MIAMI-DADE TPO **PROTECTED BIKE LANES** DEMONSTRATION PLAN

FINAL REPORT

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TPO Miami-Dade Transportation Planning Organization

MARLIN

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MIAMI-DADE TPO **PROTECTED BIKE LANES** DEMONSTRATION PLAN

This visualization depicts the pedestrian promenade located underneath the Miami-Dade Metrorail near Government Center. By widening the path by approximately 3 feet, there is an opportunity to delineate the travel way to better accommodate bicyclists and pedestrians. See Segment 10 on page 41 for more information about this segment.

This visualization depicts the proposed protected bike lane demonstration project located on SW 211 Street from US-1 to the Turnpike. Existing right-of-way along this segment supports a protected bike lane without significant modifications to the roadway. See Segment 1 on pages 38, 56 and 76-82 for more information.

CONTENTS

FIGURES

TABLES

SEGMENTS

1 INTRODUCTION

As Miami-Dade County continues to urbanize, residents, local government and businesses are seeking innovative solutions to increase multi-modal connectivity and accessibility across the region. According to the U.S. Census, the Miami metro area currently stands as the 8th most populous region in the United States. In addition, Census data indicates that Miami-Dade's population since 2010 has risen 7.8%. Today, Miami-Dade County endures some of the longest commute times in the United States. Data from the U.S. Census shows that the average travel time to work in Miami-Dade County is 29.9 minutes compared to the national average which is 25.9 minutes.

While South Florida hosts the advantages of flat terrain and year-round warm weather, Miami-Dade County remains below the national average in regard to bicycle commuting and safety. There is a significant portion of the Miami-Dade population that does not view traditional on-road bike lane infrastructure as a safe and viable commuting option. While conventional bike lanes have played a role in encouraging use and improving bicycle connectivity in Miami-Dade County, the challenge in this approach has been a lack in safety measures that would be attractive to a larger bicycle riding population.

Miami-Dade County now supports Complete Streets and Vision Zero programs. The county is on a mission to plan, design and construct transportation infrastructure that elevates safety for all commuting modes, including bicycling, walking and transit. Miami-Dade still lags behind the national averages regarding bicycle and transit ridership however, census data shows that the county is experiencing growth in bicycle commuting. By balancing increased connectivity with appropriate safety measures, there is a significant opportunity to facilitate an increase in Miami-Dade's bicycle ridership, particularly in commuting to work, school and other daily destinations. An endeavor that could serve as a critical link between Miami-Dade's transit and off-road bicycle facilities could be improving the county's on-road bicycle facilities. A recent trend across the nation to improve on-road bicycle infrastructure has been the installation of Protected Bike Lanes (PBLs).

While PBLs are new to the state of Florida, they have proven in other states to be a viable solution for increasing bicycle ridership and safety. This plan is intended to present PBLs as a transportation solution for Miami-Dade County to consider for fast-track implementation in two recommended locations. This plan will demonstrate PBLs as a suitable multi-modal transportation alternative for further planning, design and construction.

Figure 1: Indianapolis Trail; Image Courtesy of VisitIndy.com

PROJECT PURPOSE

The purpose of this plan is to coordinate and develop a Protected Bike Lanes Demonstration Plan for Miami-Dade County. This plan will provide Miami-Dade County with two PBL concept designs geared toward fast-track demonstration project implementation. This plan's focus was to identify demonstration-friendly segments that possess most of 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, existing on-street parking, existing bike facilities, connectivity to numerous destinations among other unique factors.

Figure 2: Chicago, Illinois; Image courtesy of Chicaocompletestreets.org

GOALS & OBJECTIVES

GOAL 1 – Identify potential roadway segments for Miami-Dade County and partnering municipalities to consider for PBL suitability

Objective: Research identified locations for first-mile/last-mile connections to transit, employment, education, the incoming SMART Plan, and other major destinations

Objective: Establish PBL feasibility criteria to rank the identified segments based on best practice information obtained from PBL projects across the nation

GOAL 2 – Develop design concepts for two demonstration projects

Objective: Research and document best practices and available data to determine design feasibility for a short-term demonstration project

Objective: Develop demonstration project concepts with visualizations and typical sections

GOAL 3 – Provide a plan and recommendations for future PBL implementation

Objective: Provide pre-and-post evaluation plan for PBL demonstration projects

Objective: Display data and information that shows future connectivity and improved safety opportunities to be incorporated in future planning efforts

2 BACKGROUND INFORMATION

WHAT IS A PROTECTED BIKE LANE?

Protected Bike Lanes (PBLs), also known as Separated Bike Lanes or Cycle Tracks differ from traditional bike lanes. According to the NACTO Urban Bikeway Design Guide, *"a cycle track (protected bike lane) is an exclusive bike facility that combines the user experience of separated path with on-street infrastructure of a conventional bike lane. A cycle track is physically separated from motor traffic and distant from the sidewalk."*[1] There currently are no Florida design standards for PBLs, but there are common guidelines used in cities across the United States (see pages 13-15). All PBLs include a physical, vertical separation that delineates the space between the automobile and the bicycle. These physical separators can range from plastic delineators to on-street parking to decorative planters to a fully constructed raised curb with landscaping and other aesthetic features. Most PBLs lie on-street, however some modified versions of PBLs can include raised bike lanes and or travel ways that fit closer as pedestrian malls or linear parks that provide separated space for bicyclists, vehicles and pedestrians. While the context of the surrounding environment may vary, the necessary design element for a PBL is the need for a physical separation between the bicyclist and the motorized vehicle to provide enhanced safety.

This plan breaks down the wide range of PBL types depending upon materials, design complexity and cost. In this plan, PBL types will be sorted into three general infrastructure categories: *light, medium*, and *heavy*. Figures 3, 4 and 5 display a simplified explanation of the three PBL types. This plan will focus on PBLs that can be placed on-street and seeks to implement PBLs that require minimal modification of the existing roadway. Emphasis will be focused on PBLs that require light to medium infrastructure devices.

PROTECTED BIKE LANE INFRASTRUCTURE

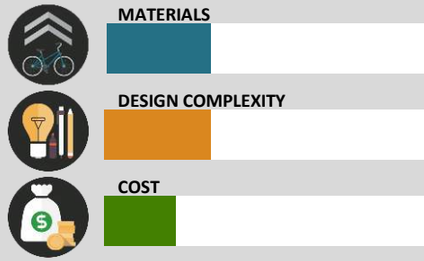


Figure 3: Image courtesy of Bike Portland

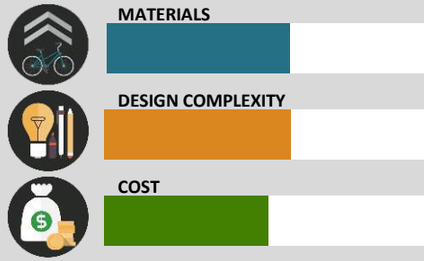


Figure 4: Image courtesy of Portland State University

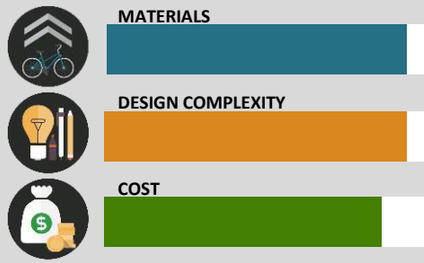


Figure 5: Image courtesy of Travelingmom.com

WHY PROTECTED BIKE LANES?

Improved Mobility

Local data has shown an increase in bicycle commuting over the past decade. See Figure 6 for Census data displaying Miami-Dade's rise in bicycle commuting. In the past decade, Miami-Dade rose from just over 3,000 to over 7,000 commuters on bicycle. Data however also shows an imbalance between male and female bicycle commuters with females accounting for only 25% of total ridership. PBLs may help attract more female riders. PBLs have been shown to successfully fill first-mile/last-mile gaps for bicycle trips connecting to transit and daily destinations. This plan is intended to identify suitable locations for PBL infrastructure that will facilitate increased bicycle ridership in Miami-Dade.

As stated by NACTO, *"By separating bicyclists from motor traffic; cycle tracks can offer a higher level of security than bike lanes and are attractive to a wider spectrum of the public."* Figure 7 displays the 4 Types of Bicycle Riders, a demographic concept introduced by the Portland Office of Transportation. Generally, less than 1% of the population choose to ride with or without infrastructure. These riders, known as "Strong and Fearless", can ride comfortably without the aid of bicycle infrastructure. The next group "Enthusiastic and Confident", accounts for 7% of the population. This group rides where bicycle infrastructure exists such as bike lanes, shared use paths and trails, however this type of rider may think twice about riding on a facility where the perception of safety is low. The next group, "Interested but Concerned" makes up 60% of the population and serves as the "Big Picture" opportunity PBLs can tap into. With a large group of Interested but Concerned riders considering bicycle commuting in Miami-Dade, PBLs can serve as a mechanism to improve Miami-Dade's mobility options.

Figure 6: Data source, American Community Survey

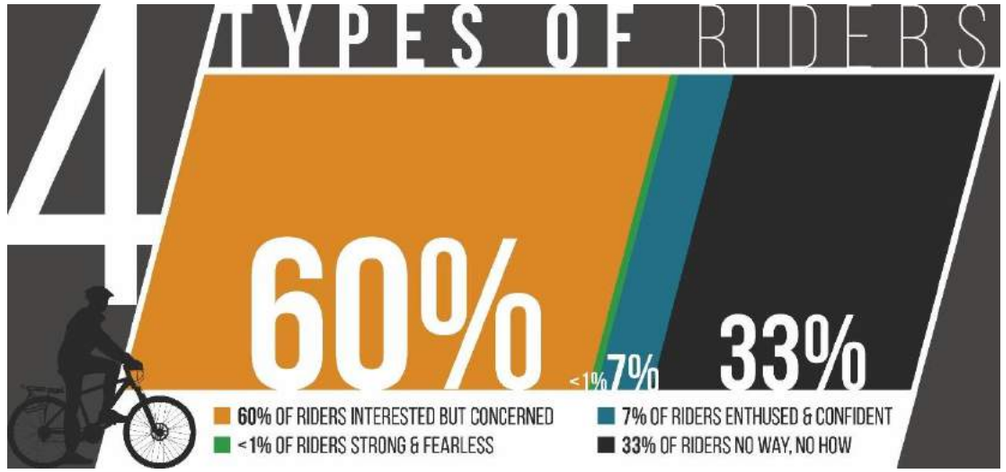


Figure 7: Data source, Portland Office of Transportation

The last group, "No Way, No How" does not care what infrastructure exists, they will choose not to ride.

Enhanced Safety: There is a current debate concerning PBLs as their still remains a broad range of interpretations regarding what "protective" devices constitute as *true protection*. However, studies have shown that streets with PBLs experience 28% fewer injuries per mile than comparable streets with no bike infrastructure.[2] One of the most common elements for successful demonstration projects is the utilization of on-street parking as the protective device. The goal of this plan will pursue on-street parking as a PBL device when feasible.

Improved Health and Quality of Life: There are numerous national initiatives further promoting and studying active transportation as a positive contributor to quality of life. A study of New York City revealed that "every $1,300 invested in building bike lanes in 2015 provided benefits equivalent to one additional year of life for all city residents".[3]

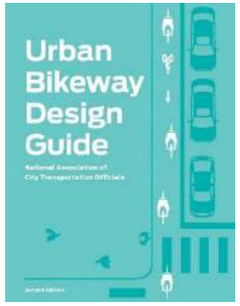
Economic Vitality: The *Protected Bike Lanes Mean Business* report notes that PBLs promote economic growth in several common ways, including a boost in real estate values, attracting talented workers, making workers healthier, and increasing retail visibility.[4] Facilitating movement to and from urban centers can be better accommodated by building improved multi-modal infrastructure such as PBLs and can help stimulate further investments into public spaces and commercial districts. Stakeholders such as local government, developers, and the community should work together to consider multi-modal improvements that can help stimulate the local economy. Through sustainable development practices such as Transit Oriented Development, New Urbanism, Smart Growth, LEED Neighborhood Development, and Complete Streets, cities are reinventing themselves to accommodate a new generation of health-conscious and environmentally informed home buyers and consumers.

Cleaner Environment: South Florida faces a multitude of environmental challenges such as habitat fragmentation, air and water quality, and impending sea level rise. The Miami-Dade County Commission has made various environmental commitments, including a reduction of greenhouse gas emissions to 80% of 2008 levels by 2050. Incorporation of improved bicycle facilities can provide mobility options that support initiatives intended to improve the environment such as Miami-Dade GreenPrint. GreenPrint defines three types of emission impacts: Emissions Reductions, Emissions Offsets, and Emissions Avoided. Implementation of bicycle infrastructure that takes vehicular trips off the roads could be categorized as Emissions Avoided.[5]

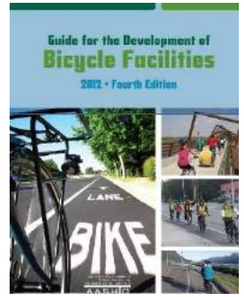
NATIONAL POLICY & DESIGN INITIATIVES

PBLs have existed longer than there has been official guidance on how to design them. Between 2011 and 2016, the number of PBLs in the U.S. quadrupled. Since this uptick in the popularity of PBLs, national agencies and organizations have followed suit by providing guidance on the planning and design of these kinds of facilities.

In the last 5 years, there has been development or updates to design guides by The National Association of City Transportation Officials (NACTO), American Association of State Highway and Transportation Officials (AASHTO), and The Federal Highway Administration (FHWA) that include PBLs (or cycle tracks) as a regular design option. The design team for this plan referred to these documents before and during the design process of the typical sections and conceptual designs. A common theme across all of these guides is that they function as a toolbox rather than a prescribed set of standards. There are a multitude of roadway configurations and constraints to consider in the design of a bike facility and these national guidelines provide options for navigating challenges and maximizing opportunities when implementing protected facilities. This plan recommends any entity that is interested in installing PBLs, will first familiarize themselves with the following guides:

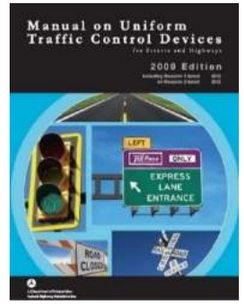


NACTO Urban Bikeway Design Guide as well as the **Urban Street Design Guide** discuss protected bike lanes, cycle tracks, and separated bike lanes and provide guidance on how to seamlessly incorporate these treatments into street design.



AASHTO Guide for Development of Bicycle Facilities covers topics from transportation and bicycle master planning to bike facility design and wayfinding. While it favors a wide range of design considerations, including bike signals and other intersection treatments, the current edition does not include separated or protected bike facilities. The next version however, planned for release in 2018, will provide guidance on protected bike lanes.[6]

FHWA Separated Bike Lane Planning and Design Guide provides guidance for planning and designing separated bike facilities. Rather than set standards, the guide provides a menu of recommendations. The design team referred to this study during the design process and generally followed the four-step process outlined in Chapter 5 of this guide.



The Manual on Uniform Traffic Control Devices (MUTCD), an FHWA publication, provides options for signing, signals and pavement markings that can accompany bike facilities. This guide is constantly being updated and includes the latest approved treatments.

Pedestrian and Bicycle Information Center

Supported by FHWA and the National Highway Traffic Safety Administration (NHTSA), the PBIC provides a wide range of policy and design technical assistance on their website, www.pedbikeinfo.org. Numerous links provide the latest information in regard to best practices and case study examples for various facilities and initiatives.

People for Bikes is behind nationwide initiatives such as the Green Lane Project and the Big Jump Project, which are intended to serve as a catalyst for communities to significantly improve bicycle infrastructure. The Green Lane Project was a five-year mission to accelerate the spread of PBLs across the nation. During that time, the number of protected facilities in the U.S. quadrupled. People for Bikes has strategic partnerships with local advocacy organizations to advance bicycling across the country for all users and supports a variety of programs including Safe Routes to School and the League of American Bicyclists. [7]

The League of American Bicyclists

The League is the nation's oldest and most influential bicycle advocacy not-for-profit organization. Initiatives such as their Bicycle Friendly America program which designates cities, businesses, and universities as Bicycle Friendly evaluates applicants based on existing and planned infrastructure and policies. A common recommendation for entities to elevate scoring is to provide a stronger bicycle network which includes the use of PBLs.

CASE STUDIES

The following cities were used as case studies to observe best practices and lessons learned. Some cities are well on their way to implementing a comprehensive network of PBLs and separated bike lanes, while some cities are still in the early phases on implementing the first PBLs on their streets. This plan researched the built environment of cities at various stages of implementation. It is important to understand the potential challenges and opportunities that come with the introduction of this new type of infrastructure to Miami-Dade. In summary, these case studies show PBLs being constructed in various cities across the United States no matter the terrain, weather conditions or population size.

NEW YORK CITY, NEW YORK

New York City is the largest city in the mid-Atlantic region and the United States. NYC has generally flat terrain and rainfall similar to the Miami-Dade area. The percent of bicycle commuters according to 2008-2012 US Census Journey to Work statistics is 0.8 % and the city currently has 0.7 miles of completed protected bike lane miles, eight miles in progress, and 22.5 miles in development.[8] Protected lanes in NYC vary in levels of infrastructure from light to heavy.

Figure 8 displays a heavy infrastructure type PBL complete with a longitudinal concrete planters, landscaping and signage features.

Figure 8: New York City, New York; Image courtesy of www.cityclock.org

PORTLAND, OREGON

Portland is a medium sized city with undulating terrain that deals with significant rainfall year-round. According to the Portland Bureau of Transportation, the percent of bicycle commuters in the city is 7.2%[9]. Portland has six cycle tracks and 17 buffered bike lanes, totaling 17 miles of separated bike facilities.

In 2015, Portland became the first city in the US to make protected bike lanes a requirement for all new construction projects on city-managed streets with an AADT of 3,000 or greater.[10]

Figure 9 displays a PBL with medium type infrastructure utilizing paint, delineators and potted planters as protective devices.

Figure 9: Portland, Oregon; Image courtesy of Portland State University

WASHINGTON D.C.

Washington D.C. is part of the Mid-Atlantic metropolis that stretches north all the way to Boston. Terrain is slightly hilly with summers that bring heat similar to Miami-Dade. The percent of bicycle commuters according to the latest Census statistics is 3.1 %.[11]

According to the District Department of Transportation, Washington D.C. has 6 miles of cycle tracks, with several miles planned for study and construction in 2017.[12] Washington D.C. is home to the largest public bike share in the U.S., Capital Bikeshare.

Figure 10 displays a two-way cycle track with medium type infrastructure utilizing paint, delineators and parking stops as protective devices.

Figure 10: Washington D.C.; Image courtesy of Marlin Engineering Inc.

AUSTIN, TEXAS

Austin is a medium sized city located in the southern portion of the country, has hilly terrain with high heat and minimal rain fall. The percent of bicycle commuters according to the latest Census statistics is 1.5 %.

According to People For Bikes Green Lane Project, Austin has 7.46 miles of protected bike lanes. Since 2009, the city has grown its bicycle network by 70%, from 126 miles to 210 miles[13]

Figure 11 displays a heavy infrastructure PBL. The facility incorporates numerous amenities such as bike parking, a bus shelter, and a curbed island serving as protection and a ramp to aid boarding bus passengers.

Figure 11: Austin, Texas; Image courtesy of Pinterest.com

BOSTON, MASSACHUSETTS

Boston is located on the north end of the northeastern metropolis. The percent of bicycle commuters according to the latest Census statistics is 1.7 %. Boston's Bike Network Plan proposes 59 miles of protected bike facilities by the year 2030.[14]

Boston is relatively new at implementing PBLs, having only started installing conventional bike infrastructure in 2008. However, the city more than doubled its miles of bike facilities between 2008 and 2013. The first PBL was introduced in 2016 with future PBLs planned in the near future.

Figure 12 displays a light type infrastructure PBL in Boston utilizing paint and delineators as the vertical separating device.

Figure 12: Boston, Massachusetts; Image courtesy of Marlin Engineering Inc.

TAMPA, FLORIDA

Tampa is a medium sized city with flat terrain with temperatures and rainfall similar to the Miami-Dade area. The percent of bicycle commuters according to the latest Census statistics is 1.4 %. PBLs compliment the local and regional transit system.

Tampa is the location of some of the first physically separated bike facilities in Florida. The city installed a cycle track in 2016 and FDOT's first physically separated bike lane will be constructed in downtown in 2017.[15]

Figure 13 displays a heavy infrastructure type PBL utilizing a curbed separator as the vertical protective device.

Figure 13: Tampa, Florida; Image courtesy of Tampa By Bike

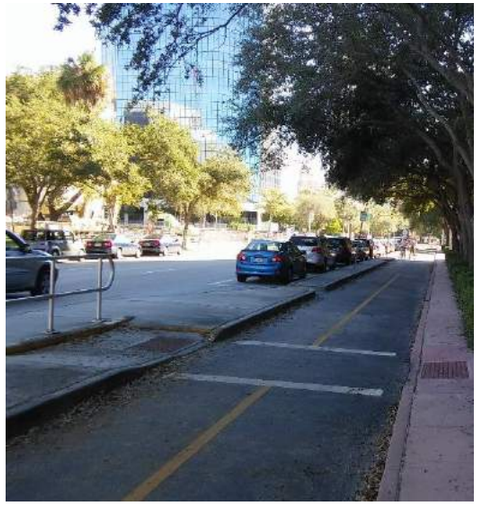


Figure 14: Image courtesy of Florida Department of Transportation

FLORIDA AND LOCAL POLICY AND DESIGN INITIATIVES

Florida Department of Transportation (FDOT): Complete Streets

Florida leads the nation as one of the most dangerous states to bicycle in the country. FDOT is in the process of significantly updating its design standards on roadways to increase safety for non-motorized users. Complete Streets is the concept which stipulates that public right-of-way should serve all modes of travel including transit, biking and walking. FDOT is currently developing a Complete Streets Handbook, also revamping its Plans Preparation Manual to become the new FDOT Design Manual. These two guidance documents should provide design guidelines and standards that allow for context-sensitive design on FDOT roads.

Miami-Dade Neat Streets

Miami-Dade County's Neat Streets Miami initiative is participating in the United States Department of Transportation Mayor's Challenge for creating Safer People, Safer Streets program. As part of this initiative, county staff formed a Local Action Team with a vision to "provide a more livable Miami-Dade through the realization of healthier, safer streets accommodating all modes of transportation." One goal of the LAT plan is to develop Complete Streets guidelines. In 2016, the Miami-Dade County Board of County Commissioners unanimously passed a resolution to adopt the Complete Streets concept, a factor in reducing roadway accidents involving pedestrians, cyclists and motorists. Miami-Dade County finalized its Complete Streets Design Guidelines in 2017. The Complete Streets manual seeks to provide Miami-Dade County and municipalities with design and policy guidance.

Strategic Miami Area Rapid Transit (SMART) Plan

The Miami-Dade Transportation Planning Organization introduced the SMART Plan In 2015. The initiative is aimed at building the metropolitan area's rapid transit network that stretches to all corners of the county. In addition to the incoming transit corridors, the surrounding land use will also be planned to redevelop into more transit-friendly densities and building forms. Considering that the SMART plan will be aided by first-mile/last-mile connections, as part of this plan, segments that touch upon the incoming SMART Plan will be given priority for demo-project implementation. Figure 16 shows the six major rapid transit SMART corridors including the Beach Corridor, NE Corridor, North Corridor, East-West Corridor, Kendall Corridor, and South Dade Transitway.

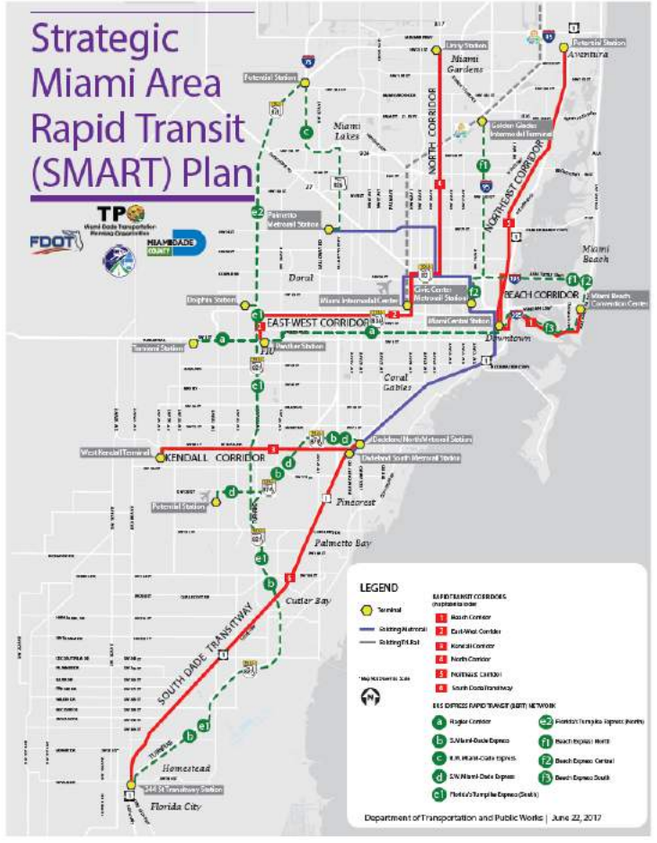


Figure 15: SMART Plan map, Miami-Dade TPO

Downtown Miami Pedestrian Priority Zone

Figure 16: Image courtesy of Downtown Miami Pedestrian Priority Zone study

In 2014, the Miami City Commission with support by the Miami Downtown Development Authority (DDA) and other stakeholders established the Pedestrian Priority Zone for the DDA area. The Miami city code of ordinances was updated to incorporate the following requirements for the Pedestrian Priority Zone:

1. Create a clear pedestrian path
2. Align curb ramps with sidewalks
3. Require crosswalks at all intersections
4. Provide automatic countdown timers with more crossing time
5. Reduce drive lane widths
6. Extend the sidewalk at all intersections
7. Enhance mid-block lighting
8. Provide shade at sidewalks
9. Designate 25MPH speed limit
10. Prohibit right turns on red

An example of this initiative is the Flagler Street reconstruction project currently underway. By 2018, Flagler Street from Miami Avenue to Biscayne Boulevard will reduce car lanes by two and double sidewalk widths on both sides of the street[21]. The increased pedestrian space will improve mobility for non-motorized users and activate the environment with other features such as sidewalk dining, parklets and community programming such as events, fairs and more.

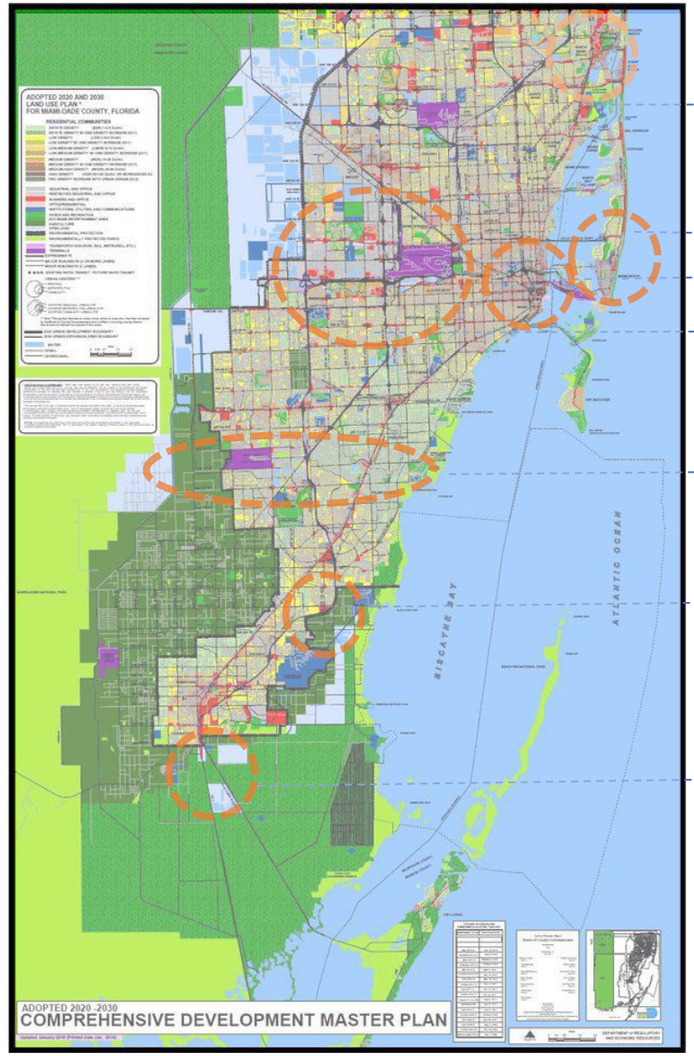
Figure 17: Image courtesy of Downtown Miami Pedestrian Priority Zone study

MIAMI-DADE COUNTY EXISTING CONDITIONS

The following maps display the existing land uses, population densities, employment areas, traffic data, transit, and bicycle facilities throughout Miami-Dade that aided in generating a list of segments to consider for PBLs. All segments that were to be identified were analyzed through the following layers of data.

2016 COMPREHENSIVE MASTER PLAN

Figure 19 displays Miami-Dade County's 2016 Comprehensive Development Master Plan. The Team researched areas that supported an array of land uses including medium to high density residential, commercial, park space, mixed-use zoning, and transportation connectivity. With commuter-friendly PBLs routes as the scope of this plan, Downtown Miami and Miami Beach represent two areas that support high levels of mixed land uses which are conducive to higher levels of multi-modal infrastructure. US-1 is a corridor that extends along the entire county and hosts a number of land uses, transit lines, employment hubs, universities, and connections to existing greenways including the East Coast Greenway which includes segments of the M-Path shared use path (future Underline), and South Dade Transitway.



Areas supporting mixed – use development

- *Aventura Area*
- *Miami Beach Area*
- *Miami Area*
- *Doral Area*
- *Kendall Corridor*
- *Cutler Bay Area*
- *Homestead Area*

Figure 18: Miami Dade County

POPULATION

The 2016 U.S. Census population estimate for Miami-Dade County was 2.7 million people, and the latest population density estimates about 1,300 people per square mile[22]. Following a polycentric make-up, much of the county is comprised of low density sprawl with clusters of density appearing at areas considered urban centers.

Major urban centers include downtown Miami, Brickell, Edgewater, Aventura, Miami Beach, Coral Gables, Hialeah, Downtown Doral, Dadeland, Cutler Bay Town center, downtown Homestead, among others.

Figure 19: Ludlam Trail Image courtesy of Friends of Ludlam Trail

Figure 7: Omni District; Image courtesy of RealMiamiCommercialRealestate.com

Figure 21: Downtown Dadeland; Image courtesy of Dienerproperties.com

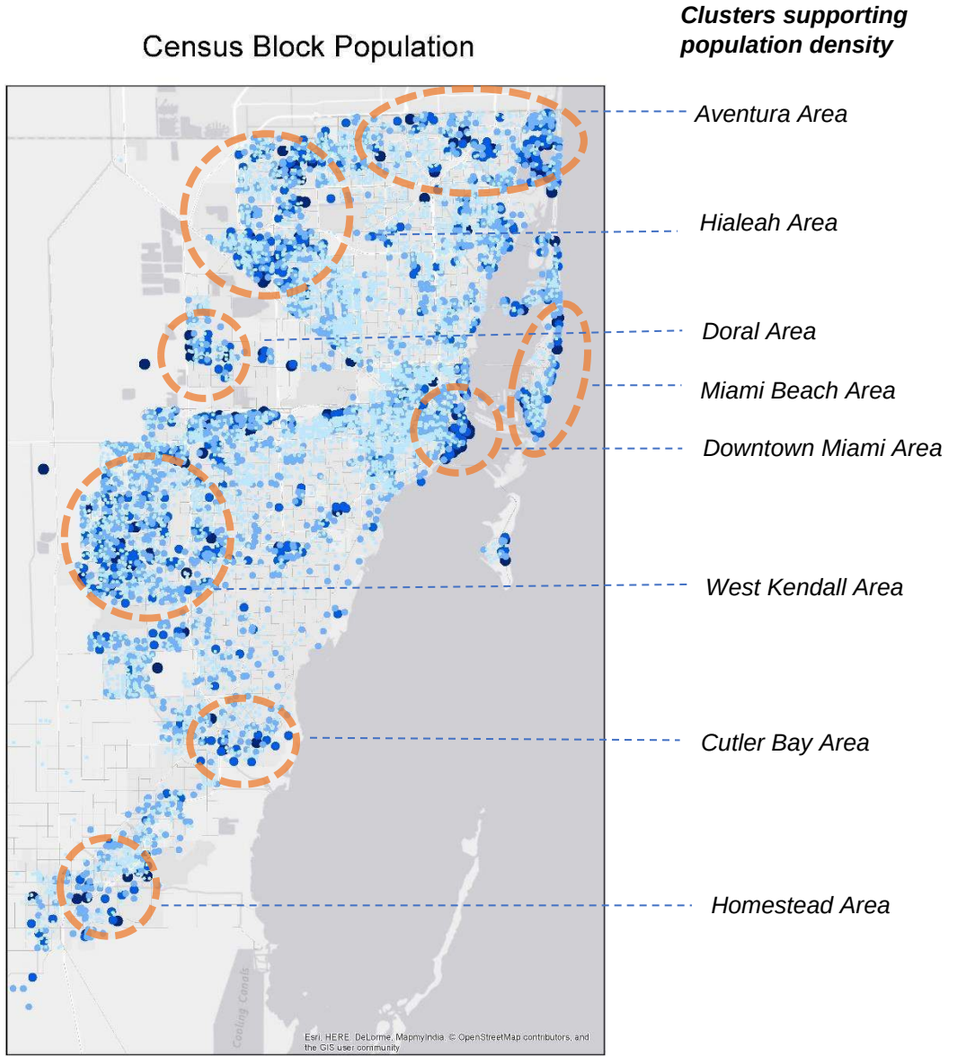


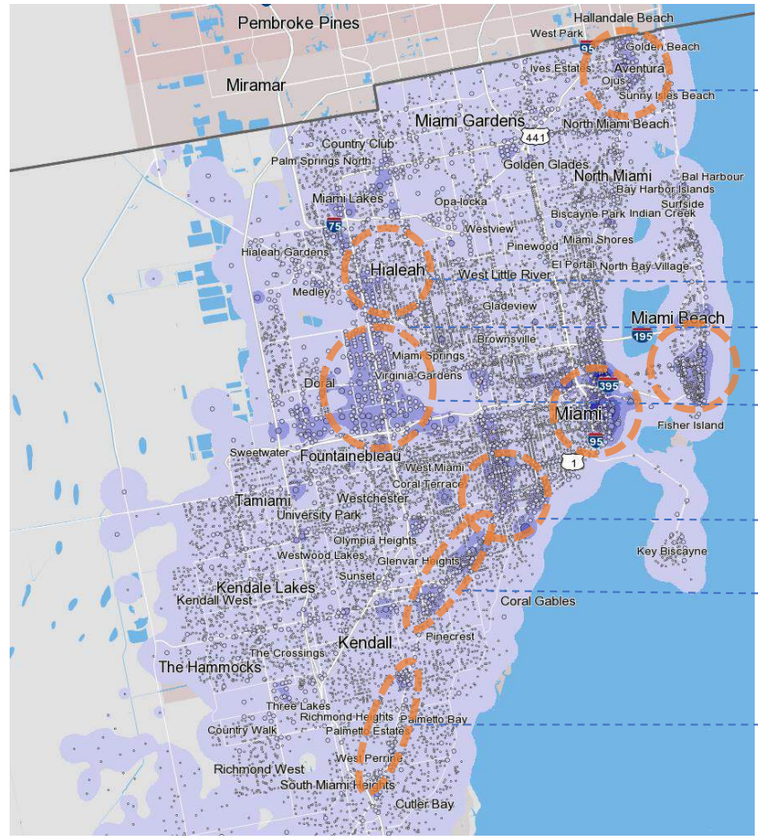
Figure 22: Data source, U.S. Census

EMPLOYMENT

Economic Census tool, OnTheMap. shows in-bound and out-bound data, origin/destination and employment density clusters spread across the county. Judging by the data, the areas in Miami-Dade County with the largest clusters are downtown Miami, Miami Beach, Coral Gables, Doral, Hialeah, and the US-1 Corridor.

