



# MIAMI LAKES **Greenways and Trails** MASTER PLAN

Prepared by  
**Kimley»Horn**

Prepared for



MIAMI-DADE  
METROPOLITAN  
PLANNING  
ORGANIZATION

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# Miami Lakes

## Greenways and Trails Master Plan

*Prepared for:*

Town of Miami Lakes



Miami-Dade MPO



*Prepared by:*

Kimley-Horn and Associates, Inc.

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2014  
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# Miami Lakes Greenways and Trails Master Plan

## TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	1
PURPOSE AND NEED.....	2
What is a Greenway? .....	3
What is a Trail? .....	4
Bicycling in Miami Lakes .....	5
Scenic Trail Opportunities.....	7
Connectivity to Parks.....	8
Benefits of Walking and Bicycling .....	9
PROPOSED FACILITIES FROM PRIOR PLANS .....	14
TRANSPORTATION MOBILITY ANALYSIS .....	16
Bicycling and Walking Activity Levels .....	16
GIS Data Map Series .....	17
Commute Trip Reduction Program.....	25
Pedestrian Safety.....	26
NETWORK IDENTIFICATION AND SUPPLEMENTAL INFRASTRUCTURE .....	28
Proposed Network Plan .....	28
Primary Trail Facilities .....	32
NW 77 <sup>th</sup> Court Bicycling/Walking Trail.....	33
Neighborhood Greenway/Canal Trail Bicycling/Walking Trail .....	37
NW 67 <sup>th</sup> Avenue Bicycling/Walking Trail .....	40
NW 87 <sup>th</sup> Avenue Bicycling/Walking Trail .....	43
NW 154 <sup>th</sup> Street Bicycling/Walking Trail .....	45
Elder Pedestrian Safety .....	47
IMPLEMENTATION STEPS, COSTS AND DESIGN GUIDELINES.....	57



# Miami Lakes Greenways and Trails Master Plan

## LIST OF FIGURES

Figure 1. Map of Proposed Facilities from Prior Plans.....	14
Figure 2. Bicycle Crashes .....	19
Figure 3. Pedestrian Crashes.....	20
Figure 4. Bicycle Level of Service.....	21
Figure 5. Pedestrian Level of Service.....	22
Figure 6. Metrobus Ridership Range per Stop .....	23
Figure 7. 2010 Census Population Density .....	24
Figure 8. Proposed Network Plan.....	29
Figure 9. Proposed Network Plan with Funded Projects .....	30
Figure 10. Shared Use Path Design Guideline .....	58
Figure 11. Neighborhood Trail Design Guideline.....	59
Figure 12. Trail Adjacent to Canal Design Guidelines .....	60

## LIST OF TABLES

Table 1: Journey to Work Data.....	17
Table 2: Facility Types Considered in this Plan.....	31



# Miami Lakes Greenways and Trails Master Plan

## EXECUTIVE SUMMARY

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

Some of the highlights of the proposed network plan include:

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

The report also includes design guidelines and a planning level opinion of probable cost (OPC) for the various components of the *Miami Lakes Greenways and Trails Plan*.



# Miami Lakes Greenways and Trails Master Plan

## PURPOSE AND NEED

Enhancing the bicycle and pedestrian network within the Town of Miami Lakes is consistent with the Town's Adopted Comprehensive Plan. The goal of the Transportation Element of the Town's Comprehensive Plan is to develop and maintain a multimodal transportation system that meets the diverse circulation needs of Miami Lakes in a safe and efficient manner and protects the quality of life for all residents. Within this goal, the Town lists several policies such as providing a complete and inter-connected sidewalk network and extending the bicycle circulation system to unserved areas within the Town. The *Town of Miami Lakes Strategic Plan* lists enhancing pedestrian friendliness and building bike paths as part of its strategic initiatives.

Bicycle and pedestrian facilities are important components of a multimodal transportation system. Bicycle and pedestrian facilities, such as greenways, trails, bike paths, bike lanes, sidewalks, and crosswalks, designate space for bicycle and pedestrian travel which enhances bicycling and walking as viable transportation options. Supplemental



bicycle and pedestrian infrastructure, such as signage, traffic signals, curb ramps, bike racks, benches, and end-of-trip facilities (lockers, changing rooms, bike storage rooms, etc.), enhance the experience of bicyclists and pedestrians and encourage greater usage.

Combining these facilities and supplemental infrastructure is important to create an integrated system that augments bicycling and walking as modes of transportation. Bicycling and walking are not only transportation modes; they are also popular recreational activities. Many people in Miami Lakes take advantage of favorable weather throughout much of the year to enjoy bicycle riding and walking or running for leisure and mobility.

According to recent 2009 USDOT data from the *National Household Travel Survey* (NHTS), approximately one-quarter of all trips within the Miami urbanized area are one mile or less in



# Miami Lakes Greenways and Trails Master Plan

length. Providing appropriate bicycle and pedestrian facilities can encourage short trips to be made on a bicycle or on foot instead of by automobile, which can help reduce traffic congestion, and contributes to a healthy citizenry.

The purpose of this Plan is to recommend specific projects to help create a safe and convenient non-motorized transportation system to connect communities, schools, parks, and businesses. The Plan will focus on key elements of non-motorized transportation including pedestrian pathways, bicycle trails, shared-use paths, recreational greenways, and connections to mass transit, thereby optimizing walking and bicycling as healthy, clean transportation options in Miami Lakes.



## *What is a Greenway?*

A greenway is a linear open space established along either a natural corridor or a man-made corridor (such as a street, canal, utility corridor, or highway). Greenways serve a dual-nature as both a link in the transportation system and a park for recreational purposes. Greenways can exist in both rural and urban areas. Rural greenways are often associated with long-distance travel and recreation including abandoned railroad corridors, rivers, large state and



national parks, and ecologically significant natural corridors that provide for hiking and wildlife migration. Protected linear corridors in urbanized areas can be more challenging to provide due to land constraints and other obstacles; however, urban greenways are just as vital due to the critical need for the environmental, health, and transportation benefits associated with greenways in modern cities. In addition, the large



# Miami Lakes Greenways and Trails Master Plan

population base of a modern urbanized area often furnishes a higher number of potential greenway users within close proximity.

## *What is a Trail?*

A trail is a pathway providing the opportunity to move from one place to another. Trails can be developed naturally over time due to frequent usage by people or animals. Trails can also be established in greenways or other corridors to facilitate or encourage movement or recreation along a certain path. The NW 170<sup>th</sup> Street Greenway Trail (pictured on the right) is an example of a trail in Miami Lakes. Trails can be made of a natural surface, such as grass or dirt, or a hard surface, such as concrete or asphalt. Trails and trail networks provide positive opportunities for users:

- Exercise/healthy lifestyles
- Safe routes to schools
- Bike to work
- Walk to a shopping center
- Foster community involvement
- Meet neighbors
- Access the park system
- Experience tranquil outdoor settings



The Town desires to develop a network of greenway trails that will provide transportation functionality as well as recreation opportunities. Trails should be developed in scenic areas wherever possible to take advantage of the natural beauty of Miami Lakes including tree canopies and water bodies. Trails should be designed for all non-motorized users including bicyclists, pedestrians, runners, and in-line skaters.



# Miami Lakes Greenways and Trails Master Plan

## *Bicycling in Miami Lakes*

In addition to consistency with the Town's Adopted Comprehensive Plan, the Town supports bicycling and walking through many different ways including implementing trail projects such as the NW 170<sup>th</sup> Street Greenway Trail (pictured on the previous page), participating in bike rodeos for the community, and conducting Town staff bike rides to observe the bicycling conditions within the community. A bike rodeo is a clinic designed to teach children the skills and precautions to ride a bicycle safely. Bike rodeos are typically held in parking lots and include chalk courses with obstacles created by traffic cones and other devices.





# Miami Lakes Greenways and Trails Master Plan

Several of the key transportation corridors in Miami Lakes have wide sidewalks under tree-lined canopies including NW 154<sup>th</sup> Street, NW 67<sup>th</sup> Avenue, Miami Lakeway North, and Montrose Road. These wide sidewalks provide non-motorized transportation and recreation opportunities.



The Miami Lakes Business Park West is an area that is commonly used by on-road bicyclists for recreation purposes including evening and weekend rides.





# Miami Lakes Greenways and Trails Master Plan

## *Scenic Trail Opportunities*

Several corridors in the Town present opportunities for providing scenic greenway trails including canal corridors (NW 170<sup>th</sup> Street Greenway Trail, NW 77<sup>th</sup> Court Canal Bicycling and Walking Trail, NW 139<sup>th</sup> Street/NW 57<sup>th</sup> Court Canal Bicycling and Walking Trail, and the Canal Trail south of Bamboo Street) and tree-lined canopy wide sidewalk corridors (NW 154<sup>th</sup> Street, NW 67<sup>th</sup> Avenue, Miami Lakeway North, and Montrose Road). It should be noted that the canal trail corridors that pass behind residential neighborhoods, such as the canal along the southern boundary of the Town, are considered long-range opportunities.





# Miami Lakes Greenways and Trails Master Plan

## *Connectivity to Parks*

The Town of Miami Lakes has one of the most unique park systems in Miami-Dade County including several large Town parks and numerous pocket parks. In total there are 101 parks located within the 6.5 square mile area of the Town, which means that almost every resident is located within walking distance of a park. The *Greenways and Trails Master Plan* strives to provide a network focused around connectivity to the parks. Highlights include connectivity to Miami Lakes Optimist Park, Miami Lakes Picnic Park West, and Royal Oaks Park. The Town may consider a future park in the location of the par 3 golf course, which if it were to happen could become a long range opportunity to be added to the greenways and trails network. In addition, several of the proposed new greenway trail corridors could potentially become parks due to the scenic and aesthetic quality of the trail experience.





# Miami Lakes Greenways and Trails Master Plan

## *Benefits of Walking and Bicycling*

### Active Transportation

Active transportation is travel powered by human energy with walking and biking the most common examples (Rails-to-Trails Conservancy 2007). To encourage more walking and biking, communities must create active transportation systems that consist of seamless networks of accessible trails, sidewalks and on-road bike facilities. At a time when nearly half of all trips made in the Miami-Dade urbanized area are three miles or less (USDOT, *National Household Travel Survey*, 2009), and the vast majority of these short trips taken by automobile, the practicality and wisdom of making biking and walking mainstream transportation options are undeniable. Especially when connected with transit, a new host of mobility choices are opened up through active transportation.

Active transportation must grow to meet the nation's mobility needs while fostering vibrant healthy places. Specific plans for projects in the *Miami Lakes Greenways and Trails Master Plan* are needed to elevate greenway trails, biking, and walking as local transportation priorities and present a strong case for increased investment in trails, biking and walking.

### Mobility

Active transportation has the potential to carry a significant part of the transportation load. Communities that invest in walking and biking have seen tremendous growth in walking and biking trips. Minneapolis, Minnesota, for example, has nearly a 30 percent share of non-motorized trips.

With nearly half of all trips under three miles (USDOT 2009), expanding safe, active transportation choices, which are ideal for short trips, can make a significant contribution to the transportation load. The Town of Miami Lakes has 2,646 residents who currently work and live within the Town





# Miami Lakes Greenways and Trails Master Plan

boundaries according to the U.S. Census Bureau Longitudinal Employer-Household Dynamics (LEHD) data. These works trips represent potential trips that are within range of many people's bicycling abilities if safe and connected pathways are provided. However, many transportation mode choice statistics undercount walking and biking trips by focusing only on work trips (such as the U.S. Census Bureau Journey-to-Work data), which account for only 15 percent of all trips (Bureau of Transportation Statistics 2002). Therefore, the total number of all trips that are within walking and bicycling range is much higher than just the number of residents who work in the Town.

Expanding transportation choices needs to be at the heart of the long term transportation strategy. The status quo practice of expanding roadway capacity is a recipe for gridlock. Communities with good walking and biking conditions can expect a five to 15 percent reduction on overall vehicle miles traveled (Litman, *Smart Emission Reduction Strategies*, 2007).

When offered a real choice through the provision of walking and biking infrastructure, people will choose to walk and bike. Portland, Oregon, for example has built more than 100 miles of trails and bike lanes since 2001. This and earlier investments have resulted in tripling bicycle miles traveled over the last decade (City of Portland, *Portland Bicycle Count Report*, 2012).

## Public Health

Childhood obesity has become a major public health problem. The obesity rate has doubled for children and tripled for adolescents since 1980 (U.S. Department of Health and



Human Services, *Childhood Obesity*, 2005). Obesity contributes to approximately 300,000 annual deaths on average.

The lack of physical activity is a significant factor in the growing obesity epidemic. Daily walking and biking used to be an integral part of kid's



# Miami Lakes

## Greenways and Trails Master Plan

lives. Today, however, only 13 percent of children walk to school down from 48 percent in 1969 (USDOT, *National Household Travel Survey*, 2009). It should be noted that following focused investments in the Safe Routes to School program, data show that the decline in rates of walking and bicycling to school has stabilized. In addition, physical activity trend data for children indicate that one-third of adolescents are not getting recommended levels of exercise and 10 percent are completely inactive (U.S. Department of Health and Human Services, *Childhood Obesity*, 2005).

People who reported using trails at least once a week were twice as likely to meet physical activity recommendations than people who reported rarely or never using trails according to a study published by the American Journal of Preventive Medicine (Librett et. al., *Characteristics of Physical Activity Levels Among Trail Users*, 2006).

### Economic Development

Trails build strong, economically vital communities. Trails, according to a National Association of Homebuilders study cited by the *New York Times*, are the number one amenity potential homeowners cite when they are looking at moving into a new community.

Trails provide communities with a valuable amenity that translates into increased housing values. In Indianapolis, for example, the increased property value associated with proximity to trails was estimated at more than \$140 million (Lindsey et. al., *Public Choices and Property Values: Evidence from Greenways in Indianapolis*, 2003).

Trails build local businesses. Bicycle tourists, a growing, affluent segment of the tourist market, contribute significantly to local businesses that are well-connected to trails. Along the Virginia Creeper Trail in southwest Virginia, visitors spend \$1.59 million annually providing an estimated 27 new full-time jobs (Bowker et. al., *Virginia Creeper Trail: An Analysis of Use, Economic Impacts, Visitors' Characteristics, and Preferences*, 2004).



# Miami Lakes Greenways and Trails Master Plan

## Pollution

Transportation is a leading source of climate pollution representing approximately 28 percent of overall U.S. greenhouse gas emissions in 2011 (Environmental Protection Agency 2013). It is also the fastest rising source of CO<sub>2</sub> emissions. Over 90 percent of the fuel used for transportation is petroleum-based. In addition, cars are the dominant mode of transportation even for short trips under three miles (USDOT, *National Household Travel Survey*, 2009). With most trips within a 15- to 20-minute bike ride, many of these trips are ripe for conversion to walking, biking and transit with the right investments in infrastructure and programs. Recent studies have shown that making communities more bike/pedestrian friendly can make a significant contribution towards reduction in greenhouse gas emissions by driving down vehicle miles traveled.



## Family and Community

Community and family are the heart of greenway trail experiences. One of the most significant benefits of trails is the sense of community and the connections they build. Well-designed trails transform “community” from an abstraction into a real place. At their most basic, trails encourage personal interaction in a way entirely unavailable to automobile users. Individuals passing in cars are limited to, at most, a honk and a wave.

