14-170 | Thermoplastic Preformed Bike Arrow | EA | $105.25 | - | $0.00 |
| 711-16-101 | Thermoplastic, Standard-Other, White, Solid, 6" | GM | $3,430.06 | - | $0.00 |
| | TOTAL SIGNING AND PAVEMENT MARKINGS ITEMS | | | | $0.00 |
| | SUBTOTAL | | | | $137,803.64 |
| | MOBILIZATION | | LS | 10% | $ 13,780.36 |
| | MOT | | LS | 10% | $ 13,780.36 |
| | DRAINAGE | | LS | 10% | $ 13,780.36 |
| | SIGNALIZATION | | LS | 10% | $ 13,780.36 |
| | DESIGN | | LS | 10% | $ 13,780.36 |
| | TOTAL COST | | | | $206,705.46 |

# Cost Per Mile Estimates

## Shared Use Path and Sidepath Lighting

| PAY ITEM | DESCRIPTION | UNITS | UNIT COST | QUANTITY | TOTAL (ROUNDED TO NEAREST HUNDRED) |
|---|---|---|---|---|---|
| | **Lighting** | | | | |
| 630-2-11 | Conduit, F&I, Open Trench | LF | $9.94 | 5,300 | $52,682.00 |
| 635-2-11 | Pull & Splice Box, F&I, 13" x 24" | EA | $658.80 | 158 | $104,090.40 |
| 715-1-12 | Lighting Conductors, F&I, Insul.,NO.6-6 | LF | $2.02 | 16,000 | $32,320.00 |
| 715-7-11 | Load Center, F&I, Secondary Voltage | EA | $13,433.67 | 1 | $13,433.67 |
| 715-500-1 | Pole Cable Distribution System, Conventional | EA | $814.13 | 156 | $127,004.28 |
| 715-516-115 | Light Pol Comp.,F&I, Pole Top Mnt, AL,15' | EA | $5,000.00 | 156 | $780,000.00 |
| | | | | **TOTAL LIGHTING ITEMS** | **$1,109,530.35** |

## Protected/Buffered/Conventional Bike Lane Lighting

| PAY ITEM | DESCRIPTION | UNITS | UNIT COST | QUANTITY | TOTAL (ROUNDED TO NEAREST HUNDRED) |
|---|---|---|---|---|---|
| | **Lighting** | | | | |
| 630-2-11 | Conduit, F&I, Open Trench | LF | $9.94 | 10,600 | $105,364.00 |
| 635-2-11 | Pull & Splice Box, F&I, 13" x 24" | EA | $658.80 | 290 | $191,052.00 |
| 715-1-12 | Lighting Conductors, F&I, Insul.,NO.6-6 | LF | $2.02 | 32,000 | $64,640.00 |
| 715-7-11 | Load Center, F&I, Secondary Voltage | EA | $13,433.67 | 2 | $26,867.34 |
| 715-500-1 | Pole Cable Distribution System, Conventional | EA | $814.13 | 286 | $232,841.18 |
| 715-516-115 | Light Pol Comp.,F&I, Pole Top Mnt, AL,15' | EA | $5,000.00 | 286 | $1,430,000.00 |
| | | | | **TOTAL LIGHTING ITEMS** | **$2,050,764.52** |

## Mixed Traffic Lighting

| PAY ITEM | DESCRIPTION | UNITS | UNIT COST | QUANTITY | TOTAL (ROUNDED TO NEAREST HUNDRED) |
|---|---|---|---|---|---|
| | **Lighting** | | | | |
| 630-2-11 | Conduit, F&I, Open Trench | LF | $9.94 | 10,600 | $105,364.00 |
| 635-2-11 | Pull & Splice Box, F&I, 13" x 24" | EA | $658.80 | 276 | $181,828.80 |
| 715-1-12 | Lighting Conductors, F&I, Insul.,NO.6-6 | LF | $2.02 | 32,000 | $64,640.00 |
| 715-7-11 | Load Center, F&I, Secondary Voltage | EA | $13,433.67 | 2 | $26,867.34 |
| 715-500-1 | Pole Cable Distribution System, Conventional | EA | $814.13 | 272 | $221,443.36 |
| 715-516-115 | Light Pol Comp.,F&I, Pole Top Mnt, AL,15' | EA | $5,000.00 | 272 | $1,360,000.00 |
| | | | | **TOTAL LIGHTING ITEMS** | **$1,960,143.50** |

## TRANSPORTATION PLANNING ORGANIZATION

Learn More by Visiting:
www.miamidadetpo.org/