An important research criteria in this plan is to search for areas that possess dense clusters of employment. Employment centers can help ease congestion on roads by encouraging employees to consider bicycle and transit commuting instead of driving. Bicycle commuting will require safe and accessible multi-modal routes that support non-motorized travel.

While one business encouraging bicycle commuting has minimal impact at the metropolitan scale, if clusters of businesses collaborate to encourage an area-wide transit and/or bicycling culture, there is a potential to improve non-motorized level of service. The League of American Bicyclists' Bicycle Friendly Business designation program is an innovative way of educating and encouraging businesses to adopt a bike-friendly approach to business practices. Part of this study will involve evaluating employment centers that provide bike-friendly policies who can help advocate, promote and utilize a PBL if it was made available in their community.



Areas supporting Employment Centers

- *Aventura Area*
- *Hialeah Area*
- *Doral Area*
- *Miami Beach Area*
- *Downtown Miami Area*
- *Coral Gables Area*
- *US-1 Corridor*
- *South Dade US-1 Corridor*

Figure 23: Data source, https://onthemap.ces.census.gov/

EXISTING AND FUTURE TRAFFIC

AADT & 2040 V/C

Traffic volume plays a major role in a street's level of attractiveness for a bicyclist. The PBL evaluation criteria included a review of Average Annual Daily Traffic (AADT) along segments. High-volume segments were less likely candidates for PBL installation.

In addition to existing AADT, future traffic projections were also considered. Volume to Capacity (V/C) ratio is a common factor to consider. A street with a low V/C ratio would suggest an opportunity to propose a lane repurposing. Any V/C over 1 demonstrates a road that is overly stressed and repurposing a lane would have negative impacts towards level of service for cars.

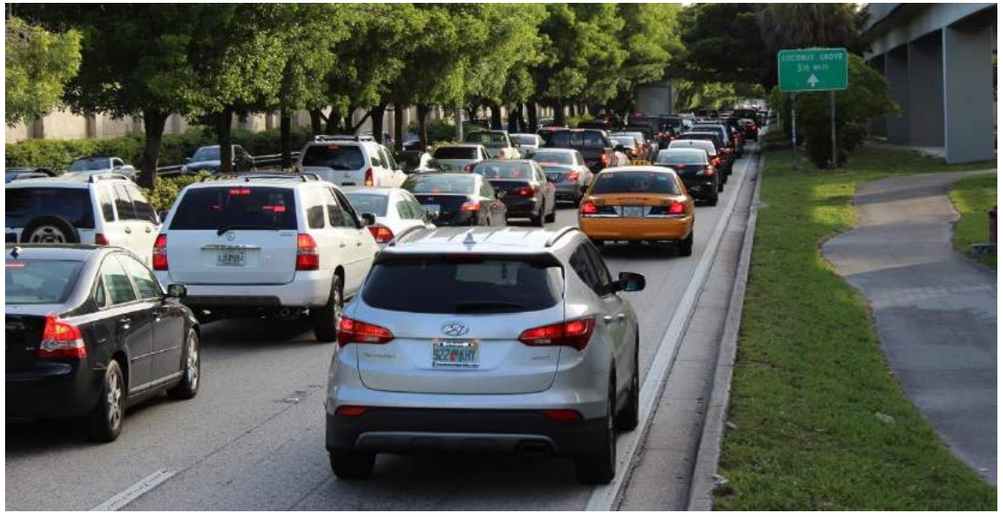


Figure 24: The M-Path adjacent to US-1 traffic; Image courtesy of The New Tropic

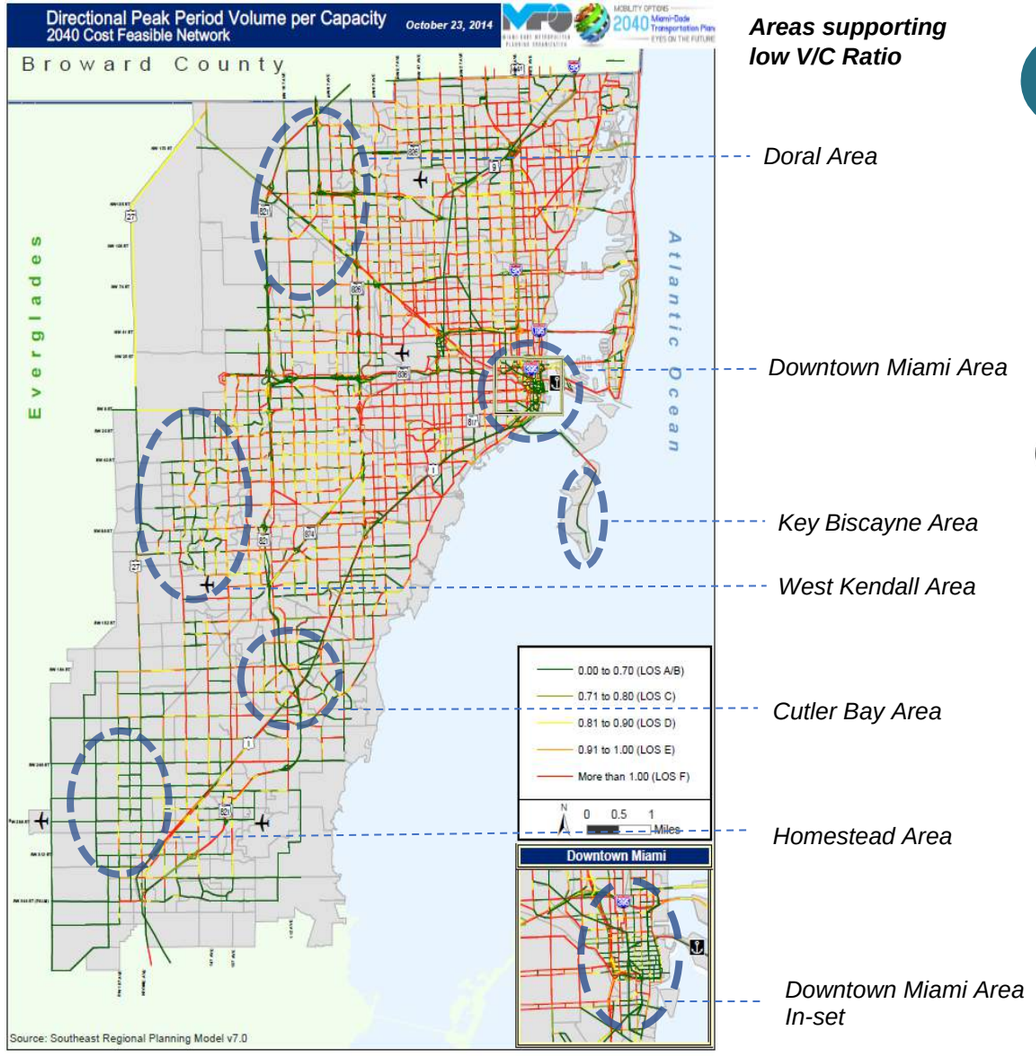


Figure 25: Miami-Dade TPO

EXISITING TRANSIT

Multi-modal connectivity is critical to the success of a bike lane network. PBLs need good transit connections in addition to connecting to other bike facilities. In addition to the incoming SMART Plan, potential PBL locations were evaluated for their proximity and ability to connect to existing transit infrastructure including Tri-Rail, Metrorail, Metromover, Metrobus, and local trolley/circulator routes.

Tri-Rail – Tri-rail is administered by the South Florida Regional Transportation Authority. This heavy commuter rail system provides lines from its southernmost station at Miami International Airport and extends north into Palm Beach County.

Metrorail – Metrorail contains two lines with the green line connecting Dadeland South Station to the Palmetto Station and the Orange line serving as a spur from the Earlington Heights station that connects to Miami International Airport.

Metromover – The Metromover is an elevated people-mover system the runs through downtown Miami with 3 lines that connects the Omni District, Central Business District and Brickell.

Metrobus – Miami-Dade Metrobus services 800+ buses that travel throughout the county daily. Major park & ride lots can be found at SW 152 St and US1, Dadeland South Station, Dadeland North Station, West Kendall Bus Terminal, Kendall Drive Park and Ride, and downtown Miami. Buses are equipped to support 2 – 3 bicycles.

Trolley/Circulator – Local trolley routes are provided by municipalities such as the City of Miami, Miami Beach, Coral Gables, Pinecrest, Aventura, North Miami, and Homestead. Trolleys provide first-mile/last-mile connections for circulation to and from popular commercial districts and transit hubs. Trolleys are equipped to support 2 – 3 bicycles.

Figure 26: Miami-Dade County

PARKS AND OPEN SPACE MASTER PLAN

The Miami-Dade County Parks and Open Space Master plan displays the county's existing and planned green spaces. In addition to traditional park spaces, this master plan is unique in that it demonstrates a new approach to park planning which now views greenways and public spaces as an extension of parks. Figure 29 shows the master plan map. Notice the green corridors that run along major commuter routes.

Beyond parks, preserves and conservation areas, the Miami-Dade County Parks, Recreation, and Open Spaces Department now supports infrastructure initiatives that transform automobile corridors into aesthetically pleasing greenways that service the community with safe access to multi-modal transportation corridors. Beyond infrastructure, the department also supports programmatic initiatives such as Bike 305 that coordinates community education and events that support safe, family-friendly bicycling culture. This approach can encourage community health benefits such as reduced obesity, lower heart rates, and increased quality of life.

Providing links to greenway corridors can facilitate non-motorized travel to and from residential neighborhoods, transit hubs, and urban centers. This plan will search for urban parks that lie close to land uses with high density residential and employment centers, entertainment, and dining.

Major greenway corridors can be seen along US-1 to downtown Miami, Tamiami Trail, Key Biscayne, Miami Beach, SW 27th Avenue, and Krome Avenue.

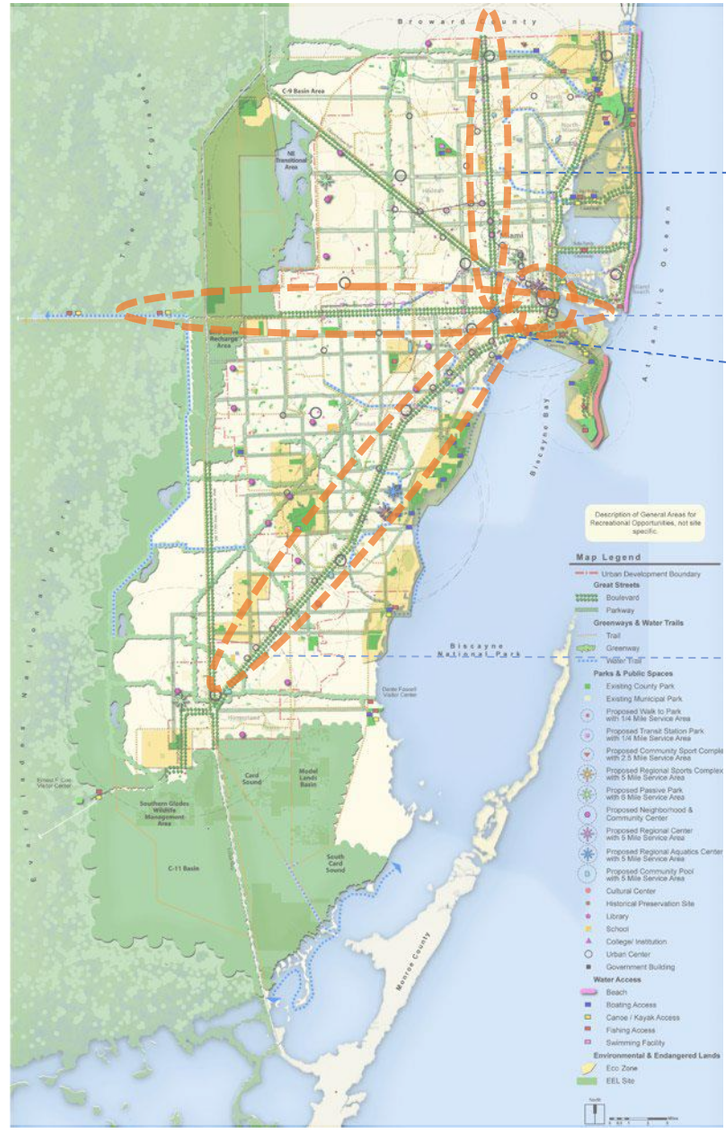


Figure 27: Miami-Dade County

EXISITING PREFERRED BIKE ROUTES

The Team collected data that observed non-motorized activity in various locations around the county to better understand existing bike routes. The Team utilized a combination of non-motorized count data collected by the TPO and Strava data to identify preferred bicycling routes in Miami-Dade. Strava is a mobile device application that uses GPS to record activity by bicyclists. Aggregated user data was mapped to show popular recreational bicycling routes to help identify potential PBL corridors.

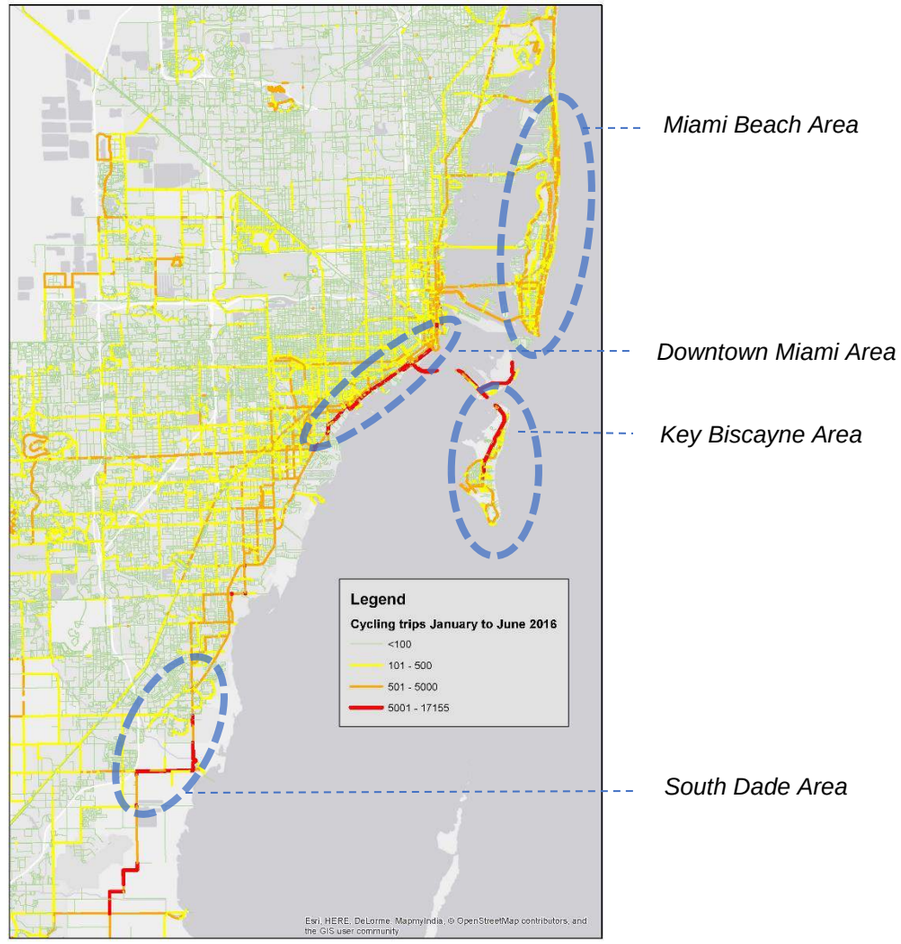


Figure 28: Data source, Strava/FDOT

EXISITING SHARED-USE PATHS/ LINEAR PARKS / LOW STRESS NETWORKS

In addition to the incoming SMART Plan, there are a number of off-road regional trail/linear park projects that are in the process of being implemented. In addition to connecting to transit, it will be important to find additional opportunities to strengthen the overall bike network of Miami-Dade County. These important urban trails will not only provide a safe place for recreational riding, but also provide opportunities for increased bicycle commuting to and from daily destinations.

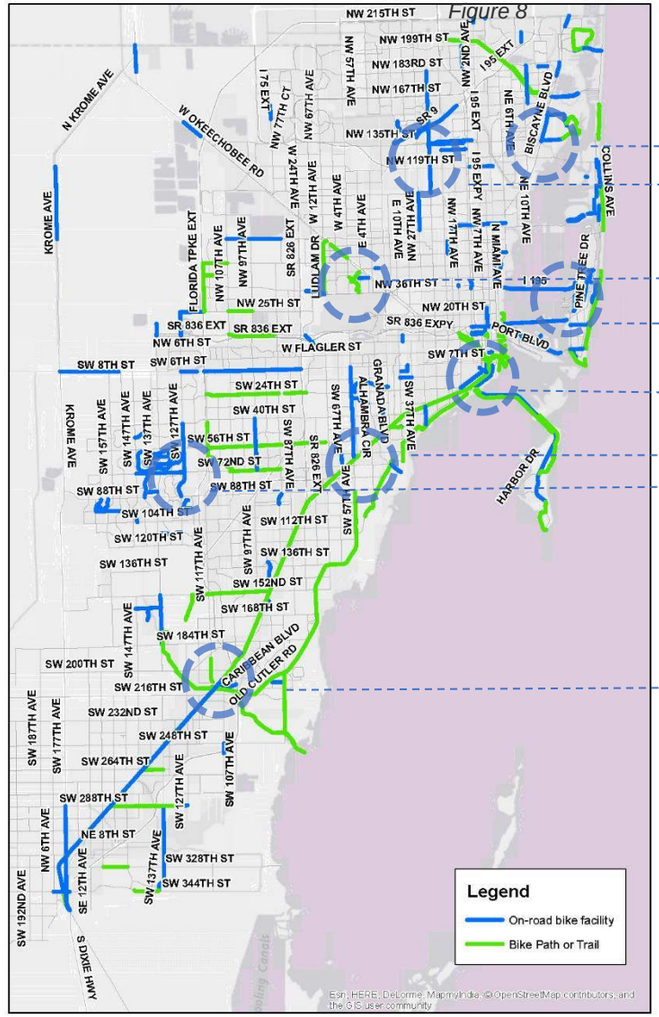
Miami-Dade is developing a network of shared-use paths that are physically separated from the roadway and used by pedestrians and bicyclists. Most shared-use paths are located on or along a linear feature such as a water body (canal, river or coastline), railroad, or major roadway. Using shared-use paths for transportation can be challenging because their connectivity may be limited by the boundary of the linear feature, a barrier or some other factor. PBL facilities can connect shared-se paths to destinations and to low-volume streets to create low-stress networks that serve the “Interested but Concerned” population.

Some examples of existing and developing shared-use paths include:

The Underline (M-path)
South Dade Trail
Ludlam Trail
Miami River Greenway
Black Creek Trail
Snapper Creek Greenway
See pages 21 – 23 for details

Existing Bike Facilities

Figure 8



Areas supporting Trail/Greenway connectivity

Figure 29: Florida Department of Transportation

The Underline (Existing M-Path)

The Underline is a planned 10-mile linear park and trail that stretches from Dadeland South Metrorail station to Brickell Station. The current M-Path shared use path that exists on the corridor is set for a vast number of intersection safety improvements and an assortment of park amenities and aesthetic enhancements. The Underline will serve as important connector for multimodal commuters traveling to and from the US-1 corridor. The corridor is home to eight Metrorail stations, and a significant amount of employment centers, high density residential, entertainment, the University of Miami and more. The Underline is also an important segment of the East Coast Greenway.

Figure 30: The Underline rendering, Image courtesy of Friends of the Underline

South Dade Trail

The South Dade Trail is an extension of the M-path and stretches for nearly 20 miles south from Dadeland South Station to Florida City. The South Dade Trail also shares right-of-way with the South Dade Transitway. This particular corridor which runs parallel to US-1 serves as one of the SMART Plan transit lines. With the SMART Plan still in its preliminary stages, it's not possible to accurately determine how the South Dade Trail will be modified and how it will work in tandem with the incoming rapid transit. The South Dade Trail is also a segment of the East Coast Greenway and connects to other greenways such as Black Creek Trail (Page 28).

Figure 31: South Dade Trail, Image courtesy of Southfloirdafinds.com

Ludlam Trail

The Ludlam Trail is a partially abandoned railroad that is proposed to develop into a linear park and trail. The segment is 6.2 miles long and stretches from Dadeland North Metrorail station to Miami International Airport. The corridor is centrally located within the county and is in close proximity to 5 schools, 4 parks, 2 transit hubs and multiple residential neighborhoods and commercial districts. The Ludlam Trail lies close to the City of South Miami which is scheduled to have a protected bike lane connection on SW 64th Street (see page 30). The Ludlam trail connects to the Underline, South Dade Trail and undeveloped sections of the Snapper Creek Greenway (Page 28).

Figure 32: Ludlam Trail community event

Miami River Greenway

The Miami River Greenway is a development initiative aimed at beautifying the Miami River's edge from the mouth of Biscayne Bay through downtown Miami to the Miami Intermodal Center (MIC). The Miami River Commission is an entity that supports the initiative and works closely with local government and developers to coordinate construction on a parcel-by-parcel shared path greenway that services non-motorized users. With its central location to downtown Miami, the Greenway will provide safe bicycle connectivity for thousands of potential users who are using the greenway to connect to home, work, transit, employment, entertainment and more.

Figure 33: Image courtesy of greenway.com and The Miami River Commission

Black Creek Trail

The Black Creek Trail is an 8.7-mile-long trail that extends from Black Point marina to Serena Lakes Park. The paved path serves as one of the county's few east-west multi-modal corridors. The land use surrounding this trail is predominately low density residential with segments in which the trail abuts natural open spaces, parks, commercial districts, transit, and other regional trails. At this point in time, the Black Creek Trail paved path extends to SW 117 Avenue. There are plans to eventually extend the trail as far West Kendall.

Figure 34: Black Creek Trail, Image courtesy of Green Mobility Network

Snapper Creek Greenway

The Snapper Creek Greenway is a 10-mile planned/partially completed separated path that extends from West Kendall to eventually the Old Cutler Trail. Like the Black Creek Trail, one of the important features of this trail is its east-west connectivity which is an existing challenge and request from local bicycling groups. The master plan for this greenway involves two main segments, A and B. Segment B connects from Bird Road and SW 117th Avenue to Snapper Creek Drive and SW 107 Avenue. Segment B however remains incomplete and is currently still in planning stages. Once completed, other connecting trails will include the M-Path, South Dade Trail, Red Road linear park, and Old Cutler Trail.

Figure 35: Snapper Creek; Image courtesy of Google Earth

CURRENT MIAMI-AREA PROTECTED/SEPERATED BIKE-LANE PROJECTS

West Avenue: City of Miami Beach

In 2017, the City of Miami Beach was successful in implementing the first protected bike lane in Miami-Dade County. The protected lanes on West Ave are planned to span from Lincoln Road to 8th Street, but are currently only installed just south of 17th Street.

The 2016 Miami Beach Bicycle and Pedestrian Master Plan identified this and other locations for PBLs. The plan includes a wide array of bicycle facilities including various versions of PBLs ranging from planter protection to plastic delineators.

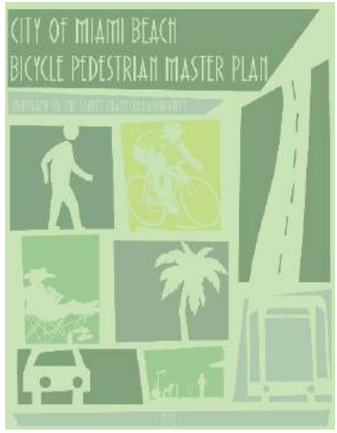


Figure 36: Miami Beach Protected Bike Lane; Image courtesy of Frankie Ruiz

SE/SW 1ST Street: **Miami-Dade County**

Miami-Dade County is in the preliminary construction phase of the SE/SW 1st Street Complete Streets project. The segment runs from SW 2nd Avenue to Biscayne Boulevard. Part of the Complete Street design includes a PBL segment that is primarily utilizing plastic delineators as the vertical separating element. In addition to the PBL, there is a dedicated bus lane also planned for the roadway. The segment provides connectivity to transit, employment, open space, retail and entertainment areas.

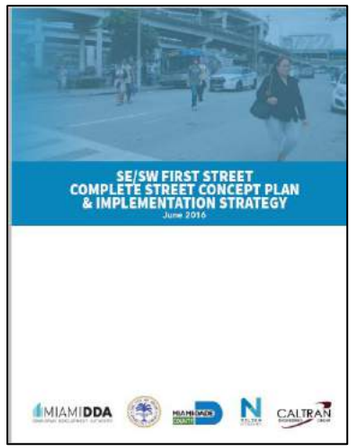


Figure 37: SE 1st Street Complete Street, Courtesy of Miami-Dade County

SW 64TH Street: City of South Miami

The City of South Miami is currently in the design phase of a PBL on SW 64th (Hardee) Street from Red Road to the Ludlam Trail. The segment was first proposed in South Miami's 2014 Intermodal Transportation Plan. Typical sections from the plan include a 3-foot buffer with a landscaped island providing a robust vertical element separating the 5-foot bike lane from the 11-foot car lane. This level of infrastructure demonstrates characteristics of a Heavy type PBL (see page 3).

Advantages of this PBL segment are the existing right-of-way, tree coverage, and connectivity to existing bike facilities. There is also a connection to the incoming Ludlam Trail project which will provide north-south connectivity to numerous destinations including more greenways, schools and transit.

Quick Build Program

Similar to this plan, the Quick Build program seeks low-cost, high-impact opportunities to demonstrate that transportation solutions such as PBLs work in South Florida, and thus inspire more planning, design, and construction. In 2016, community not for profit and bicycle / pedestrian advocacy organization, Green Mobility Network (GMN) was the recipient of a grant from the National Foundation, Transit Center.

The program involves a partnership among Miami-Dade County, professional urbanists, community volunteers, and local municipalities collaborating to design and construct solutions that facilitate more usage of walking, biking, and transit. Many proposed applications include PBL pilot project ideas.

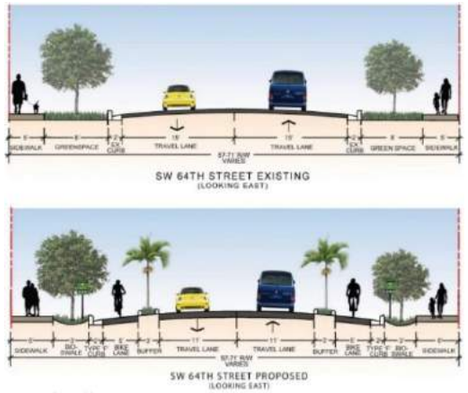


Figure 38: South Miami Protected bike lane graphic courtesy of City of South Miami

MIAMI-DADE COUNTY

GREEN MOBILITY NETWORK

MIAMI-DADE TRANSPORTATION
QUICK-BUILD PROGRAM

Plan Z Rickenbacker Park

Plan Z Rickenbacker Park is a community driven project aimed at creating a linear park/protected bike lane stretching from the Key Biscayne Toll booth over the Rickenbacker Causeway to Virginia Key. The Rickenbacker Causeway is a major destination for cyclists, triathletes and other recreational riders. The roadway is also considered one of the county's most dangerous roads as numerous cycling collisions have occurred along the segment mostly due to cases of drunk driving and speeding.

The Rickenbacker Park project envisions an aesthetically pleasing bike route that also protects cyclists with some form of physical barrier. Segments of the proposal were part of the evaluation of this plan.

Figure 39: Plan Z rendering courtesy of PlanZ.com

Biscayne Green

Biscayne Green is a project involving a significant aesthetic, environmental, and multi-modal enhancement to Biscayne Boulevard. Its adjacent land use includes Bayfront Park, Metromover stations, commercial and public spaces. Various renditions of the Biscayne Green concept address multi-modal accessibility issues and depict separated bus lanes and protected bike lanes that separate the bicyclist from motorized traffic.

In an effort to introduce the concept to the community, the Miami DDA, The Knight Foundation, The Miami Foundation, and The Street Plans Collaborative partnered for the Biscayne Green Activation project which brought a pop-up Biscayne Green concept that transformed the massive parking lot underneath the local Metromover stations into a public space/park/bike-pedestrian transit hub for a short period of time.

Figure 40: Biscayne Green graphic and image courtesy of Miami DDA, Biscayne Green and therealdeal.com

3 POTENTIAL LOCATIONS

STUDY ADVISORY COMMITTEE

Once background research was completed, the team organized a Study Advisory Committee (SAC) to review the research and provide advisement for potential PBL segments. The SAC met on three occasions to discuss progress of the plan and offer recommendations and comments. In addition to the SAC meetings, during the plan's duration, the team also presented to the Transportation Planning Organization's Transportation Planning Council (TPC), Bicycle Pedestrian Advisory Committee (BPAC), and Miami Downtown Development Authority (DDA).

The SAC was comprised of municipal and agency stakeholders who represented public works, bicycle and pedestrian planning, parks and recreation, parking authority, downtown development authority and more. Together, the team received feedback from the SAC regarding segments that were either under consideration for PBLs or possessed some of the necessary characteristics that could be favorable for a PBL such as a strong connection to transit, low AADT or V/C ratio, pavement width, and were free of any obvious fatal flaws.

The following pages provide detail on locations that were suggested and reviewed for potential PBL segments within Miami-Dade County. It must be noted that review of these segments does not mean that no other areas in the county are suitable for PBLs; it instead means that these locations possessed many of the factors that would suggest a favorable location for fast-track implementation based on the available data and knowledge of the stakeholders.

Figure 41: Study Advisory Committee

SEGMENT IDENTIFICATION

Table 1 displays all of the segments that were reviewed. Once the list of segments was gathered, the team researched and organized relevant data. A total of 25 locations were identified by the study advisory committee. Several other segments were either extended or added by advisement from stakeholders throughout the process of the plan, and based on comments shared at the status update presentations provided at the Miami DDA, TPC, and BPAC meetings.

SEGMENTS REVIEWED

#	Segment	2040 V/C*	AADT**	R/W Width	# Lanes	Pavement Width	Segment Length	On-street Parking	Speed Limit	Bike lane	Shoulder	One way
1	SW 211th Street from US-1 to Turnpike	0.0 to 0.70	20000	120'	4	90'	0.8 miles	Yes	35	Yes	Yes	No
2	Julia Tuttle Causeway	>1.0	118000	116'	6	116'	2.75 miles	No	55	Yes	Yes	No
3	NE 1st Ave from SE 1st Street to NE 17th St	0.0 to 0.70	17500	70'	3	47'	1.26 miles	Yes	30	No	Yes	Yes
4	S/N Miami Ave from SE 2nd St to N 11th St	0.70 to 1.0	6600	56'	3-2	30'	0.7 miles	Yes	30	No	Yes	Yes
5	NW/NE 5th St from NW 7th Ave to Biscayne Blvd	0.0 to 0.70	10500	70'	3	50'	1.09 miles	Yes	30	No	Yes	Yes
6	NW/NE 6th St from NW 5th Ave to Biscayne Blvd	> 1.0	11500	50'	2	38'	1.1 miles	Yes	30	No	Yes	Yes
7	NW/NE 8th St from NW 1st Ave to Biscayne Blvd	n/a	n/a	67'	2	32'	0.4 miles	Yes	30	No	Yes	No
8	SW 1 St from SW 2nd Ave to Biscayne Blvd	0.0 to 0.70	7100	66'	3	48'	0.65 miles	Yes	30	Sharrows***	Yes	Yes
9	S Bayshore Dr from Aviation Ave to Mercy Way	0.91 to >1.0	18000	48'	3	38'	1.25 miles	Yes	30	No	Yes	No
10	Government Center from SW 1st St to SW 3rd Street	n/a	n/a	55'	0	55'	0.25 miles	No	30	No	No	No
11	SW 136th St from SW 82nd Ave to SW 90th Ave	0.0 to 1.0	17200	110'	4	92'	1.25 miles	No	30	No	No	No
12	NW 3rd Ct from W Flagler St to NW 8th St	0.71 to 0.8	13500	67'	4	48	0.5 miles	No	30	No	No	Yes
13	Red Rd from US-1 to 72nd St	0.71 to 0.8	15000	74'	5	54'	0.22 miles	No	30	No	No	No
14	SW 26th Rd from M-Path to Rickenbacker Toll	0.70 to > 1.0	39000	86'	4	46'	0.37 miles	No	30	No	No	No
15	Crandon Blvd From Bear Cut bridge to Bill Baggs park	0.70 to > 1.0	35000	216'	4	66'	3.5 miles	No	30	Yes	No	No
16	NW 79th St from NW 13th Ct to Biscayne Blvd	0.0 to > 1.0	28800	100'	4	60'	2.25 miles	Yes	40/30	Sharrows	Yes	No
17	NW 82nd St from NW 13th Ct to Biscayne Blvd	0.0 to > 1.0	17000	62'	2	45'	2.3 miles	Yes	40/35	Yes	Yes	Yes
18	SW 2nd St from North River Dr to SW 1st Ave	n/a	n/a	65'	3	45'	0.25 miles	Yes	30	No	Yes	Yes
19	NE 29th Street NW 7th Ave to N Miami Ave	0.91 to >1.0	8600	80'	4	60'	0.75 miles	Yes	30	No	Yes	No
20	NW 5th Ave from NW 22nd St to NW 29th St	n/a	n/a	100'	3	80'	0.4 miles	Yes	30	No	Yes	No
21	Main Highway from Franklin Ave to McFarlane Rd	> 1.0	none	70'	4	45'	0.3 miles	Yes	30	No	Yes	No
22	Biscayne Blvd from Port Blvd to SE 3rd	0.0 to 0.70	36000	244'	6	90'	0.55 miles	No	30	No	No	No
23	NE 125th from N Miami Ave to Biscayne Blvd	0.81 to >1.0	31500	90'	4	68'	2.25 miles	Yes	30	Sharrows	Yes	No
24	SW 64th St from Red Road to Ludlam Trail	0.0 to 0.70	8600	72'	2	25'	1.03 miles	No	30	No	No	No
25	SW 216th St from Black Creek Trail to Biscayne Trail	0.0 to 0.70	18000	120'	4	50	2.7 miles	No	30	No	No	No

* V/C = volume to capacity ratio

** AADT = Average Annual Daily Traffic

*** Sharrow = shared bicycle lane markings on pavement

Table 1: Potential segment locations

3 POTENTIAL LOCATIONS

1. SW 211TH STREET FROM US-1 TO TURNPIKE

City: Cutler Bay

2040 V/C: 0.0 to .70

AADT: 20,000

Number of Lanes: 4

Right-of-Way: 120'

Destinations within 1/2 Mile:

SMART PLAN | BIKE TRAILS/ GREENWAYS | PARKS

Pavement Width: 90'

Segment Length: .8 miles

On-Street Parking: Yes

Posted Speed Limit: 35 mph

Bike Lanes: Yes

Cost*: $24,000 – $160,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

- Ample Right-of-way
- Bike lanes already present
- Connects to Black Creek Trail
- Connects to South Dade Busway
- Proximity to major shopping destination
- Sidewalks

CONSTRAINTS

- Auto dominated environment
- Low density development

3 POTENTIAL LOCATIONS

2. JULIA TUTTLE CAUSEWAY

City: Miami - Miami Beach

2040 V/C: >1.0

AADT: 118,000

Number of Lanes: 6

Right-of-Way: 116’

Destinations within 1/2 Mile:

SMART PLAN

HOSPITALS

Pavement Width: 116’

Segment Length: 2.75 miles

On-Street Parking: no

Posted Speed Limit: 55 mph

Bike Lanes: Yes

Cost*: $82,500 – $1,100,000

*Projected costs range between delineators (least expensive) and rigid bollards (most expensive).