Residents living in walkable neighborhoods are more likely to have higher levels of social capital. The importance of walkable neighborhoods for creating strong communities is demonstrated in a 2003 study that found that residents in highly walkable neighborhoods are more likely to know their neighbors, participate politically, trust others, and be socially engaged than those residing in suburbs of low walkability (Leyden, *Social Capital and the Built Environment: The Importance of Walkable Neighborhoods*, 2003).



# Miami Lakes Greenways and Trails Master Plan

Walking contributes to higher levels of mental health and a quality aging experience. Safe, walkable neighborhoods are vital components contributing to mental health and well-being of the community, as well as the opportunity for residents to age in place (Cagney and Wen, *Social Capital and Health: Part II Chapter 11. Social Capital and Aging-Related Outcomes*, 2008). The Miami-Dade Age-Friendly Initiative (AFI) is based on the successes, assets, needs, and gaps multiple sectors face in creating a metropolitan area that fosters a physical and social environment for older adults of all ages to stay active and health with dignity and enjoyment. Miami Lakes is one of five municipalities participating with Miami-Dade County in the State of Florida/Department of Elder Affairs/AARP designation of becoming a Community for a Lifetime.





# Miami Lakes Greenways and Trails Master Plan

## PROPOSED FACILITIES FROM PRIOR PLANS

Several key planning efforts have already been performed that provide background and context for the *Miami Lakes Greenways and Trails Master Plan* including the following.

- North Dade Greenways Master Plan
- Miami Lakes Commute Trip Reduction Plan
- Miami-Dade MPO 2035 Bicycle and Pedestrian Plan
- Miami-Dade County Open Space Master Plan (OSMP)
- Miami-Dade MPO Pedestrian Safety at Parks Plan
- Town of Miami Lakes Comprehensive Master Plan
- Town of Miami Lakes Transportation Master Plan
- NW 170<sup>th</sup> Street Greenway Plan
- Miami Lakeway Safe Routes to School Trail Plan

A map of proposed bikeways, pedestrian paths, and open space recommended in prior planning efforts is shown in Figure 1 on the following page. It is important to utilize these prior planning efforts as a foundation for the *Miami Lakes Greenways and Trails Master Plan*.









# Miami Lakes Greenways and Trails Master Plan

## TRANSPORTATION MOBILITY ANALYSIS

A general transportation mobility analysis was conducted to identify bicycle and pedestrian mobility issues through data analysis in the Town of Miami Lakes. The purpose of this task is to collect data that will allow the study team to properly assess the existing conditions of alternative travel modes in Miami Lakes, and to analyze the future bicycle and pedestrian infrastructure needs.

### *Bicycling and Walking Activity Levels*



USDOT data from the *National Household Travel Survey* (2009) indicate that bicycling and walking account for approximately 10 percent of all trips in the Miami-Dade urbanized area, with walking representing approximately 9 percent and bicycling representing approximately 1 percent. The USDOT NHTS data are collected on daily trips taken in a 24-hour period for all trips, all

modes, all purposes, and all trip lengths. Florida's participation in the NHTS Add-On Program allows sufficient data collection to be analyzed at the urbanized area level.

The United States Bureau of the Census measures transportation data for work trips only using a sampling of respondents that complete the census long form as part of the annual American Community Survey (ACS). Updated socioeconomic, demographic, and housing information is now available on an annual basis. The 2008-2012 ACS 5-Year Estimates were used for this analysis.

Work trip characteristics in the Town of Miami Lakes demonstrate that residents are less likely to make work trips on foot or by bicycle than in the County and State as a whole. "Drove alone" is the dominant journey-to-work mode within the Town of Miami Lakes, with the percentage of single occupant vehicles at about 4 percent more than in the County as a whole.



# Miami Lakes Greenways and Trails Master Plan

Table 1: Journey to Work Data

Description	Town of Miami Lakes		Miami-Dade County		State of Florida		United States	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Car, truck, or van	12,489	89.18%	964,180	86.44%	7,256,082	89.50%	120,551,904	86.17%
Drove Alone	11,308	80.75%	857,014	76.83%	6,443,859	79.48%	106,519,508	76.14%
Carpooled	1,181	8.43%	107,166	9.61%	812,223	10.02%	14,032,099	10.03%
Public Transportation	189	1.35%	60,007	5.38%	164,698	2.03%	6,967,689	4.98%
Taxicab	11	0.08%	1,641	0.15%	6,514	0.08%	159,486	0.11%
Motorcycle	0	0.00%	2,403	0.22%	29,200	0.36%	316,992	0.23%
Bicycle/Walked	140	1.00%	30,167	2.70%	178,715	2.20%	4,724,083	3.38%
Other means	16	0.11%	11,627	1.04%	92,845	1.15%	1,195,856	0.85%
Worked at home	1,159	8.28%	45,399	4.07%	379,422	4.68%	5,977,629	4.27%

## GIS Data Map Series

Using geographic information systems (GIS), a map series was prepared to illustrate existing transportation mobility conditions and community features in Miami Lakes that help form the background conditions for improving the Town's bicycle and pedestrian mobility.

Figures 2 through 7 present the GIS Data Map Series.

- Figure 2. Bicycle Crashes
- Figure 3. Pedestrian Crashes
- Figure 4. Bicycle Level of Service (BLOS)
- Figure 5. Pedestrian Level of Service (PLOS)
- Figure 6. Metrobus Ridership Range per Stop
- Figure 7. 2010 Census Population Density

Bicycle Level of Service (BLOS) and Pedestrian Level of Service (PLOS) were calculated according to the methodology established in the *2009 FDOT Quality/Level of Service (QLOS) Handbook*. The BLOS Model is based on the following facility characteristics:

- Average effective width of the outside thru lane;
- Number of thru lanes;
- Motorized vehicle volumes;



# Miami Lakes

## Greenways and Trails Master Plan

- Motorized speeds;
- Heavy vehicle (truck) volumes; and
- Pavement conditions.

Similar to the required BLOS roadway characteristic criteria, the PLOS Model requires additional variable information to complete its assessment and calculate its LOS. The facility characteristics needed to complete the PLOS calculation are listed below:

- Existence of a sidewalk;
- Lateral separation of pedestrians from motorized vehicles;
- Motorized vehicle volumes; and
- Motorized vehicle speeds.

The PLOS and BLOS of a corridor are determined by using the respective characteristics above in the LOS score equations from the *2009 FDOT Q/LOS Handbook*.

As shown in Figure 4, the majority of the major roadways within the Town of Miami Lakes have a BLOS of E. On the contrary, Figure 5 shows that the majority of the major roadway segments within the Town of Miami Lakes have a PLOS of D or better, indicating the result of a much greater investment over the years in pedestrian infrastructure than bicycle facilities, which is consistent with findings from the County as a whole.



# TOWN OF MIAMI LAKES GREENWAYS AND TRAILS MASTER PLAN

## FIGURE 2: BICYCLE CRASHES 2005-2011



### Legend

- Bicycle Crashes
- Major Roads
- Other Roads
- Water
- Parks
- Town of Miami Lakes
- Miami-Dade County









# TOWN OF MIAMI LAKES GREENWAYS AND TRAILS MASTER PLAN

## FIGURE 4: BICYCLE LEVEL OF SERVICE (BLOS)



### Legend

- BLOS A
- BLOS B
- BLOS C
- BLOS E
- BLOS F
- Major Roads
- Other Roads
- Water
- Parks
- Town of Miami Lakes
- Miami-Dade County



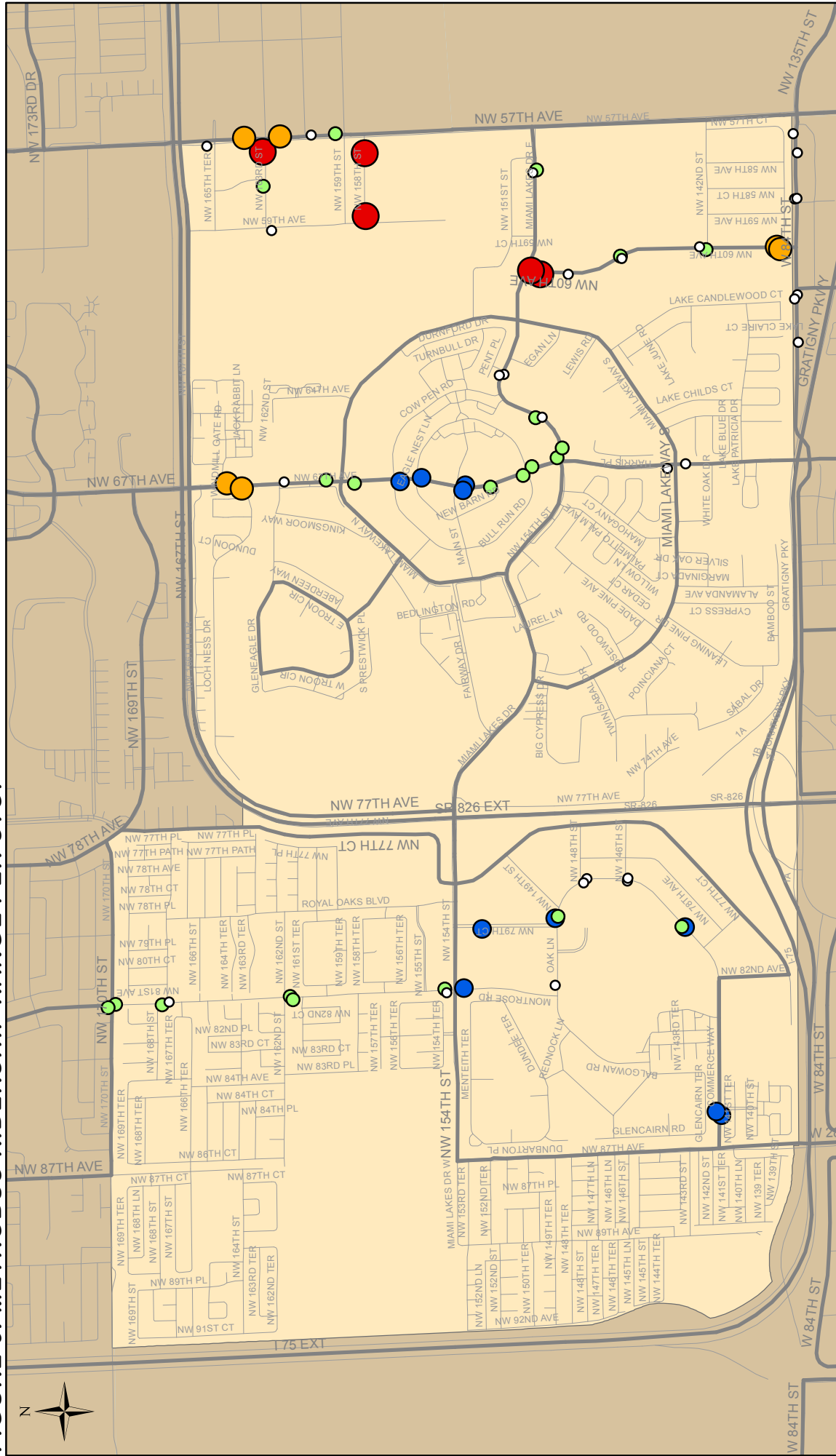






# TOWN OF MIAMI LAKES GREENWAYS AND TRAILS MASTER PLAN

## FIGURE 6: METROBUS RIDERSHIP RANGE PER STOP



### Legend

Average Daily Ridership



0 - 5



6 - 10



11 - 25



26 - 50



>50



Major Roads



Other Roads



Town of Miami Lakes



Miami-Dade County



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0 0.25 0.5 1 Miles









# Miami Lakes

## Greenways and Trails Master Plan

### *Commute Trip Reduction Program*

The Town of Miami Lakes recognizes that continued growth in the region is placing a strain on the Town's transportation system resulting from vehicular congestion that is compromising the quality of life for residents and adversely impacting the community's sense of place. The roadways within the Town that exhibit LOS F conditions according to the Town of Miami Lakes Transportation Master Plan include NW 67<sup>th</sup> Avenue, NW 82<sup>nd</sup> Avenue, NW 154<sup>th</sup> Street, Miami Lakeway North, and Miami Lakeway South.

In 2013, the Town completed the *Commute Trip Reduction Program* that identified strategies to help ease traffic congestion. The Program recognizes that a comprehensive system of transit, bicycle, and pedestrian infrastructure combined with Transportation Demand Management (TDM) strategies will play a crucial role in maintaining mobility and reducing automobile dependency. The established goals of the Commute Trip Reduction Program are as follows.

- Reduce dependence on single occupant vehicles.
- Reduce peak hour traffic congestion on Town roadways.
- Increase efficiency of the existing transportation system.
- Offer mobility choices through provision of multimodal transportation infrastructure.
- Provide sustainable lifestyle choices to residents of the community.
- Enhance the livability of the Town of Miami Lakes.

Twenty-five preliminary TDM strategies were identified, from which thirteen TDM strategies were selected for implementation through a screening process.

- |                                 |                                       |
|---------------------------------|---------------------------------------|
| ▪ Carpooling                    | ▪ Pedestrian Master Planning          |
| ▪ Vanpooling                    | ▪ Public Outreach                     |
| ▪ Emergency Ride Home           | ▪ Employer Outreach                   |
| ▪ Telecommuting                 | ▪ TDM Marketing and Promotion         |
| ▪ Flexible/Compressed Work Week | ▪ Employer Transportation Coordinator |
| ▪ Commuter Tax Incentives       | ▪ Commute Trip Reduction Ordinance    |
| ▪ Bicycle Master Planning       |                                       |

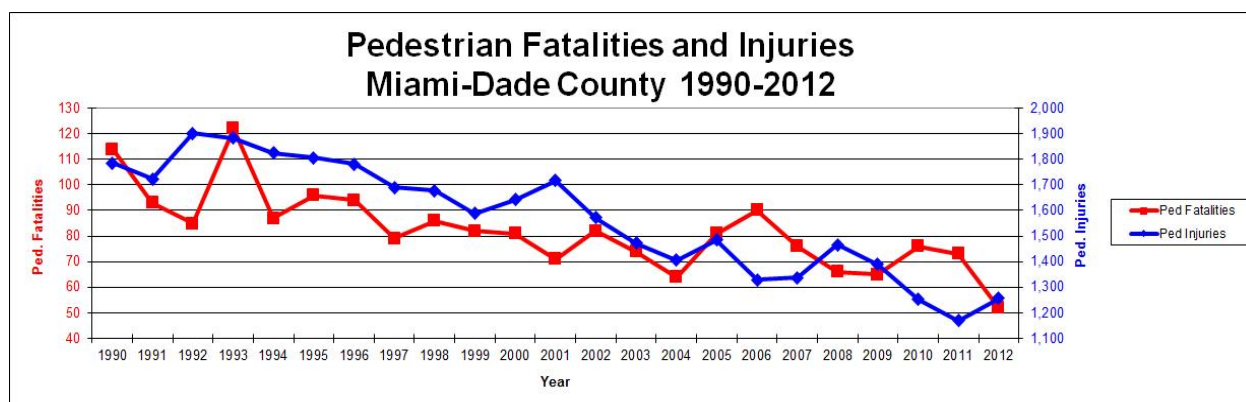


# Miami Lakes Greenways and Trails Master Plan

The development of the *Miami Lakes Greenways and Trails Master Plan*, along with ongoing coordination with the Miami-Dade MPO, is part of the implementation steps for the Bicycle Master Planning recommendation and the Pedestrian Master Planning recommendation.