OPPORTUNITIES

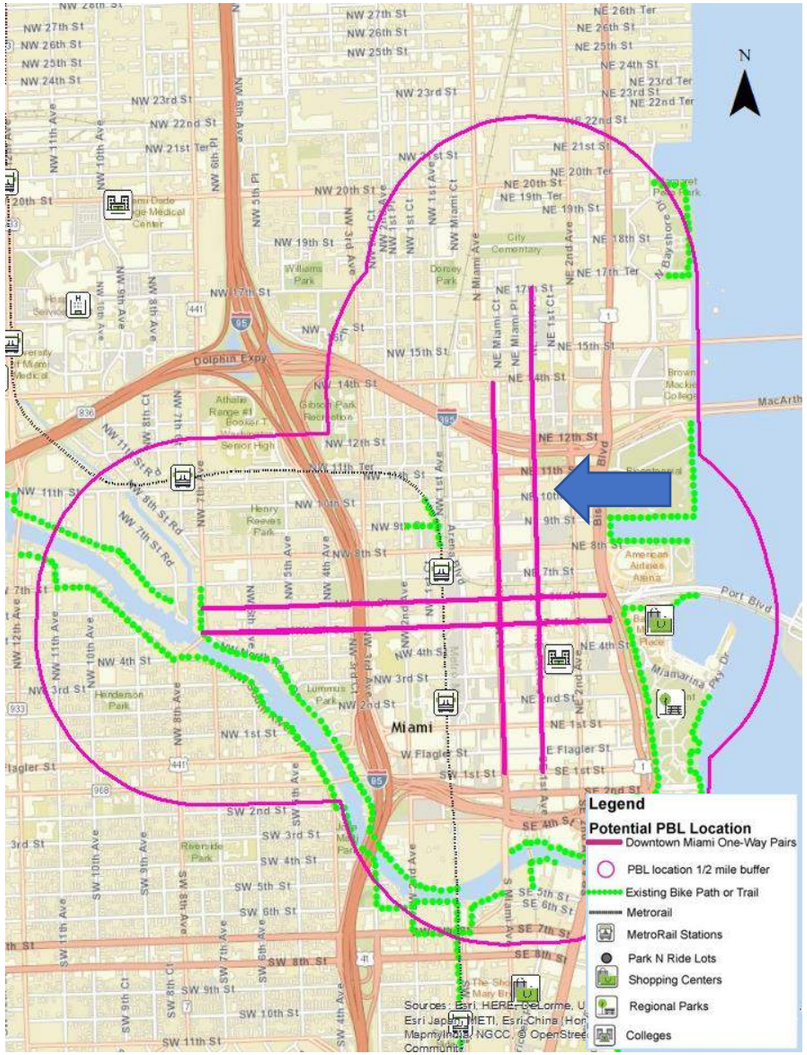
- Ample Right-of-way
- Important connection
- Nearby population density
- Public support
- Sidewalks

CONSTRAINTS

- Fast Speed Limit
- High AADT
- Interstate guidelines
- No Sidewalks

3 POTENTIAL LOCATIONS

3. NE 1ST AVENUE FROM SE 1ST STREET TO NE 17TH STREET (DOWNTOWN NETWORK)



City: Miami

2040 V/C: 0.0 to 0.7

AADT: 17,500

Number of Lanes: 3

Right-of-Way: 70’

Destinations within 1/2 Mile:

SMART PLAN · COLLEGES/ UNIVERSITIES · BIKE TRAILS/ GREENWAYS

Pavement Width: 47’

Segment Length: 1.26 miles

On-Street Parking: Yes

Posted Speed Limit: 30 mph

Bike Lanes: no

Cost*: $20,160 - $504,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

- Connects to SMART plan
- High density development
- Level of Service A/B
- Low AADT
- One-way vehicular traffic
- Proximity to many destinations
- Sidewalks

CONSTRAINTS

- On-street parking is highly valued
- ROW varies along corridor

3 POTENTIAL LOCATIONS

4. SOUTH/NORTH MIAMI AVENUE FROM SE 2ND STREET TO N 11TH STREET (DOWNTOWN NETWORK)

City: Miami

2040 V/C: 0.7 to 1.0

AADT: 6,600

Number of Lanes: 2-3

Right-of-Way: 56'

Pavement Width: 30'

Segment Length: 0.7 miles

On-Street Parking: Yes

Posted Speed Limit: 30 mph

Bike Lanes: no

Destinations within 1/2 Mile:

COLLEGES/ UNIVERSITIES | TRANSIT | PARKS | EMPLOYMENT

Cost*: $11,200 - $280,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

- Connects to SMART plan
- High density development
- Level of Service A/B in most of the segment
- Low AADT
- One-way vehicular traffic
- Proximity to many destinations
- Sidewalks

CONSTRAINTS

- On-street parking is highly valued
- ROW varies along corridor

3 POTENTIAL LOCATIONS

5. NW/NE 5TH STREET FROM NW 7TH AVENUE TO BISCAYNE BOULEVARD (DOWNTOWN NETWORK)

City: Miami

2040 V/C: 0.0 to 0.7

AADT: 10,500

Number of Lanes: 3

Right-of-Way: 70’

Destinations within 1/2 Mile:

COLLEGES/ UNIVERSITIES | TRANSIT | PARKS | EMPLOYMENT

Pavement Width: 50’

Segment Length: 1.09 miles

On-Street Parking: Yes

Posted Speed Limit: 30 mph

Bike Lanes: no

Cost*: $17,440 - $436,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

- Connects to SMART plan
- High density development
- Level of Service A/B
- Low AADT
- One-way vehicular traffic
- Proximity to many destinations
- Sidewalks

CONSTRAINTS

- On-street parking is highly valued

3 POTENTIAL LOCATIONS

6. NW/NE 6TH STREET FROM NW 7TH AVENUE TO BISCAYNE BOULEVARD (DOWNTOWN NETWORK)

City: Miami

2040 V/C: > 1.0

AADT: 4,600

Number of Lanes: 2

Right-of-Way: 50’

Pavement Width: 38’

Segment Length: 1.1 miles

On-Street Parking: Yes

Posted Speed Limit: 30 mph

Bike Lanes: no

Destinations within 1/2 Mile:

COLLEGES/ UNIVERSITIES | TRANSIT | PARKS | EMPLOYMENT

Cost*: $17,600 - $440,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

- Connects to SMART plan
- High density development
- Low AADT
- One-way vehicular traffic
- Proximity to many destinations
- Sidewalks

CONSTRAINTS

- On-street parking is highly valued
- ROW varies along corridor

3 POTENTIAL LOCATIONS

7. NW/NE 8TH STREET FROM NW 1ST AVENUE TO BISCAYNE BOULEVARD

City: Miami

2040 V/C: N/A

AADT: N/A

Number of Lanes: 2

Right-of-Way: 67’

Pavement Width: 32’

Segment Length: 0.4 miles

On-Street Parking: Yes

Posted Speed Limit: 30 mph

Bike Lanes: no

Destinations within 1/2 Mile:

Cost*: $6,400 - $160,000

COLLEGES/ UNIVERSITIES | TRANSIT | PARKS | EMPLOYMENT | BIKE TRAILS/ GREENWAYS

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

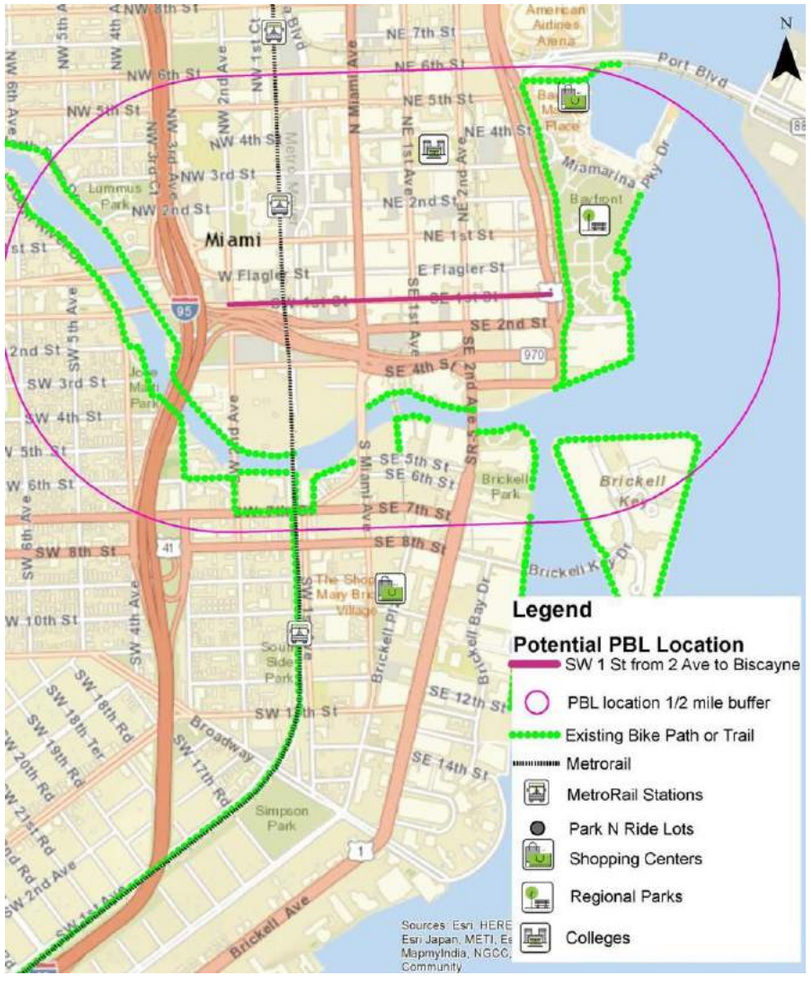
- Connects to Overtown Greenway plan
- High density development (Miami World Center)
- Proximity to many destinations
- Sidewalks

CONSTRAINTS

- Heavy Construction

3 POTENTIAL LOCATIONS

8. SW 1ST STREET FROM SW 2ND AVENUE TO BISCAYNE BOULEVARD



City: Miami

2040 V/C: 0.0 to 0.7

AADT: 7,100

Number of Lanes: 3

Right-of-Way: 66’

Pavement Width: 48’

Segment Length: 0.65 miles

On-Street Parking: Yes

Posted Speed Limit: 30 mph

Bike Lanes: no (Sharrows)

Destinations within 1/2 Mile:

COLLEGES/ UNIVERSITIES | PARKS | TRANSIT | BIKE TRAILS/ GREENWAYS | SHOPPING CENTERS

Cost*: $10,400 - $260,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

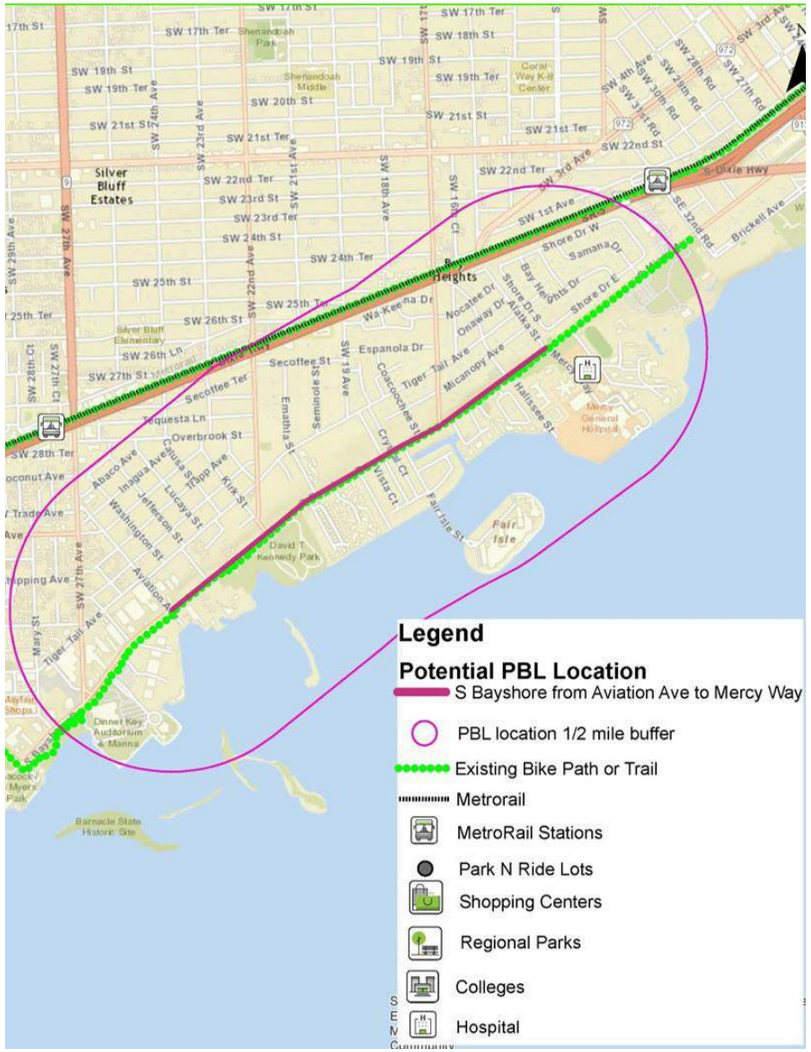
- Connects to Metrorail and Metromover
- Level of Service A/B
- Low AADT
- On-street parking
- One-way vehicular traffic
- Proximity to Miami River Greenway
- Proximity to many destinations
- Sidewalks

CONSTRAINTS

- On-street parking is highly valued

3 POTENTIAL LOCATIONS

9. SOUTH BAYSHORE DRIVE FROM AVIATION AVENUE TO MERCY WAY



City: Miami

2040 V/C: 0.91 to >1.0

AADT: 18,000

Number of Lanes: 2

Right-of-Way: 48’

Pavement Width: 38’

Segment Length: 1.25 miles

On-Street Parking: Yes

Posted Speed Limit: 30 mph

Bike Lanes: no

Destinations within 1/2 Mile: HOSPITALS, PARKS, TRANSIT, SHOPPING CENTERS, BIKE TRAILS/ GREENWAYS

Cost*: $20,000 - $500,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

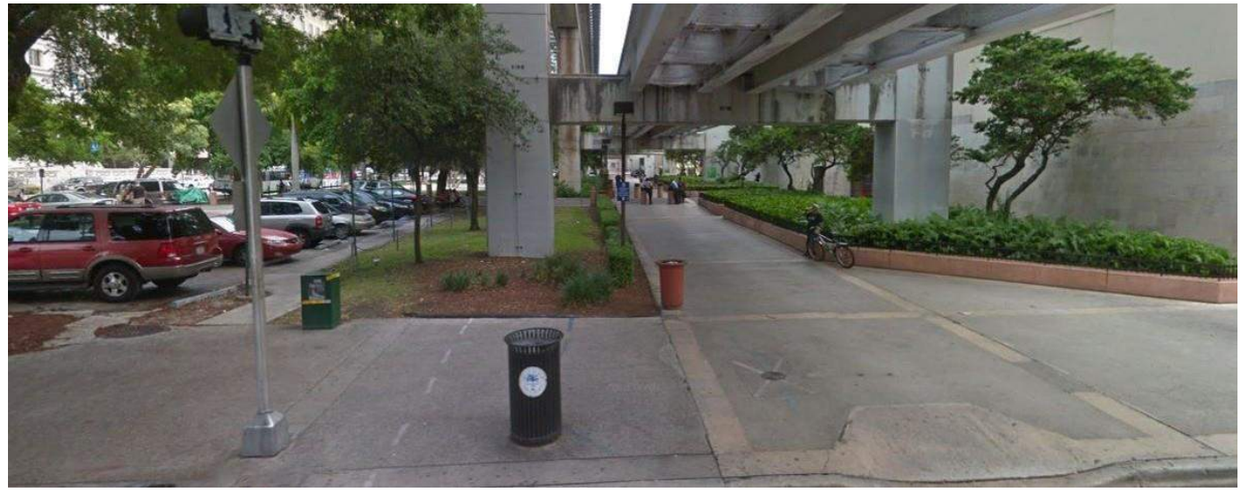
- Connects to high density residential
- Connects to hospital
- Proximity to many destinations
- Scenic route

CONSTRAINTS

- Narrow Right-of-way
- Varied number of lanes along route

3 POTENTIAL LOCATIONS

10. GOVERNMENT CENTER FROM SW 1ST STREET TO SW 3RD STREET



City: Miami

2040 V/C: N/A

AADT: N/A

Number of Lanes: 0

Right-of-Way: 55’

Pavement Width: 55’

Segment Length: 0.25 miles

On-Street Parking: no

Posted Speed Limit: N/A

Bike Lanes: no

Destinations within 1/2 Mile:

SMART PLAN · TRANSIT · COLLEGES/ UNIVERSITIES · PARKS · BIKE TRAILS/ GREENWAYS

Cost*: $4,000 - $100,000

*Projected costs range between delineators (least expensive), rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

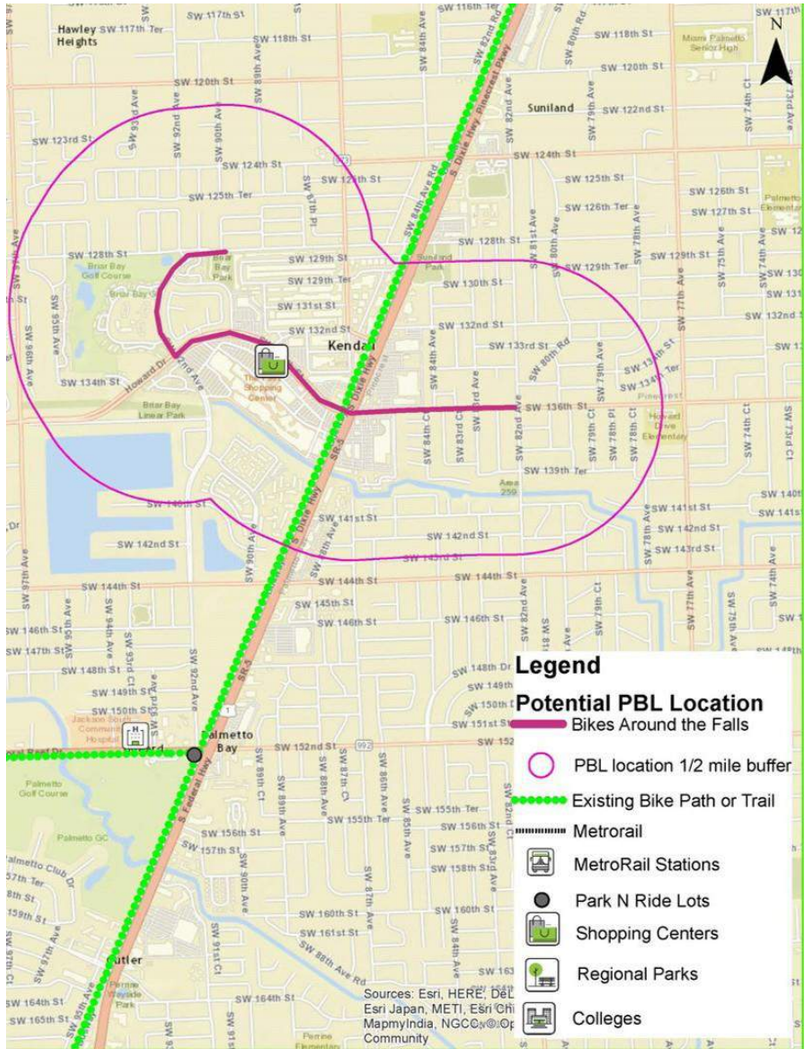
- Center of Miami-Dade County
- Connects to Metrorail and Metromover
- Does not share space with cars
- Proximity to many destinations
- Sheltered space

CONSTRAINTS

- Narrow pathway

3 POTENTIAL LOCATIONS

11. SW 136TH STREET FROM SW 82ND AVENUE TO SW 90TH AVENUE



City: Miami

2040 V/C: 0.0 to 1.0

AADT: 17,200

Number of Lanes: 4

Right-of-Way: 110’

Pavement Width: 92’

Segment Length: 1.25 miles

On-Street Parking: no

Posted Speed Limit: 30 mph

Bike Lanes: no

Destinations within 1/2 Mile:

SMART PLAN · SHOPPING CENTERS · BIKE TRAILS/ GREENWAYS

Cost*: $20,000 - $500,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

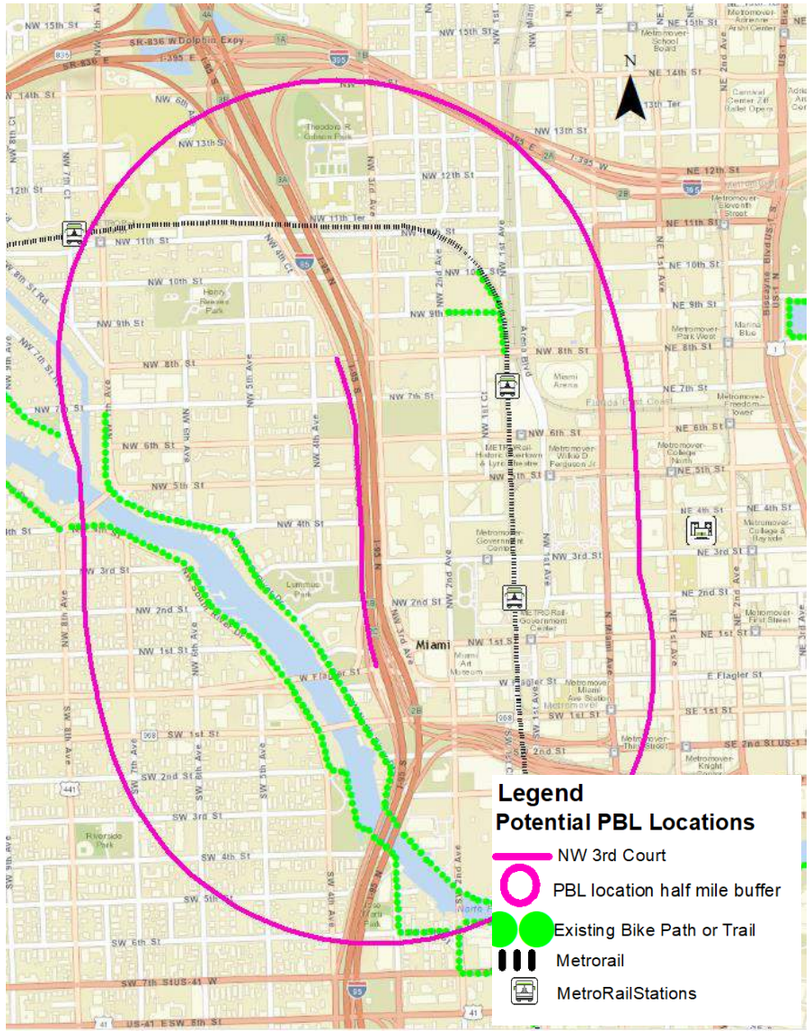
- Connects to South Dade Busway
- Connects to South Dade Trail
- Connects to popular 136 bus stop
- Connects with palmetto Bay
- One-way vehicular traffic
- Proximity to many destinations
- Sidewalks

CONSTRAINTS

- Auto dominated environment
- Lack of shade
- Low density development

3 POTENTIAL LOCATIONS

12. NW 3RD COURT FROM WEST FLAGLER STREET TO NW 8TH STREET



City: Miami

2040 V/C: 0.71 to 0.8

AADT: 13,500

Number of Lanes: 4

Right-of-Way: 67’

Pavement Width: 48’

Segment Length: 0.5 miles

On-Street Parking: No

Posted Speed Limit: 30 mph

Bike Lanes: No

Destinations within 1/2 Mile:

SMART PLAN · TRANSIT · BIKE TRAILS/ GREENWAYS · PARKS · SHOPPING CENTERS

Cost*: $15,400 – $260,000

*Projected costs range between delineator posts (least expensive), rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

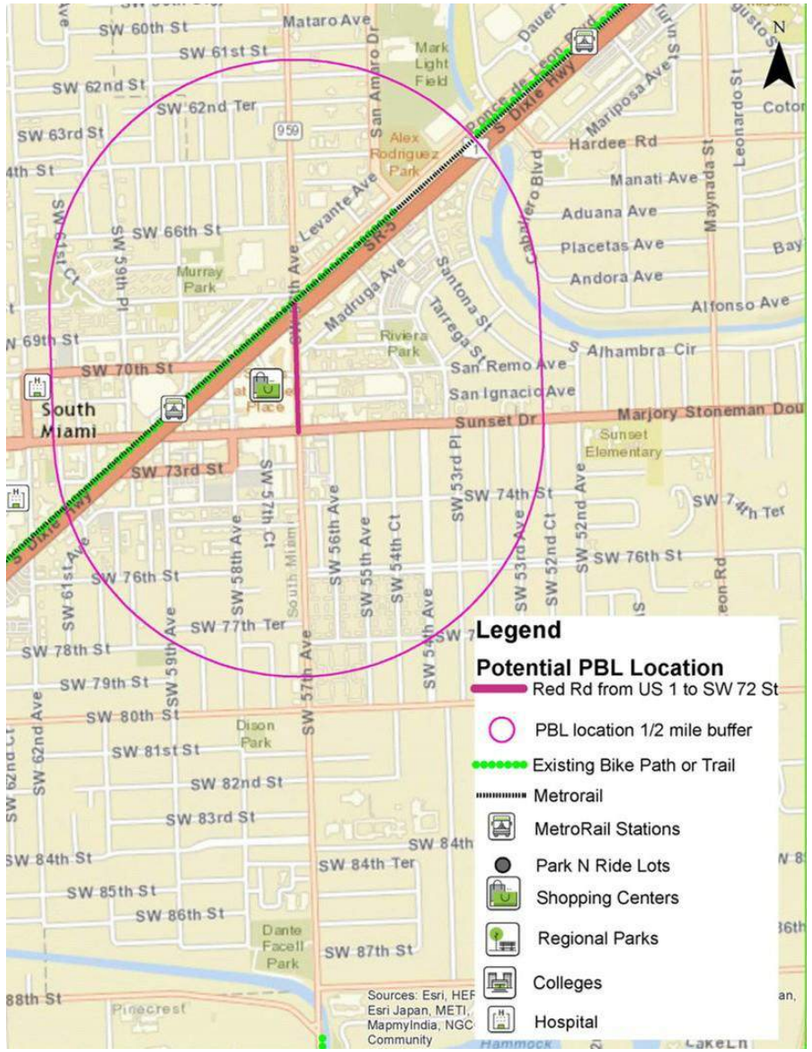
- Connects to high density development
- Low AADT
- On-street parking
- One-way vehicular traffic
- Proximity to incoming Brightline station
- Sidewalks

CONSTRAINTS

- On-street parking is highly valued

3 POTENTIAL LOCATIONS

13. RED ROAD FROM US-1 TO SW 72ND STREET



City: South Miami

2040 V/C: 0.71 to 0.8

AADT: 15,000

Number of Lanes: 4

Right-of-Way: 74’

Pavement Width: 54’

Segment Length: 0.22 miles

On-Street Parking: no

Posted Speed Limit: 30 mph

Bike Lanes: no

Destinations within 1/2 Mile:

TRANSIT · HOSPITALS · SHOPPING CENTERS · PARKS · EMPLOYMENT

Cost*: $3,520 - $88,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

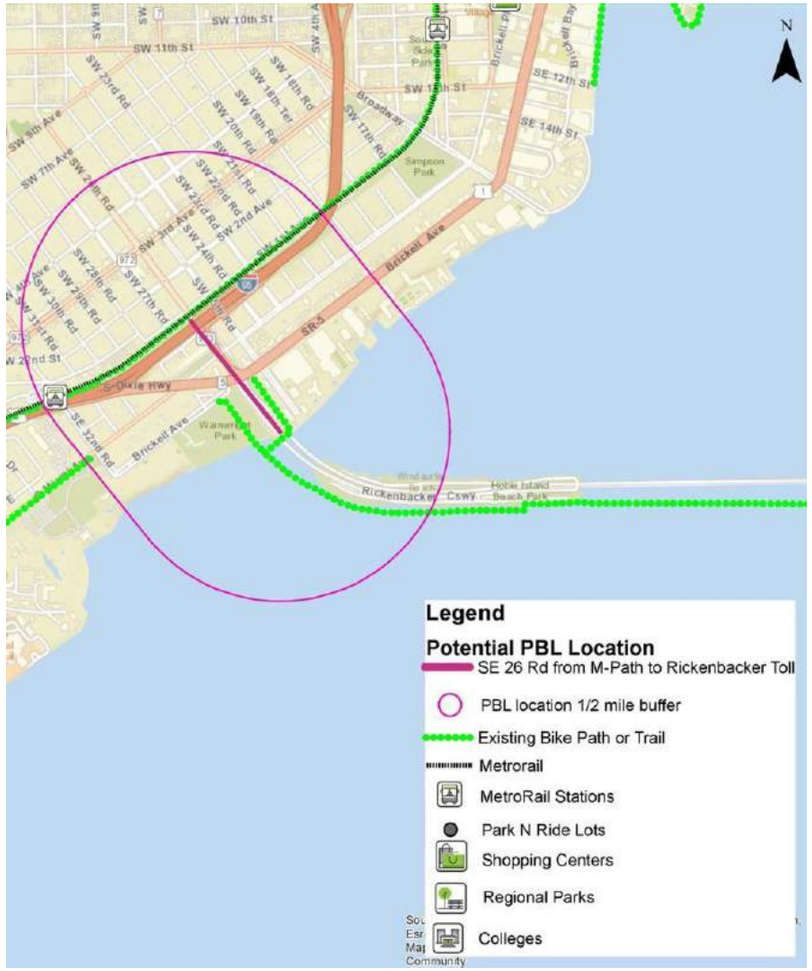
- Bike lane on north end of US-1
- Connects to The Underline
- Connects to high density development
- Proximity to many destinations
- Sidewalks

CONSTRAINTS

- Connection to section with poor LOS
- Narrow Lanes
- Short segment

3 POTENTIAL LOCATIONS

14. SW 26TH ROAD FROM M-PATH TO RICKENBACKER TOLL



City: Miami

2040 V/C: 0.71 to >1.0

AADT: 39,000

Number of Lanes: 4

Right-of-Way: 86’

Pavement Width: 66’

Segment Length: 0.37

On-Street Parking: no

Posted Speed Limit: 30 mph

Bike Lanes: Yes (Partial)

Destinations within 1/2 Mile:

TRANSIT PARKS EMPLOYMENT

Cost*: $11,100 - $148,000

*Projected costs range between delineators (least expensive), rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

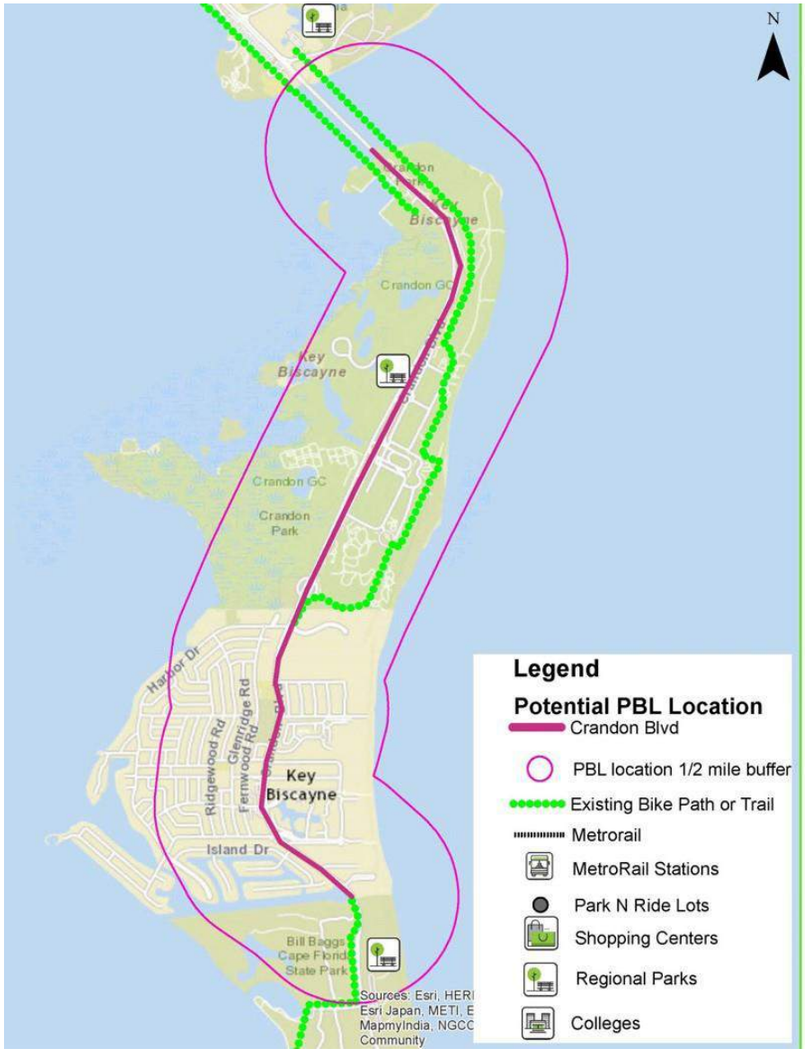
- Connects to the incoming Underline and plan Z projects
- Proximity to many destinations
- Sidewalks

CONSTRAINTS

- Auto dominated environment
- Heavy traffic infrastructure
- Short segment
- Tight Right-of-way

3 POTENTIAL LOCATIONS

15. CRANDON BOULEVARD FROM BEAR CUT BRIDGE TO BILL BAGGS PARK



City: Key Biscayne - Miami

Pavement Width: 66’

2040 V/C: 0.7 to > 1.0

Segment Length: 3.5 miles

AADT: 35,000

On-Street Parking: no

Number of Lanes: 4

Posted Speed Limit: 45/30 mph

Right-of-Way: 216’

Bike Lanes: Yes

Destinations within 1/2 Mile:

Cost*: $105,000 - $1,400,000

COLLEGES/ UNIVERSITIES · TRANSIT · PARKS · EMPLOYMENT

*Projected costs range between delineators (least expensive), rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

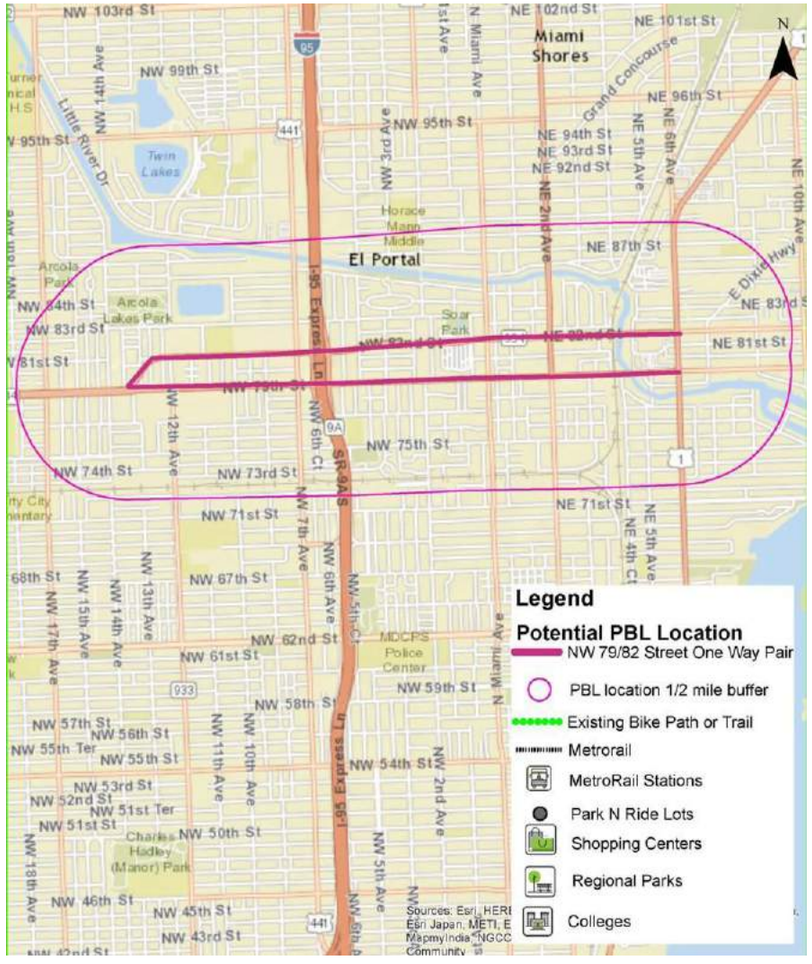
- Connection to key Biscayne
- Connects to green bike lanes
- High visibility project
- Strong cycling community and ability to build public support

CONSTRAINTS

- High auto speeds
- Lack of commuter connectivity

3 POTENTIAL LOCATIONS

16. NW 79TH STREET FROM NW 13TH COURT TO BISCAYNE BOULEVARD



City: Miami

2040 V/C: 0.0 to > 1.0

AADT: 28,800

Number of Lanes: 4

Right-of-Way: 100’

Destinations within 1/2 Mile:

Pavement Width: 60’

Segment Length: 2.25 miles

On-Street Parking: Yes

Posted Speed Limit: 40/30 mph

Bike Lanes: no (Sharrows)

Cost*: $36,000 - $900,000

SMART PLAN

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

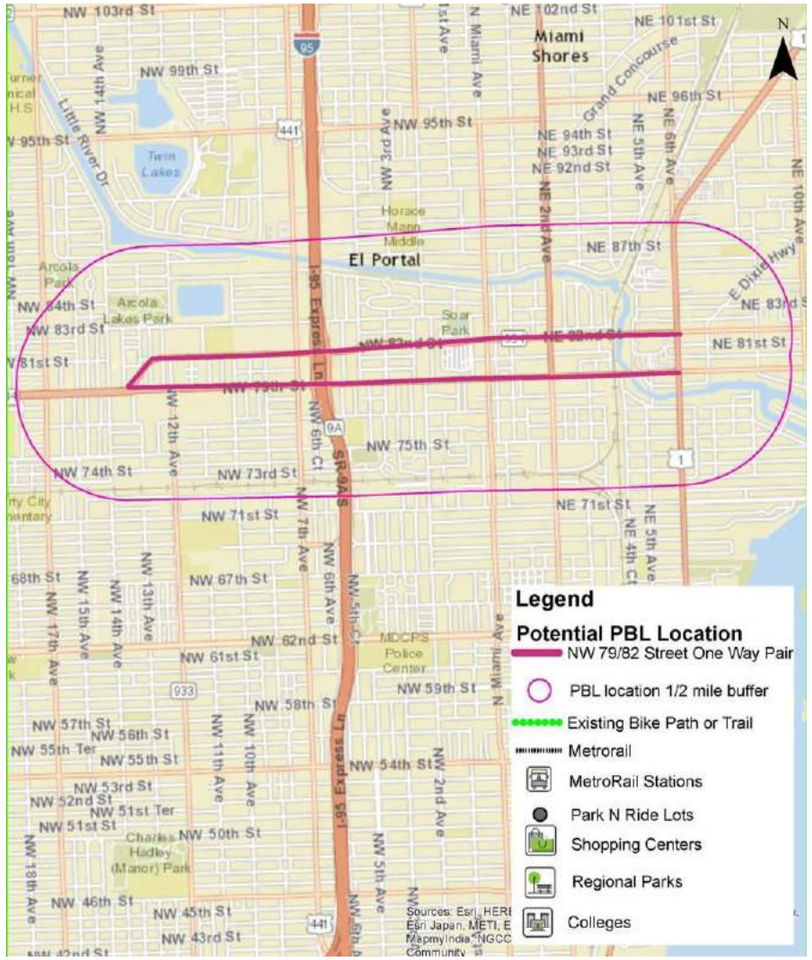
- Enhance beach connectivity
- Sidewalks

CONSTRAINTS

- Lack of shade
- Lots of driveway interference
- Low density development

3 POTENTIAL LOCATIONS

17. NW 82ND STREET FROM NW 13TH COURT TO BISCAYNE BOULEVARD



City: Miami-Dade

2040 V/C: 0.0 to > 1.0

AADT: 17,000

Number of Lanes: 2

Right-of-Way: 62’

Destinations within 1/2 Mile:

Pavement Width: 45’

Segment Length: 2.3 miles

On-Street Parking: Yes

Posted Speed Limit: 40/35 mph

Bike Lanes: Yes

Cost*: $36,800 - $920,000

SMART PLAN

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

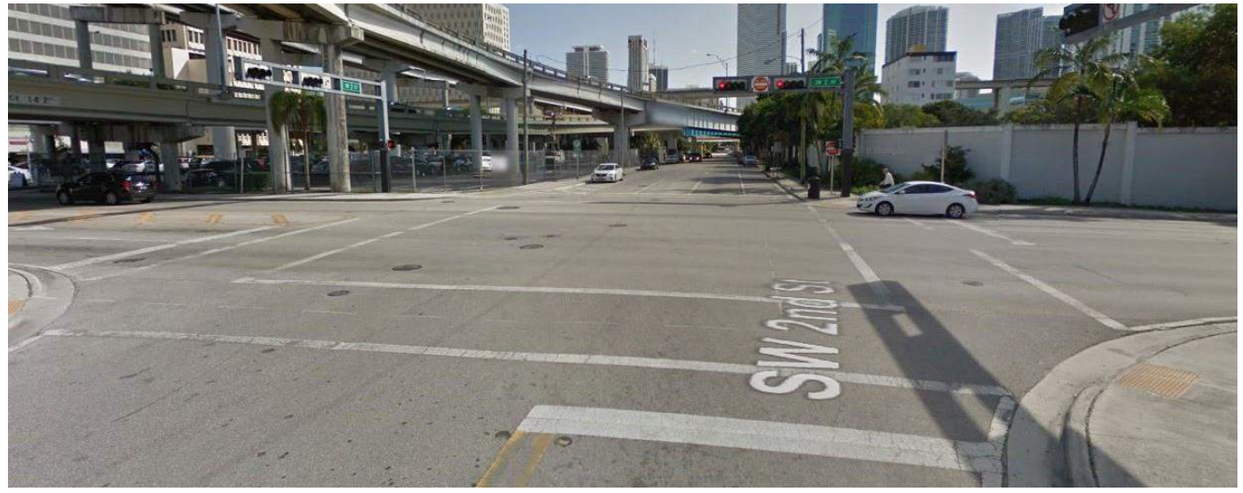
- Bike lanes on both sides
- Enhance beach connectivity
- Low AADT
- Sidewalks

CONSTRAINTS

- Lack of shade
- Lots of driveway interference
- Low density development

3 POTENTIAL LOCATIONS

18. SW 2ND STREET FROM NORTH RIVER DRIVE TO SW 1ST AVENUE



City: Miami

2040 V/C: N/A

AADT: N/A

Number of Lanes: 3

Right-of-Way: 65’

Pavement Width: 45’

Segment Length: 0.25 miles

On-Street Parking: Yes

Posted Speed Limit: 30 mph

Bike Lanes: no

Destinations within 1/2 Mile:

SMART PLAN · TRANSIT · BIKE TRAILS/ GREENWAYS · EMPLOYMENT · PARKS

Cost*: $4,000 - $100,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

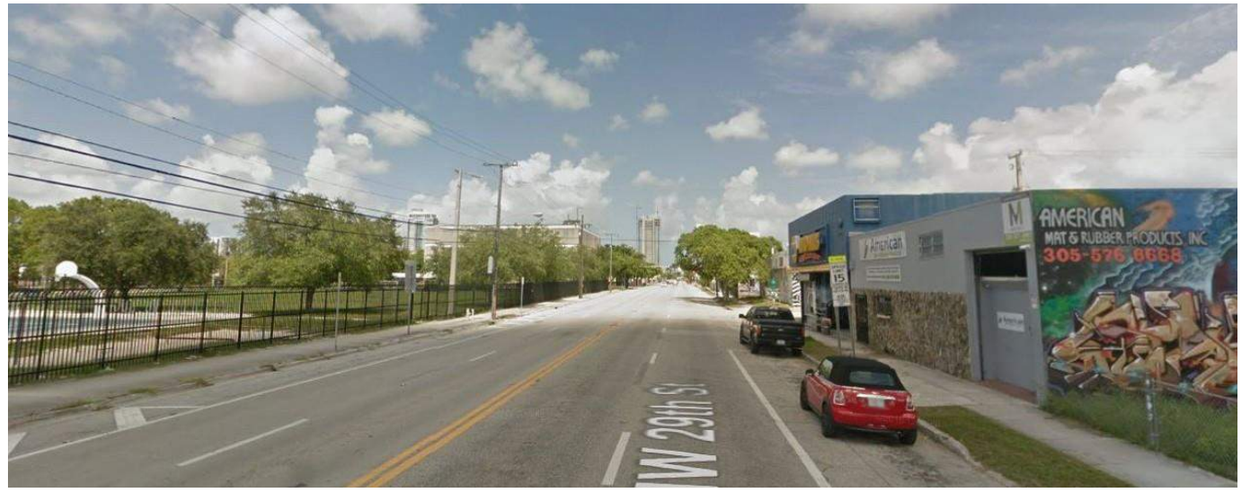
- Connection to Miami River greenway
- On-street parking
- One-way vehicular traffic
- Proximity to many destinations
- Sidewalks

CONSTRAINTS

- Lack of traffic data
- One way become a two way road at SW 2nd Avenue

3 POTENTIAL LOCATIONS

19. NE 29TH STREET FROM NW 7TH AVENUE TO NORTH MIAMI AVENUE



City: Miami

2040 V/C: 0.91 to > 1.0

AADT: 8,600

Number of Lanes: 4

Right-of-Way: 80’

Destinations within 1/2 Mile:

SMART PLAN

SHOPPING CENTERS

Pavement Width: 60’

Segment Length: 0.75

On-Street Parking: Yes

Posted Speed Limit: 30 mph

Bike Lanes: no

Cost*: $12,000 - $300,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

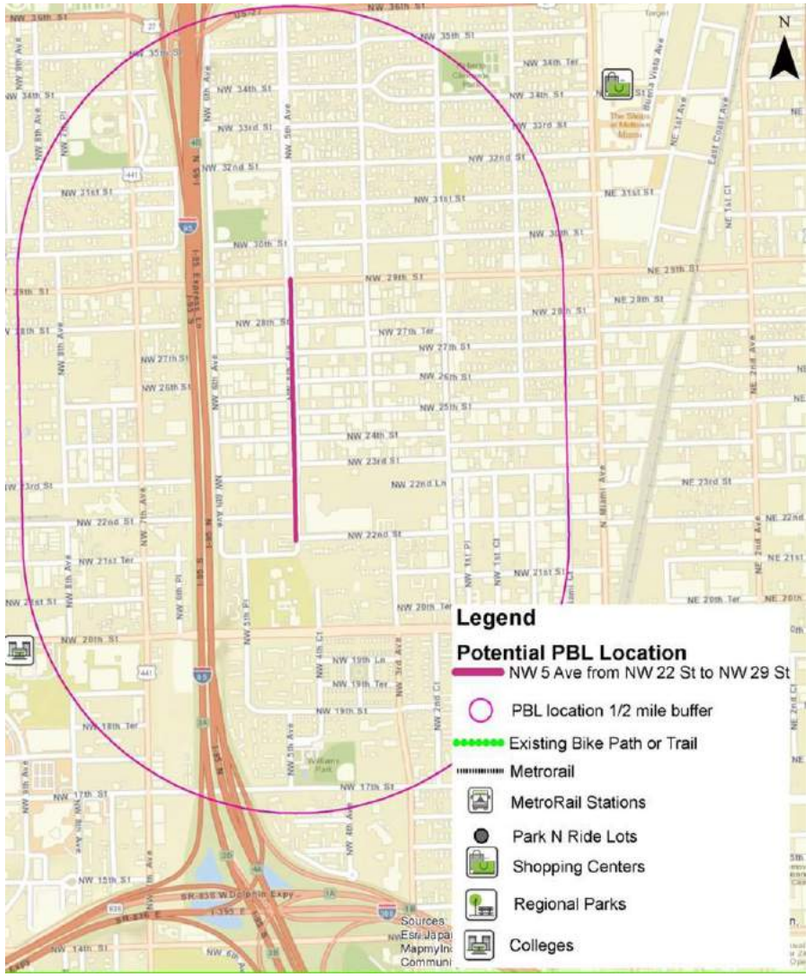
- Could connect to 5th Avenue protected Bike lane
- mixed use development
- Sidewalks

CONSTRAINTS

- Industrial zoning could mean high truck traffic

3 POTENTIAL LOCATIONS

20. NW 5TH AVENUE FROM NW 22ND STREET TO NW 29TH STREET



City: Miami

2040 V/C: N/A

AADT: N/A

Number of Lanes: 3

Right-of-Way: 100’

Destinations within 1/2 Mile:

SHOPPING CENTERS

Pavement Width: 80’

Segment Length: 0.4 miles

On-Street Parking: Yes

Posted Speed Limit: 30 mph

Bike Lanes: no

Cost*: $6,400 - $160,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

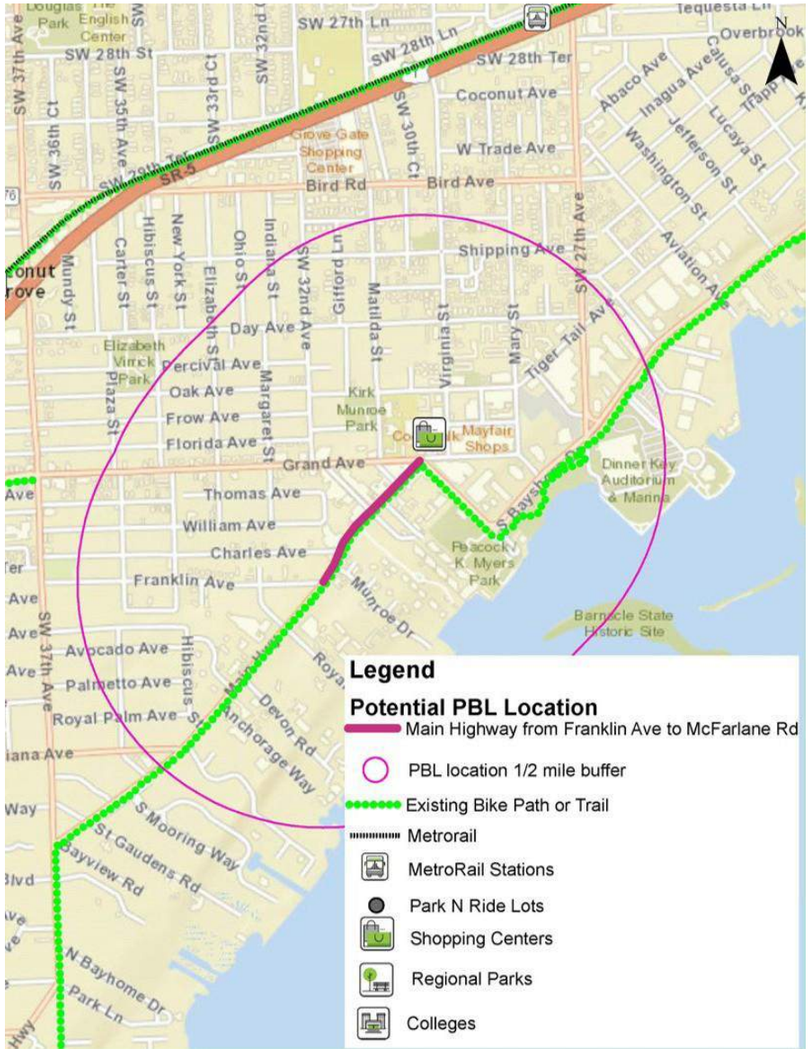
- Could connect to 29th Street protected Bike lane
- mixed use development
- Sidewalks

CONSTRAINTS

- Lack of AADT data
- Lack of residential development

3 POTENTIAL LOCATIONS

21. MAIN HIGHWAY FROM FRANKLIN AVENUE TO MCFARLANE ROAD



City: Miami

2040 V/C: > 1.0

AADT: N/A

Number of Lanes: 4

Right-of-Way: 70’

Destinations within 1/2 Mile:

SHOPPING CENTERS

COLLEGES/ UNIVERSITIES

Pavement Width: 45’

Segment Length: 0.3 miles

On-Street Parking: Yes

Posted Speed Limit: 30 mph

Bike Lanes: no

Cost*: $4,800 - $120,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

- Dense tree canopy
- Low AADT
- Scenic bike route
- Sidewalks

CONSTRAINTS

- Lack of AADT data
- Lack of commuter destinations
- Lack of sidewalks
- Tight Right-of-way

3 POTENTIAL LOCATIONS

22. BISCAYNE BOULEVARD FROM PORT BOULEVARD TO SE 3RD STREET

City: Miami

Pavement Width: 90’

2040 V/C: 0.0 to 0.7

Segment Length: 0.55 miles

AADT: 36,000

On-Street Parking: no

Number of Lanes: 8

Posted Speed Limit: 30 mph

Right-of-Way: 244’

Bike Lanes: no

Destinations within 1/2 Mile:

Cost*: 8,800 - $220,000

SHOPPING CENTERS | BIKE TRAILS/ GREENWAYS | COLLEGES/ UNIVERSITIES | TRANSIT | EMPLOYMENT | PARKS

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

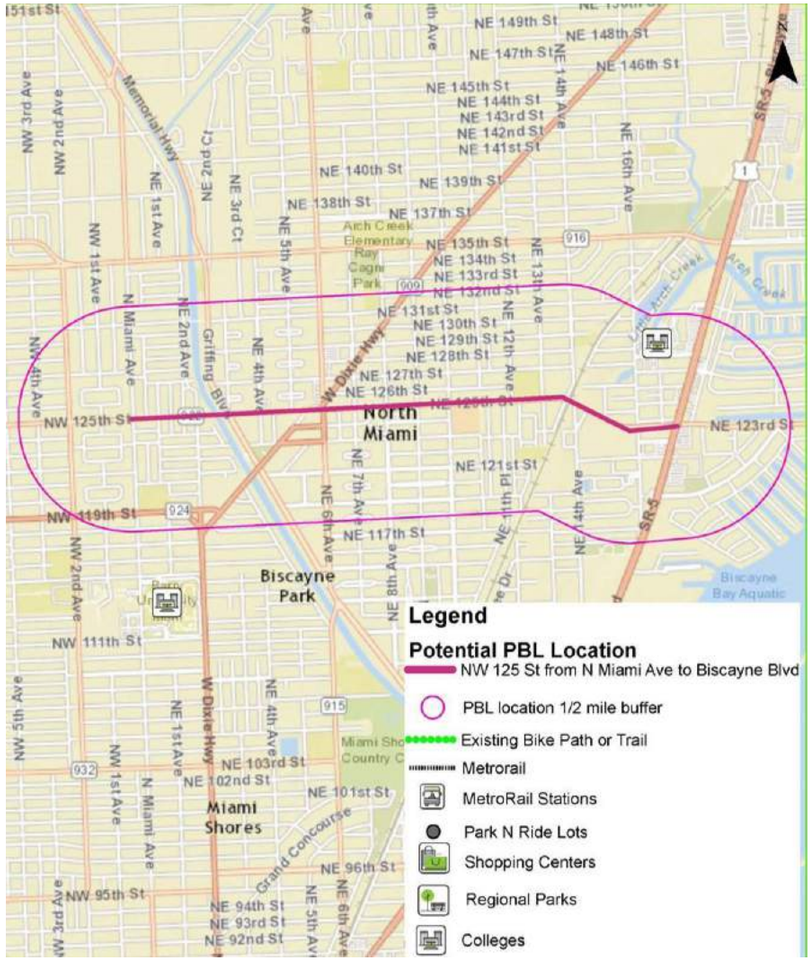
- Connection to high density development
- Connectivity to Regional Park
- High visibility project
- Level of Service A/B
- One-way vehicular traffic
- Proximity to many destinations

CONSTRAINTS

- High vehicle speeds

3 POTENTIAL LOCATIONS

23. NE 125TH STREET FROM NORTH MIAMI AVENUE TO BISCAYNE BOULEVARD



City: Miami-Dade

2040 V/C: 0.81 to > 1.0

AADT: 31,500

Number of Lanes: 4

Right-of-Way: 90’

Pavement Width: 68’

Segment Length: 2.25 miles

On-Street Parking: Yes

Posted Speed Limit: 30 mph

Bike Lanes: no (Sharrows)

Destinations within 1/2 Mile:

SMART PLAN · TRANSIT · PARKS · EMPLOYMENT

Cost*: $36,000 - $900,000

*Projected costs range between on-street parking (least expensive), delineator posts, rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

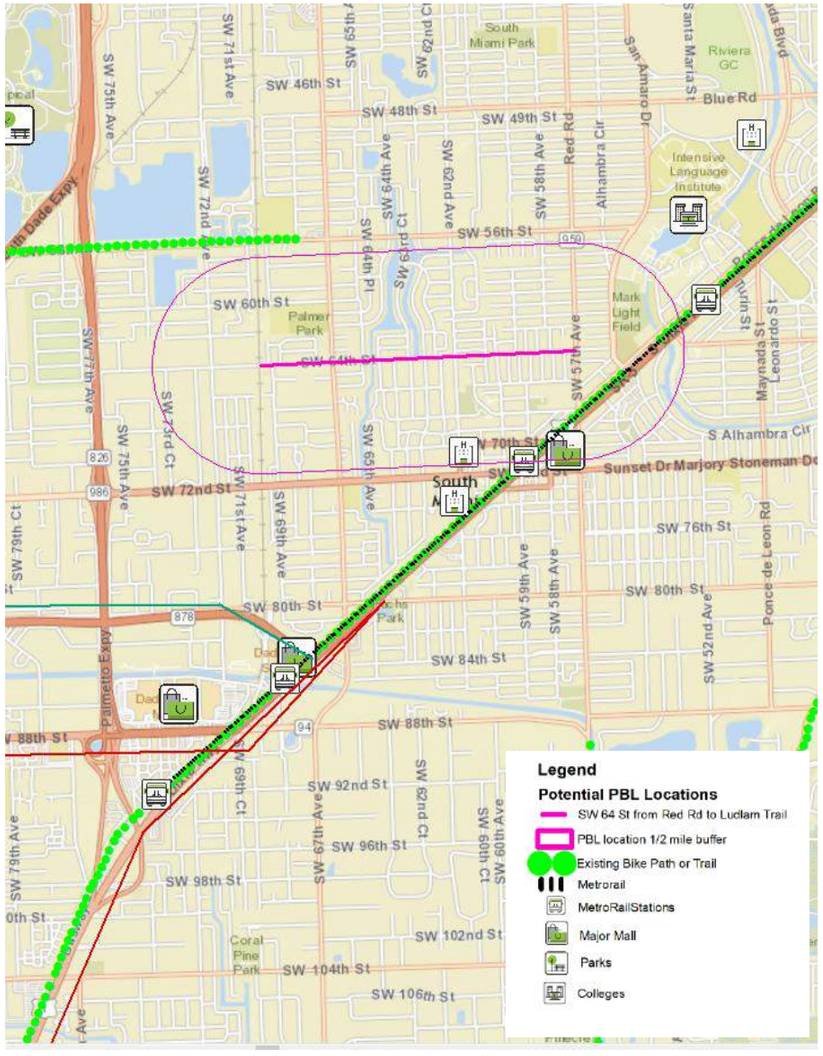
- Connectivity to SMART corridor
- On-street parking
- Sidewalks

CONSTRAINTS

- High auto speeds
- Lack of shade

3 POTENTIAL LOCATIONS

24. SW 64TH STREET FROM RED ROAD TO LUDLAM TRAIL



City: South Miami

2040 V/C: 0.0 to 0.7

AADT: 8600

Number of Lanes: 2

Right-of-Way: 72’

Destinations within 1/2 Mile:

TRANSIT PARKS EMPLOYMENT

Pavement Width: 25’

Segment Length: 1.03 miles

On-Street Parking: no

Posted Speed Limit: 30 mph

Bike Lanes: no

Cost*: $30,900 - $412,000

*Projected costs range between delineator posts (least expensive), rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

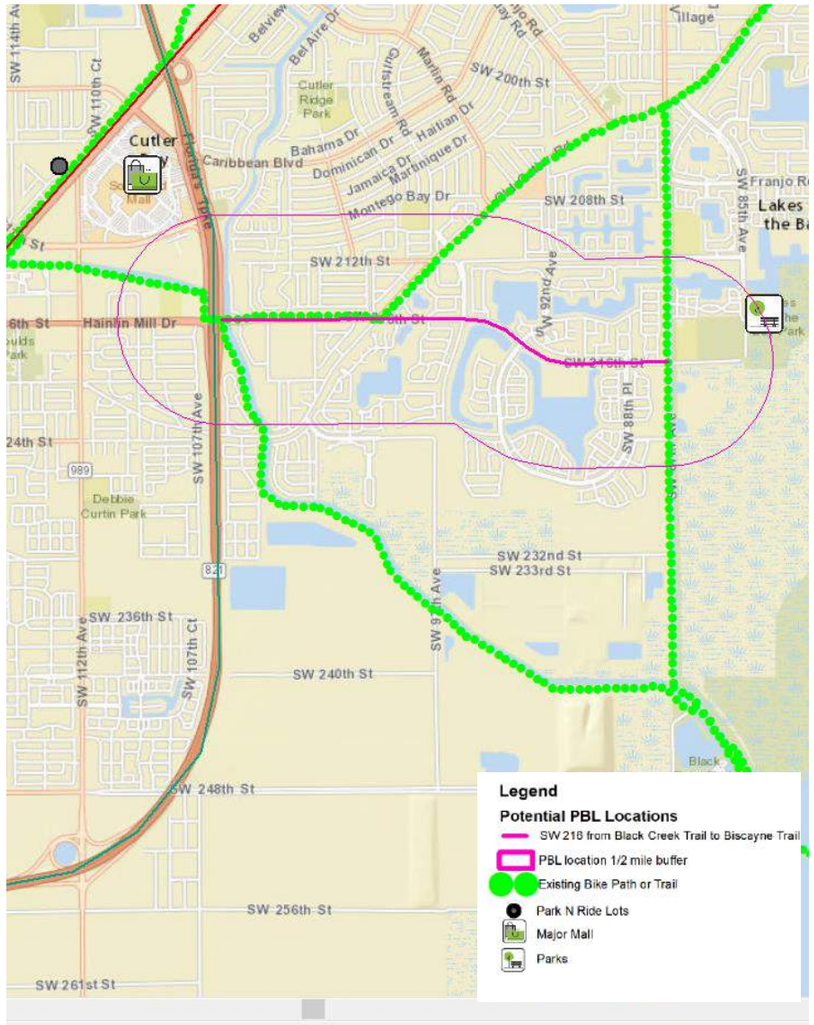
- Connection to planned trail
- Level of Service
- Proximity to school

CONSTRAINTS

- Lack of connectivity to employment

3 POTENTIAL LOCATIONS

25. SW 216th STREET FROM BLACK CREEK TRAIL TO BISCAYNE TRAIL



City: Cutler Bay

2040 V/C: 0.0 to 0.7

AADT: 18000

Number of Lanes: 4

Right-of-Way: 120’

Pavement Width: 50’

Segment Length: 2.7 miles

On-Street Parking: no

Posted Speed Limit: 30 mph

Bike Lanes: no

Destinations within 1/2 Mile:

Cost: $81,000 - $1,080,000

TRANSIT PARKS EMPLOYMENT

*Projected costs range between delineator posts (least expensive), rigid bollards, and decorative planters (most expensive).

OPPORTUNITIES

- Connection to Biscayne trail, old Cutler trail and South Dade trail
- Level of Service
- Proximity to many destinations
- Sidewalks

CONSTRAINTS

- Lack of connectivity to employment

3 POTENTIAL LOCATIONS

RANKING METHODOLOGY

This plan's focus was to identify demonstration-friendly segments that possess most of following attributes: connectivity to the SMART plan and transit, low AADT, Low V/C ratios, ample right-of-way, existing on-street parking, existing bike facilities, connectivity to numerous destinations, among other unique factors that could suggest a fast-track demonstration project.

The original identified list was evaluated with a scoring system that appropriated points based on the previously mentioned criteria. During the analysis process, if there were any obvious fatal flaws that revealed themselves during the evaluation, those segments were immediately disqualified as a potential demonstration project. For example, if there was a highly favorable segment with strong connectivity to transit and employment, however lacked the appropriate right-of-way to fit a PBL, then the segment was not considered for a demonstration project.

DEMONSTRATION PROJECT RECOMMENDATIONS

SW 211 Street and the Downtown Network comprised of Miami Ave, NE 1st Ave, NW 5th and 6th streets (to be further described as the 'Downtown Network') rose as the top two most suitable locations for PBL demonstration projects based on this scoring criteria. While part of the evaluation of this study was to eliminate obvious fatal flaws, no segment was perfectly suitable for a PBL. All segments come with their own unique set of design challenges that needed to be confronted and evaluated during the conceptual design process. The team recommendations are summarized in the following pages and will be further highlighted in the demonstration project section of the report.

SEGMENTS IN RANKED ORDER

Rank	Segment	2040 V/C	LOS points	AADT	RW Width	# Lanes	Pvmnt Width	Segment length (miles)	On-street Parking	Parking Points	Speed Limit	Bike lane	Bike Facility Points	Shoulder	One way	One Way points	Proximity to:	Proximity Score	Final Score
1	NE 1st Ave from SE 1st St to NE 17th St	0.0 to 0.70	3	17500	70'	3	47'	1.26	Yes	2	30	No	0	Yes	Yes	1	SMART Plan-Universities-Transit-Parks-Employment-Trails/Greenways	13	19
2	**NW/NE 5th St from NW 5th Ave to Biscayne Blvd**	**0.0 to 0.70**	**3**	**10500**	**70'**	**3**	**50'**	**1.09**	**Yes**	**2**	**30**	**No**	**0**	**Yes**	**Yes**	**1**	**SMART Plan-Universities-Transit-Parks-Employment-Trails/Greenways**	**13**	**19**
3	S/N Miami Ave from S. 2nd St to N 11th St	0.70 to 1.0	1	6600	56'	3-2	30'	0.70	Yes	2	30	No	0	Yes	Yes	1	SMART Plan-Universities-Transit-Parks-Employment-Trails/Greenways	13	17
4	**NW/NE 6th St from NW 5th Ave to Biscayne Blvd**	**> 1.0**	**0**	**4600**	**50'**	**2**	**38'**	**1.10**	**Yes**	**2**	**30**	**No**	**0**	**Yes**	**Yes**	**1**	**SMART Plan-Universities-Transit-Parks-Employment-Trails/Greenways**	**13**	**16**
5	SW 211 St from US -1 to Turnpike	0.0 to 0.70	3	20000	120'	4	90'	0.80	Yes	0	35	Yes	1	Yes	No	0	SMART Plan-Shopping-Trails/Greenways-Transit	11	15
6	NW 3rd Ct from W Flagler St to NW 8th St	0.71 to 0.8	2	13500	67'	4	48	0.5 miles	No	0	30	No	0	No	Yes	1	SMART Plan-Transit-Trails/Greenways-Employment-Parks	12	15
7	NW/NE 8th St from NW 1st Ave to Biscayne Blvd	n/a	0	n/a	67'	2	32'	0.40	Yes	2	30	No	0	Yes	No	0	SMART Plan-Universities-Transit-Parks-Employment-Trails/Greenways	13	15
8	**SW 1st St from SW 2nd Ave to Biscayne Blvd**	**0.0 to 0.70**	**3**	**7100**	**66'**	**3**	**48'**	**0.65**	**Yes**	**2**	**30**	**Sharrows**	**0**	**Yes**	**Yes**	**1**	**Universities-Parks-Transit-Trails/Greenways-Shopping**	**8**	**14**
9	SW 2nd St from North River Dr to SW 1st Ave	n/a	0	n/a	65'	3	45'	0.25	Yes	2	30	No	0	Yes	Yes	1	SMART Plan-Transit-Trails/Greenways-Employment-Parks	10	13
10	**SW 136th St from SW 82nd Ave to SW 90th Ave**	**0.0 to 1.0**	**1**	**17200**	**110'**	**4**	**92'**	**1.25**	**No**	**0**	**30**	**No**	**0**	**No**	**No**	**0**	**SMART Plan-Shopping-Transit-Trails/Greenways-Employment**	**11**	**12**
11	Red Rd from US-1 to SW 72nd St	0.71 to 0.8	2	15000	74'	5	54'	0.22	No	0	30	No	0	No	No	0	Transit-Hospitals-Shopping-Employment-Trails/Greenways	10	12
12	**SW 216th St from Black Creek Trail to Biscayne Trail**	**0.0 to 0.70**	**3**	**18000**	**120'**	**4**	**50**	**2.70**	**No**	**0**	**30**	**No**	**0**	**No**	**No**	**0**	**Black Creek, Ludlam Trail, Biscayne Trail**	**9**	**12**
13	S Bayshore Dr from Aviation Ave to Mercy Way	0.91 to >1.0	0	18000	48'	3	38'	1.25	Yes	2	30	No	0	Yes	No	0	Hospitals-Parks-Transit-Shopping-Trails/Greenways	9	11
14	**Biscayne Blvd from Port Blvd to SE 3rd St**	**0.0 to 0.70**	**3**	**36000**	**244'**	**6**	**90'**	**0.55**	**No**	**0**	**30**	**No**	**0**	**No**	**No**	**0**	**Shopping-Parks-Trails/Greenways-Universities-Transit**	**8**	**11**
15	SW 64th St from Red Rd to Ludlam Trail	0.0 to 0.70	3	8600	72'	2	25'	1.03	No	0	30	No	0	No	No	0	Trails/Greenways	7	10
16	**Government Center from SW 1st St to SW 3rd St**	**n/a**	**0**	**n/a**	**55'**	**0**	**55'**	**0.25**	**No**	**0**	**30**	**No**	**0**	**No**	**No**	**0**	**SMART Plan-Transit-Universities-Parks-Trails/Greenways**	**9**	**9**
17	NW 82nd St from NW 13th Ct to Biscayne Blvd	0.0 to > 1.0	0	17000	62'	2	45'	2.30	Yes	2	40/35	Yes	1	Yes	Yes	1	SMART Plan	3	7
18	**NE 29th St from NW 7th Ave to N Miami Ave**	**0.91 to >1.0**	**0**	**8600**	**80'**	**4**	**60'**	**0.75**	**Yes**	**2**	**30**	**No**	**0**	**Yes**	**No**	**0**	**SMART Plan-Shopping**	**5**	**7**
19	Julia Tuttle Causeway	>1.0	0	118000	116'	6	116'	2.75	No	0	55	Yes	1	Yes	No	0	SMART Plan-Hospital	5	6
20	**NW 5th Ave from NW 22nd St to NW 29th St**	**n/a**	**0**	**n/a**	**100'**	**3**	**80'**	**0.40**	**Yes**	**2**	**30**	**No**	**0**	**Yes**	**No**	**0**	**Shopping-Employment**	**4**	**6**
21	NE 125th St from N Miami Ave to Biscayne Blvd	0.81 to >1.0	0	31500	90'	4	68'	2.25	Yes	2	30	Sharrows	0	Yes	No	0	SMART Plan-Universities	4	6
22	**NW 79th St from NW 13th Ct to Biscayne Blvd**	**0.0 to > 1.0**	**0**	**28800**	**100'**	**4**	**60'**	**2.25**	**Yes**	**2**	**40/30**	**Sharrows**	**0**	**Yes**	**No**	**0**	**SMART Plan**	**3**	**5**
23	Main Highway from Franklin Ave to McFarlane Rd	> 1.0	0	none	70'	4	45'	0.30	Yes	2	30	No	0	Yes	No	0	Shopping-Parks	3	5
24	**SW 26th Rd from M-Path to Rickenbacker Toll**	**0.70 to > 1.0**	**0**	**39000**	**86'**	**4**	**46'**	**0.37**	**No**	**0**	**30**	**No**	**0**	**No**	**No**	**0**	**Transit-Trails/Greenways**	**4**	**4**
25	Crandon Blvd from Bear Cut Bridge to Bill Baggs State Park	0.70 to > 1.0	0	35000	216'	4	66'	3.50	No	0	30	Yes	1	No	No	0	Parks-Trails/Greenways	2	3

Table 2: Segments in ranked order

DOWNTOWN NETWORK OPPORTUNITIES

-NE 1st Avenue from SE 1st Street to NE 17th Street
-Miami Ave from SE 1st Street to NE 29th Street
-NE/NW 5th Street from Biscayne Boulevard to the Miami River Greenway
-NE/NW 6th Street from Biscayne Boulevard to the Miami River Greenway

The Downtown Network was originally introduced in the TPO study, "Application of Innovative Strategies for Improved Bicycle Safety and Mobility". In the report, a portion of this location included the two one-way pairs as a suitable location to consider for a PBL installation. This proposed PBL location extends these original segments to SE 1st Street to NE 17th Street (north and south) and 7th Avenue to Biscayne Boulevard (east and west). Reasons behind extending the network was to connect to the Miami River Greenway and Biscayne Boulevard. Doing so would allow for a strengthened overall network with separated trails and other PBL planned facilities. In addition, with the network serving through the heart of downtown, these segments connect with a long assortment of mixed use development, employment, schools, entertainment and dining. Finally, the downtown location does serve as the core of the SMART plan.