## *Pedestrian Safety*

The promotion of pedestrian safety is a fundamental tenet of the *Miami Lakes Greenways and Trails Plan*. The Miami-Dade MPO maintains a database of pedestrian crashes, which shows that investment in pedestrian safety infrastructure improvements as well as education, enforcement, and encouragement programs over the years has resulted in an overall reduction in pedestrian injuries and fatalities over the past two decades.



Source: Miami-Dade MPO from Department of Highway Safety and Motor Vehicles (DHSMV) Data

In particular, elder pedestrian safety is of critical concern within the Town. According to national 2010 data, 4,280 pedestrians were killed in traffic crashes, 813 of whom (19 percent) were elder adults aged 65 and older (National Highway Traffic Safety Administration [NHTSA], *Traffic Safety Facts*, 2010). In Miami-Dade, the problem is even more pronounced. In 2010, 29 out of the 73 pedestrian fatalities in Miami-Dade traffic crashes (40 percent) were elder adults (Alliance for Aging, *Elder Pedestrian Safety in Miami-Dade: An Overview*, 2013). Elder pedestrian safety is an essential component of a community's efforts to address the transportation and mobility needs of its citizens. The *Miami Lakes Greenways and Trails Plan* includes a series of recommendations focused on improving safety and mobility for elder



# Miami Lakes Greenways and Trails Master Plan

pedestrians in the Elder Pedestrian Safety section. These recommendations when implemented are intended to help lower elder pedestrian crash rates in the future. Figure 3 in the GIS Data Map Series presents pedestrian crash location data according to the MPO's pedestrian crash database.



# Miami Lakes Greenways and Trails Master Plan

## NETWORK IDENTIFICATION AND SUPPLEMENTAL INFRASTRUCTURE

Bicycle and pedestrian connectivity should be provided throughout the Miami Lakes community. Most streets already have basic sidewalks that provide pedestrian circulation. Based on the transportation mobility analysis that was conducted for this Plan, and coupled with an understanding of the Purpose and Need established, an analysis of the Town's transportation system was conducted.

### *Proposed Network Plan*

The analysis resulted in the creation of a Proposed Network Plan as shown in Figure 8. The Proposed Network Plan identifies the type of facilities recommended for the Town's street network. The Proposed Network Plan builds upon the opportunities established from prior plans reviewed earlier in this report. In addition, the Proposed Network Plan serves the Town's mobility needs for all ages and abilities and is consistent with Americans with Disabilities Act (ADA) accessibility requirements.

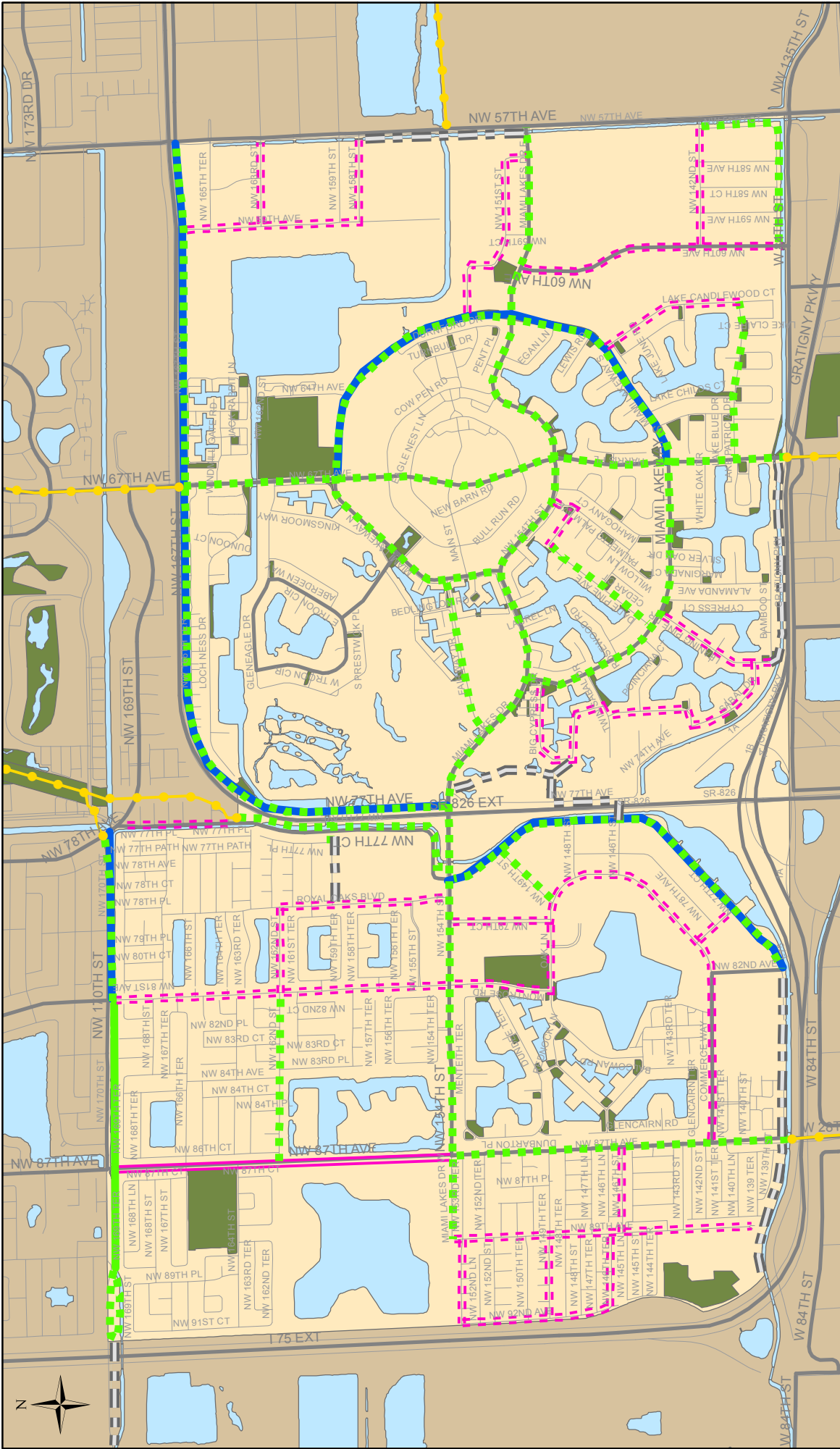
Off-road facilities, as identified in the Proposed Network Plan, refer to wide sidewalks, greenways trails, or shared use paths located outside of the roadway traveled way that are at least eight (8) feet in width and accommodate a basic level of pedestrian and bicycle mobility and interaction. It should be noted that "new construction" shared use paths should be a minimum of ten (10) feet wide to meet current design guidelines (American Association of State Highway Transportation Officials [AASHTO], *AASHTO Guide for the Development of Bicycle Facilities*, 4<sup>th</sup> Edition, 2012; Florida Department of Transportation [FDOT], *FDOT Greenbook*, 2011). However, several of the Town's key arterials including NW 67<sup>th</sup> Avenue (Ludlam Road) and NW 154<sup>th</sup> Street (Miami Lakes Drive) were built with 8-foot sidewalks adjacent to the roadway before modern design guidelines were in effect. These facilities are incorporated into this analysis with the suggestion that upgrades, such as additional sidewalk width at bottlenecks and reconstructing the curb ramps to be the width of the path, could result in these wide sidewalks forming the backbone of a comprehensive network of off-road bicycle and pedestrian facilities throughout the Town.












# TOWN OF MIAMI LAKES GREENWAYS AND TRAILS MASTER PLAN FIGURE 9: PROPOSED NETWORK PLAN WITH FUNDED PROJECTS





# Miami Lakes Greenways and Trails Master Plan

Table 2: Facility Types Considered in this Plan

Off-Road Facilities		
Shared Use Path	Paved facilities for bicyclists and pedestrians that are a minimum of ten (10) feet in width, which can be (a) within the roadway right-of-way beside the street, or (b) in a separate right-of-way such as a canal or park	
Greenway Trails	Paved or natural surface trails within a greenway, such as a canal bank, abandoned railroad corridor, or park, which range in width and usage	
Wide Sidewalks	Sidewalks that are at least eight (8) feet in width and provide for a basic level of mobility for both pedestrians and bicyclists, although wide sidewalks do not meet modern design criteria for bicycle facilities	
On-Road Facilities		
Bike Lanes	Bike lanes designate available roadway space for preferential use by bicyclists and shall have a minimum functional width of 4 feet separated from motor vehicle lanes by a continuous lane line stripe	
Sharrows	Shared lane markings (sharrows) may be used in travel lanes to indicate a shared condition where bicyclists may occupy the travel lane and to indicate the optimum lateral placement for bicyclists in the lane	



# Miami Lakes

## Greenways and Trails Master Plan

On-road facilities refer to bicycle facilities located within the traveled way of a roadway or street. For purposes of this Plan, considered types of on-road bicycle facilities are designated bike lanes and shared lane markings (sharrows). Although the focus of the *Miami Lakes Greenways and Trails Master Plan* is on off-road bicycle and pedestrian facilities, the study team in conjunction with the Interagency Coordination Committee established for the development of the Plan recognized the importance of identifying the existing and potential future on-road bicycle facilities on the Proposed Network Plan to indicate the important additional connectivity provided by on-road facilities.

More information on the various types of off-road and on-road facilities considered in this Plan can be found in Appendix A and in design guidelines such as the *AASHTO Guide for the Development of Bicycle Facilities, 4<sup>th</sup> Edition, 2012*.

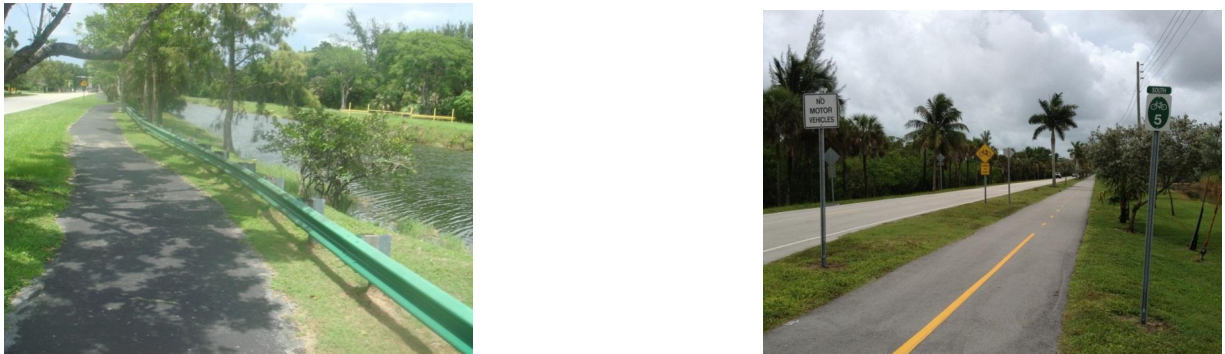
### *Primary Trail Facilities*

During the course of the analysis conducted for the Plan, several key trail facilities were developed in conjunction with Town staff and the Interagency Coordination Committee. Additional conceptual design work was prepared for the key trail facilities to help determine feasibility and to assist Town staff in future efforts to potentially acquire grant funding for construction of these facilities. These key trail facilities are intended to form the primary backbone of the Miami Lakes trail network. The following facilities were identified as the primary trail facilities.

- NW 77<sup>th</sup> Court Bicycling/Walking Trail
- Neighborhood Greenway/Canal Trail Bicycling/Walking Trail
- NW 67<sup>th</sup> Avenue Bicycling/Walking Trail
- NW 87<sup>th</sup> Avenue Bicycling/Walking Trail
- NW 154<sup>th</sup> Street Bicycling/Walking Trail



# Miami Lakes Greenways and Trails Master Plan

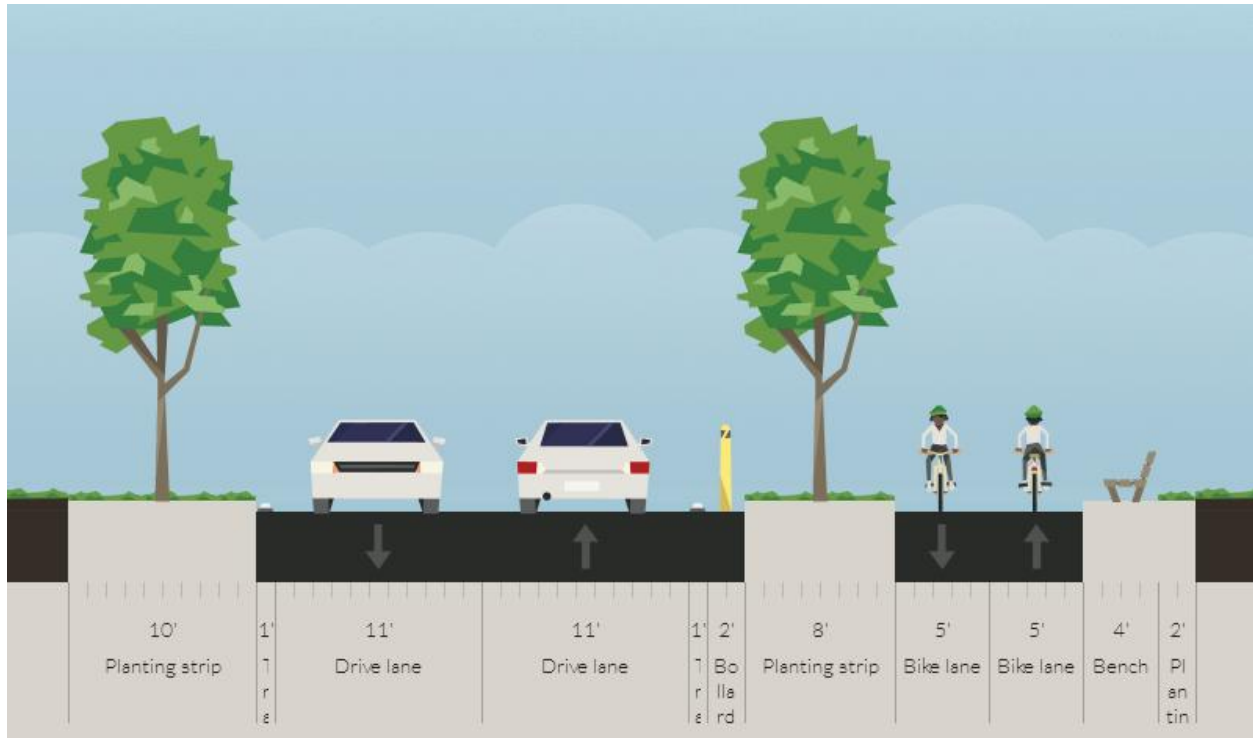
NW 77 <sup>th</sup> Court Bicycling/Walking Trail	
Project Description	Install a 10-foot wide shared use path along the east side of NW 77 <sup>th</sup> Court between the roadway and the canal that would serve as a bicycling and walking trail separated from the roadway by a guardrail. Focus traffic enforcement on the NW 154 <sup>th</sup> Street intersection to enhance motorists' yielding to bikes and pedestrians.
Agencies Involved	Town of Miami Lakes, Florida Department of Transportation (FDOT), Miami-Dade Public Works and Waste Management Dept.
Notes	<ul style="list-style-type: none"> <li>• A shared use path can fit within the existing canal bank for the majority of the NW 77<sup>th</sup> Court corridor south of NW 154<sup>th</sup> Street</li> <li>• The existing canal bank narrows between NW 146<sup>th</sup> Street and NW 148<sup>th</sup> Street along the east side of NW 77<sup>th</sup> Court; therefore, NW 77<sup>th</sup> Court will need to be realigned to the west to accommodate a continuous shared use path on the east side of the roadway</li> <li>• The path may need to narrow at the new fire station and may need to become a sidewalk directly adjacent to NW 77<sup>th</sup> Court due to existing constraints in the area</li> <li>• Install a new crosswalk across NW 154<sup>th</sup> Street on the east side of the NW 77<sup>th</sup> Court intersection for future path continuation</li> </ul>
Implementation Strategy	FDOT Project FM#430821-3 is programmed to implement portions of the project including shared lane pavement markings on NW 77 <sup>th</sup> Court and bike lanes on the NW 77 <sup>th</sup> Avenue/NW 167 <sup>th</sup> Street frontage road. Seek grant funding for construction of the shared use path or incorporate into a roadway improvement project.
Supplemental Infrastructure	<ul style="list-style-type: none"> <li>• Observation area with lookout and potential fishing area</li> <li>• Rest area with benches and shelters</li> </ul>
 <p>Examples of canal trails beside roadways</p>	