DOWNTOWN NETWORK CONSTRAINTS

The downtown network comes with challenges in regard to varying right-of-way widths along the corridor segment. In order for the PBL to fit properly, lane repurposing of automobile travel lanes and on-street parking are being proposed in this concept design. Further analysis will be needed by traffic and roadway design engineers for potential design challenges in regard to traffic flow, turning radius, drainage, etc. Please see Appendix A (page 93) for a projected Level of Service table displaying how a lane repurposing may affect motor vehicle traffic. According the table, no segment of the roadway falls below Level of Service D.

Figure 42: North Miami Avenue at NE 13th Street

The Omni district offers a range of adjacent amenities conducive to a PBL segment such as connection Omni Park. Also notice the incoming density with the local residential condos also adjacent to the corridor.

Figure 43: North Miami Avenue at NE 14th Street

The intersection at Miami Avenue at NE 14th street presents a design challenge which must be further addressed if a connection is going to remain seamless heading north to potentially NE 29th Street. Heading south of NE 14th Street however, there is a range of commercial activity all the way to the heart of downtown Miami.

Figure 44: North Miami Avenue at NE 11th Street

The intersection of Miami Avenue at NE 11th Street presents an opportunity to have a partnership with a local dining merchants. Partnerships can be made with local private businesses and the community for more creative PBL treatments such as planters and or on-street parking should the community request and or support it.

SW 211 STREET OPPORTUNITIES

A demonstration PBL project on SW 211 street is being proposed between Florida's Turnpike and US-1. The connectivity to the Black Creek Trail, South Dade Trail, the Caribbean Boulevard Complete Street, and SMART Plan shows many possibilities for this to become an actively used bike commuting corridor. In addition, this segment connects to a wide variety of biking facilities and a bus hub that provides extended connectivity to farther destinations including downtown Miami, Black Point, and West Kendall. Regarding design, it also provides ample right-of-way which reduced potential encroachment of private land.

SW 211 STREET CONSTRAINTS

SW 211 Street does come with its own unique set of challenges. For example, as the upcoming conceptual drawings will display, the bus hub is also acting as a bus staging area thus causing the right-of-way to include an assortment of buses stacked along the roadway. This causes an issue with conflict points between the buses and potential bike riders. Further analysis regarding proximity to the bus stops and clearance for buses to pull in and out of the stops must be further evaluated. Potential solutions for this challenge include consolidating bus stops and utilizing the ample parking available from the adjacent parking lots.

Figure 45: Wal-mart located at US-1 and SW 211 Street

The SW 211 Street segment lies adjacent to a major hub for the Town of Cutler Bay. The Town is currently enduring significant challenges with traffic congestion.

Figure 46: Mixed-use development at SW112 Avenue and SW 211 Street

The Town Center will provide similar building types as this version currently adjacent to the Miami-Dade Cultural Arts Center of SW 211 Street.

Figure 47: South Dade Government Center located along SW 211 Street

The Town Center is also host to the South Dade Government Center. In addition to government services, the site also is home to a local fire and police station.

4 CONCEPTUAL DESIGN ONE

DOWNTOWN NETWORK

The renderings, typical sections, and plan view conceptual drawings will show a PBL on the left-hand side. Best practice research recommends left-hand side PBL facilities in order to avoid conflicts with right turning vehicles and transit. As referenced in the NACTO Urban Street Design Guide: “A raised cycle track or parking buffered cycle track applied on a one-way street, removes cyclists from potential conflicts with bus traffic and creates a pedestrian safety island that decreases exposure time for pedestrians.”

The typical sections for north and south bound routes do not propose the repurposing of any car travel lanes. These sections will show a lane repurposing one side of existing on-street parking to become a 5-foot bike lane and 3-foot buffer with plastic delineators serving as the vertical protection device.

Regarding 5th and 6th streets, right-of-way provides enough room to provide on-street parking for the majority of the segment. In the particular case for the 5th and 6th street segments, on-street parking would be shifted over for both segments with a 7-foot bicycle lane and 3-foot buffer which accommodates for the door-zone for parked cars. For NE 1st Avenue, 5th and 6th Streets, the typical section will propose no travel lane repurposing. The Miami Avenue segment does however propose a lane repurposing, moving from 3 travel lanes for cars to 2 travel lanes in order to allocate appropriate room for the PBL.

Figure 48: Proposed PBL design at North Miami Avenue and NE 15th Street

Figure 49: Existing conditions at North Miami Avenue and NE 15th Street

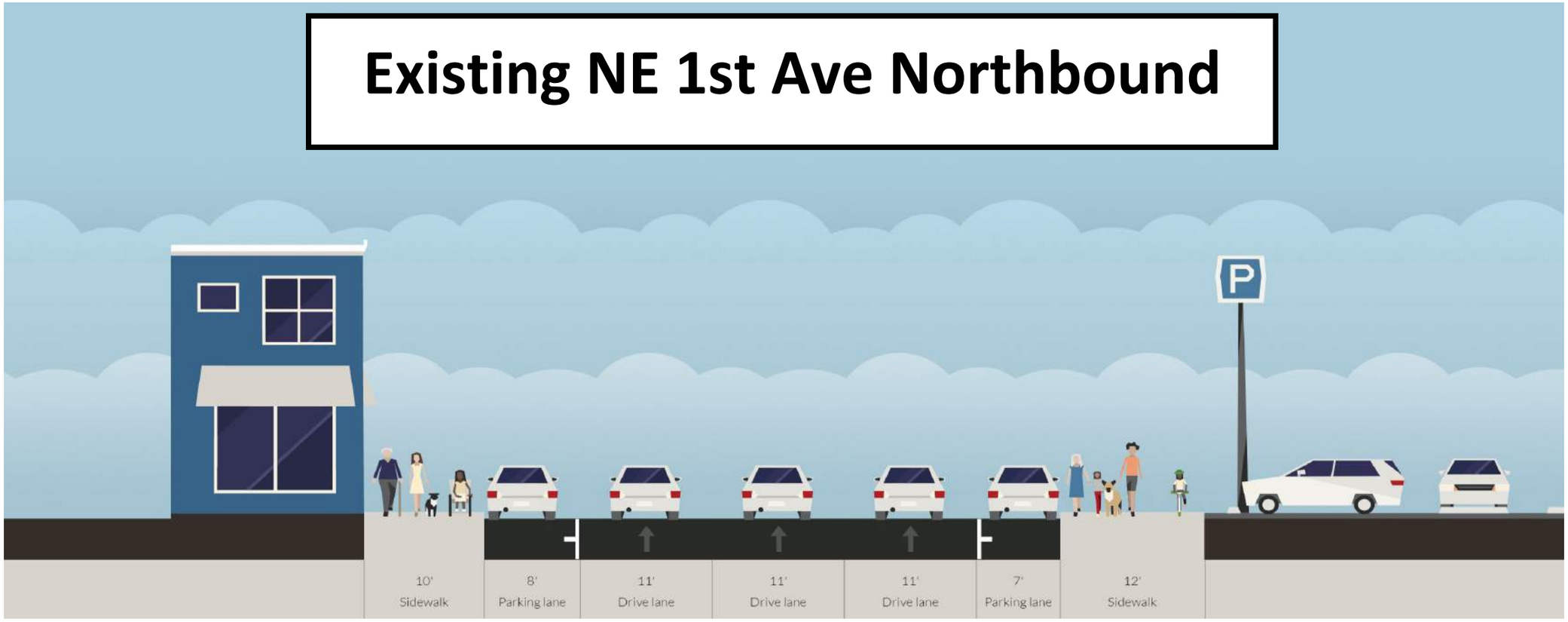


Figure 50: Streetmix.com

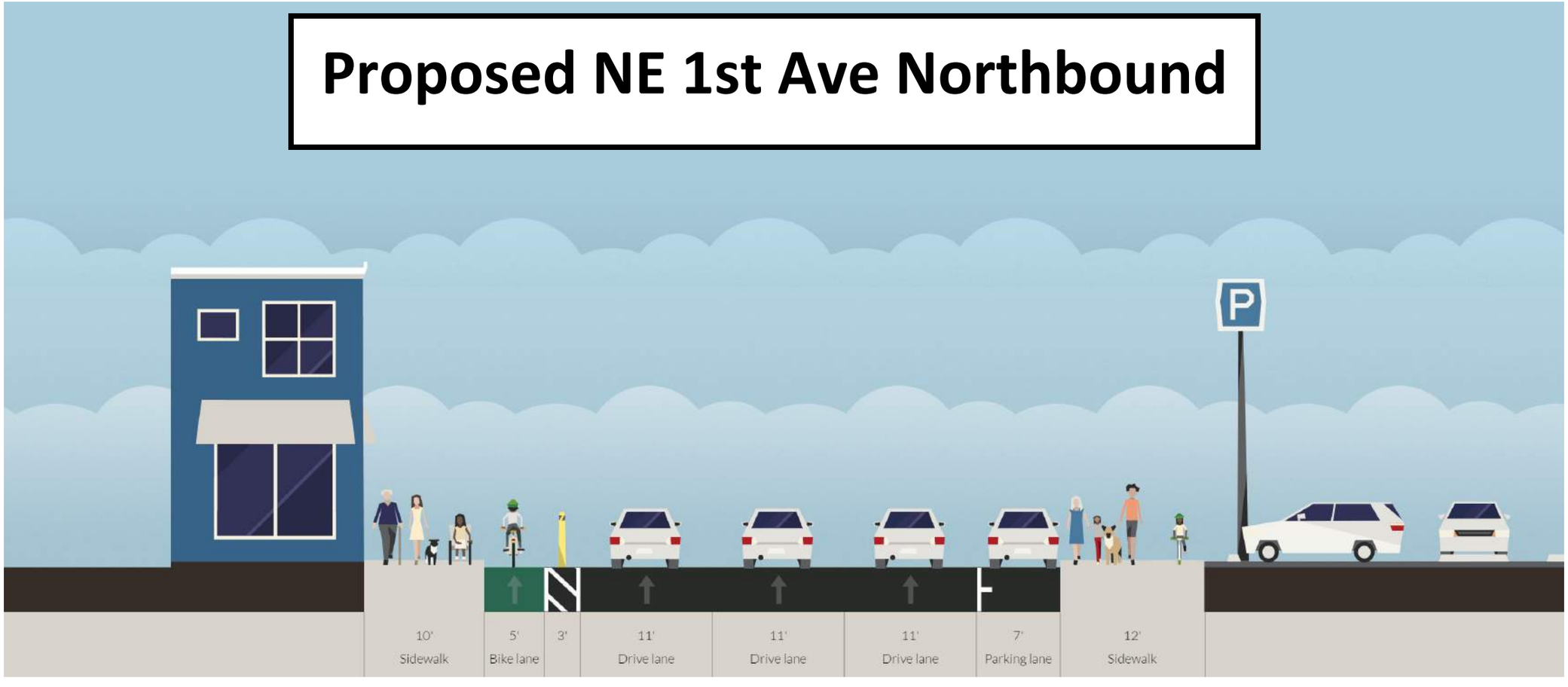


Figure 51: Streetmix.com

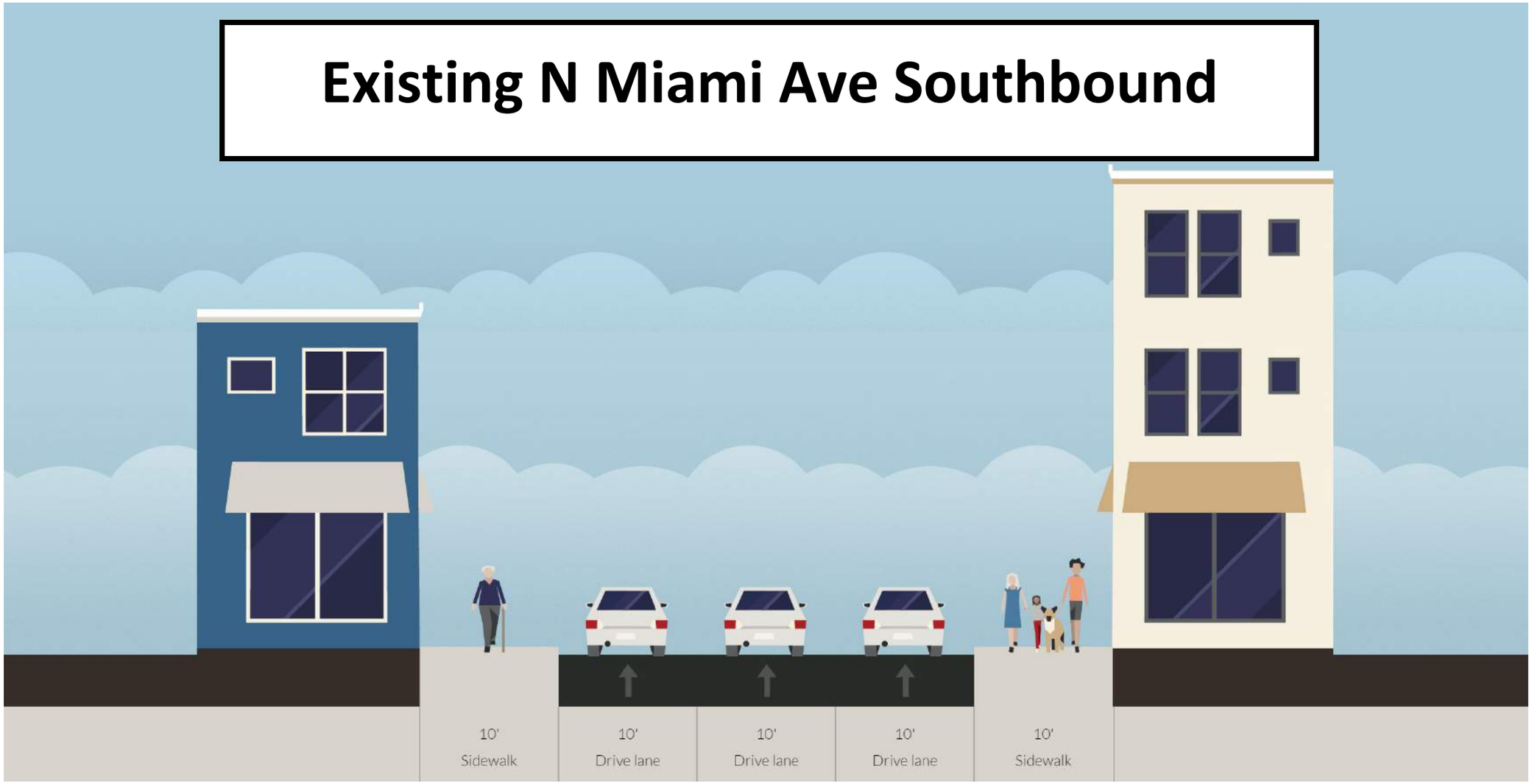
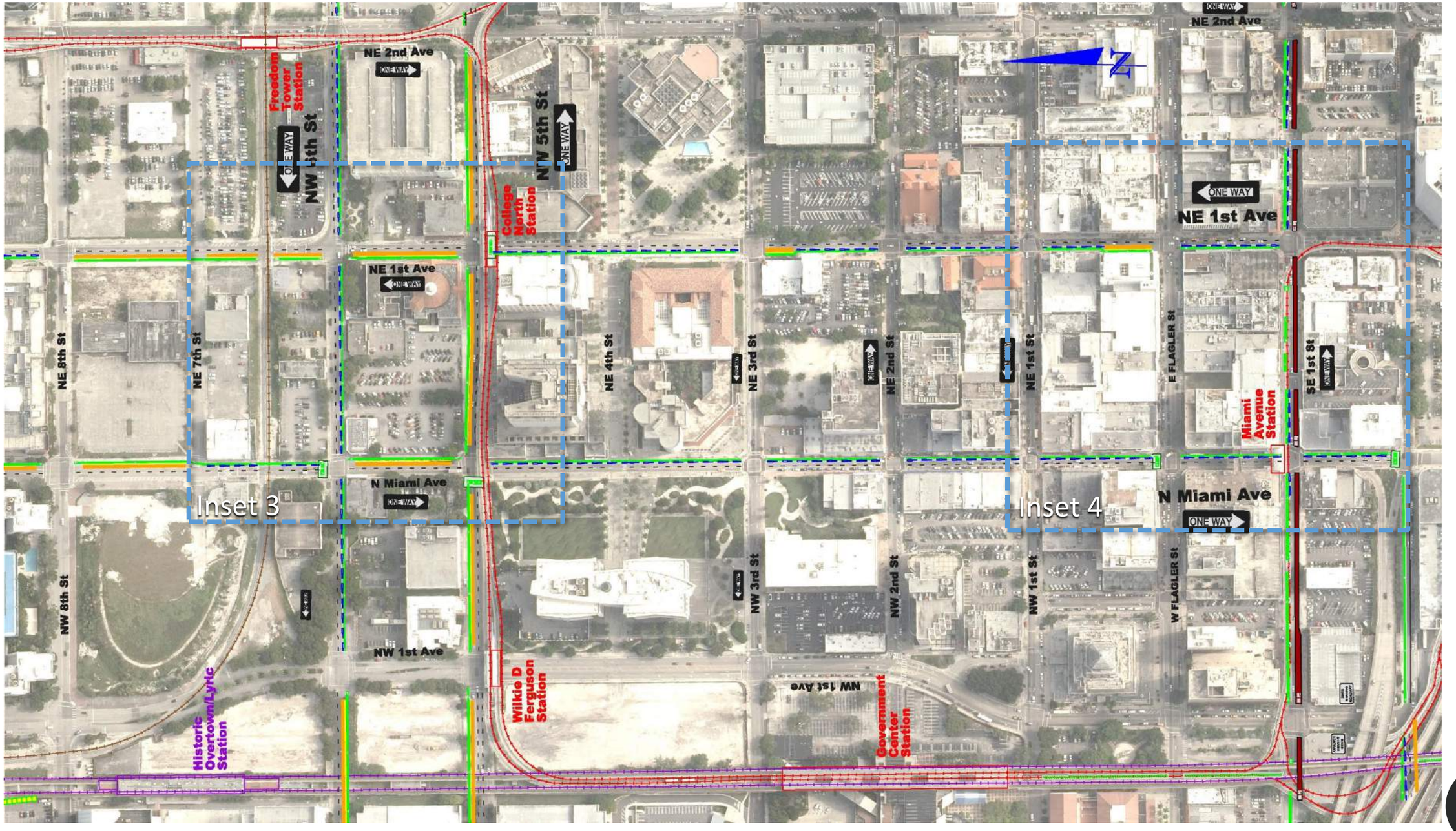


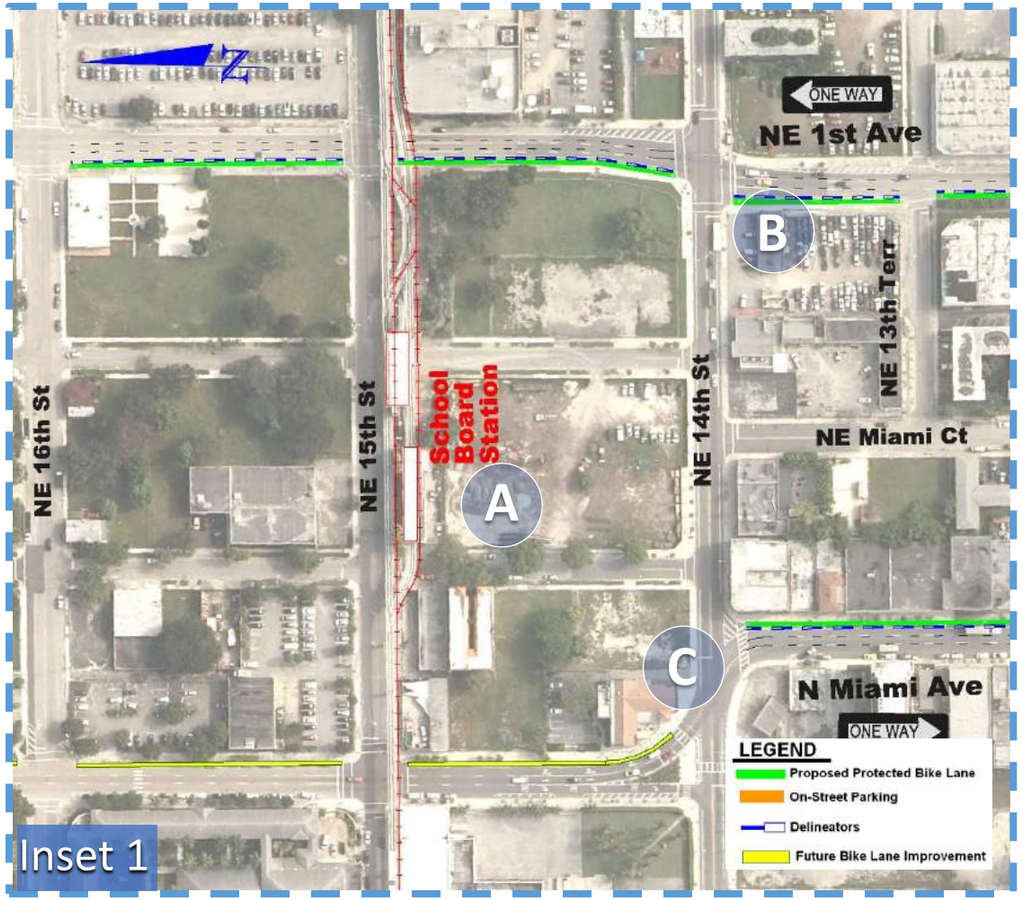
Figure 52: Streetmix.com

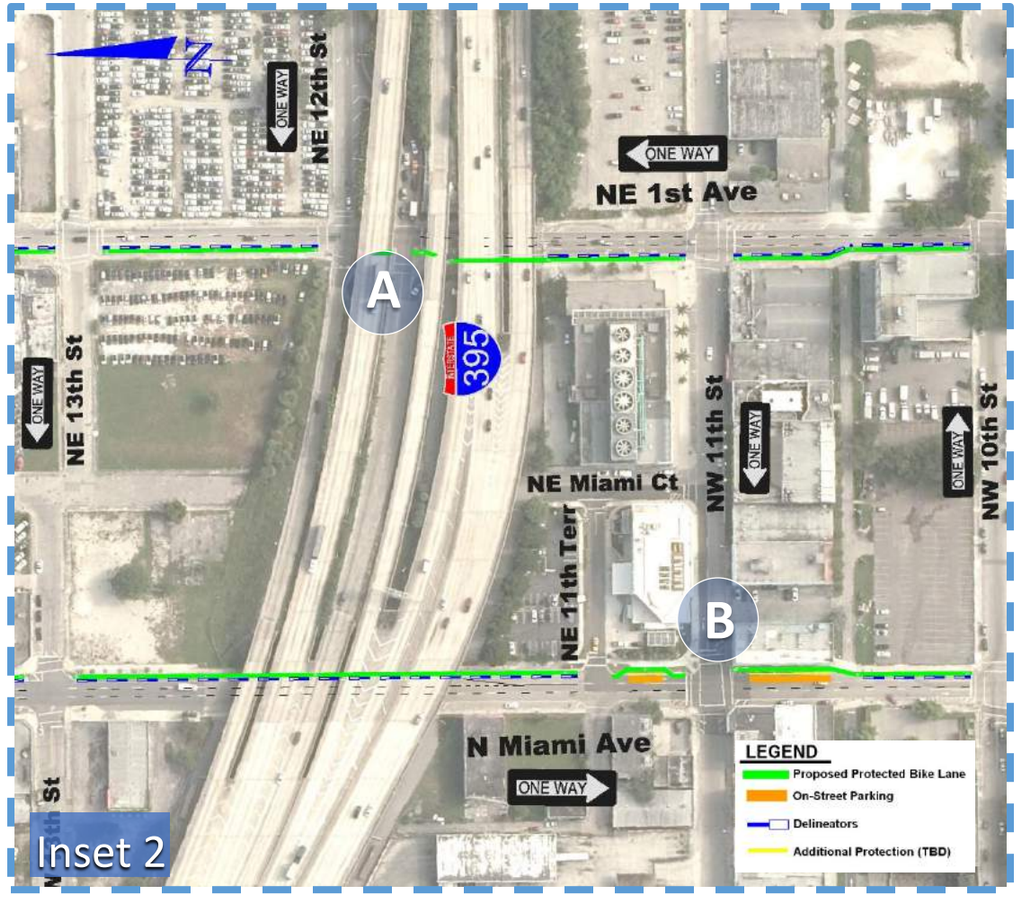
Figure 53: Streetmix.com


Protected Bike Lanes North / South
Downtown Corridor 1st Ave & Miami Ave
NE 2nd Ave
NE 1st Ct
NE 17th St
NE 16th St
NE 15th St
School Board Station
NE 14th St
NE 13th Ter
NE 13th St
NE Miami Ct
NE 12th St
NW 14th St
NW 13th St
Inset 1
Inset 2
Eleventh Street Station
Park West Station
ONE WAY
NE 1st Ave
395
NE 11th Ter
NE Miami Ct
N Miami Ave
NE 9th St
NW 11th St
alley
NW 10th St
NW 9th St
LEGEND
Proposed Protected Bike Lane
Proposed Bike Box
Existing Bike Trail / Path
On-Street Parking
Proposed Bus Lane
Delineators
Additional Protection (TBD)
Miami Metromover
Miami Metrorail

MIAMI-DADE TPO **PROTECTED BIKE LANES** DEMONSTRATION PLAN







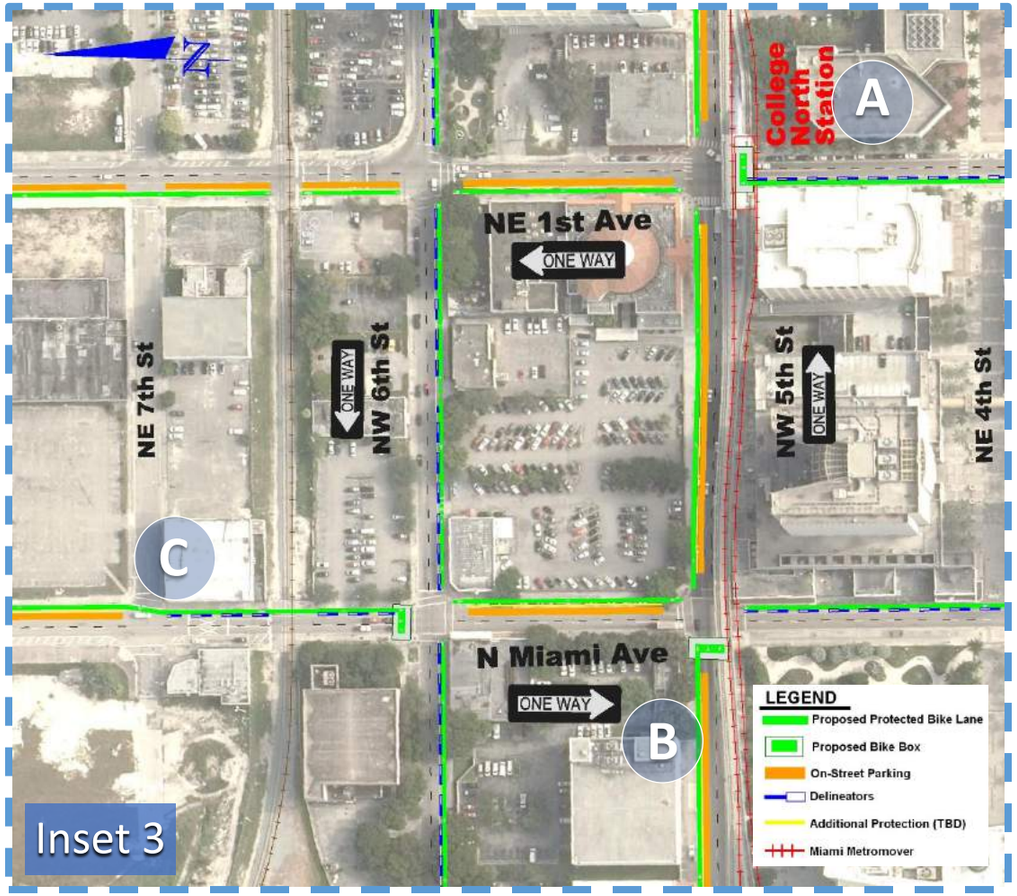
A – Connection to School Board Station

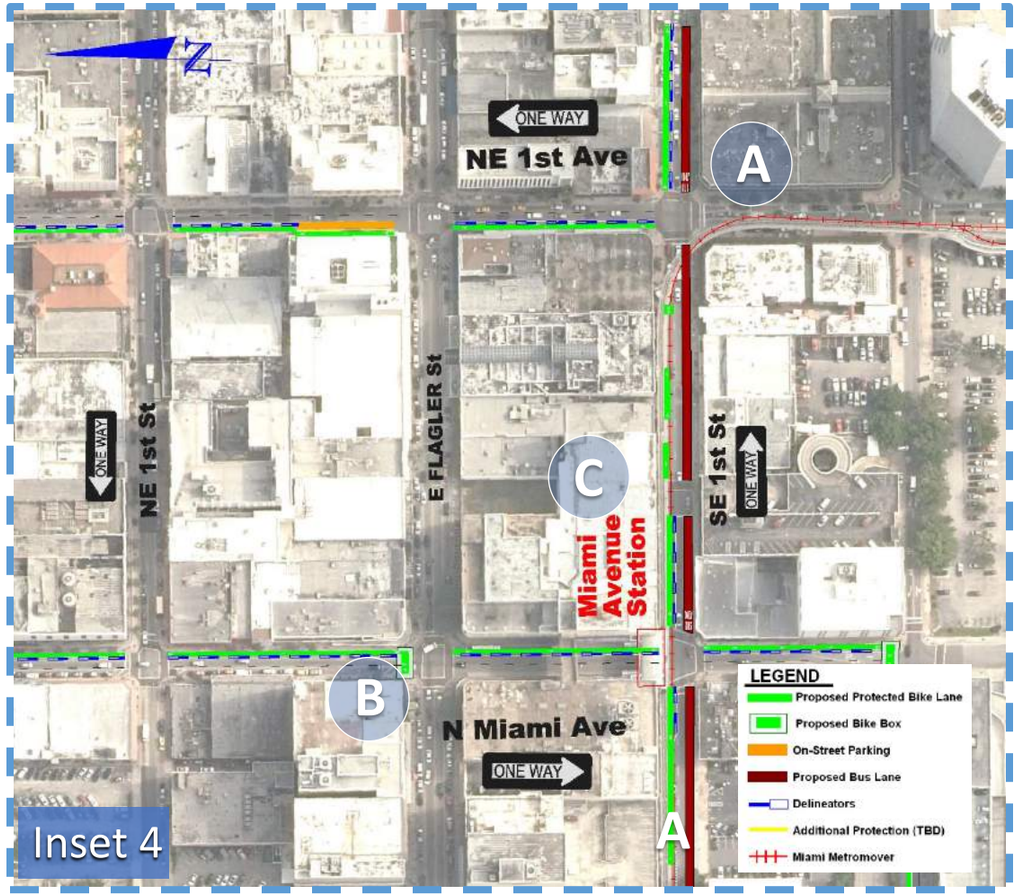
B – NE 1st Ave continues Northbound

C – Intersection design challenge to connect to future PBL

A – Design challenge thru the I-395 connection

B – On-street parking challenge with lane removal





A – Connection to College North Station

B – Connection to court house

C – Transition between delineators to on-street parking protection

A – Intersection with NE 1st Street Complete Street project

B – Proposed Bike Box to facilitate safe turning

C - Connection to Miami Avenue Station

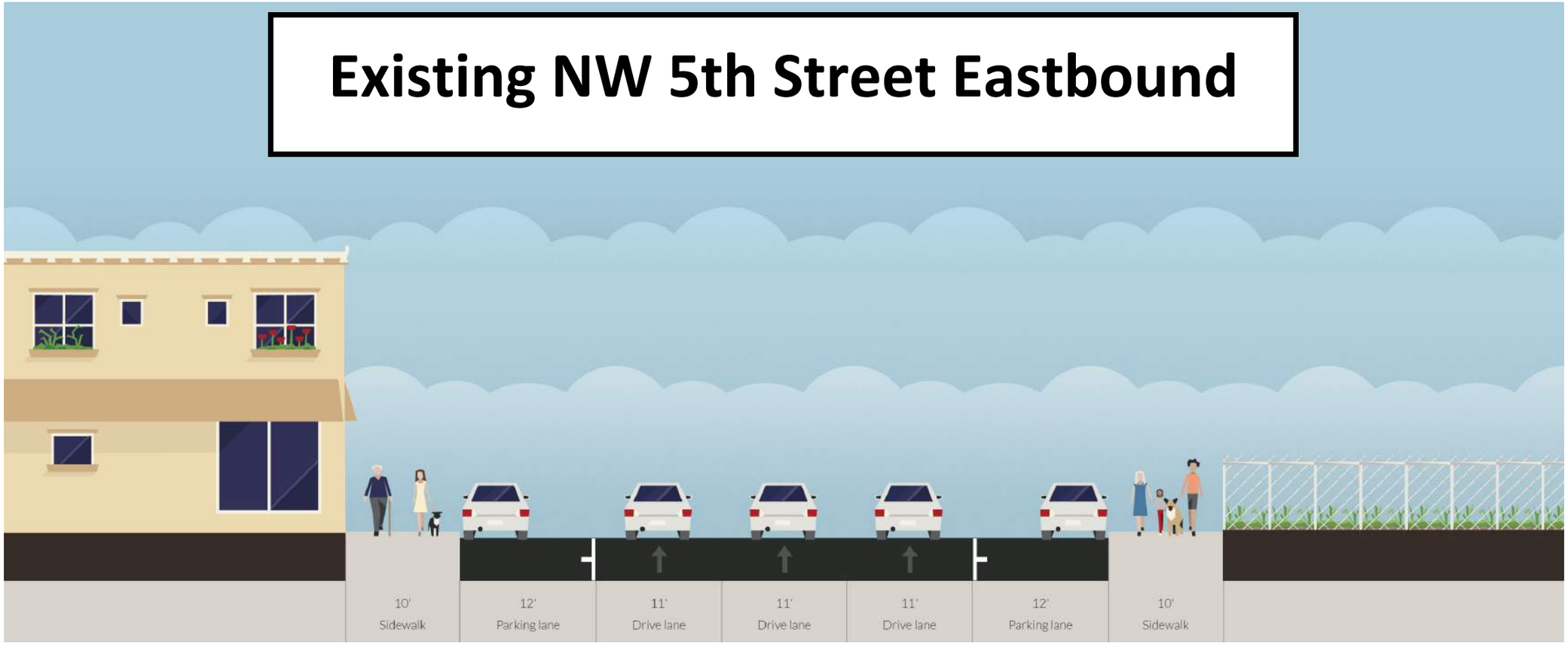


Figure 54: Streetmix.com

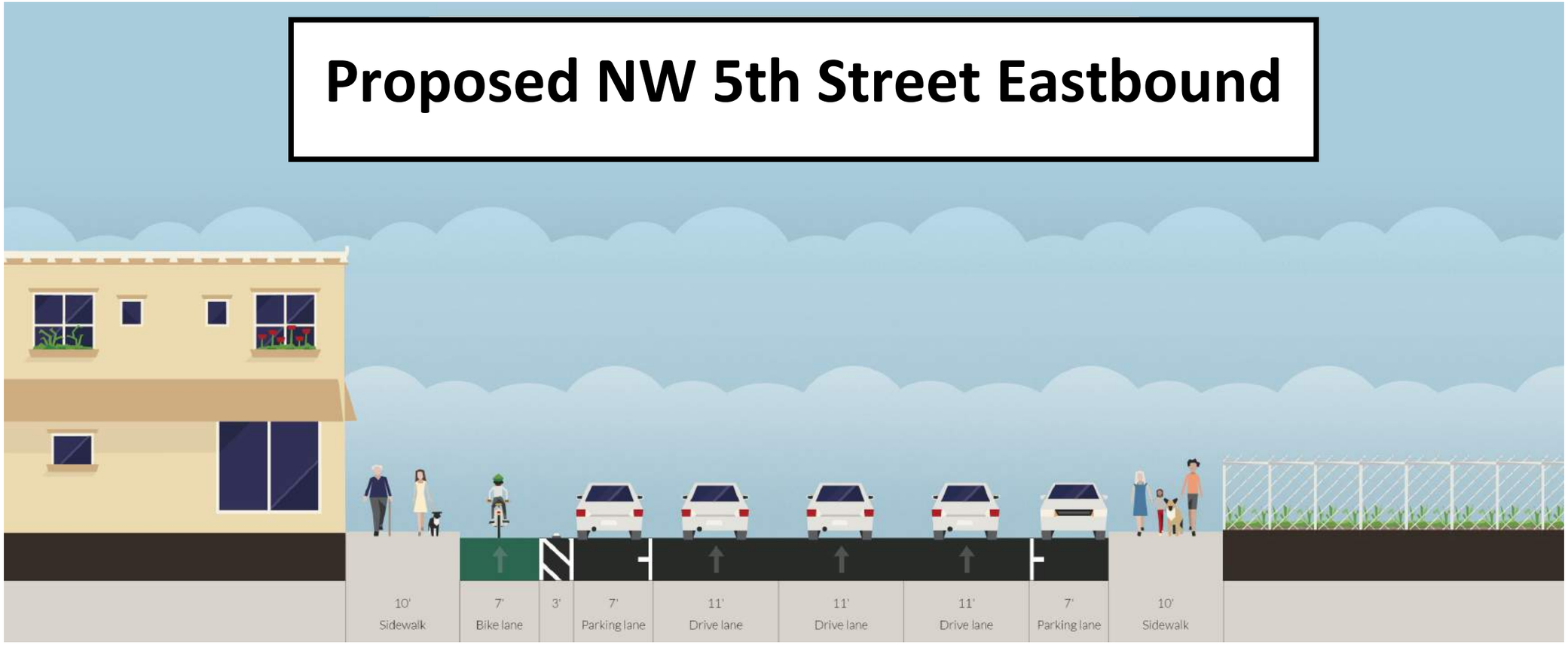
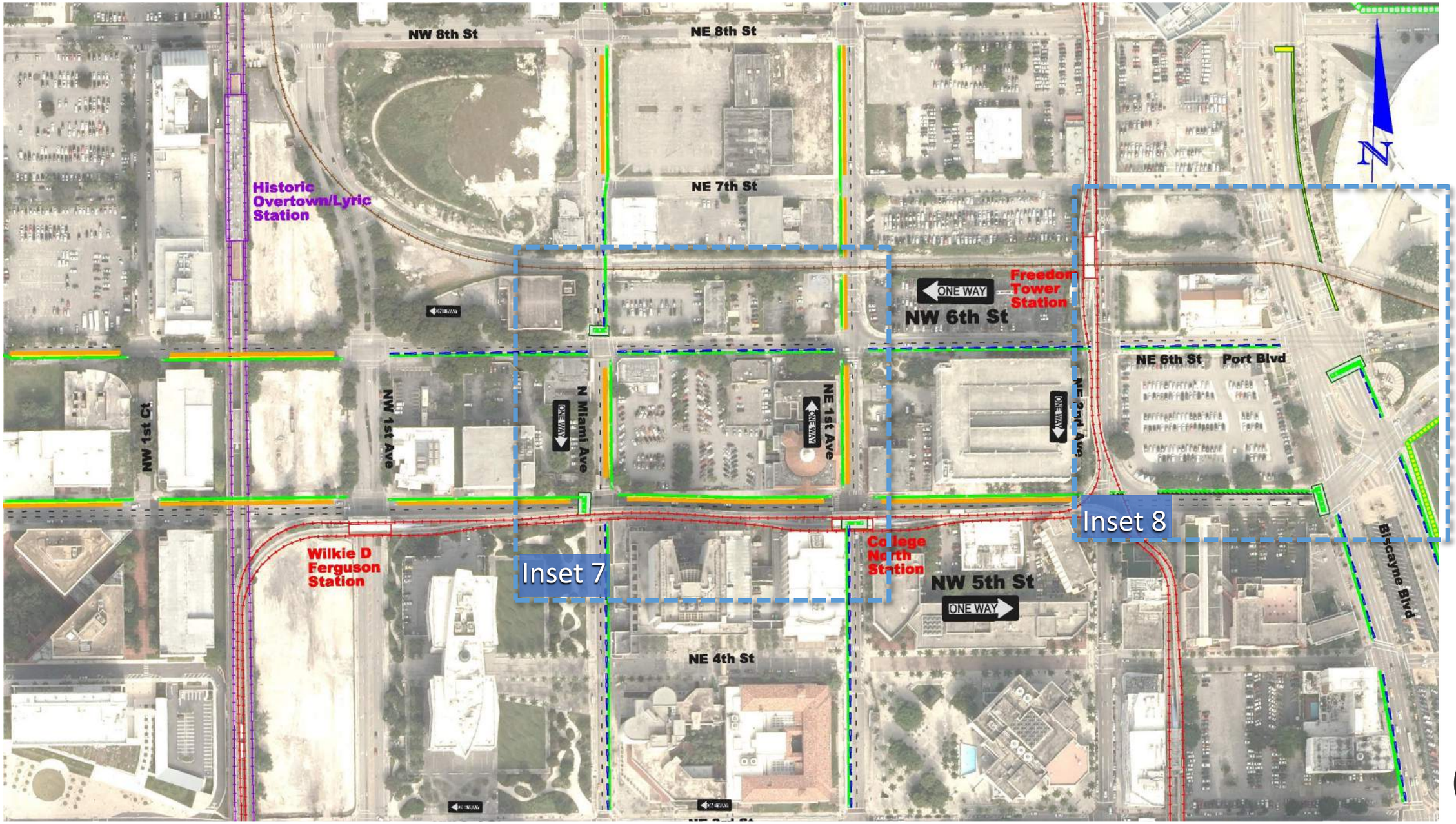


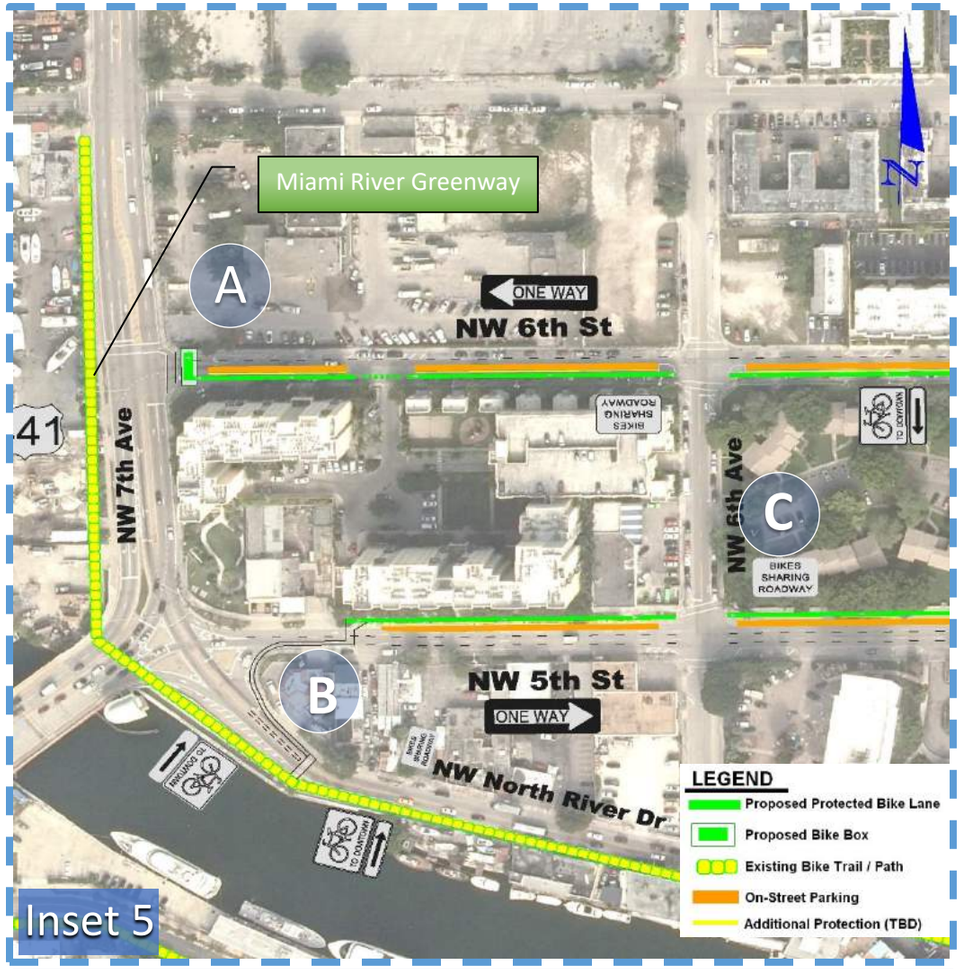
Figure 55: streetmix.com

Figure 56: Streetmix.com

Figure 57: Streetmix.com


LEGEND
Proposed Protected Bike Lane
Proposed Bike Box
Existing Bike Trail / Path
On-Street Parking
Delineators
Additional Protection (TBD)
Miami Metromover
Miami Metrorail
Protected Bike Lanes East / West
Downtown Corridor 5th St & 6th St
95
N
ONE WAY
NW 6th St
441
NW 7th Ave
Miami River Greenway
NW 6th Ave
NW 5th Ave
NW 4th Ave
NW 5th St
ONE WAY
NW North River Dr
Inset 5
Inset 6
NW 3rd Ct
NW 3rd Ave
NW 2nd Ave


NW 8th St
NE 8th St
NE 7th St
Historic Overtown/Lyric Station
NW 1st Ct
NW 1st Ave
N Miami Ave
NE 1st Ave
ONE WAY
NW 6th St
Freedom Tower Station
NE 6th St
Port Blvd
NE 2nd Ave
Inset 7
Inset 8
Wilkie D Ferguson Station
College North Station
NW 5th St
ONE WAY
NE 4th St
Biscayne Blvd
N



A – Westbound connection to 7th Ave / Miami River Greenway

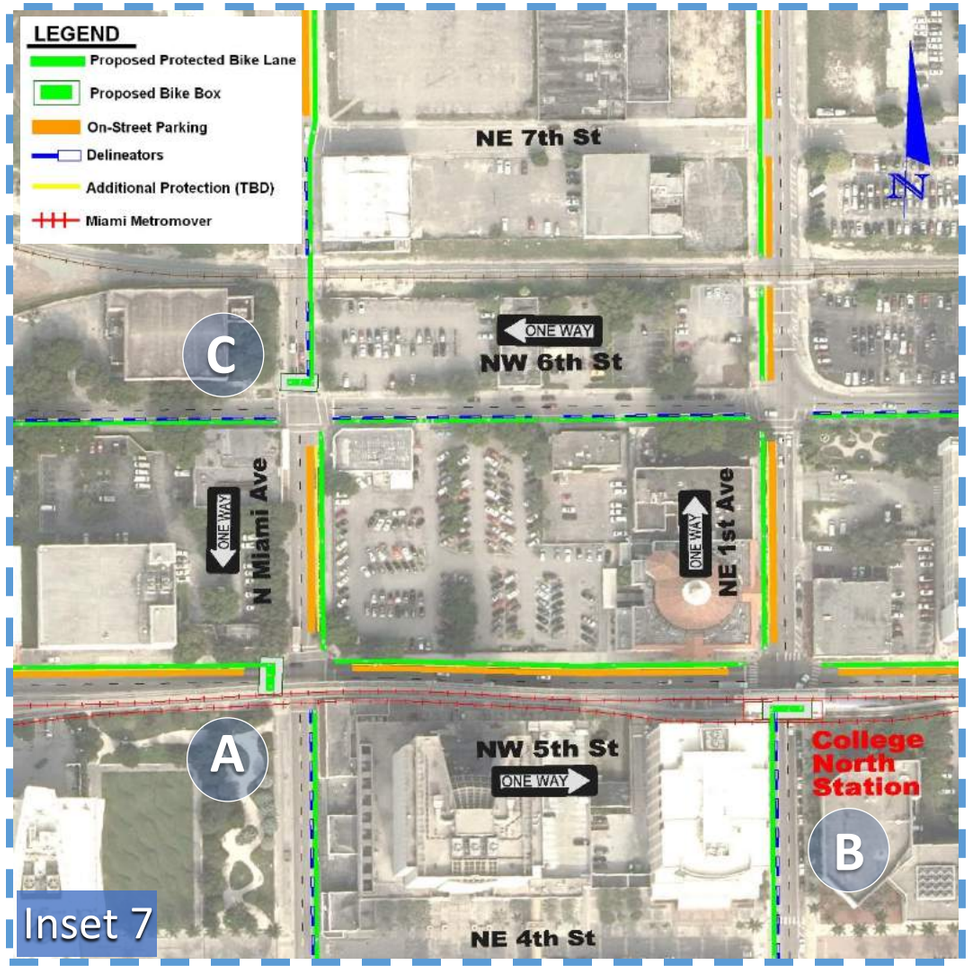
B – Crosswalk to Eastbound from the Miami River Greenway

C – Sharrows on 6th Ave to connect Eastbound - Westbound

A – On-street parking on left side only for bike protection

B – Driveway entrance shown by hash-marks

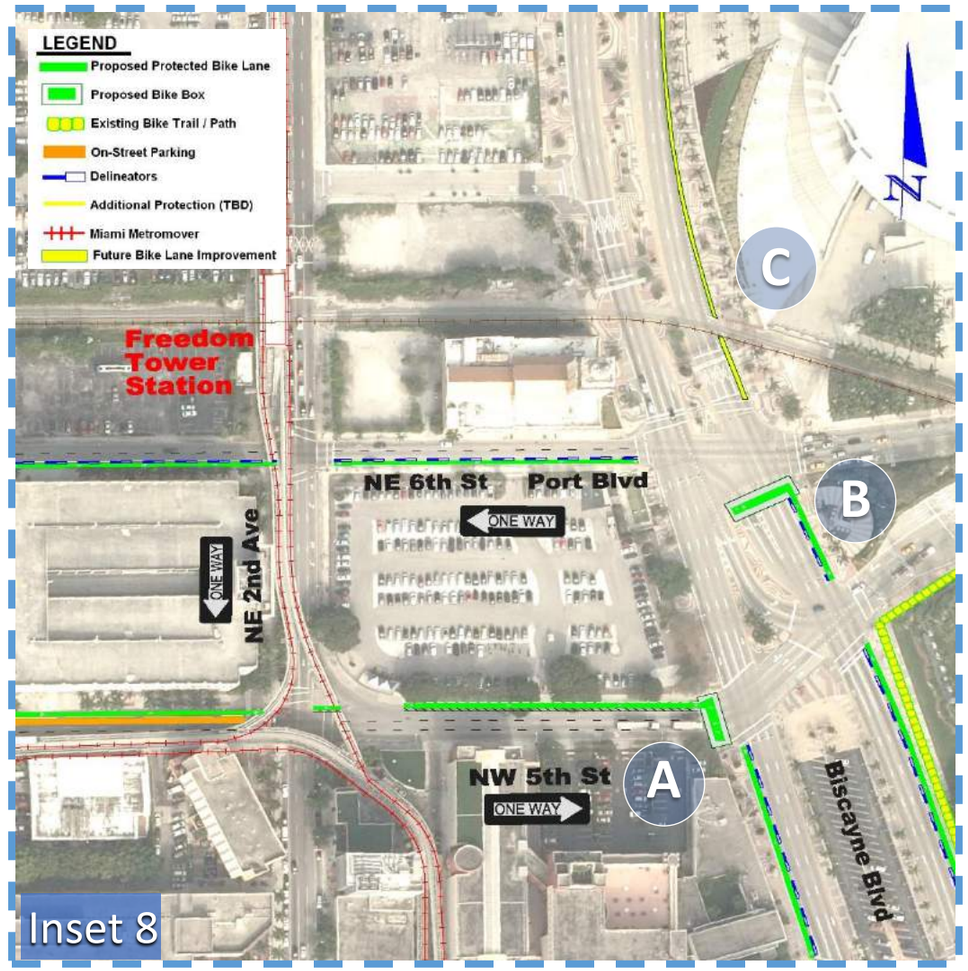
C – Potential NW 3rd Ct connection to the Miami River Greenway



A – Intersection with North - South Corridor 1st and Miami Ave

B – Connection to College North Station

C – Proposed bike boxes for enhanced protection at red light



A – Connection to Biscayne Blvd / Bay Walk / Biscayne Green

B – Potential Biscayne Green connection to westbound 6th Street

C – Potential connection from arena to future bike lane

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2 CONCEPTUAL DESIGN TWO

SW 211 Street between US-1 and Turnpike

The rendering, typical sections, and plan-view conceptual drawings for this segment are different from the downtown location in a number of ways. For instance, on this section, the PBL is proposed on the right side rather than the left. Part of this decision was made because of the suburban context of this location. Instead of constrained space with more dense and intense development, this is a low-density environment with suburban character when it comes to car speeds and arterial treatment to the space. These serve as some of the reasons for staying with the traditional right-side PBL facility treatment.

Rather than propose delineators as the protective barrier, this segment has instead proposed planters as the protective device. The team considered this short segment as a suitable location to propose this device due to its proximity to the South Dade Cultural Arts Center and numerous other institutions, private entities and other stakeholders who could adopt a segment of the planter PBLs. SW 211 Street is considered a major entertainment and cultural destination for the South Dade region.

In this typical section, no changes are proposed to the car travel lanes. Existing space is utilized to provide a 7-foot bike lane and 4-foot buffer with planters serving as the vertical protection device.

Figure 58: Existing conditions at SW 211 Street adjacent to Miami-Dade Cultural Arts Center

Figure 59: Proposed PBL design at SW 211 Street adjacent to Miami-Dade Cultural Arts Center

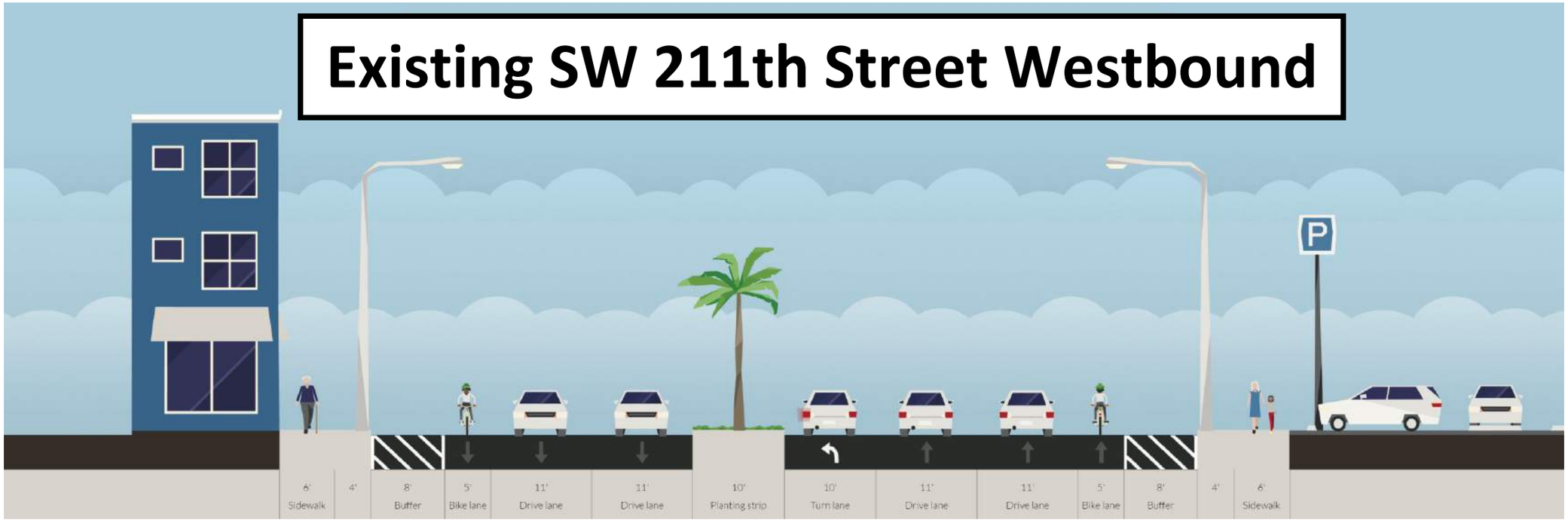
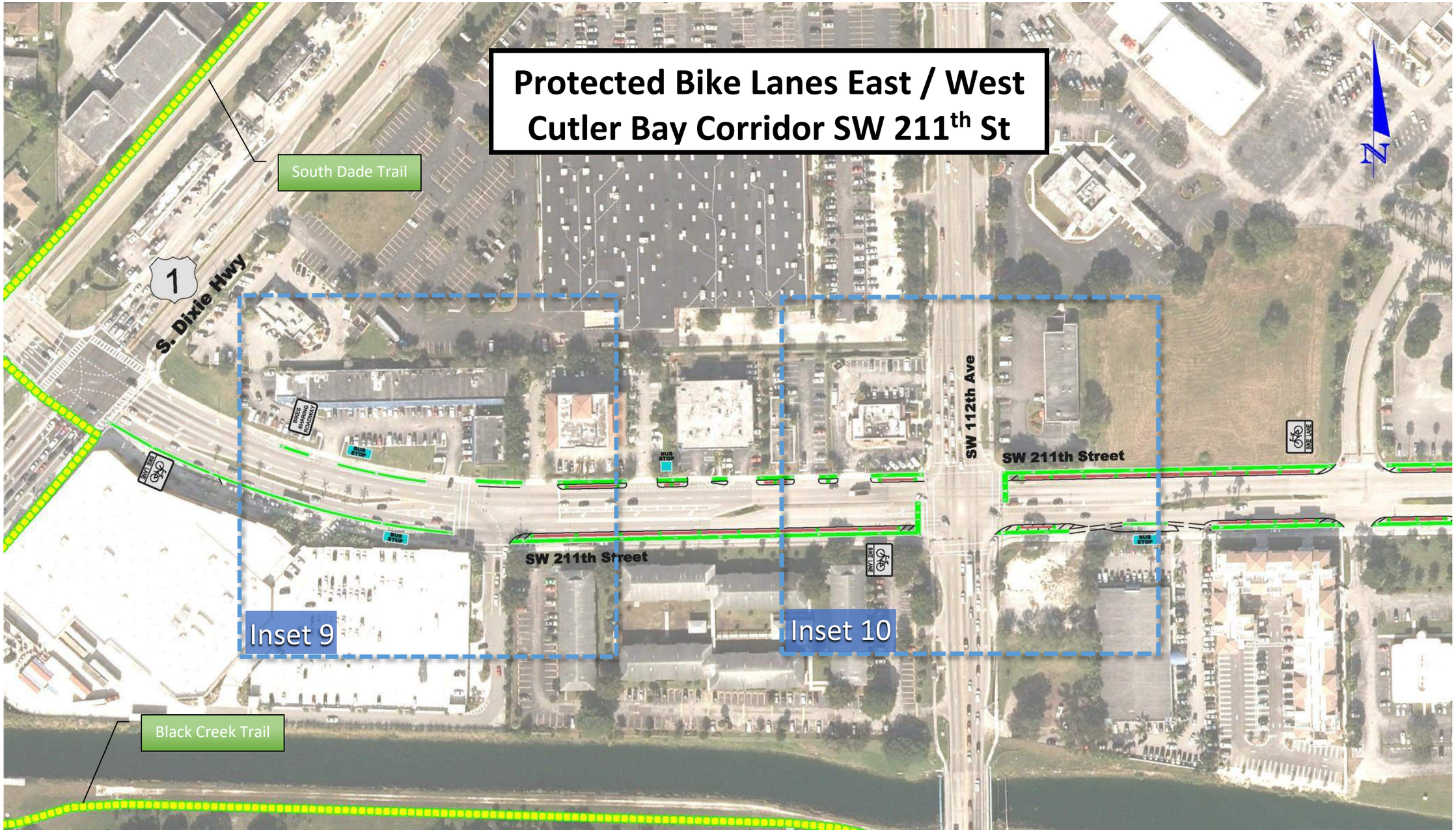
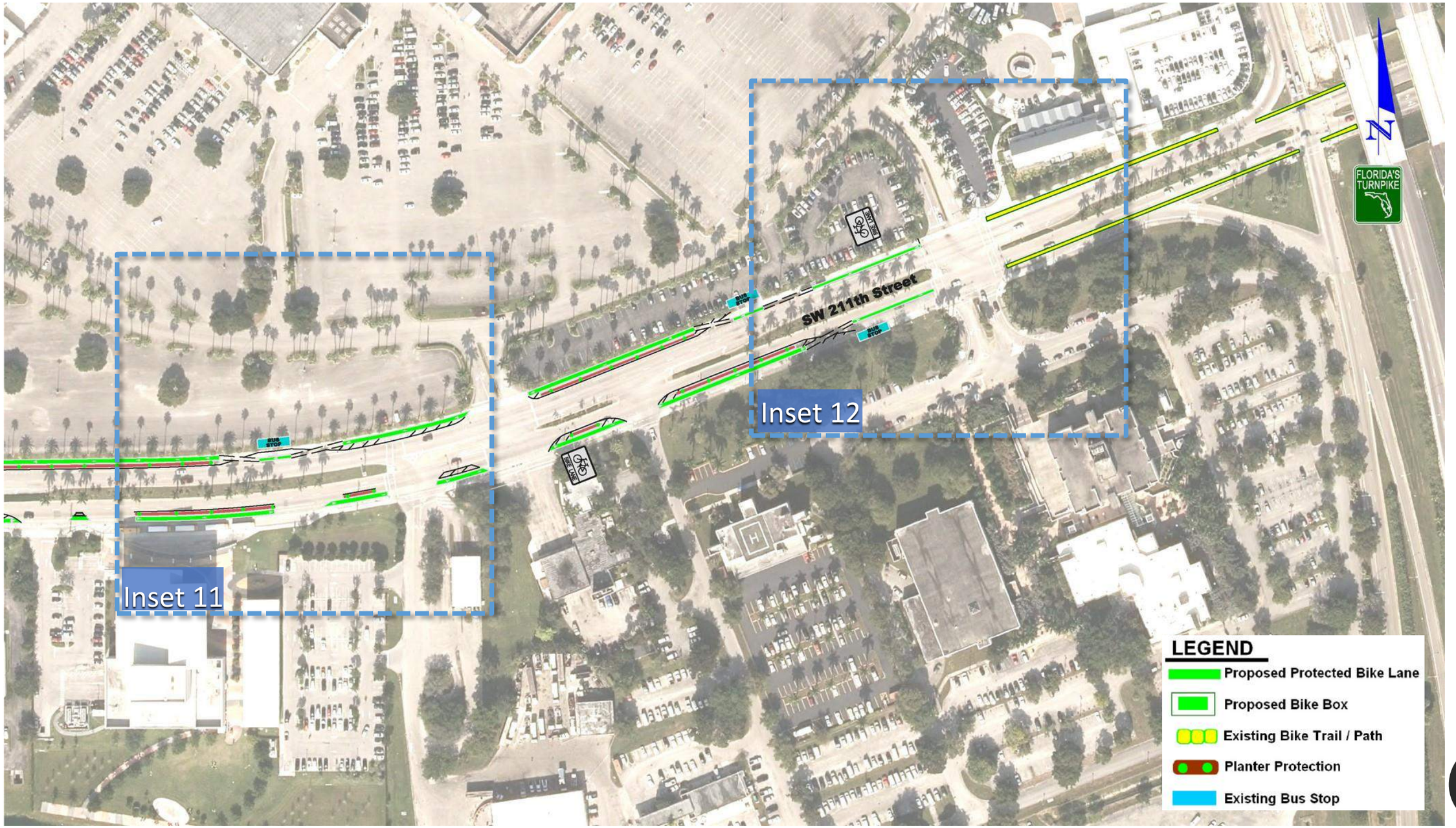
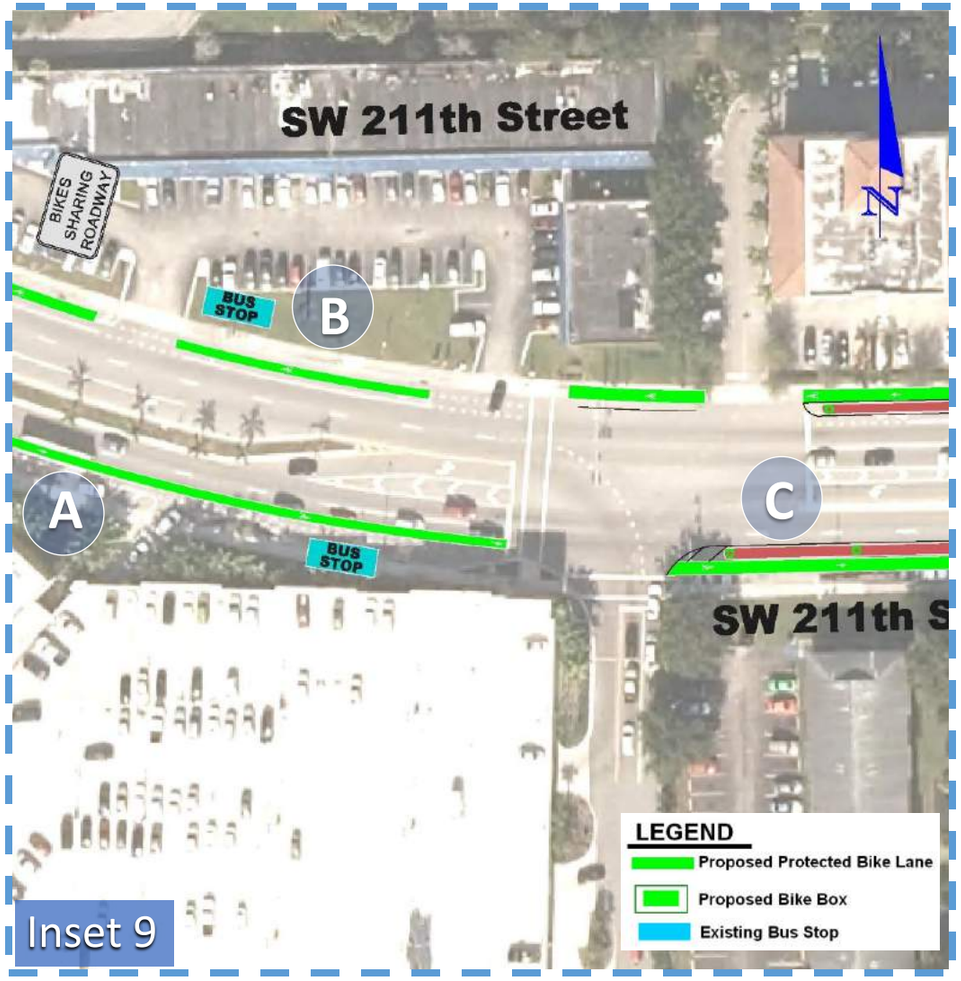


Figure 60: Streetmix.com

Figure 61: Streetmix.com


Protected Bike Lanes East / West
Cutler Bay Corridor SW 211th St
South Dade Trail
1
S. Dixie Hwy
SW 112th Ave
SW 211th Street
SW 211th Street
Inset 9
Inset 10
Black Creek Trail
N

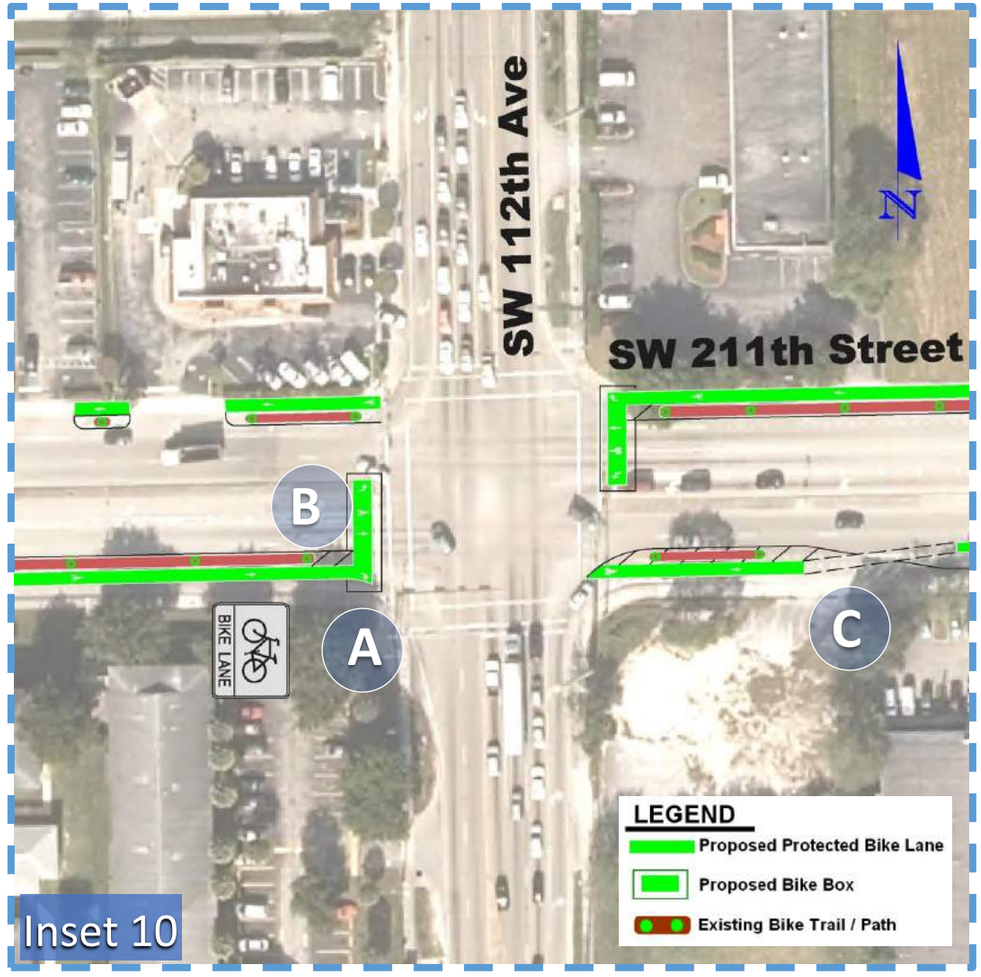

Inset 11
Inset 12
SW 211th Street
FLORIDA'S TURNPIKE
N
LEGEND
Proposed Protected Bike Lane
Proposed Bike Box
Existing Bike Trail / Path
Planter Protection
Existing Bus Stop



A – Connection to Black Creek Trail and South Dade Trail

B – Buffered Bike lane with no vertical protection

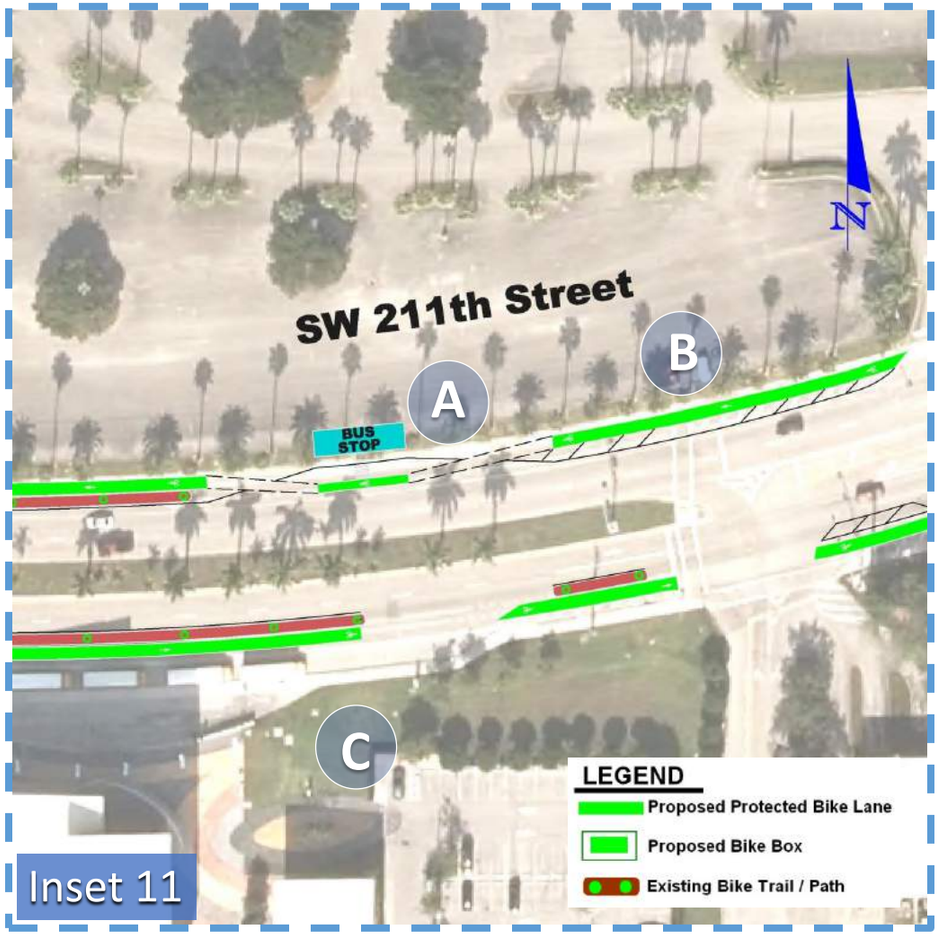
C – Planters as vertical protection



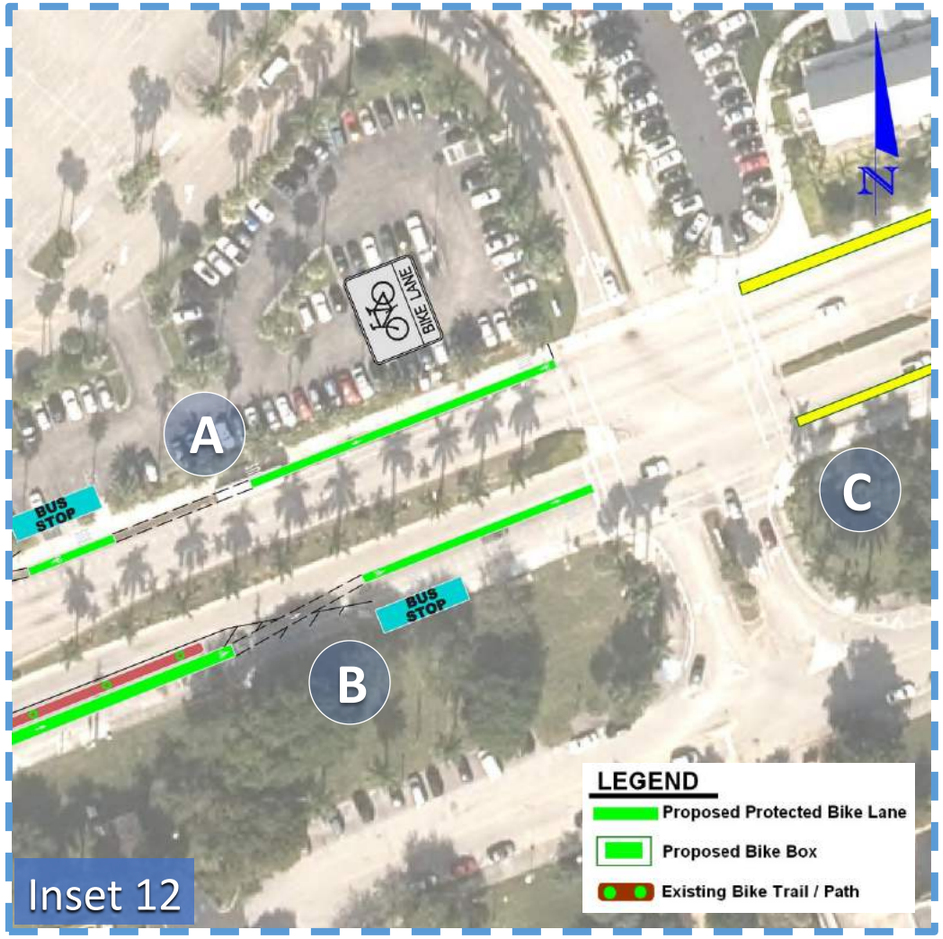
A – Intersection at SW 211 St & SW 112th Ave

B – Proposed bike boxes for enhanced protection at red light

C – Bus bay configuration with no vertical protection



A – Bus bay configuration with no vertical protection
B – Buffered bike lane for turning vehicles / bus bay
C – Connection to Miami Dade Cultural Art Center



A – Bus bay configuration with no bike protection
B – Buffered bike lane for turning vehicles and bus bay
C – Connection to future bike lane towards Caribbean Boulevard

5 IMPLEMENTATION

This section will focus on general application practices to facilitate a demonstration project. The projected costs provide a broad range of total costs as it assumes protection devices that range from as little as plastic delineators to a landscaped median. The scope of this study assumes costs ranging from plastic delineators to on-street parking to planters to rigid bollards. Based on the figures provided and assuming per mile costs, the costs for either PBL treatment could range from approximately $35,000 to $1,700,000 for the Downtown network and $6,400 to $320,000 for SW 211 Street. These figures do not assume any design challenges that may arise from traffic impact analysis or roadway design analysis. Further analysis will be needed to evaluate potential issues such as turning radii for large trucks and buses, drainage, utilities are not negatively affected.