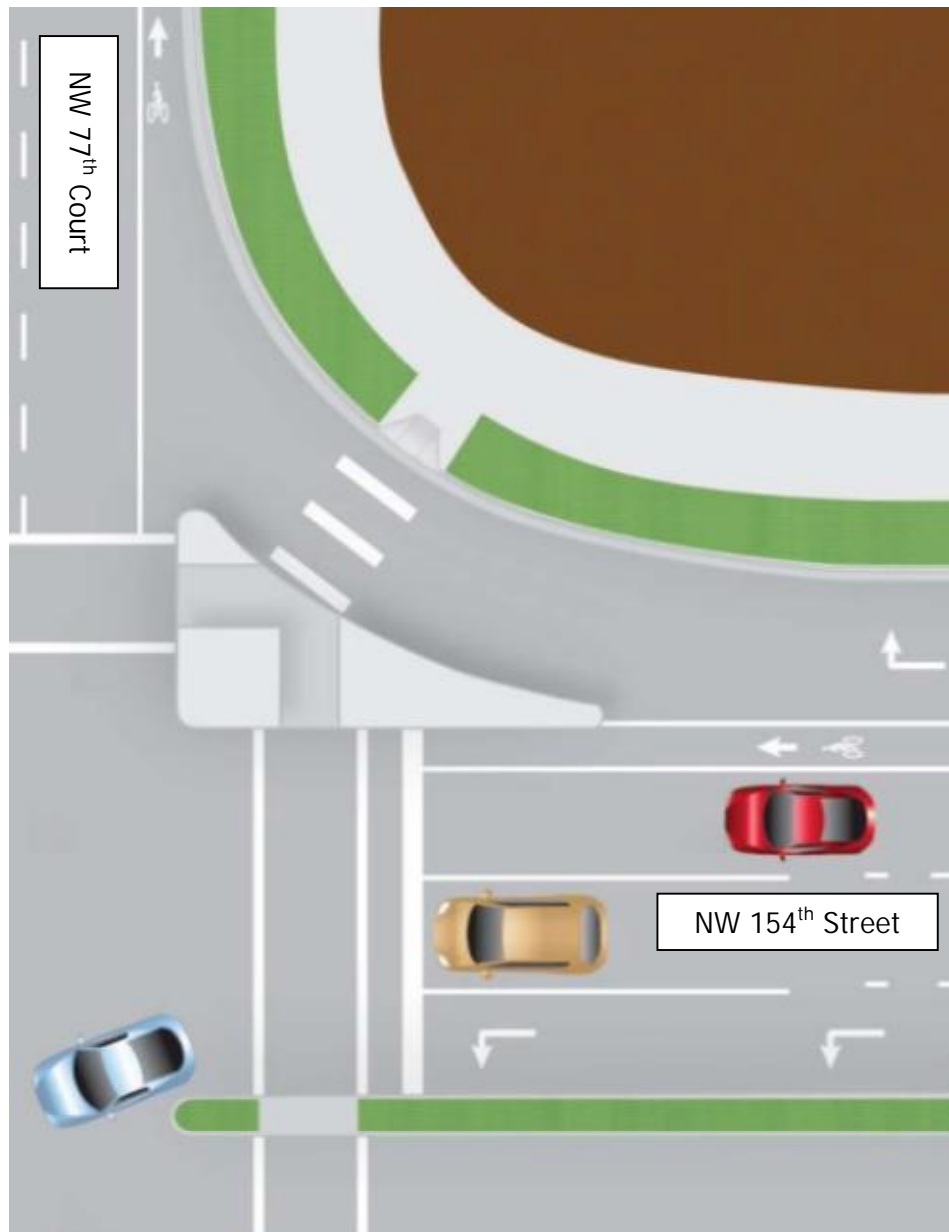
# Miami Lakes Greenways and Trails Master Plan



NW 77<sup>th</sup> Court Trail Typical Section



# Miami Lakes Greenways and Trails Master Plan



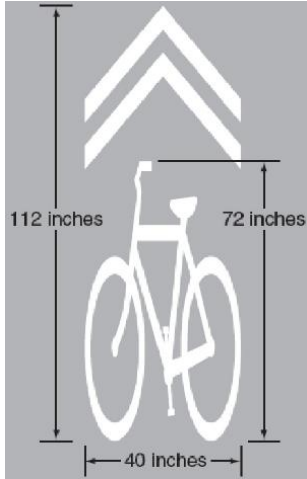




Conceptual Rendering of the Proposed New Crosswalk for the NW 77<sup>th</sup> Court Trail at NW 154<sup>th</sup> Street

The concept design for the proposed NW 77<sup>th</sup> Court trail crosswalk at NW 154<sup>th</sup> Street includes a “pork chop island” to provide a refuge for trail users between the westbound right-turn lane and the through lanes. A median refuge should also be provided for trail users crossing NW 154<sup>th</sup> Street.



# Miami Lakes Greenways and Trails Master Plan

Neighborhood Greenway/Canal Trail Bicycling/Walking Trail	
Project Description	<p>This trail consists of two phases.</p> <ul style="list-style-type: none"> <li>Neighborhood Greenway – Future on-road facility with bicycle sharrow pavement markings on Sabal Drive, Twin Sabal Drive, and Big Cypress Drive. The neighborhood greenway could also be supplemented with bike route wayfinding signage to indicate that the neighborhood greenway is part of a larger overall system</li> <li>Canal Trail – Future off-road facility with a shared use path in the canal right-of-way along the southern boundary of the Town between Leaning Pine Drive and NW 67<sup>th</sup> Avenue. The canal portion of this facility is considered a long-range opportunity due to implementation steps and timeframes</li> </ul>
Agencies Involved	Town of Miami Lakes, Miami-Dade County Public Works and Waste Management Department, Miami-Dade County Department of Environmental Resource Management
Notes	<ul style="list-style-type: none"> <li>Sharrow pavement markings are used to designate shared lane conditions and to provide guidance to bicyclists on appropriate lateral placement within the travel lane</li> </ul>
Implementation Strategy	Implement neighborhood greenway elements as either a standalone project or as a component of a traffic calming project
<div>   <div> <p>Neighborhood greenway elements</p>  </div> <div>   </div> </div>	





0 300 600  
SCALE AS SHOWN

Connection to Future  
Potential Park

Rest Area

Miami Lakes Drive

Palmetto Expressway  
SR-826

Future  
On-Road  
Facility

Miami Lakes South

Miami Lakes  
Elementary School

Future  
Off-Road  
Facility

NW 67th Avenue

SR 924

Observation Area



# Miami Lakes Greenways and Trails Master Plan



Neighborhood Greenway Typical Section (50' ROW)

Examples – Sabal Drive, Big Cypress Drive





Neighborhood Greenway Typical Section (70' ROW)

Examples – Dade Pine Avenue, Lake Patricia Drive



# Miami Lakes Greenways and Trails Master Plan

NW 67 <sup>th</sup> Avenue Bicycling/Walking Trail	
Project Description	<p>Utilize the 8-foot wide sidewalk along the east side of NW 67<sup>th</sup> Avenue (Ludlam Road) as a bicycling/walking path, with strategic intersection and signage improvements to upgrade the sidewalk to a future off-road facility.</p> <ul style="list-style-type: none"> <li>• Upgrade ADA curb ramps at intersections and driveways to the width of the path</li> <li>• Add concrete to expand the existing width of the path around pinch-points such as bus shelters</li> <li>• Relocate objects such as signs and trash receptacles to be outside of the clear width of the path with the goal of creating 8 feet of unobstructed path width</li> <li>• Add D11-1 "bike route" wayfinding signs</li> <li>• Add W11-15 "trail crossing" warning signs at cross-street</li> <li>• Add W5-4a "path narrows" signs at locations where the pinch-point cannot be widened due to physical or right-of-way constraints</li> </ul>
Agencies Involved	Town of Miami Lakes, Miami-Dade County Public Works and Waste Management Department
Notes	<ul style="list-style-type: none"> <li>• The NW 67<sup>th</sup> Avenue bicycling/walking trail would form the north-south spine facility in the eastern half of the Town</li> </ul>
Implementation Strategy	Implement as a component of roadway improvement or reconstruction projects on the indicated corridor
<div>  <p>Example of sidewalk trail where the curb ramps are the width of the path</p> </div> <div>  <p>Additional concrete width around bus stop including the optional use of green color</p> </div>	





0 600 1200  
SCALE AS SHOWN

**Palmetto Expressway  
SR-826**

**Miami  
Lakes  
Park**

**Miami Lakes  
Middle School**

**Miami  
Lakes  
Town  
Center**

**Rest Area**

**Future  
Off-Road  
Facility**

**SR-823**

**Miami Lakes  
Elementary School**

**SR 924**

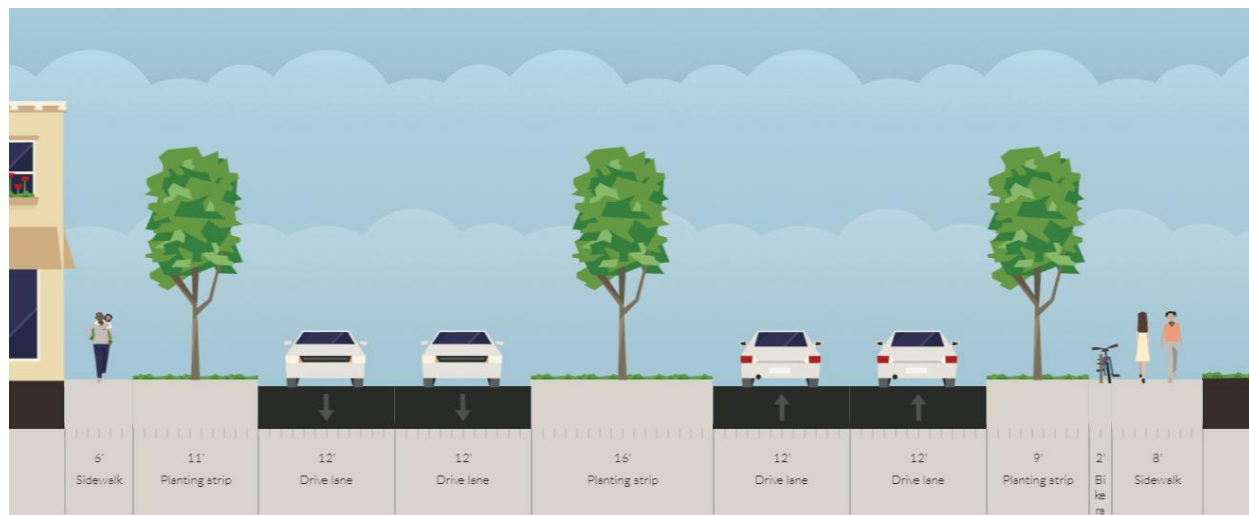
**NW 67th Ave**

**Palmetto Expressway  
SR-826**

**Miami Lakes Drive**






# Miami Lakes Greenways and Trails Master Plan



NW 67<sup>th</sup> Avenue Typical Section (100' ROW)



# Miami Lakes Greenways and Trails Master Plan

NW 87 <sup>th</sup> Avenue Bicycling/Walking Trail	
Project Description	<p>Widen the existing sidewalk along the east side of NW 87<sup>th</sup> Avenue to 8-10 feet in width as a bicycling/walking path, with strategic intersection and signage improvements to upgrade the sidewalk to a future off-road facility.</p> <ul style="list-style-type: none"> <li>• Upgrade ADA curb ramps at intersections and driveways to the width of the path</li> <li>• Relocate objects such as signs and trash receptacles to be outside of the clear width of the path with the goal of creating 8-10 feet of unobstructed path width</li> <li>• Add D11-1 "bike route" wayfinding signs</li> <li>• Add W11-15 "trail crossing" warning signs at cross-street</li> <li>• Add W5-4a "path narrows" signs at locations where the pinch-point cannot be widened due to physical or right-of-way constraints</li> </ul>
Agencies Involved	Town of Miami Lakes, Miami-Dade County Public Works and Waste Management Department
Notes	<ul style="list-style-type: none"> <li>• The NW 87<sup>th</sup> Avenue bicycling/walking trail would form the north-south spine facility in the western half of the Town</li> <li>• This trail would connect to the recently implemented on-road bicycle lanes on NW 87<sup>th</sup> Avenue north of NW 154<sup>th</sup> Street</li> </ul>
Implementation Strategy	Implement as a component of roadway improvement or reconstruction projects on the indicated corridors
<div>  <p>Example of an 8-foot sidewalk with benches and landscaping</p> </div> <div>  </div> <div>  <p>The NW 87<sup>th</sup> Avenue trail would connect to the designated bike lanes north of NW 154<sup>th</sup> Street</p> <p>W11-15 "Trail Crossing" warning signs</p> </div>	





0 350 700  
SCALE AS SHOWN

I-75 Extension

NW 154th Street

Palmetto Expressway  
SR 826

Future  
Off-Road  
Facility

NW 87th Avenue

Barbara Goleman  
Senior High School

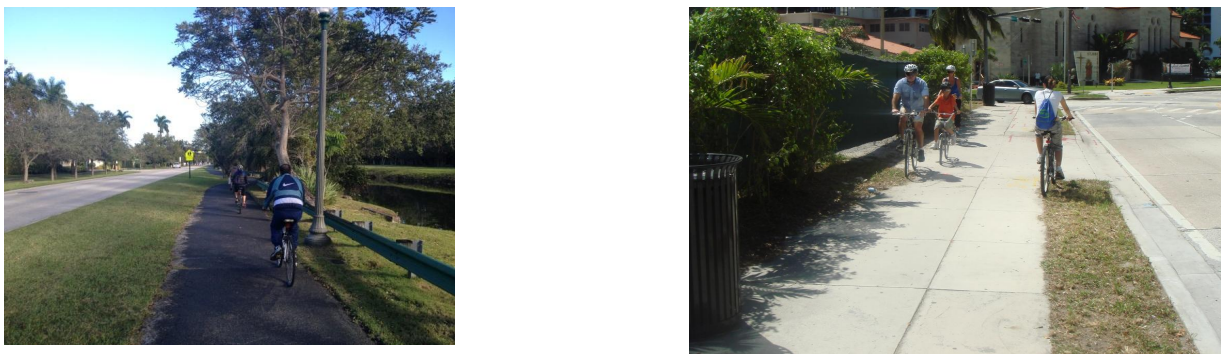
Commerce Way

NW 77th Court

SR 924



# Miami Lakes Greenways and Trails Master Plan

NW 154 <sup>th</sup> Street Bicycling/Walking Trail	
Project Description	<p>Utilize the 8-foot wide sidewalk along the south side of NW 154<sup>th</sup> Street (Miami Lakes Drive) as a bicycling/walking path, with strategic intersection and signage improvements to upgrade the sidewalk to a future off-road facility.</p> <ul style="list-style-type: none"> <li>• Widen existing narrow sidewalk sections to at least 8 feet</li> <li>• Upgrade ADA curb ramps at intersections and driveways to the width of the path</li> <li>• Add concrete to expand the existing width of the path around pinch-points such as bus shelters</li> <li>• Relocate objects such as signs and trash receptacles to be outside of the clear width of the path with the goal of creating 8 feet of unobstructed path width</li> <li>• Add D11-1 "bike route" wayfinding signs</li> <li>• Add W11-15 "trail crossing" warning signs at cross-street</li> <li>• Add W5-4a "path narrows" signs at locations where the pinch-point cannot be widened due to physical or right-of-way constraints</li> </ul>
Agencies Involved	Town of Miami Lakes, Florida Department of Transportation (FDOT), Miami-Dade County Public Works and Waste Management Department
Notes	<ul style="list-style-type: none"> <li>• The NW 154<sup>th</sup> Street bicycling/walking trail would form the east-west spine facility of the Town and connect the east and west sides</li> </ul>
Implementation Strategy	Implement as a component of roadway improvement or reconstruction projects on the indicated corridors
 <p>Examples of wide sidewalk facilities</p>	







# Miami Lakes Greenways and Trails Master Plan

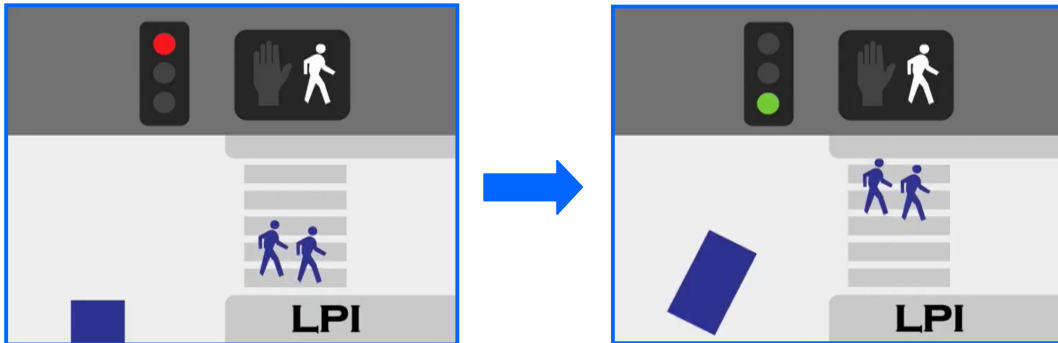
## *Elder Pedestrian Safety*

As discussed in the Transportation Mobility Analysis section of this report, the promotion of pedestrian safety, and in particular elder pedestrian safety, is a fundamental tenet of the *Miami Lakes Greenways and Trails Master Plan*. Elder pedestrian safety is an essential component of the community's efforts to address the transportation and mobility needs of its citizens.

The following recommendations are made to address elder pedestrian safety in the Town of Miami Lakes.





# Miami Lakes Greenways and Trails Master Plan

Leading Pedestrian Interval	
Description	Leading Pedestrian Interval (LPI) is a traffic signal timing technique that reserves a pedestrian WALK phase for 3 to 5 seconds prior to the concurrent green phase with permissive turns for motor vehicles to allow pedestrians to enter the crosswalk before turning motor vehicles attempt to cross their path.
Targeted Crash Types	Right-Hook Crashes
Notes	<ul style="list-style-type: none"> <li>• Increases turning motorists' visibility of pedestrians</li> <li>• Allows pedestrians to establish their right-of-way in the crosswalk before turning motor vehicles have a concurrent green indication</li> <li>• Use where heavy turning vehicle volume on permissive green comes into conflict with pedestrians</li> <li>• The LPI is particularly helpful for elder pedestrians who are slower to start into the intersection</li> <li>• The <i>Pedestrian Facilities User Guide</i> published by FHWA indicates that the LPI reduces conflicts for pedestrians by approximately 50 percent</li> <li>• See 2009 MUTCD Chapter 4E and the FHWA <i>Older Driver and Pedestrian Highway Design Handbook</i> for more information.</li> </ul>
Implementation Strategy	Work with Miami-Dade Public Works Signals and Signs Division to implement as part of resurfacing and traffic operations projects at signalized intersections as a strategy to reduce pedestrian crashes.
	






# Miami Lakes Greenways and Trails Master Plan

Adjust Pedestrian Walk Phase Timing at Intersections	
Description	Adjust the pedestrian phase timing to consider a slower walking speed of 2.8 ft/s for elderly pedestrians at signalized intersections.
Targeted Crash Types	Elderly Pedestrian Crashes
Notes	<ul style="list-style-type: none"> <li>The Manual on Uniform Traffic Control Devices (MUTCD) suggests 3.5 feet/second as a typical walking speed for timing pedestrian walk phases at signalized intersections. However, the MUTCD also suggests adjusting the pedestrian walk phase timing to consider a slower walking speed of 2.8 feet/second for areas where elderly pedestrian safety is a concern</li> </ul>
Implementation Strategy	Work with Miami-Dade Public Works Signals and Signs Division to implement as part of resurfacing and traffic operations projects at signalized intersections as a strategy to reduce pedestrian crashes.
	





# Miami Lakes Greenways and Trails Master Plan

Prohibited Right-Turn-On-Red (RTOR)	
Description	Prohibit motorists from turning right during the red interval at certain signalized intersection approaches based on a pedestrian safety approach. Potential locations could include Main Street and NW 67 <sup>th</sup> Avenue, and Miami Lakes Drive and NW 67 <sup>th</sup> Avenue due to high volumes of pedestrians and crash history.
Targeted Crash Types	Right-Hook Crashes
Notes	<ul style="list-style-type: none"> <li>• Prohibiting vehicle right turns during the red phase can enhance pedestrian safety because although vehicles are required to yield or stop for pedestrians in the crosswalk, motorists do not always look to their right before making a right turn</li> <li>• Right-turning vehicles attempting to make turns on red often encroach upon pedestrians in the crosswalk due to line-of-sight restrictions</li> <li>• Can be useful where: <ul style="list-style-type: none"> <li>○ there are restricted sight lines between motorists and pedestrians</li> <li>○ there are an unusual number of pedestrian conflicts with turns on red</li> <li>○ a leading pedestrian interval is used</li> </ul> </li> <li>• Can be implemented during certain time periods or at all times of day</li> </ul>
Implementation Strategy	Work with Miami-Dade Public Works Signals and Signs Division to implement as part of resurfacing and traffic operations projects or as a standalone project. Prohibited RTOR could be implemented if signage and other treatments, such as LPI, have been tried and did not produce optimal results.
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>R10-11</p> </div> <div style="text-align: center;">  <p>R10-11a</p> </div> <div style="text-align: center;">  <p>R10-11b</p> </div> </div>	




# Miami Lakes

## Greenways and Trails Master Plan

Enforcement of Yielding to Pedestrians	
Description	Implement programs to enforce driver-yielding to pedestrians. Focus areas should include the Town Center area, the NW 154 <sup>th</sup> Street/Miami Lakes Drive corridor, the NW 77 <sup>th</sup> Court corridor, and bicycling/walking trail intersections at major streets
Targeted Crash Types	Intersection Straight-Through, Left-Turn, and Right-Hook Crashes
Notes	<ul style="list-style-type: none"> <li>• Programs that over time combine decoy pedestrians, warnings, informational flyers to give to violators, and citations deliver optimum results</li> <li>• One week of a strong and visible enforcement program can result in increased yielding behavior for a year</li> <li>• Refer to 2004 study of a program in Miami Beach documented in <i>Effects of a Driver Enforcement Program on Yielding to Pedestrians</i> by Ron Van Houten and J.E. Louis Malenfant</li> <li>• Cameras that use video analytics and radar to determine if a vehicle is stopped when a pedestrian is in the crosswalk can be installed</li> </ul>
Implementation Strategy	Coordinate with local law enforcement agencies
<div>  <p>Signage for Chicago's crosswalk enforcement initiatives notifies drivers that they must yield to pedestrians in crosswalk at the enforcement locations</p> </div> <div>  <p>Cameras in Washington D.C. record drivers as pedestrians step into crosswalks. Violations are issued to drivers who fail to stop for pedestrians who have the right of way. A team of officers and employees review the photos/videos from the enforcement cameras before issuing tickets to ensure that the violation notices are valid.</p> </div>	



# Miami Lakes Greenways and Trails Master Plan

Safe Steps – Pasos Seguros Program Expansion	
Description	Expand the Safe Steps – Pasos Seguros program to help educate seniors on the proper pedestrian safety techniques.
Targeted Crash Types	Elderly Crashes
Notes	<p>The program is the Alliance for Aging, Inc.'s bilingual project to reduce elder pedestrian crashes in Miami-Dade County through:</p> <ul style="list-style-type: none"> <li>• Public awareness TV campaign</li> <li>• Educational curriculum provided in areas with high rates of elderly pedestrian crashes</li> <li>• Safe Steps Pasos Seguros Workshops where a facilitator gives a presentation at a community center, elder housing center, or civic organization on safe pedestrian behaviors</li> </ul>
Implementation Strategy	Coordinate with the Alliance for Aging, Inc. staff to implement and expand the program components
	



# Miami Lakes Greenways and Trails Master Plan

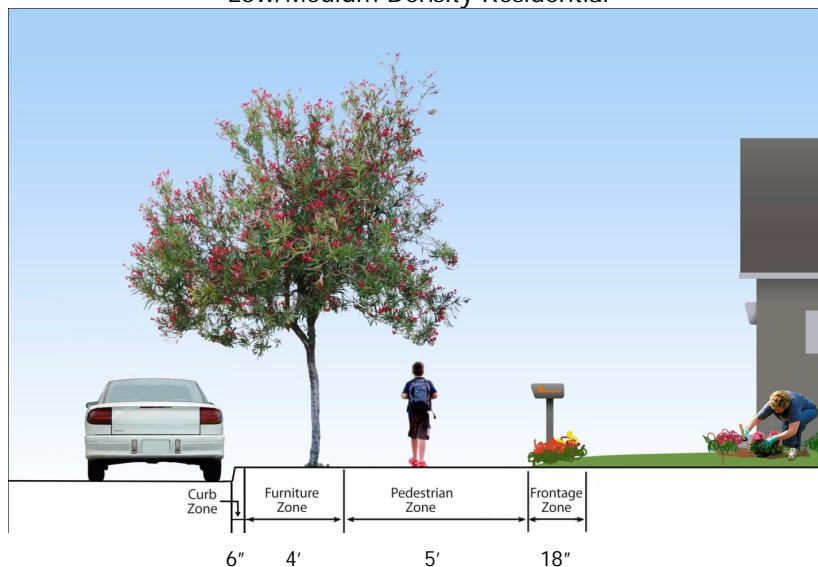
Pedestrian Throughway Zones	
Description	Relocate elements within the right-of-way (including but not limited to signage, lighting, trees, benches, and traffic signal devices) obstructing bicycle and pedestrians paths to establish a clear throughway pedestrian network throughout Miami Lakes.
Targeted Crash Types	Walking Along Roadway
Notes	<ul style="list-style-type: none"> <li>• Clear pedestrian travel zones enhance the pedestrian environment and foster community life in residential and commercial districts</li> <li>• A desired minimum pedestrian travel zone width of 6 feet should be provided in areas with active pedestrian activity</li> <li>• For higher pedestrian volume areas, such as business districts and transit stations, additional width should be provided</li> <li>• Trees, planting strips, utilities, traffic signal equipment, benches, water fountains, bicycle parking racks are examples of street furniture</li> <li>• See <i>Designing Walkable Urban Thoroughfares: A Context Sensitive Approach</i>, an ITE Recommended Best Practice, and <i>Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highway</i> ("Florida Greenbook") Chapter 19 for more information.</li> </ul>
Implementation Strategy	Implement as a component of any road improvement or beautification project



# Miami Lakes Greenways and Trails Master Plan

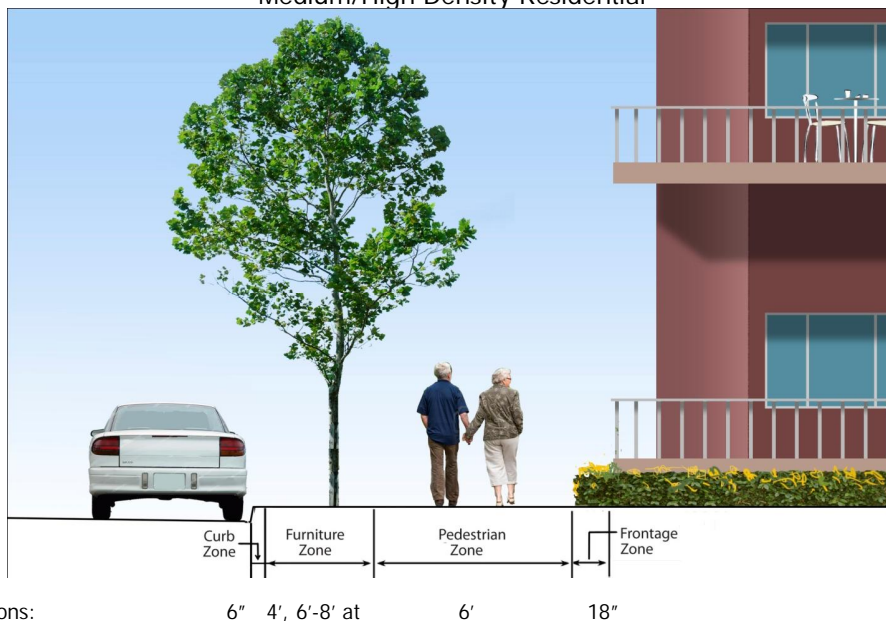
## Pedestrian Throughway Zones (continued)

### Low/Medium Density Residential



Minimum Dimensions:

### Medium/High Density Residential



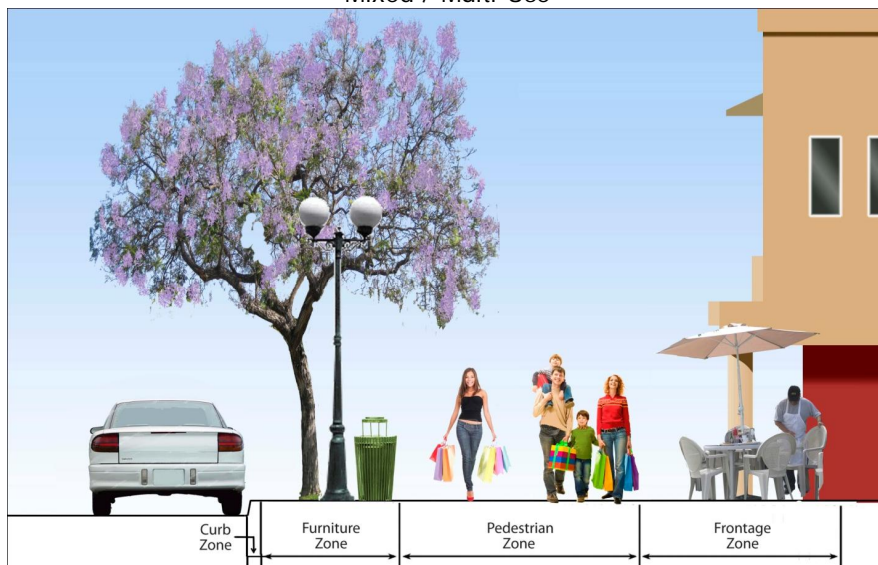
Minimum Dimensions:



# Miami Lakes Greenways and Trails Master Plan

## Pedestrian Throughway Zones (continued)

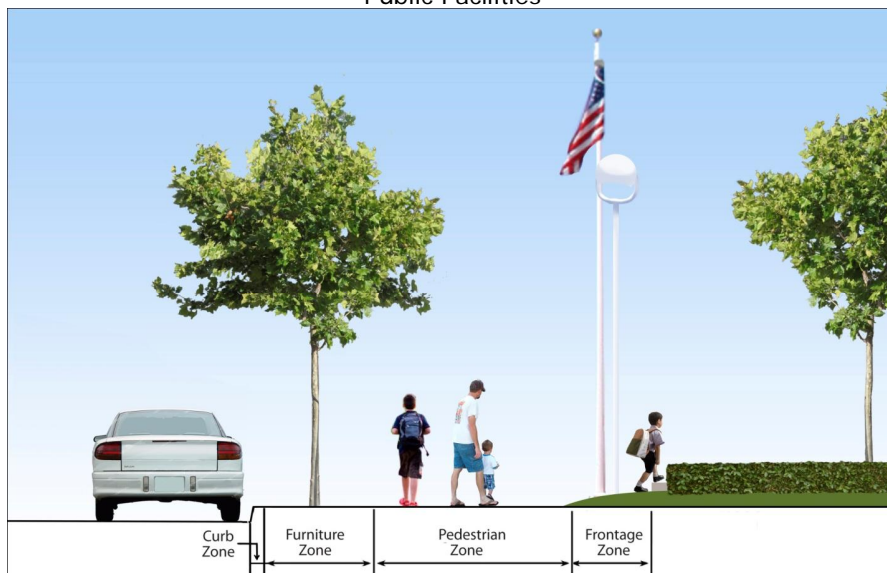
### Mixed / Multi-Use



Minimum Dimensions:

6" 4' 6' 18"

### Public Facilities



Minimum Dimensions:

6" 5', 6'-8' at bus stops, and where large trees are desired 6' 18"



# Miami Lakes Greenways and Trails Master Plan

Implement Missing Sidewalks	
Project Description	To provide a complete sidewalk network throughout the Miami Lakes area, construct new sidewalks where connections are missing and repair existing deteriorated/cracked sidewalks.
Lead Agencies	Town of Miami Lakes, Miami-Dade County Public Works and Waste Management Department
Implementation Strategy	Implement as a component of any roadway improvement project or as a standalone project
<p>Example of Missing Sidewalk in Miami Lakes along NW 60<sup>th</sup> Avenue</p> 	

Recommended Sidewalk Improvements	
Street	Improvement Type
NW 60 <sup>th</sup> Avenue – Business Park East	Construct sidewalk on both sides, connect to bus stops
NW 142 <sup>nd</sup> Street – Business Park East	Construct sidewalk on one side
NW 151 <sup>st</sup> Street / NW 153 <sup>rd</sup> Street / NW 57 <sup>th</sup> Court / NW 59 <sup>th</sup> Court	Construct sidewalk on one side
NW 59 <sup>th</sup> Avenue	Construct sidewalk on one side, connect to bus stops
NW 159 <sup>th</sup> Street	Construct sidewalk on one side
NW 163 <sup>rd</sup> Street	Construct sidewalk on one side, connect to bus stops
NW 165 <sup>th</sup> Street	Construct sidewalk on one side



# Miami Lakes Greenways and Trails Master Plan

## IMPLEMENTATION STEPS, COSTS AND DESIGN GUIDELINES

The design principles of the Town of Miami Lakes Greenways and Trails Plan are based on current state and national documents, which include standards and guidelines for designing bicycle and pedestrian facilities.

- *Manual on Uniform Traffic Control Devices (MUTCD)*, Federal Highway Administration
- *Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highway* ("Florida Greenbook")
- *AASHTO Guide for the Development of Bicycle Facilities*, 4<sup>th</sup> Edition, 2012
- *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*, an ITE Recommended Best Practice
- *Pedestrian Facilities User Guide*, Federal Highway Administration
- *Florida Pedestrian Facilities Planning and Design Handbook*, Florida Department of Transportation
- *Florida Bicycle Facilities Planning and Design Handbook*, Florida Department of Transportation
- *Urban Bikeway Design Guide*, National Association of City Transportation Officials (NACTO)

In general, paved shared use paths expected to carry both pedestrian and bicyclist traffic should be designed to a minimum width of 10 feet to allow space for travelers to pass each other without conflict. Pedestrians and bicyclists often travel in groups of two or more, which impacts the width of the facility.

Miami Lakes has an existing network of 8-foot wide sidewalks on several key arterials. Since the cost and impact of widening these facilities would be substantial, it is recommended that they be implemented into the network through key specific location improvements such as



# Miami Lakes Greenways and Trails Master Plan

intersection curb ramp widening, additional concrete around pinch-points, bicycle route wayfinding signage, and trail crossing warning signage at intersections. These narrower facilities could be considered paved neighborhood trails rather than shared use paths.

The following figures illustrate key design principles associated with shared use paths and neighborhood trails.

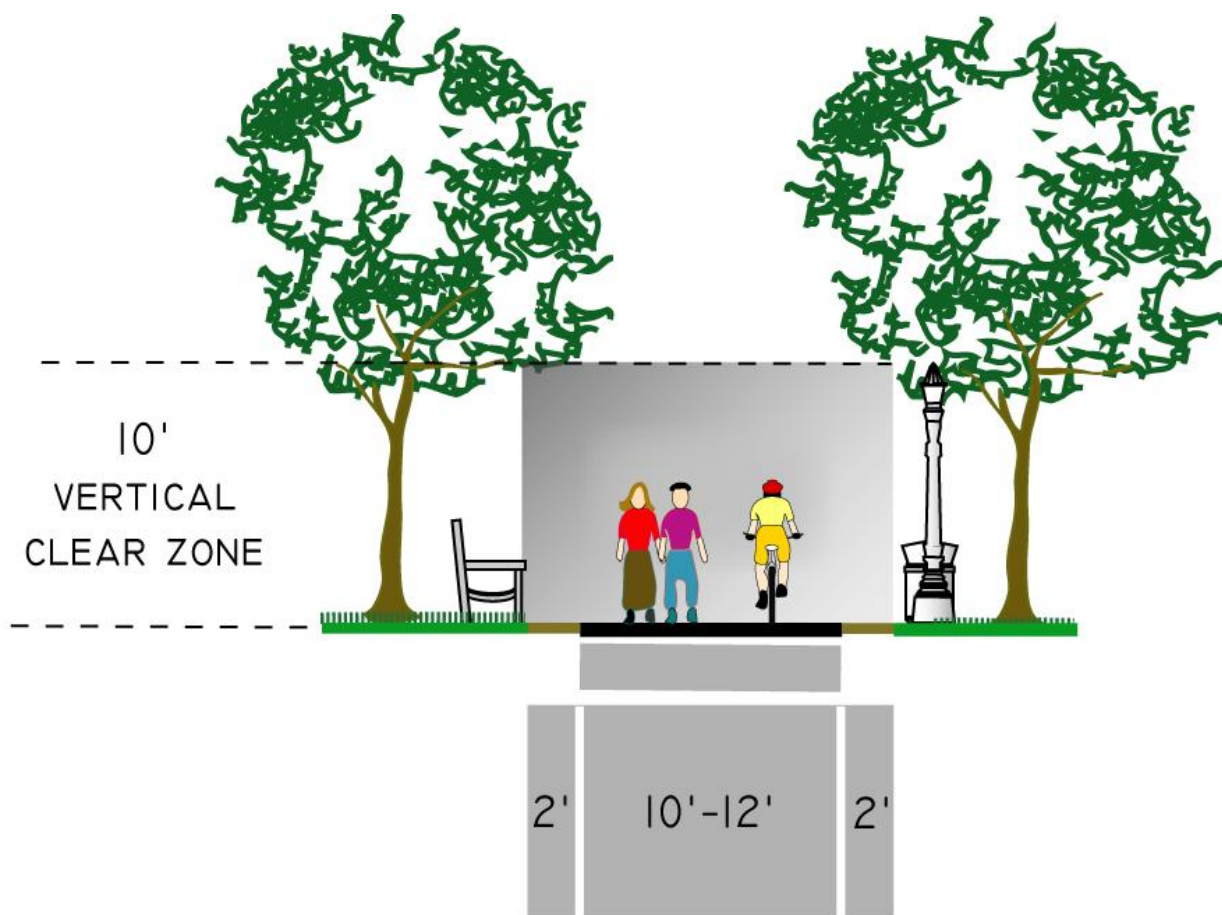


Figure 10. Shared Use Path Design Guideline



# Miami Lakes Greenways and Trails Master Plan

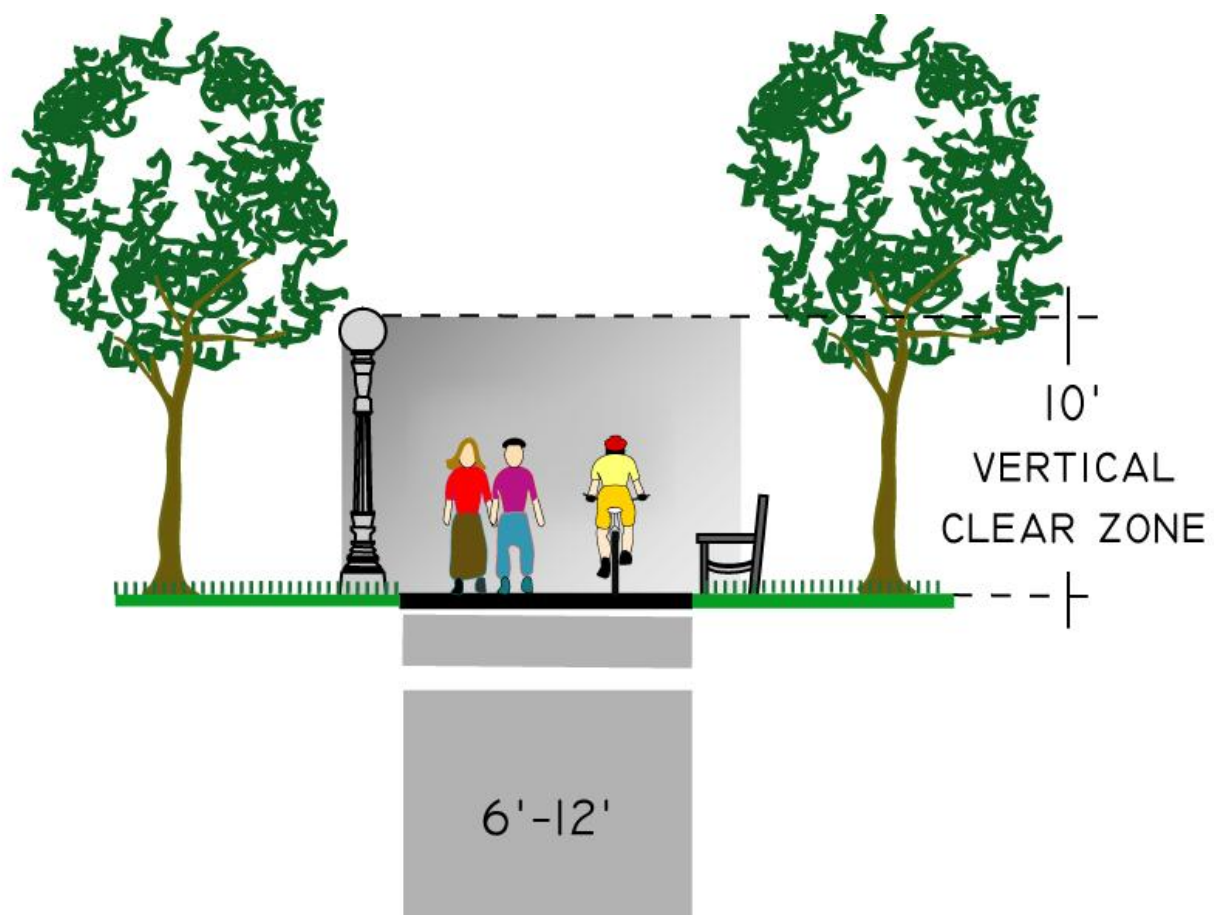


Figure 11. Neighborhood Trail Design Guideline



# Miami Lakes Greenways and Trails Master Plan

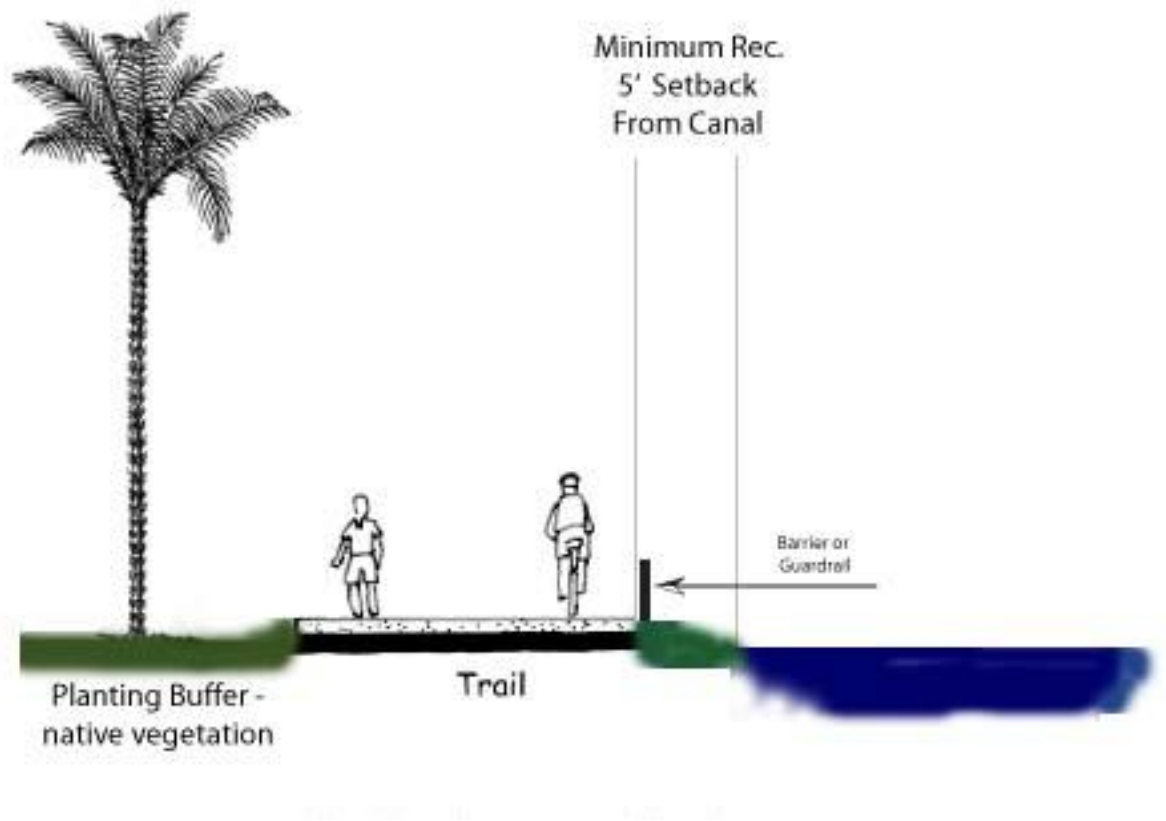


Figure 12. Trail Adjacent to Canal Design Guidelines

A planning level opinion of probable cost was developed for the greenways and trail network based on typical per mile costs for greenways and trails. The planning level opinion of probable cost is based on the implementation steps needed to complete the facility, such as “bike lane plus sidewalk” or “intersection corner and sign improvements.” The planning level opinion of probable cost is included in the table on the following page.