POTENTIAL PBL TYPES

Figure 62: Graphic courtesy of People for Bikes

STRIPED BUFFER

1.5 ft. additional width; $8k-$16k per lane-mile

PROTECTION LEVEL	+ +
INSTALLATION COST	$
DURABILTY	
AESTHETICS	

DELINEATOR POSTS

1.5 ft. additional width; $15k-$30k per lane-mile

PROTECTION LEVEL	+ + + +
INSTALLATION COST	$ $
DURABILTY	
AESTHETICS	

TURTLE BUMPS

1.5 ft. additional width; $15k-$30k per lane-mile

PROTECTION LEVEL	+ + + +
INSTALLATION COST	$ $
DURABILTY	
AESTHETICS	

Figure 63: Graphic courtesy of People for Bikes

LINEAR BARRIERS

6 in. additional width; $25k-$75k per lane-mile

PROTECTION LEVEL	+ + + +
INSTALLATION COST	$ $
DURABILTY	
AESTHETICS	

PARKED CARS

11 ft. for parking + buffer; $8k-$16k per lane-mile

PROTECTION LEVEL	+ + + + +
INSTALLATION COST	$
DURABILTY	
AESTHETICS	

JERSEY BARRIERS

2 ft. additional width; $80k-$160k per lane-mile

PROTECTION LEVEL	+ + + + +
INSTALLATION COST	$ $ $
DURABILTY	
AESTHETICS	

Figure 64: Graphic courtesy of People for Bikes

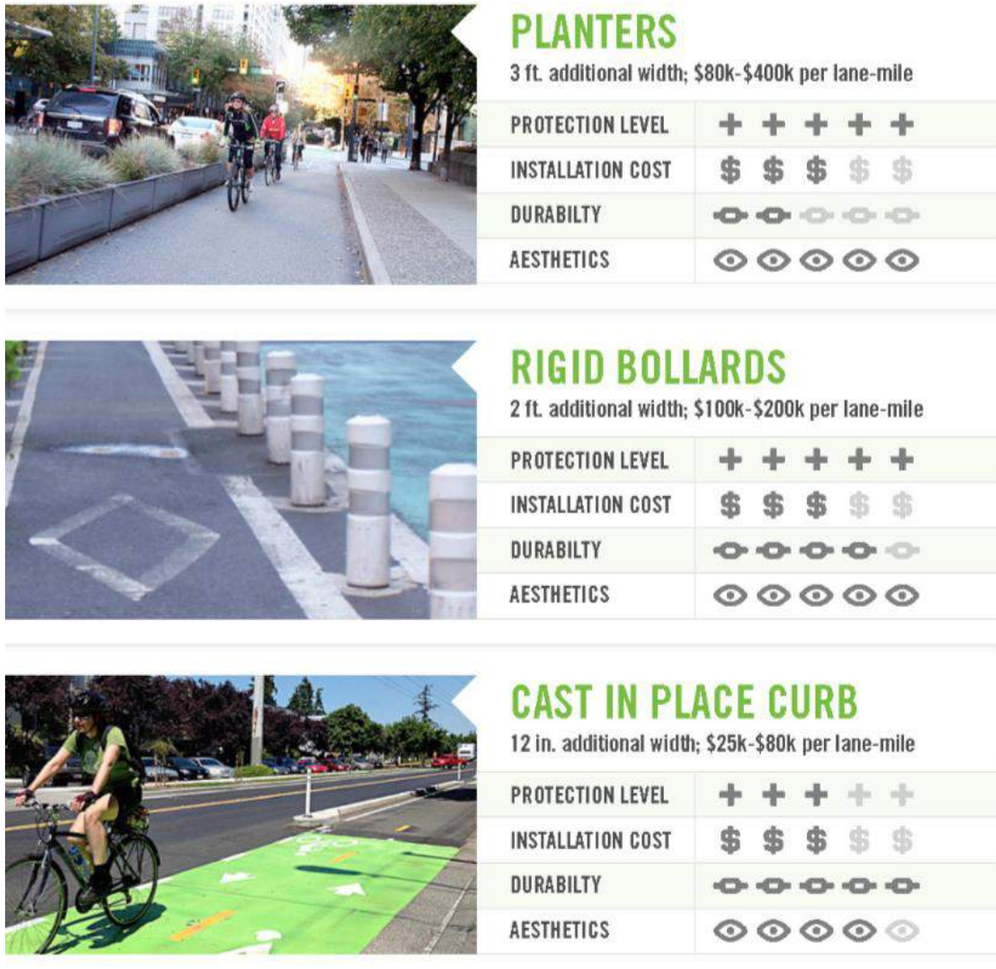


Figure 65: Graphic courtesy of People for Bikes

POTENTIAL FUNDING SOURCES

Communities interested in investing in heavier PBL infrastructure should consider applying for funding from Federal and State funding sources. It is important to consider a combination of sources which include pooling funds with neighboring municipalities, public-private partnerships with the business community, and non-profit sources such as charitable foundations that support active transportation and healthy public spaces. The following list provides a handful of sources to consider when searching for revenue to support investments in bicycle infrastructure.

The Transportation Investment Generating Economic Recovery (TIGER): TIGER provides municipalities with opportunities for the Department of Transportation (DOT) to support projects that achieve national objectives. DOT evaluates potential projects on innovation, partnerships, project readiness, benefit cost analysis, and cost share. https://www.transportation.gov/tiger

Federal Lands Access Program (FLAP): This program was designed to improve Transportation facilities that provide access to or are adjacent to Federal lands. The program supplements State and local resources for public roads, transit systems, and other transportation facilities. https://flh.fhwa.dot.gov/programs/flap/

Transportation Alternatives Program (TAP): The TAP is a federal funding program that provides funding for Transportation Enhancements, Recreational Trails, Safe Routes to School, and other discretionary programs. Projects eligible for TAP funding can include bicycle infrastructure improvements. https://www.fhwa.dot.gov/map21/factsheets/tap.cfm

Shared-Use Nonmotorized (SUN) Trail Network: Managed by the Florida Department of Transportation, the SUN Trail system funds non-motorized paved shared-use trails that

are part of the Florida Greenways and Trails System Priority Map coordinated by OGT. http://floridasuntrail.com/

League of American Bicyclists (LAB): LAB provides local groups and organizations with a competitive grant program called Big Idea grants. Eligible projects include pop-up and pilot style PBL projects. http://www.bikeleague.org/content/announcing-big-ideas-grants

People 4 Bikes: People for Bikes is a national advocacy organization that provides local advocacy groups with an annual grant program called The Big Jump. The program seeks to funds innovative community and neighborhood scale projects that support bicycle infrastructure such as PBLs. http://www.peopleforbikes.org/pages/community-grants

Transit Center: Transit Center is a New York based foundation that funds programs across the nation that support active transportation projects. PBL projects fit under the criteria of active transportation and would qualify as applicable submission for funding. http://transitcenter.org/grants/

Knight Cities: The Knight Cities program is a progressive grant program for cities including Miami, Detroit, and Akron. The program encourages groups and individuals to propose transformative programs and projects that can inhibit community-wide impact. http://knightcities.org/

The Miami Foundation Public Space Challenge: The Public Space Challenge is a competitive community grant administered by The Miami Foundation's Our Miami program. Submissions are evaluated by a combination of crowd sourced votes, feasibility, and after further analysis by professional staff. Pop-up to Pilot level PBLs would qualify within the parameters of this grant program. http://ideas.ourmiami.org/page/about

6 PBL EVALUATION CONSIDERATIONS

Goal	Measures	Potential Indicators
Improved Mobility	▪ Travel Time ▪ Connectivity of Bicycle Network ▪ Percentage of Bicycle Commuters ▪ Percentage of Students Bicycling to School	▪ Travel time by bike vs other modes ▪ Miles of connected bike facilities ▪ Origin/Destination/Mode Surveys ▪ Non-motorized counts
Enhanced Safety	▪ Crash Rates ▪ Serious Injury and Fatality Rates ▪ Perception of Safety	▪ Reduction in crash rates ▪ Travel Surveys ▪ Lighting study ▪ Non-motorized counts
Improved Health	▪ Rate of Use of Active Transportation ▪ Community Obesity and Other Health Factors ▪ Travel Time and Reliability to Health Care Facilities ▪ Community Healthcare Expenditures	▪ Health Impact Assessment
Economic Vitality	▪ Connections Between Jobs and Residential Areas ▪ Economic Forecasting for Local Businesses ▪ Tourism Rates ▪ Real Estate Indicators	▪ Local business profitability ▪ New leases, construction, & property improvements ▪ Survey of businesses ▪ Employment Rate ▪ Average Income
Cleaner Environment	▪ Reduced Carbon Footprint ▪ Air Quality Levels ▪ Water Quality Levels ▪ Noise Quality Levels	▪ Environmental Assessment ▪ Air Quality Assessment ▪ Water Quality Assessment

Table 3: Evaluation considerations

PRE AND POST DATA COLLECTION

In order to best evaluate the success of a PBL demonstration project, it is highly important that a municipality consider pre and post data collection exercises. There are numerous advantages that come with capturing data along a future PBL segment before the infrastructure upgrade is installed. Ultimately, if the data can prove that utilization has risen significantly due to the PBL upgrade, it enables the project to not only receive funds, but also enable other non-related segments to receive funding as it now has a case study with positive results the potential PBL project can reference to. Below is a list of potential benefits that come with implementing a formal a count program as part of a PBL project.

SAFETY

- Better understand the extent and severity of bicycle crashes by knowing usage information on the state's roadway system and facilities
- Bolster the safety and mobility of non-motorized users by enabling better informed facilities planning and investment.
- Evaluate the use and safety of bicycle and pedestrian facilities.
- Provide insight into exposure to risk for safety analyses.
- Target safety and educational campaigns and identify areas for increased enforcement.

INFRASTRUCTURE

- Inform prioritization of bicycle infrastructure and planning projects and target funding and maintenance needs.
- Monitor facility usage before and after project implementation to evaluate the impacts of specific projects.
- Identify trends to help in planning and designing multimodal infrastructure.
- Bridge gaps in bicycle routes and identify deficiencies in the system.

POLICY AND PLANNING

- Supplement Transportation Monitoring and Data Inventory programs and track trends in non-motorized traffic over time.
- Model future non-motorized projections at the site, corridor and regional levels and identify trends in facility use.
- Identify non-motorized traffic patterns that can be used to interpret and extrapolate short-duration counts into annual traffic estimates.
- Better inform policy decisions as well as transportation plans and programs and develop performance indicators to track progress related to goals and objectives.
- Enhance Miami-Dade's integrated, intermodal transportation system that provides travelers with transportation modes.
- Inform the public and decision makers about bicycle behaviors, use and travel patterns.

VIDEO RECORDING

Of the various methods utilized to count bicycle activity, the method this plan recommends is video recording technology and software. Based on experience in past count studies, video recording provides a range of benefits other types of devices cannot capture such as intersection behavior between rider and car, rider type, and gender. Today there exists numerous video recording technologies that contain imbedded software able to distinguish bicyclists from pedestrians and other modes of travel.

Video recording devices should be placed in a location that offer a vantage point to not only count bicycle activity but also analyze context sensitive locations such as intersections, and connection points to other trails and bicycle facilities. Drawbacks from this method are the high costs associated with this technology.

PNEUMATIC TUBES

If cost constraints do not allow for video recording software, the next recommended technology is pneumatic tubes. While tube technology has been popular for counting automobiles, newer tubes have been reconfigured to more accurately distinguish bicycle activity.

Tubes should be placed in a location that anticipates high bicycle usage such as a PBL entrance point or near a highly used intersection. Depending on the company providing the tube technology, some services provide online real time counting allowing the account holder to receive real-time figures on bicycle activity within the corridor.

Drawbacks from this method is the limited amount of qualitative data captured such us analyzing rider types based on age, gender, and immediate behavior towards fellow bicyclist, pedestrians, and automobiles.

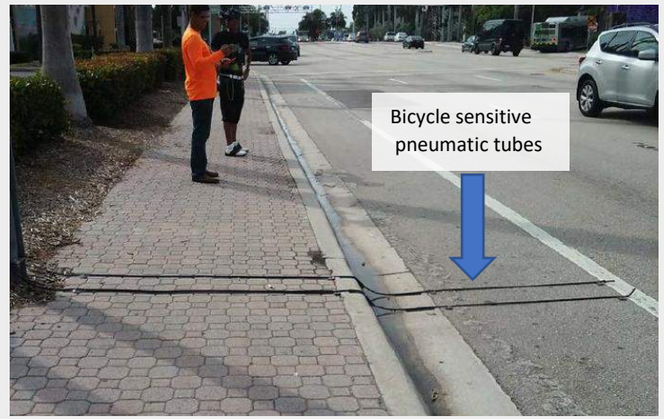


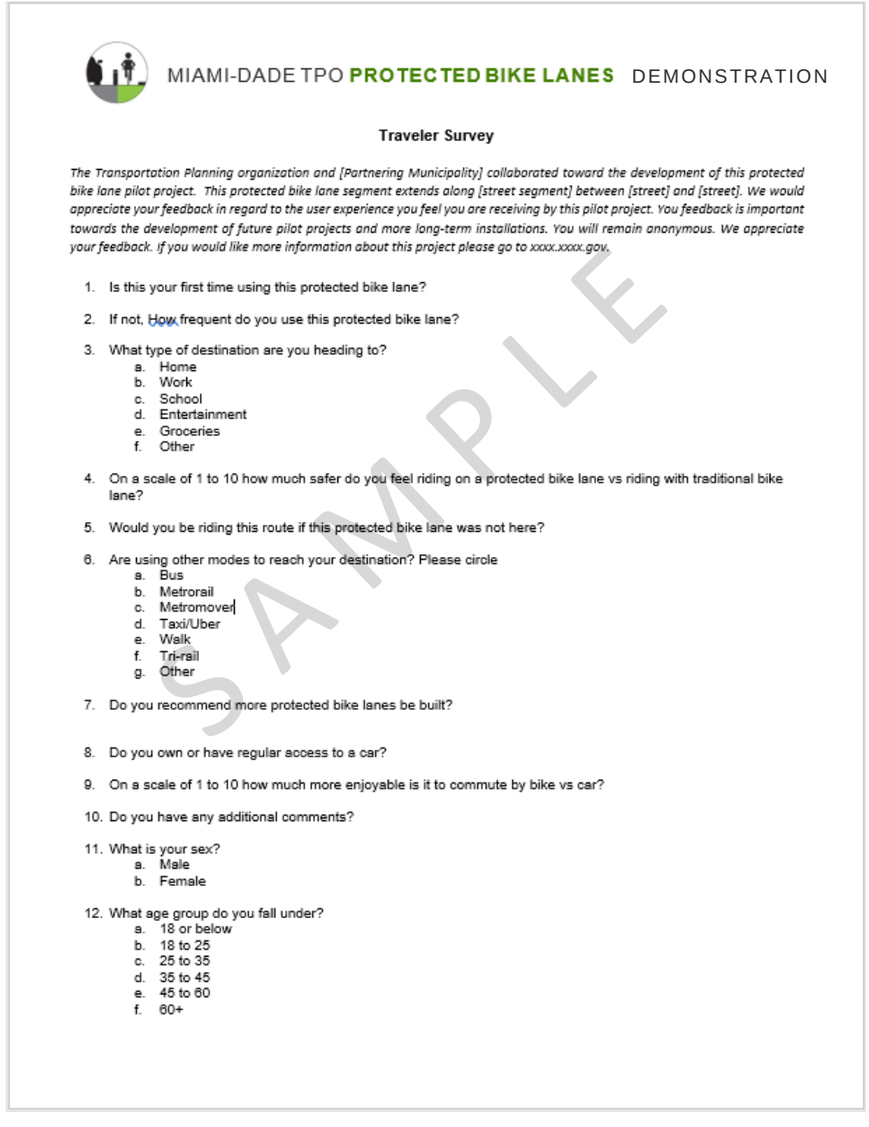
Figure 66: Graphic and images by Marlin Engineering Inc.

TRAVELER SURVEY

While quantitative data is valuable, qualitative data is just as necessary. Hearing from the users of PBLs themselves provide insights that are unapparelled in regard to understanding the successes, challenges, and adjustments that need to be made in order to optimize the safety and convenience of the rider and his/her surrounding environment. Attached to this report is a sample survey that can be provided to active or potential PBL users in a variety of ways. Perhaps the most valuable capture would be when the users are actively using the PBL is real-time.

Local advocacy groups can serve as partners who help distribute surveys at organized events or on a scheduled day during a time of day when active use is expected. Other methods of distribution can include access to users via a link provided on the TPO website, or even through access of a web application which a user could conveniently enter in through their smart phone. Once a large of enough sample of surveys are collected, further analysis can reveal trends that offer insights on how to further improve the PBL experience through improved safety measures, expanded network, and enhanced accessibility.

Figure 67: Survey takers



MIAMI-DADE TPO **PROTECTED BIKE LANES** DEMONSTRATION

Traveler Survey

The Transportation Planning organization and [Partnering Municipality] collaborated toward the development of this protected bike lane pilot project. This protected bike lane segment extends along [street segment] between [street] and [street]. We would appreciate your feedback in regard to the user experience you feel you are receiving by this pilot project. You feedback is important towards the development of future pilot projects and more long-term installations. You will remain anonymous. We appreciate your feedback. If you would like more information about this project please go to xxxx.xxxx.gov.

1. Is this your first time using this protected bike lane?
2. If not, How frequent do you use this protected bike lane?
3. What type of destination are you heading to?
   a. Home
   b. Work
   c. School
   d. Entertainment
   e. Groceries
   f. Other
4. On a scale of 1 to 10 how much safer do you feel riding on a protected bike lane vs riding with traditional bike lane?
5. Would you be riding this route if this protected bike lane was not here?
6. Are using other modes to reach your destination? Please circle
   a. Bus
   b. Metrorail
   c. Metromover
   d. Taxi/Uber
   e. Walk
   f. Tri-rail
   g. Other
7. Do you recommend more protected bike lanes be built?
8. Do you own or have regular access to a car?
9. On a scale of 1 to 10 how much more enjoyable is it to commute by bike vs car?
10. Do you have any additional comments?
11. What is your sex?
    a. Male
    b. Female
12. What age group do you fall under?
    a. 18 or below
    b. 18 to 25
    c. 25 to 35
    d. 35 to 45
    e. 45 to 60
    f. 60+

SAMPLE

FUTURE CONSIDERATIONS

Should PBLs prove, with data, that they provide improved indicators in any evaluation category regarding mobility, safety, economy, environment, and public health, future planning should involve exploring opportunities that are requested of the Miami-Dade public. Comments from the BPAC stressed that safety and network connectivity was paramount in future efforts to build PBL segments. Remaining segments that did not rise as the top locations can still be further researched for implementation.

PBL Safety: Should the proposed demonstration projects or other segments reviewed turn out to be viable transportation improvements, more permanent and robust protection can include the following considerations: bollards, planters, more on-street parking, and curbed islands.

Intersection Safety: A topic of discussion during the BPAC meeting was enhanced bicycle facilities at intersections. More usage of other complimentary amenities could include bicycle boxes, pavement markings, way-finding, signage, and other more innovative concepts such as protected intersections. Advocates emphasized the importance for design of PBLs to better address end points and major intersections that contribute to high-caution areas in relation to motorists.

Larger network: Comments at committee meetings referred to increased connectivity to nearby trails and greenways. In addition, while the focus of this study was on commuter-friendly routes and connection to transit, more attention should be paid towards longer routes that are highly utilized by the recreational cycling community. Appendix B includes additional PBL concepts for consideration that connected to the Downtown Network during the design and analysis process. These typical sections include NW 3rd Court, Biscayne Boulevard and SE 2nd Street. Finally, one final rendering (inside cover page) depicts a separated bike lane that could potentially run underneath the Metrorail on a shared pedestrian path towards SE 1st Street.

Figure 68: Image courtesy of Curbed LA

Figure 69: Image courtesy of People for Bikes

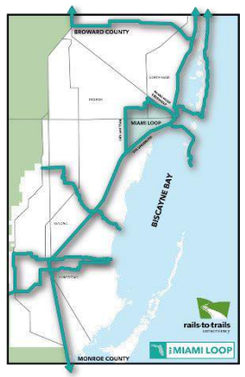


Figure 70: Image courtesy of Rails to Trails Conservancy

Figure 71: Image courtesy of The Miami Bike Scene

REFERENCES

1 *Urban Bikeway Design Guide*. New York: National Association of City Transportation Officials, 2014. Print.

2 Lusk, Anne C., Peter G. Furth, Patrick Morency, Luis F. Miranda-Moreno, Walter C. Willett, and Jack T. Dennerlein. "Risk of Injury for Bicycling on Cycle Tracks versus in the Street." *Injury Prevention*. BMJ Publishing Group Ltd, 01 Jan. 2011. Web. 24 June 2017.

3 Doyle, Kathryn. "Bike Lanes Are a Sound Public Health Investment." Reuters.com. N.p., 29 Sept. 2016. Web. 24 June 2017.

4 Anderson, Michael, and Mary Lauran Hall. *Protected Bike Lanes Mean Business*. Rep. Alliance for Biking and Walking, n.d. Web.

5 Miami-Dade County. Miami-Dade Greenprint Climate Action Plan. Miami-Dade County, n.d. Web.

6 Anderson, Michael. "Another Breakthrough: AASHTO Moves toward Endorsing Protected Bike Lanes." *Peopleforbikes.org*. People for Bikes, 27 Jan. 2015. Web.

7 Peopleforbikes.org

8 http://www.nyc.gov/html/dot/downloads/pdf/nyc-protected-bike-lanes.pdf

9 "The City of Portland, Oregon." Bicycle Resources RSS. Portlant Bureau of Transportation, 20 Jan. 2016. Web.

10 Anderson, Michael. "Portland Is First U.S. City to Make Protection the Default for All New Bike Lanes." *PeopleForBikes.org*. People for Bikes, 28 Jan. 2016. Web.

11 U.S. Census Bureau, Demographic Internet Staff. "Commuting/Place of Work/Travel Time." *Commuting/Place of Work/Travel Time - People and Households - U.S. Census Bureau*. Census.gov, 21 May 2012. Web.

12 https://ddot.dc.gov/page/bicycle-lanes

13 http://austintexas.gov/department/completed-neighborhood-bicycle-projects

14 City of Boston. *Boston Bike Nework Plan*. Cityofboston.gov, Fall 2013. Web.

15 Schmitt, Angie. "Take a Look at Tampa's First Protected Bike Lane." Usa.streetsblog.org. Streetsblog USA, 17 June 2016. Web.

APPENDIX A: Miami Avenue Lane Repurposing Level of Service Table

A.M. PEAK HOUR - TRANSPORTATION CORRIDOR SEGMENT EXISTING CONDITIONS

Station ID	PRINCIPAL ROADWAY	LOCATION		JURISDICTION	FUNCTION CLASSIFICATION	# of LANES	Median Type	Speed Limit (MPH)	FDOT CLASS	Direction	PEAK HOUR Volume (V)	PEAK HOUR Vehicular Capacity (C)[1]	Peak Hour Excess Capacity	Peak Hour Level of Service	
											Vehicles	Vehicles	Vehicles	V/C	LOS
	Miami Ave[2]	SOUTH OF	NE 14 ST	CITY	MINOR ARTERIAL	3	NONE	30	CLASS 2	SB	585	2765	2180	0.21	C
	Miami Ave[2]	SOUTH OF	NE 5 ST	CITY	MINOR ARTERIAL	2	NONE	30	CLASS 2		585	1836	1251	0.32	C
	Miami Ave[3]	SOUTH OF	NE 14 ST	CITY	MINOR ARTERIAL	3	NONE	30	CLASS 2	SB	852	2765	1913	0.31	C
	Miami Ave[3]	SOUTH OF	NE 5 ST	CITY	MINOR ARTERIAL	2	NONE	30	CLASS 2		640	1836	1196	0.35	C
	Miami Ave[4]	SOUTH OF	NE 14 ST	CITY	MINOR ARTERIAL	3	NONE	30	CLASS 2	SB	1151	2765	1614	0.42	C
	Miami Ave[4]	SOUTH OF	NE 5 ST	CITY	MINOR ARTERIAL	2	NONE	30	CLASS 2		1043	1836	793	0.57	D

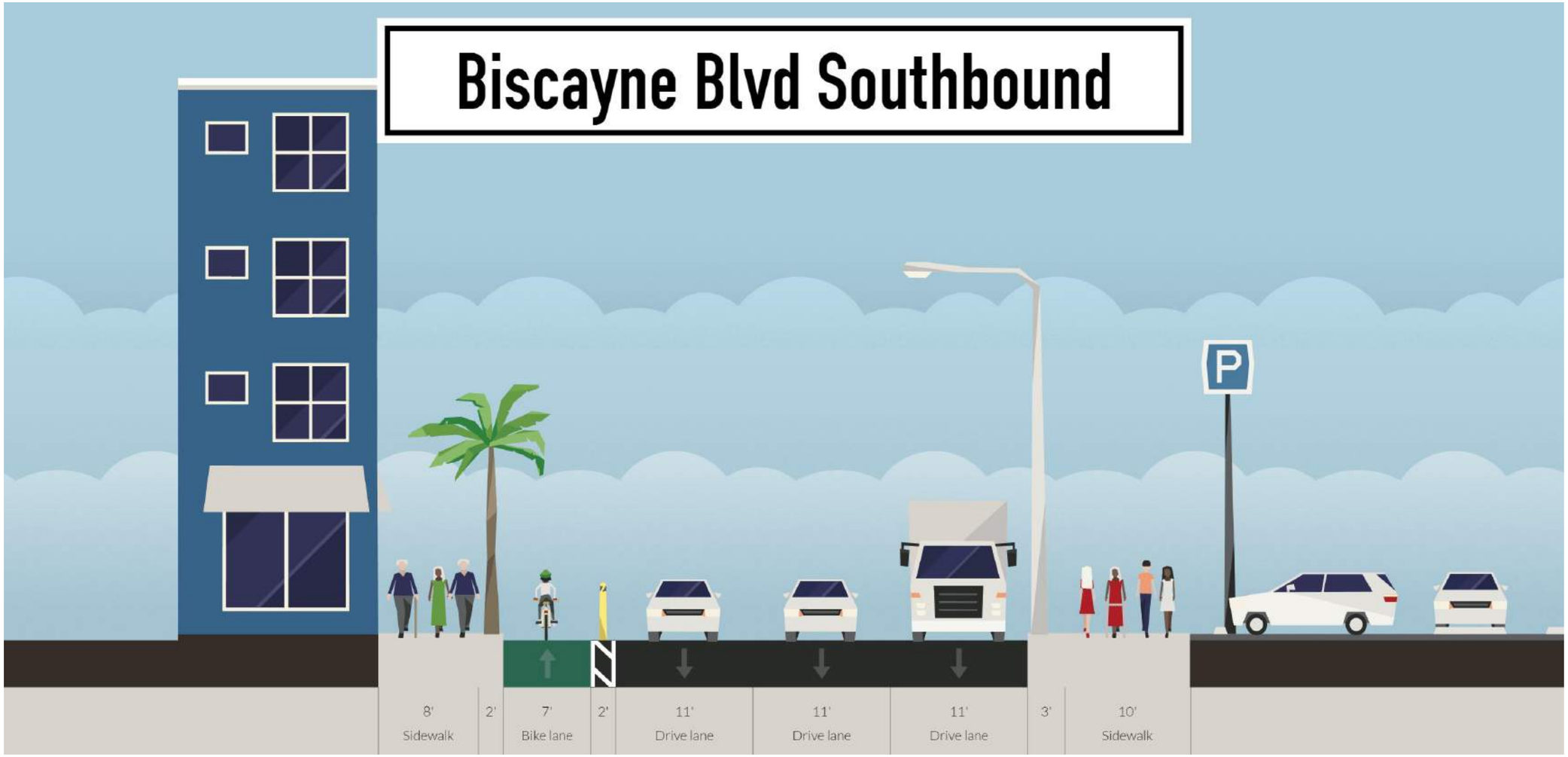
(1) Peak hour Directional Capacity derived from FDOT's 2013 Quality/Level of Service Handbook
(2) Calculated using AADT and K factor from 2016 FDOT PTMS data (872016).
(3) Taken from "Downtown Miami Transportation Network Model" study by Kimley-Horn in 2013.
(4) Taken from "All Aboard Florida" impact study by Kimley-Horn in 2014. Volumes correspond to year 2018.