MIAMI LAKES GREENWAYS AND TRAILS PLAN: COST ESTIMATE

On-Street Striping and Sign Improvements	From (South,West)	To (North, East)	Length (mi)	Cost per mile (\$)	Cost Opinion (\$)	Notes
NW 153rd Terrace	NW 92nd Avenue	NW 89th Avenue	0.25	\$10,000	\$2,500	Pavement markings and signing improvements; Add Bike Sharrows
NW 149th Terrace	NW 92nd Avenue	NW 87th Avenue	0.49	\$10,000	\$4,900	Pavement markings and signing improvements; Add Bike Sharrows
NW 146th Terrace	NW 92nd Avenue	NW 89th Avenue	0.21	\$10,000	\$2,100	Pavement markings and signing improvements; Add Bike Sharrows
NW 92nd Avenue	NW 146th Terrace	NW 153rd Terrace	0.45	\$10,000	\$4,500	Pavement markings and signing improvements; Add Bike Sharrows
Commerce Way/Oak Lane	NW 87th Avenue	NW 79th Court	1.19	\$10,000	\$11,900	Pavement markings and signing improvements; Add Bike Sharrows
NW 79th Court	Oak Lane	NW 154th Street	0.30	\$10,000	\$3,000	Pavement markings and signing improvements; Add Bike Sharrows
NW 80th Avenue	NW 77th Court/Palmetto Frontage Road	Commerce Way/Oak Lane	0.15	\$10,000	\$1,500	Pavement markings and signing improvements; Add Bike Sharrows
Big Cypress Drive	Twin Sabal Drive	S. Miami Lakeway	0.52	\$10,000	\$5,200	Pavement markings and signing improvements; Add Bike Sharrows
Twin Sabal/Sabal/Leaning Pine Drive	Big Cypress Drive	Bamboo Street	0.64	\$10,000	\$6,400	Pavement markings and signing improvements; Add Bike Sharrows
Total Proposed On-Street Striping and Sign Improvements			4.20	\$10,000	\$42,000	
On-Street Striping and Sign Improvements plus Traffic Calming	From (South,West)	To (North, East)	Length (mi)	Cost per mile (\$)	Cost Opinion (\$)	Notes
NW 89th Avenue	Palmetto Frontage Road	NW 154th Street	0.88	\$20,000	\$17,600	Pavement markings and signing improvements; Add Bike Sharrows plus traffic calming along corridor
NW 146th Street	NW 89th Avenue	NW 87th Avenue	0.38	\$20,000	\$7,600	Pavement markings and signing improvements; Add Bike Sharrows plus traffic calming along corridor
Total Proposed On-Street Striping and Sign Improvements Plus Traffic Calming			1.26	\$20,000	\$25,200	
On-Street Striping and Sign Improvements Plus Sidewalk	From (South,West)	To (North, East)	Length (mi)	Cost per mile (\$)	Cost Opinion (\$)	Notes
NW 142nd Street	NW 60th Avenue	NW 57th Avenue	0.38	\$260,000	\$98,800	Pavement Markings and signing improvements; Add Bike Sharrows plus add sidewalk on south side
Total Proposed On-Street Striping and Sign Improvements Plus Sidewalk			0.38	\$260,000	\$98,800	
Bike Lane Only	From (South,West)	To (North, East)	Length (mi)	Cost per mile (\$)	Cost Opinion (\$)	Notes
NW 158th Street	NW 59th Avenue	NW 57th Avenue	0.26	\$20,000	\$5,200	Add Bike lane (w/o drainage/curb alterations)
Total Proposed Bike Lanes			0.26	\$20,000	\$5,200	
Bike Lane Plus Sidewalk	From (South,West)	To (North, East)	Length (mi)	Cost per mile (\$)	Cost Opinion (\$)	Notes
NW 163rd Street	NW 58th Avenue	NW 57th Avenue	0.26	\$330,000	\$85,800	Add Bike lanes (w/o drainage/curb alterations) plus sidewalk to north side of road (1 side)
NW 59th Avenue	NW 158th Street	NW 107th Street	0.38	\$330,000	\$125,400	Add Bike lanes (w/o drainage/curb alterations) plus sidewalk to north side of road (1 side)
NW 60th Avenue	NW 158th Street	NW 107th Street	0.77	\$580,000	\$446,600	Add Bike lanes (w/o drainage/curb alterations) plus sidewalk to east and west sides of road (2 sides)
Total Proposed Bike Lanes Plus Sidewalk			1.41	-	\$657,800	
Intersection Corner and Sign Improvements	From (South,West)	To (North, East)	Number of Corners	Cost per corner (\$)	Cost Opinion (\$)	Notes
NW 67th Avenue	W 84th Street	NW 167th Street	15	\$25,000	\$375,000	Corner improvements including widening the curb ramp to be the width of the path and to add signage to mark off paths as bike routes
Miami Lakes Drive	NW 89th Avenue	NW 57th Avenue	41	\$25,000	\$1,025,000	Corner improvements including widening the curb ramp to be the width of the path and to add signage to mark off paths as bike routes
Total Proposed Intersection Corner and Sign Improvements			56	\$25,000	\$1,400,000	
Widen Narrow Path	From (South,West)	To (North, East)	Length (mi)	Cost per mile (\$)	Cost Opinion (\$)	Notes
NW 87th Avenue	SR 924	NW 154th Street	0.99	\$250,000	\$247,500	Widen narrow path to 10 to 12 feet
S. Miami Lakeway	Miami Lakes Drive	Miami Lakes Drive	1.60	\$250,000	\$400,000	Widen narrow path to 10 to 12 feet
Total Proposed Widening Narrow Paths			2.59	\$250,000	\$647,500	
Add Shared-Use Path (Off-Street - Along Canal)	From (South,West)	To (North, East)	Length (mi)	Cost per mile (\$)	Cost Opinion (\$)	Notes
Canal/NW 77th Court (South of NW 154th Street)	West of NW 89th Avenue	NW 154th Street	2.12	\$500,000	\$1,060,000	Add Shared-Use Path (Off-Street - Along Canal)
Canal/South of Bamboo Street	Bamboo Street	NW 67th Avenue	0.60	\$500,000	\$300,000	Add Shared-Use Path (Off-Street - Along Canal)
Canal/NW 139th Street	NW 60th Avenue	NW 142nd Street	0.57	\$500,000	\$285,000	Add Shared-Use Path (Off-Street - Along Canal)
Canal/NW 77th Court (North of NW 154th Street)	NW 154th Street	NW 76th Place	0.73	\$500,000	\$365,000	Add Shared-Use Path (Off-Street - Along Canal)
Canal/NW 170th Street	West of NW 89th Avenue	NW 89th Avenue	0.26	\$500,000	\$130,000	Add Shared-Use Path (Off-Street - Along Canal)
Canal/NW 170th Street	NW 82nd Avenue	NW 78th Avenue	0.47	\$500,000	\$235,000	Add Shared-Use Path (Off-Street - Along Canal)
Total Proposed Shared Use-Path (Off-Street - Along Canal)			4.75	\$500,000	\$2,375,000	
Add Path (Off-Street - Along Street)	From (South,West)	To (North, East)	Length (mi)	Cost per mile (\$)	Cost Opinion (\$)	Notes
NW 77th Avenue/NW 167th Street	Miami Lakes Drive	NW 57th Avenue	2.56	\$250,000	\$640,000	Add Path (Off-Street - Along Street)
NW 162nd Street	NW 87th Avenue	NW 82nd Avenue	0.50	\$250,000	\$125,000	Add Path (Off-Street - Along Street)
NW 154th Street	NW 89th Avenue	NW 87th Avenue	0.25	\$250,000	\$62,500	Add Path (Off-Street - Along Street)
Total Proposed Shared Use-Path (Off-Street - Along Canal)			3.31	\$250,000	\$827,500	

MIAMI LAKES GREENWAYS AND TRAILS PLAN: COST ESTIMATE (Per Roadway)	
Roadway	Cost
Canal/NW 170th Street	\$365,000
NW 77th Avenue/NW 167th Street	\$640,000
NW 163rd Street	\$85,800
NW 162nd Street	\$125,000
NW 158th Street	\$5,200
NW 154th Street	\$62,500
NW 153rd Terrace	\$2,500
NW 149th Terrace	\$4,900
NW 146th Street	\$7,600
NW 146th Terrace	\$2,100
NW 142nd Street	\$98,800
Canal/NW 139th Street	\$285,000
NW 92nd Avenue	\$4,500
NW 89th Avenue	\$17,600
NW 87th Avenue	\$247,500
NW 80th Avenue	\$1,500
NW 79th Court	\$3,000
NW 67th Avenue	\$375,000
NW 60th Avenue	\$446,600
NW 59th Avenue	\$125,400
S. Miami Lakeway	\$400,000
Miami Lakes Drive	\$1,025,000
Commerce Way/Oak Lane	\$11,900
Canal/NW 77th Court (North of NW 154th Street)	\$365,000
Canal/NW 77th Court (South of NW 154th Street)	\$1,060,000
Canal/South of Bamboo Street	\$300,000
Big Cypress Drive	\$5,200
Twin Sabal/Sabal/Leaning Pine Drive	\$6,400
Total	\$6,079,000



# Miami Lakes Greenways and Trails Master Plan

## Appendix A



# Greenways and Trails Master Plan

*Interagency Coordination Committee  
Meeting 1*

*Thursday, January 30, 10:00 AM – 11:30 AM*



# Agenda



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AGENDA

**GREENWAYS AND TRAILS INTERAGENCY COORDINATION  
COMMITTEE MEETING #1**  
Thursday, January 30, 2013  
10:00 a.m.  
Community Conference Room #106  
6601 Main Street, Miami Lakes, FL 33014

1. **Opening Remarks/Overview of Plan:** TOML, Tony Lopez
2. **Presentation of Data Collection:** Kimley-Horn
3. **Recommendations from Prior Plans:** Kimley-Horn
4. **Discussion of Interagency Impacts/Projects:** All Agencies
5. **Brainstorming/Idea Sharing:** All Agencies
6. **Next Meeting:** TBD



Kimley-Horn  
and Associates, Inc.



# Purpose

- To recommend specific feasible projects to help create a safe and convenient non-motorized transportation system
  - To connect
    - Residential communities
    - Schools
    - Parks
    - Businesses





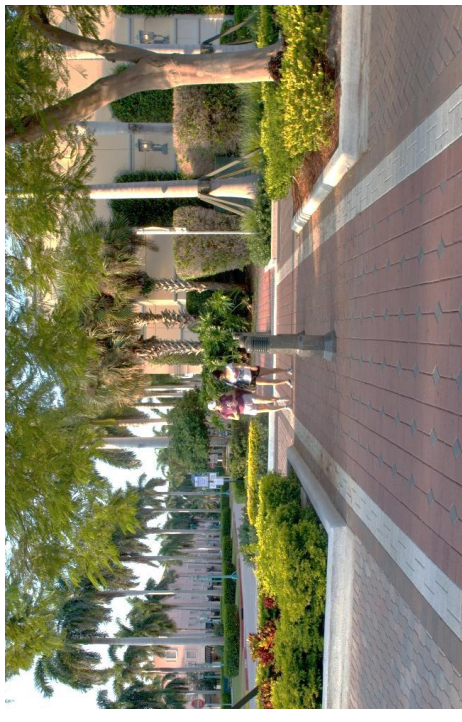
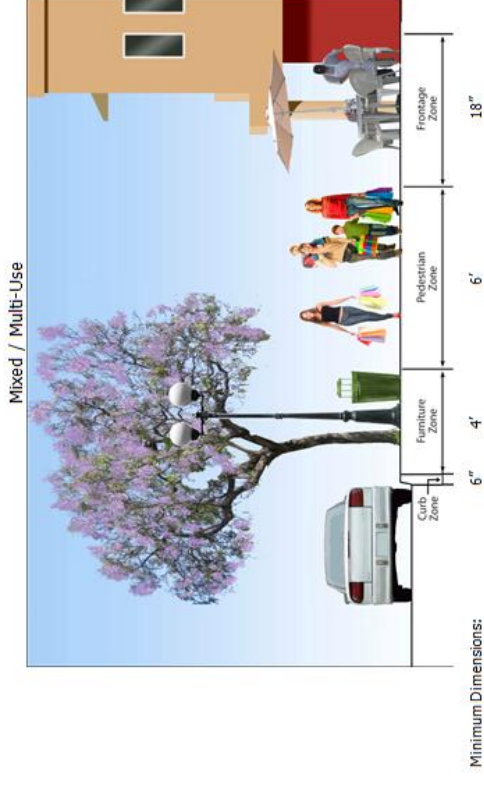
# Approach

- Intergovernmental and Stakeholder Coordination
- Data Collection and Existing Conditions Inventory
- Network Identification and Supplemental Infrastructure
- Implementation Steps and Design Guidelines
- Final Report



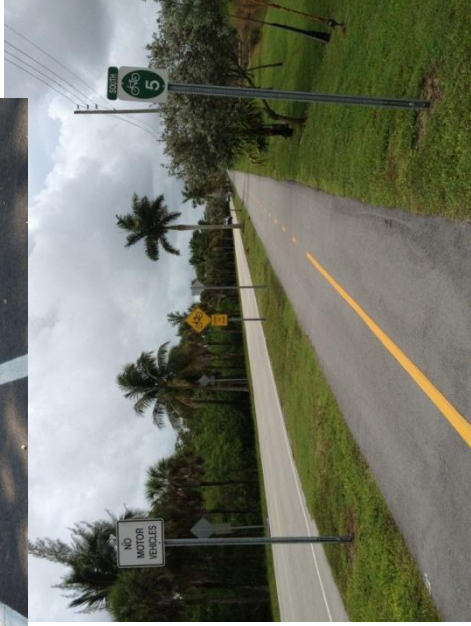
# Types of Facilities

- Sidewalks
- Crosswalks
- Shared Use Paths
- Bike Lanes
- Greenways / Linear Parks