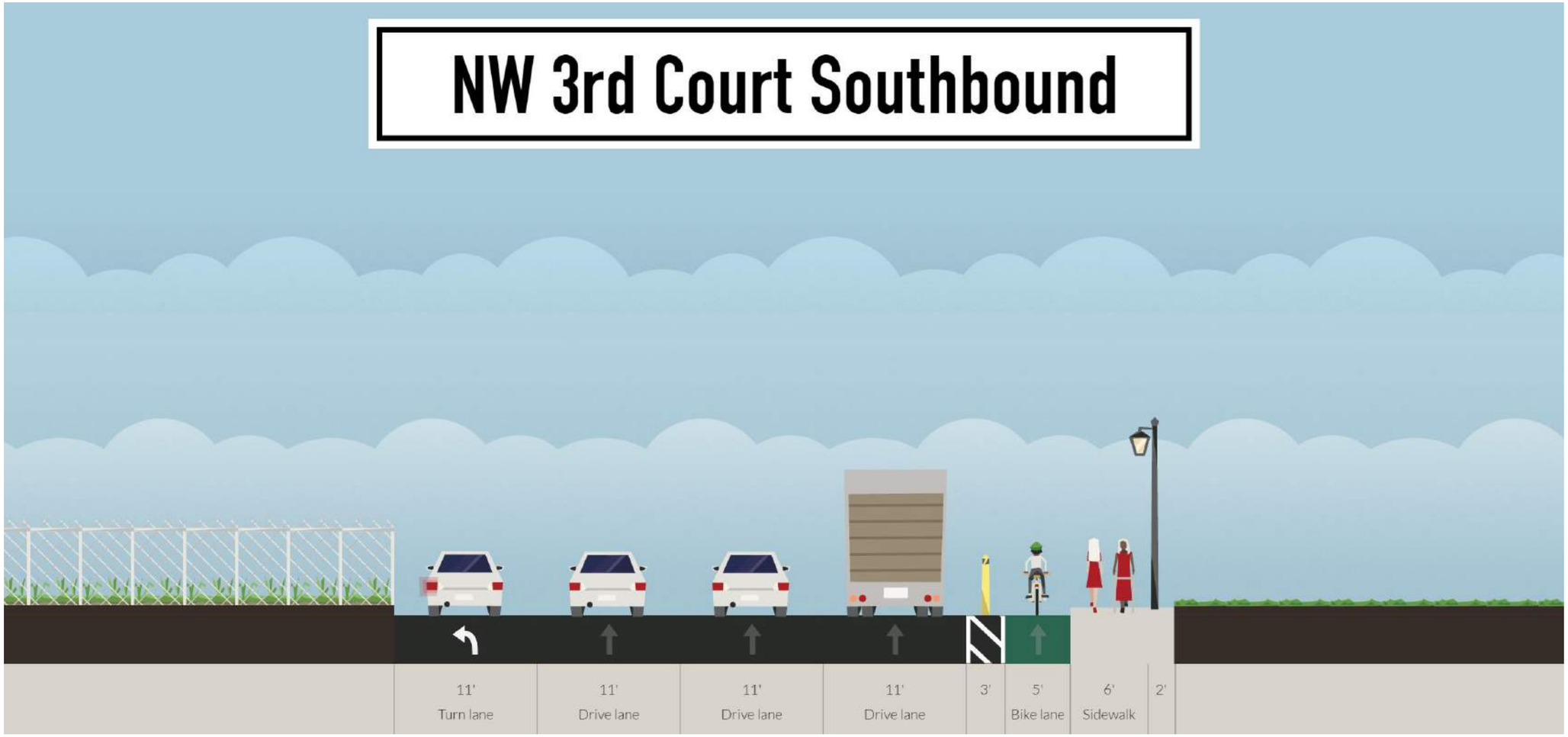
A.M. PEAK HOUR - TRANSPORTATION CORRIDOR SEGMENT FUTURE CONDITIONS (LANE REDUCTION)

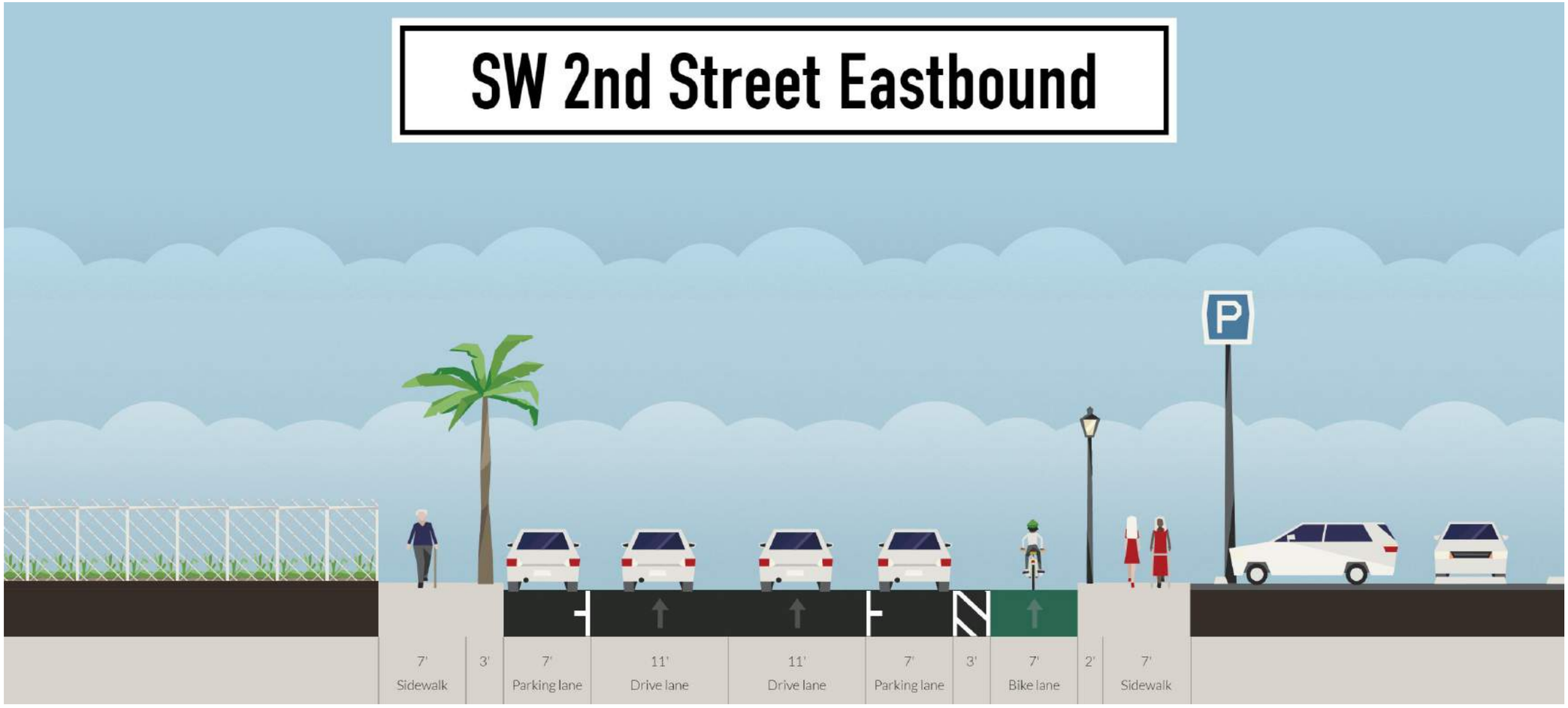
Station ID	PRINCIPAL ROADWAY	LOCATION		JURISDICTION	FUNCTION CLASSIFICATION	# of LANES	Median Type	Speed Limit (MPH)	FDOT CLASS	Direction	PEAK HOUR Volume (V)	PEAK HOUR Vehicular Capacity (C)[1]	Peak Hour Excess Capacity	Peak Hour Level of Service	
											Vehicles	Vehicles	Vehicles	V/C	LOS
	Miami Ave[2]	SOUTH OF	NE 14 ST	CITY	MINOR ARTERIAL	2	NONE	30	CLASS 2	SB	585	1836	1251	0.32	C
	Miami Ave[2]	SOUTH OF	NE 5 ST	CITY	MINOR ARTERIAL	2	NONE	30	CLASS 2		585	1836	1251	0.32	C
	Miami Ave[3]	SOUTH OF	NE 14 ST	CITY	MINOR ARTERIAL	2	NONE	30	CLASS 2	SB	852	1836	984	0.46	D
	Miami Ave[3]	SOUTH OF	NE 5 ST	CITY	MINOR ARTERIAL	2	NONE	30	CLASS 2		640	1836	1196	0.35	C
	Miami Ave[4]	SOUTH OF	NE 14 ST	CITY	MINOR ARTERIAL	2	NONE	30	CLASS 2	SB	1151	1836	685	0.63	D
	Miami Ave[4]	SOUTH OF	NE 5 ST	CITY	MINOR ARTERIAL	2	NONE	30	CLASS 2		1043	1836	793	0.57	D

(1) Peak hour Directional Capacity derived from FDOT's 2013 Quality/Level of Service Handbook
(2) Calculated using AADT and K factor from 2016 FDOT PTMS data (872016).
(3) Taken from "Downtown Miami Transportation Network Model" study by Kimley-Horn in 2013.
(4) Taken from "All Aboard Florida" impact study by Kimley-Horn in 2014. Volumes correspond to year 2018.

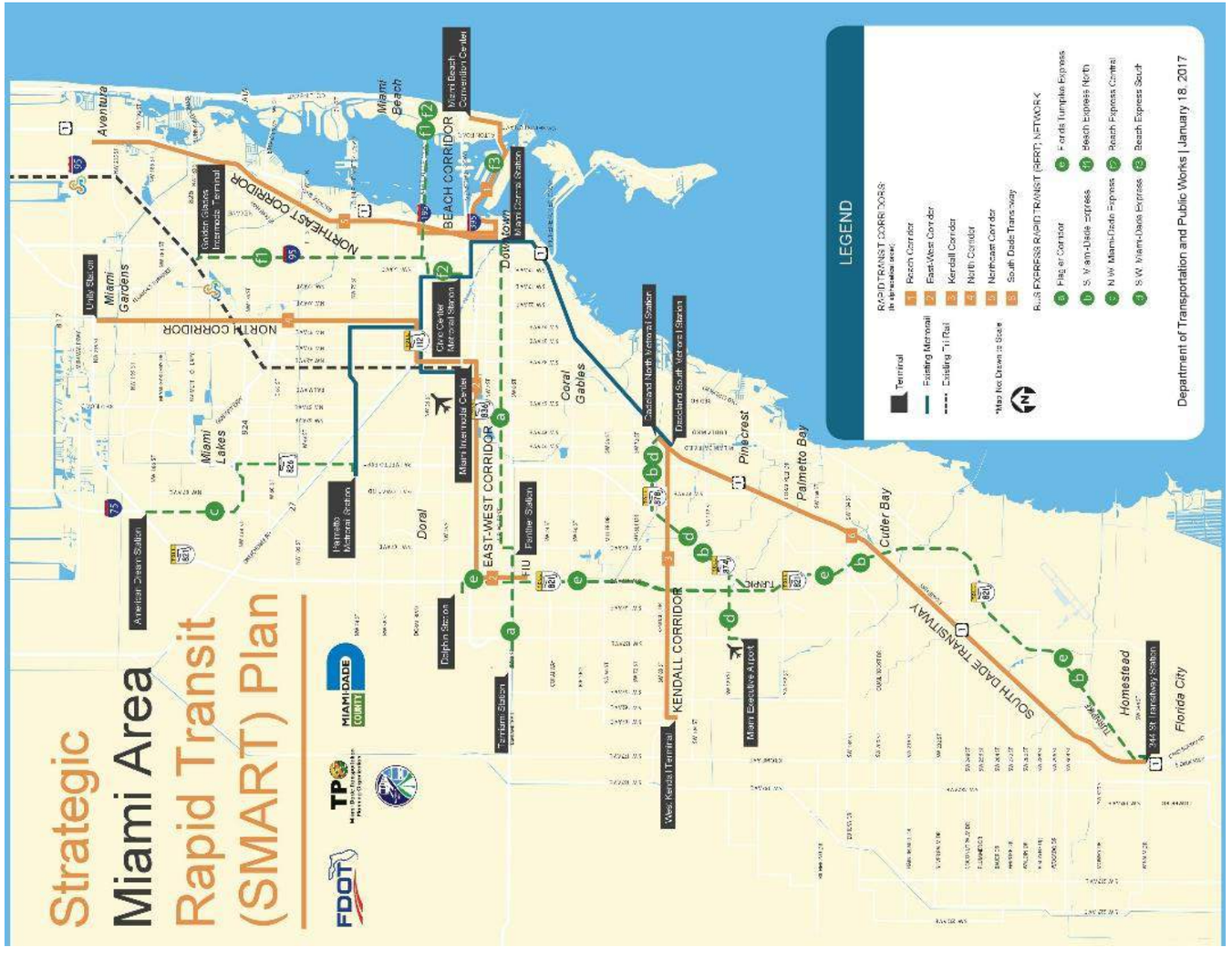
APPENDIX B: Additional Typical Sections

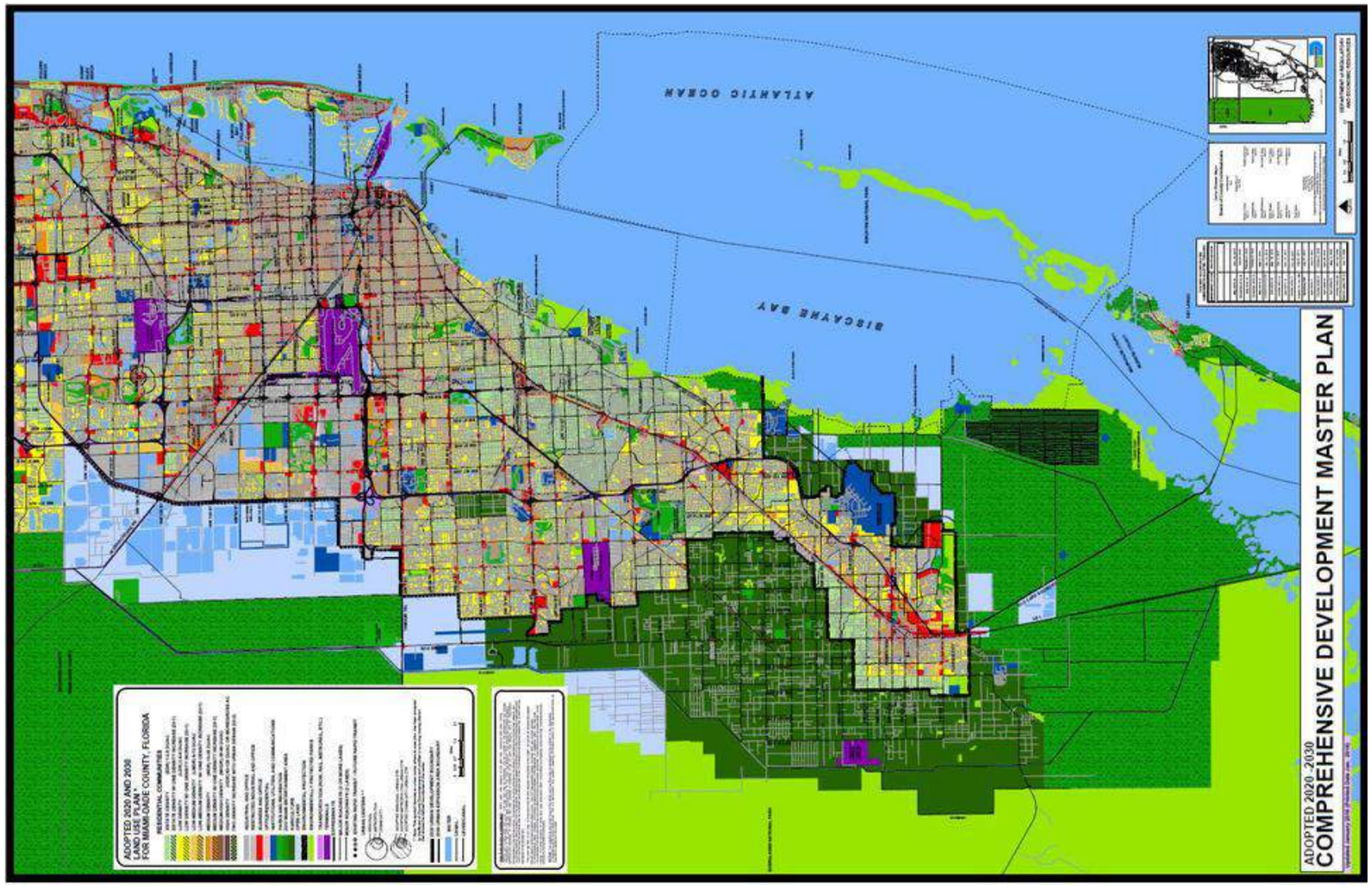

Biscayne Blvd Southbound
P
8'
Sidewalk
2'
7'
Bike lane
2'
11'
Drive lane
11'
Drive lane
11'
Drive lane
3'
10'
Sidewalk


NW 3rd Court Southbound
11'
Turn lane
11'
Drive lane
11'
Drive lane
11'
Drive lane
3'
5'
Bike lane
6'
Sidewalk
2'

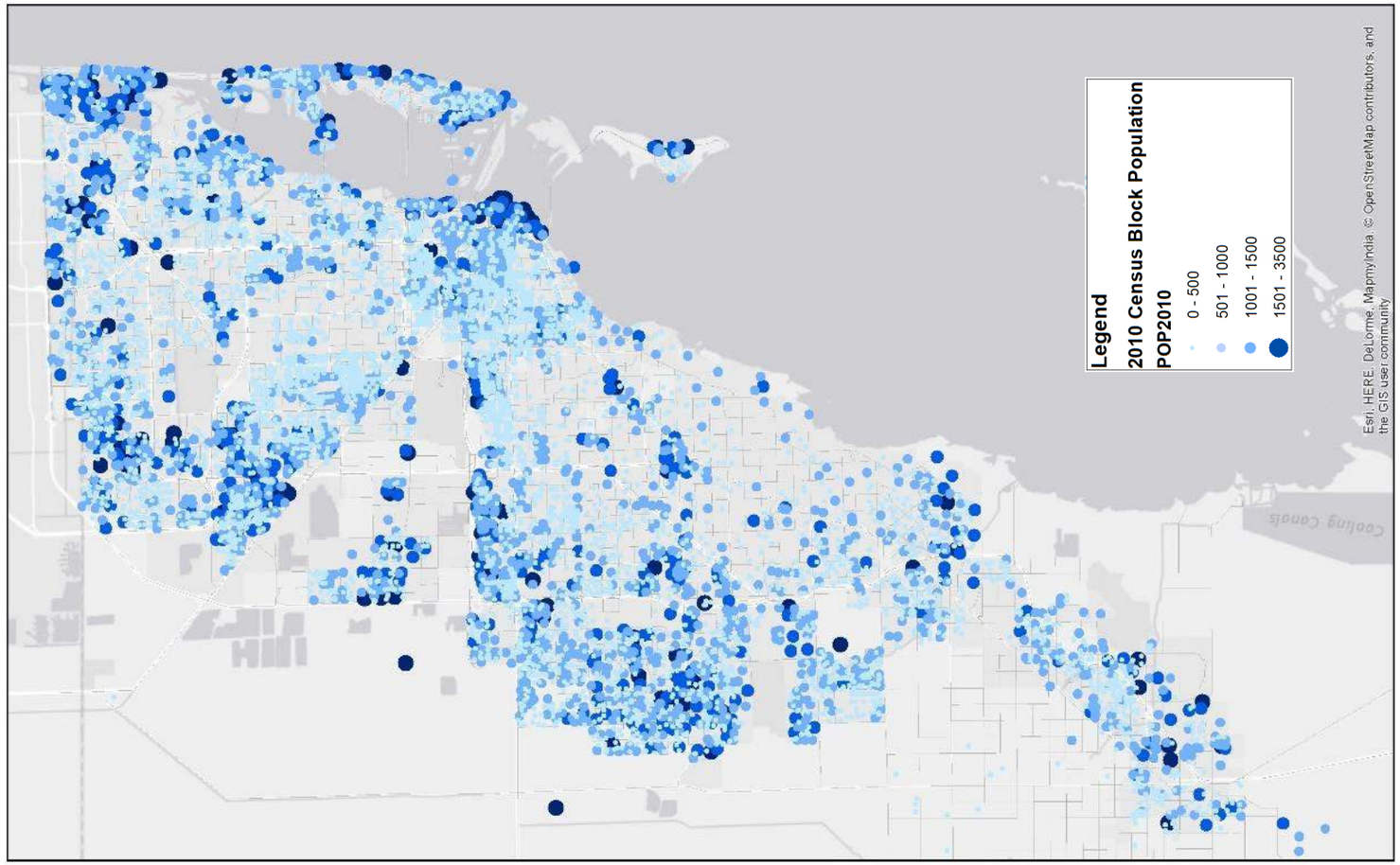

SW 2nd Street Eastbound
P
7'
Sidewalk
3'
7'
Parking lane
11'
Drive lane
11'
Drive lane
7'
Parking lane
3'
7'
Bike lane
2'
7'
Sidewalk

APPENDIX C: Enlarged Maps

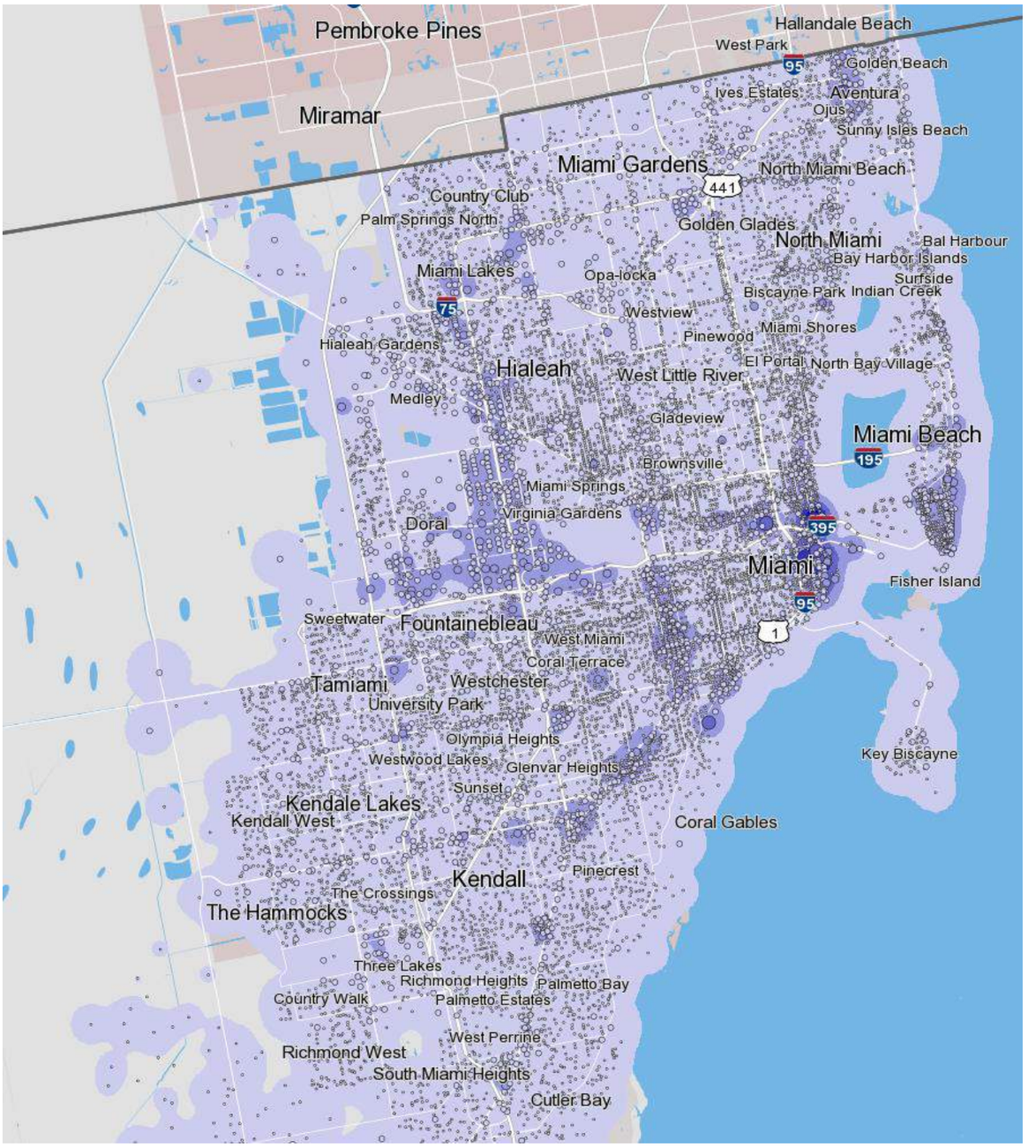


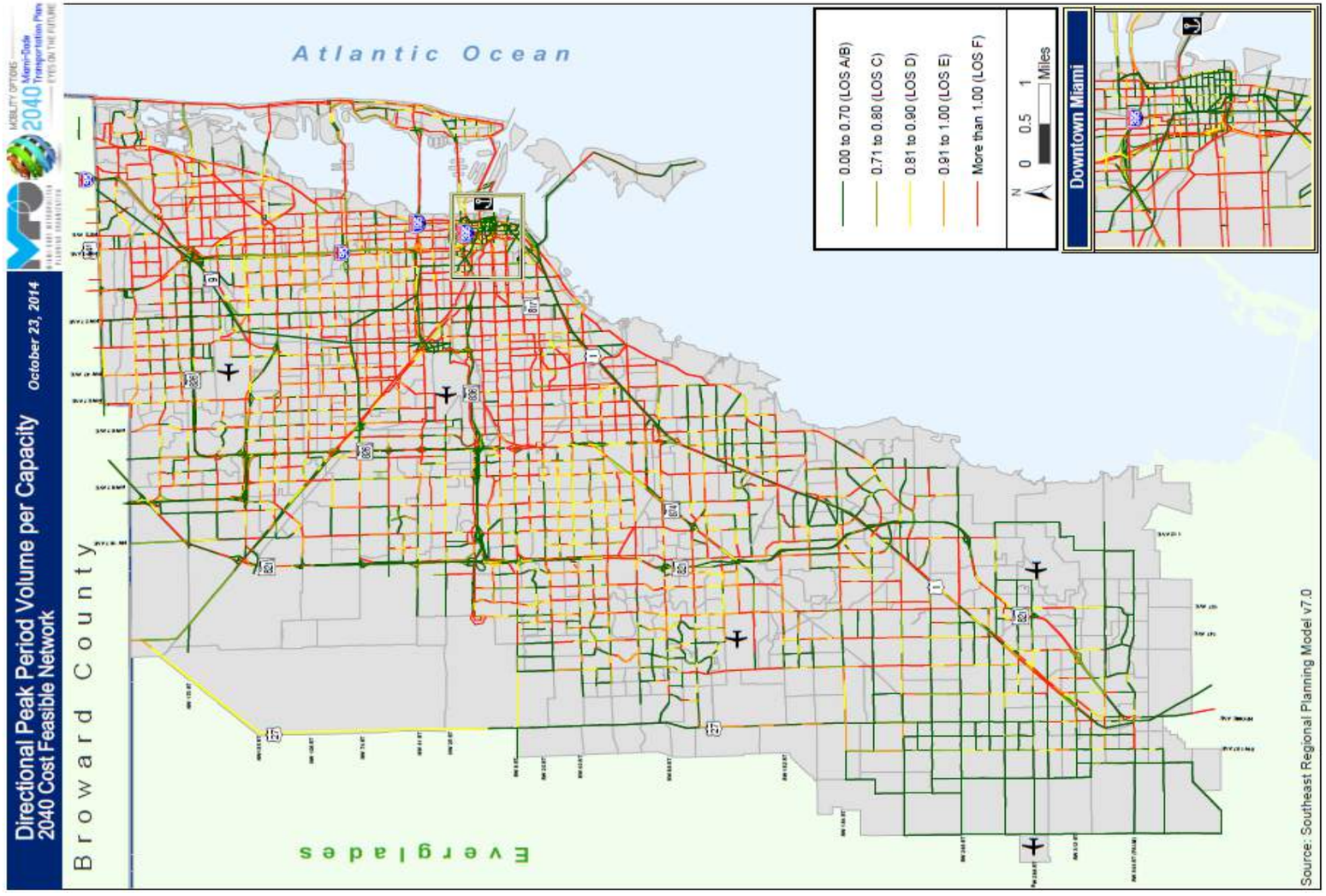

ATLANTIC OCEAN
BISCAYNE BAY
ADOPTED 2020 AND 2030
LAND USE PLAN
FOR MIAMI-DADE COUNTY, FLORIDA
ADOPTED 2020-2030
COMPREHENSIVE DEVELOPMENT MASTER PLAN

Census Block Population

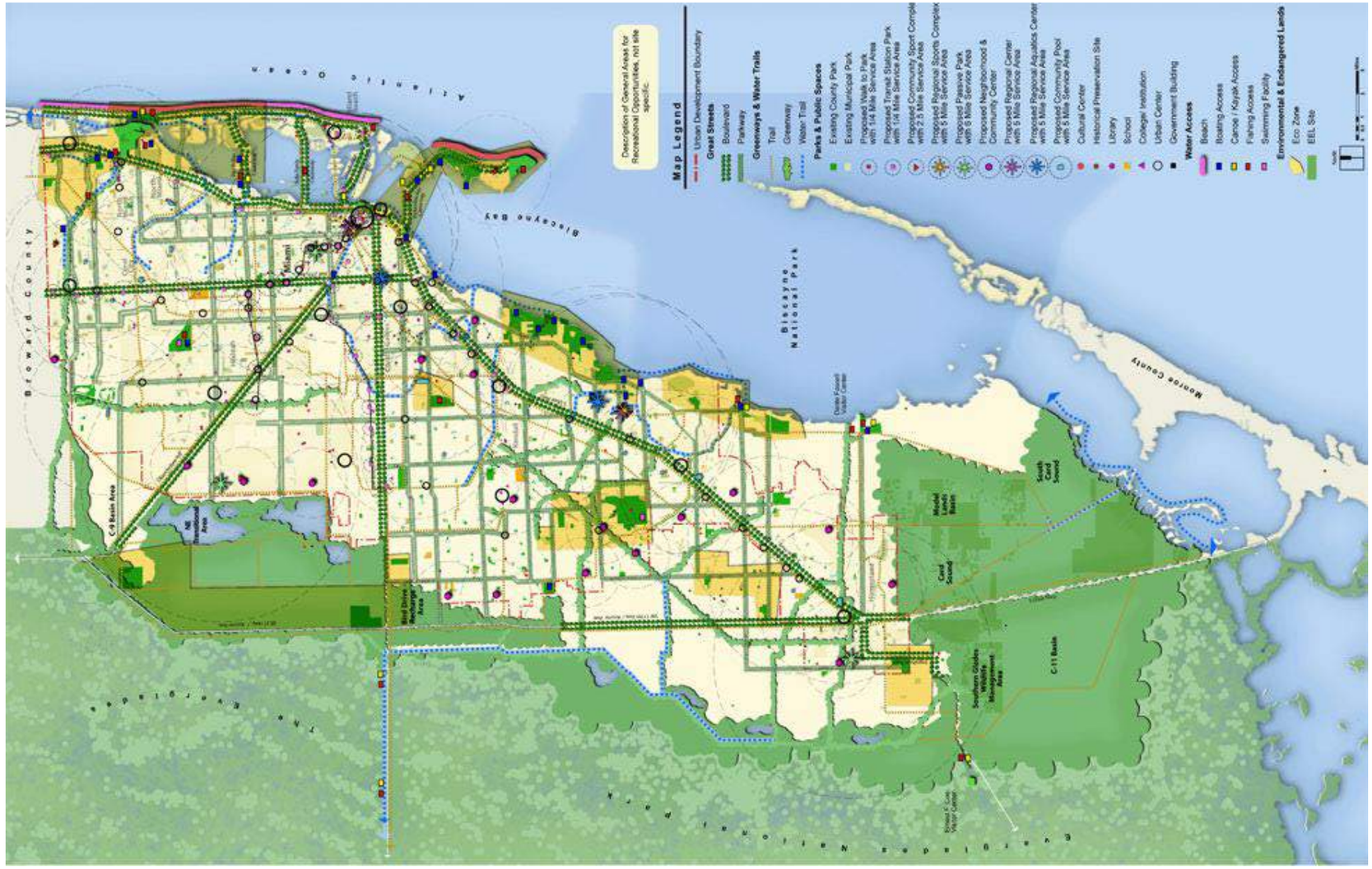


Miami-Dade Existing Employment Clusters



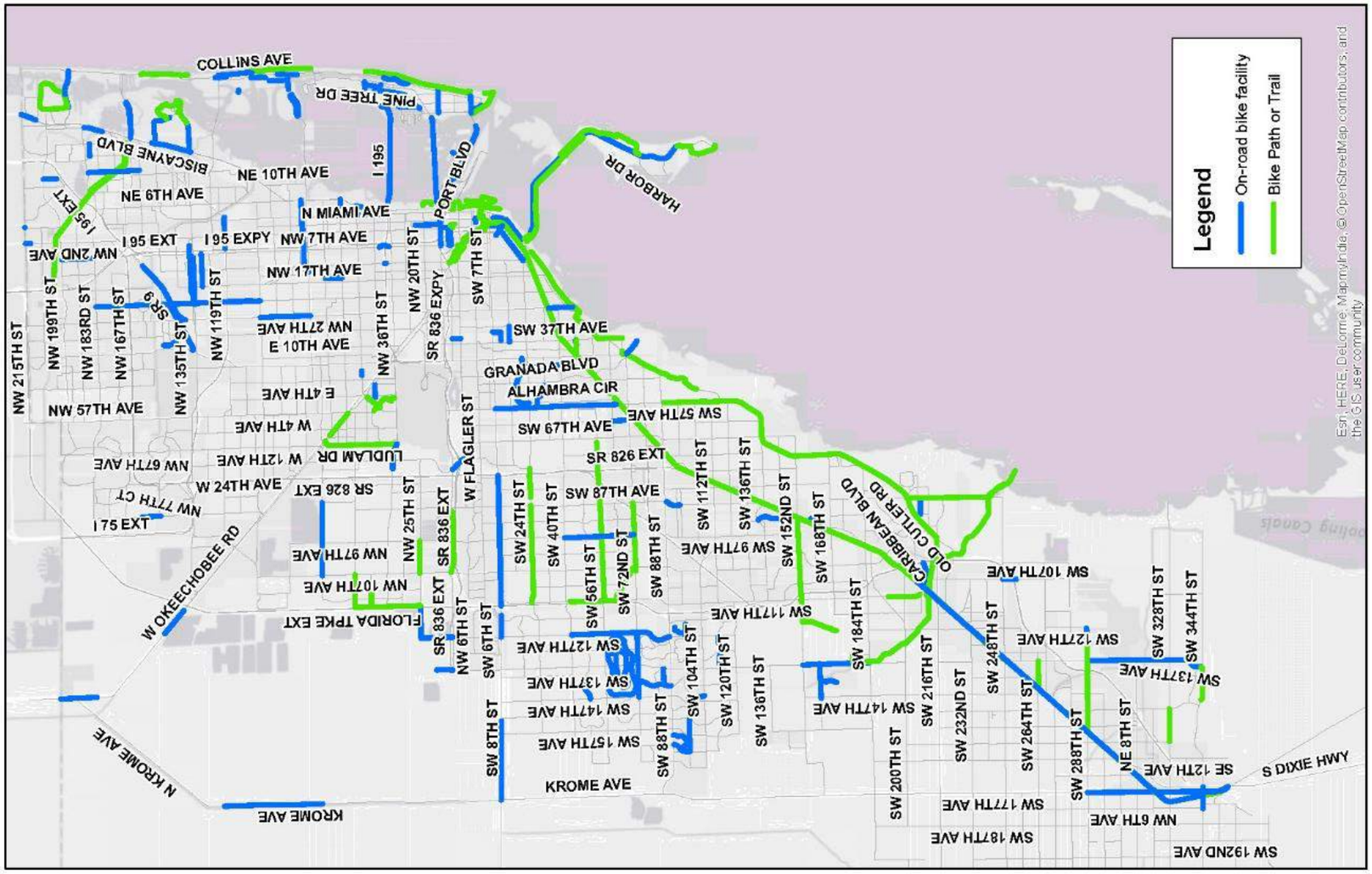

Atlantic Ocean
Directional Peak Period Volume per Capacity
2040 Cost Feasible Network
October 23, 2014
Broward County
Everglades
0.00 to 0.70 (LOS A/B)
0.71 to 0.80 (LOS C)
0.81 to 0.90 (LOS D)
0.91 to 1.00 (LOS E)
More than 1.00 (LOS F)
N
0 0.5 1
Miles
Downtown Miami
Source: Southeast Regional Planning Model v7.0

Miami-Dade Parks, Recreation, and Open Spaces Master Plan



Routes Used by Cyclists

Existing Bike Facilities



MIAMI-DADE TPO **PROTECTED BIKE LANES** DEMONSTRATION

Traveler Survey

The Transportation Planning organization and [Partnering Municipality] collaborated toward the development of this protected bike lane pilot project. This protected bike lane segment extends along [street segment] between [street] and [street]. We would appreciate your feedback in regard to the user experience you feel you are receiving by this pilot project. You feedback is important towards the development of future pilot projects and more long-term installations. You will remain anonymous. We appreciate your feedback. If you would like more information about this project please go to xxxx.xxxx.gov.

1. Is this your first time using this protected bike lane?
2. If not, How frequent do you use this protected bike lane?
3. What type of destination are you heading to?
   a. Home
   b. Work
   c. School
   d. Entertainment
   e. Groceries
   f. Other
4. On a scale of 1 to 10 how much safer do you feel riding on a protected bike lane vs riding with traditional bike lane?
5. Would you be riding this route if this protected bike lane was not here?
6. Are using other modes to reach your destination? Please circle
   a. Bus
   b. Metrorail
   c. Metromover
   d. Taxi/Uber
   e. Walk
   f. Tri-rail
   g. Other
7. Do you recommend more protected bike lanes be built?
8. Do you own or have regular access to a car?
9. On a scale of 1 to 10 how much more enjoyable is it to commute by bike vs car?
10. Do you have any additional comments?
11. What is your sex?
    a. Male
    b. Female
12. What age group do you fall under?
    a. 18 or below
    b. 18 to 25
    c. 25 to 35
    d. 35 to 45
    e. 45 to 60
    f. 60+