# Shared Use Paths (Off-Road Facilities)



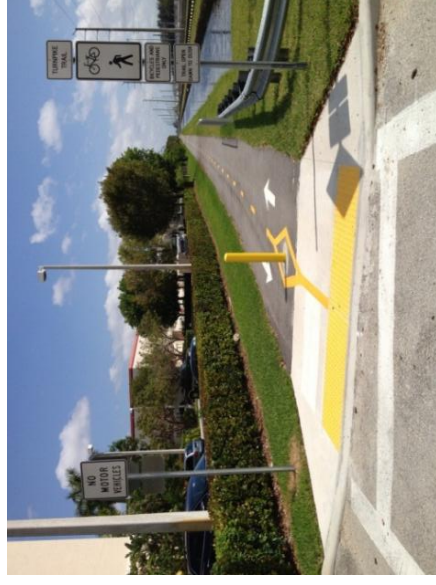
a.k.a. ... trails, multi-use trails, paths, walks, bike paths, bikeways, side paths

avoid calling them ... lanes, bike lanes, shared lanes





# Greenways / Linear Parks (Off-Road Facilities)





# Wide Sidewalks (Off-Road Facilities)





# Bike Lanes (On-Road Facilities)

avoid calling them ... paths,  
bike paths, side paths, shared  
lanes





# Sharrows (On-Road Facilities)

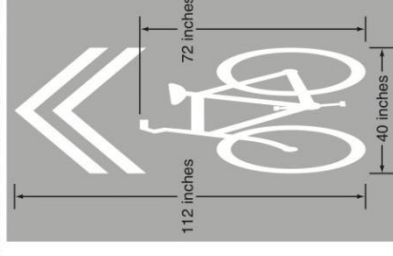


avoid calling them ... bike lanes, bike paths, trails, bikeways

streets with sharrow pavement markings can become “neighborhood greenways” when combined with traffic calming techniques and bike route wayfinding signs



Figure 9C-9. Shared Lane Marking





# USDOT Policy Statement

- Walking and bicycling are equal with other transportation modes
- Ensure convenient choices for people of all ages and abilities
- Go beyond minimum design standards within a context sensitive solution
- Collect data on walking and bicycling trips
- Maintain sidewalks and shared use paths with the same vigor that roadways are maintained
- Improve non-motorized transportation during maintenance projects



# Benefits

- Mobility from Active Transportation
  - The mode share market is there
  - Nearly half of all trips in the Miami-Dade urbanized area are 3 miles or less
  - One-quarter of all trips are 1 mile or less
    - USDOT, *National Household Travel Survey*, 2009

*“Driving a mile to the store for a quart of milk seems to me as much overkill as using a high-powered nail gun to hang a picture.”*

- Jeff Mapes



# Benefits

- Mobility from Active Transportation
  - Investments pay off!
    - Portland, OR
    - Minneapolis, MN
    - Reduced vehicle miles traveled (VMT)
      - Litman, *Smart Emission Reduction Strategies*, 2007





# Benefits

- Public Health and Wellness
  - Lack of physical activity is the primary cause in the obesity epidemic
    - U.S. Department of Health and Human Services, *Childhood Obesity*, 2005
  - Only 13 percent of children walk to school down from 48 percent in 1969
    - USDOT, *National Household Travel Survey*, 2009



# Benefits

- Economic Development
  - Trails are a desired amenity for new residents
    - New York Times realtor survey, 2003)
  - Indianapolis study shows increase in property values adjacent to trails
    - Lindsey et. al., *Public Choices and Property Values: Evidence from Greenways in Indianapolis*, 2003)



# Benefits

- Pollution
  - Transportation is a leading source of climate pollution
  - Transportation is the fastest growing source of CO2 emissions
- Environmental Protection Agency 2013



# Benefits

- Family and Community
  - More meaningful personal interaction
  - Higher social capital
  - Higher levels of mental health
  - Quality aging experience
  - Sources
    - Cagney and Wen, *Social Capital and Health: Part II Chapter 11. Social Capital and Aging-Related Outcomes*, 2008
    - Leyden, *Social Capital and the Built Environment: The Importance of Walkable Neighborhoods*, 2003



# Walking and Bicycling Activity

In the Miami-Dade area,  
**10%** of trips  
are made by walking or biking  
according to the U.S. Department  
of Transportation.

*“If you can make a city  
move by bicycling, it will  
be a more human and  
egalitarian city.”*  
- Enrique Peñalosa

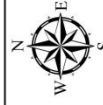




# Town of Miami Lakes Transportation Element Data, Inventory and Analysis 2030 Pedestrian Facilities Figure 2-18

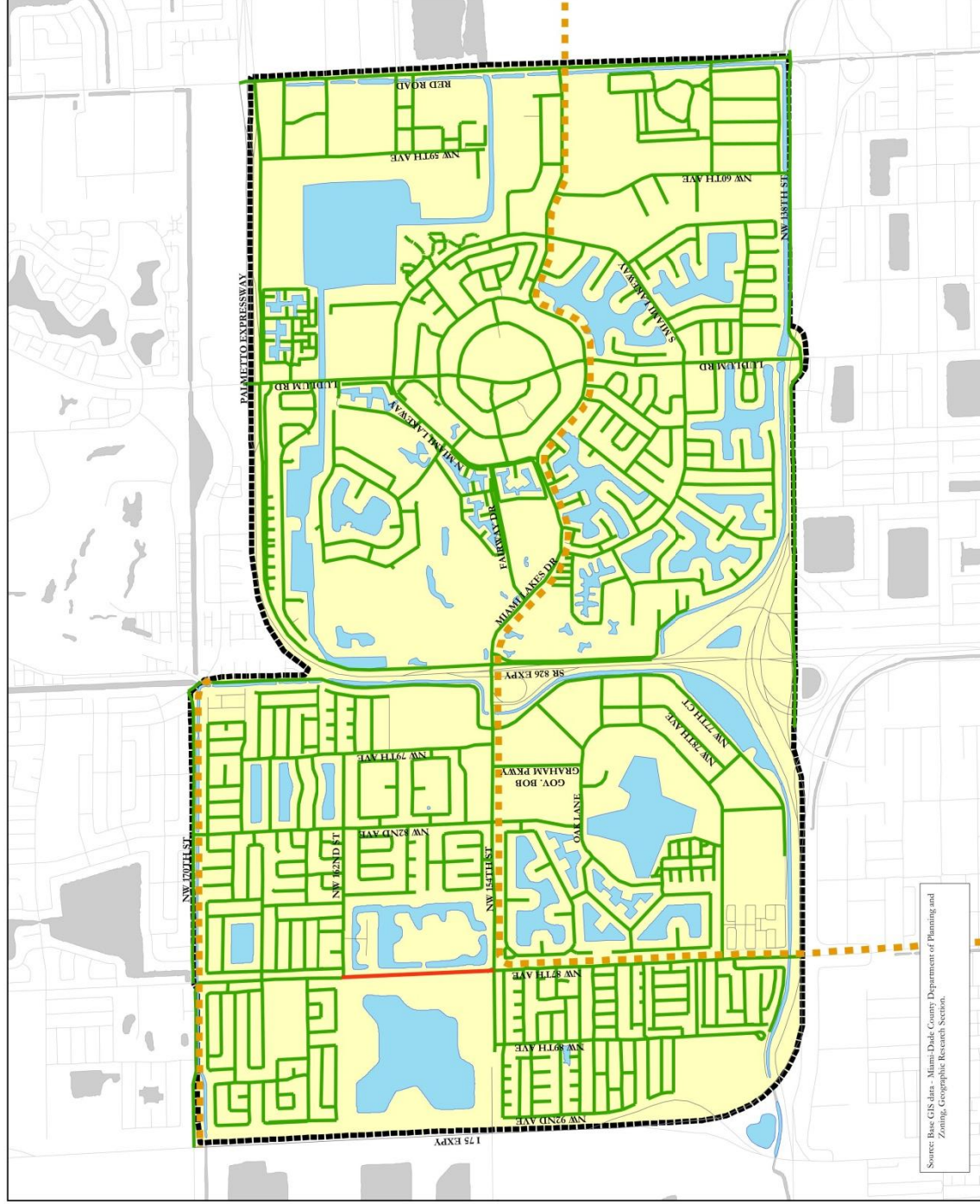
## **Legend**

- Proposed Trail
- Future Sidewalks
- Sidewalks
- Waterbodies
- Town Boundary



0 0.25 0.5  
 Miles

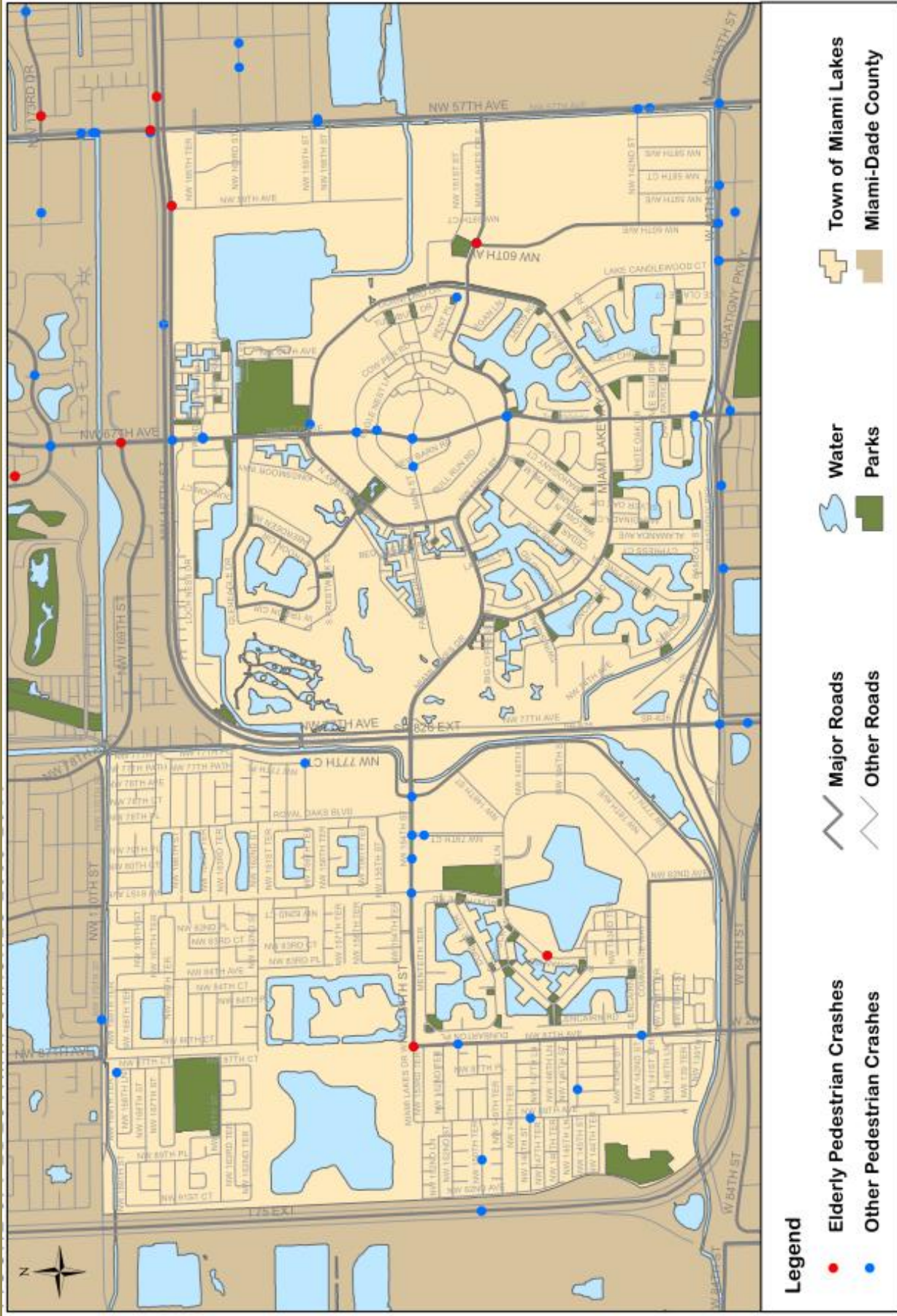
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 and Associates, Inc.  
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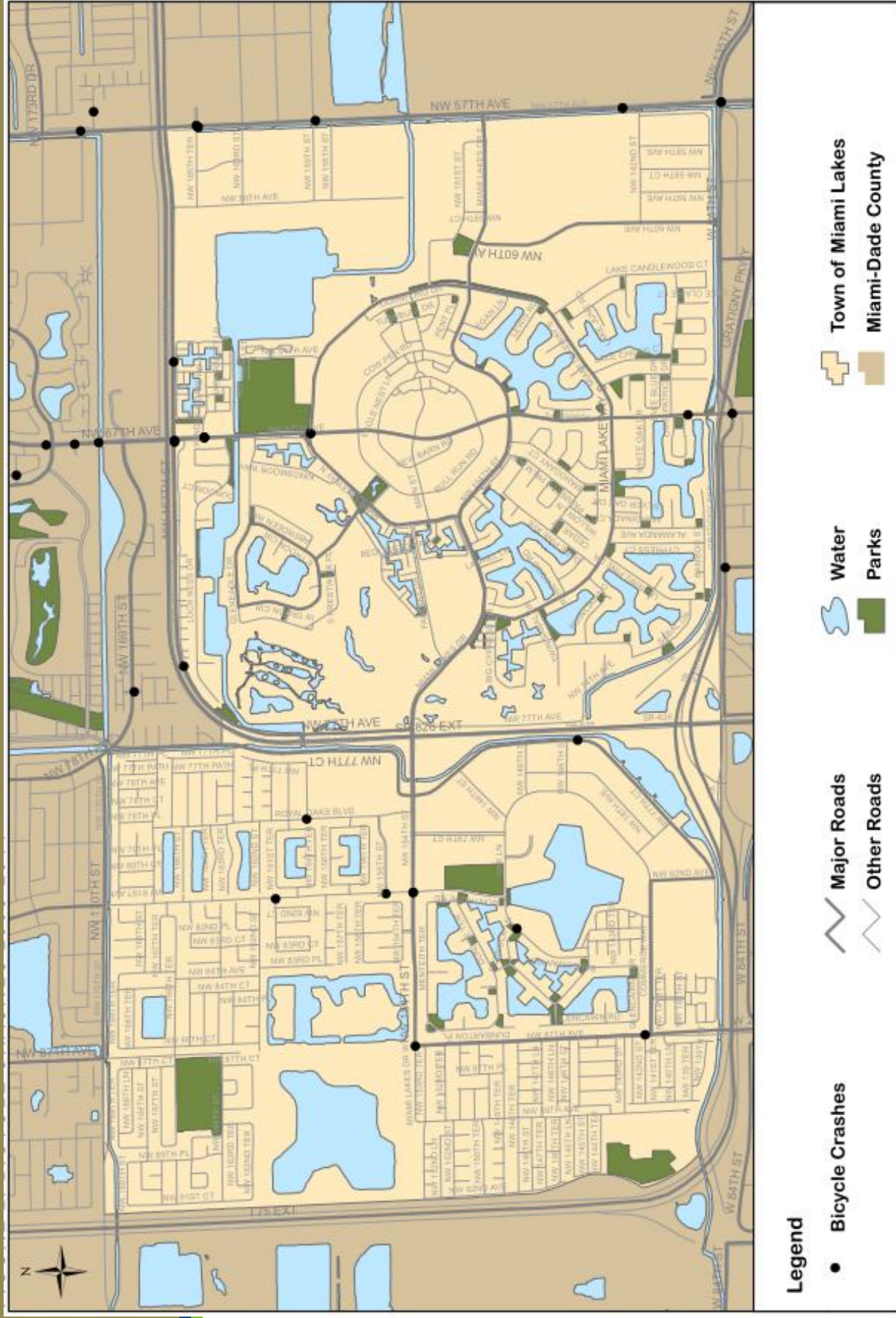














# Pedestrian Level of Service (PLOS)



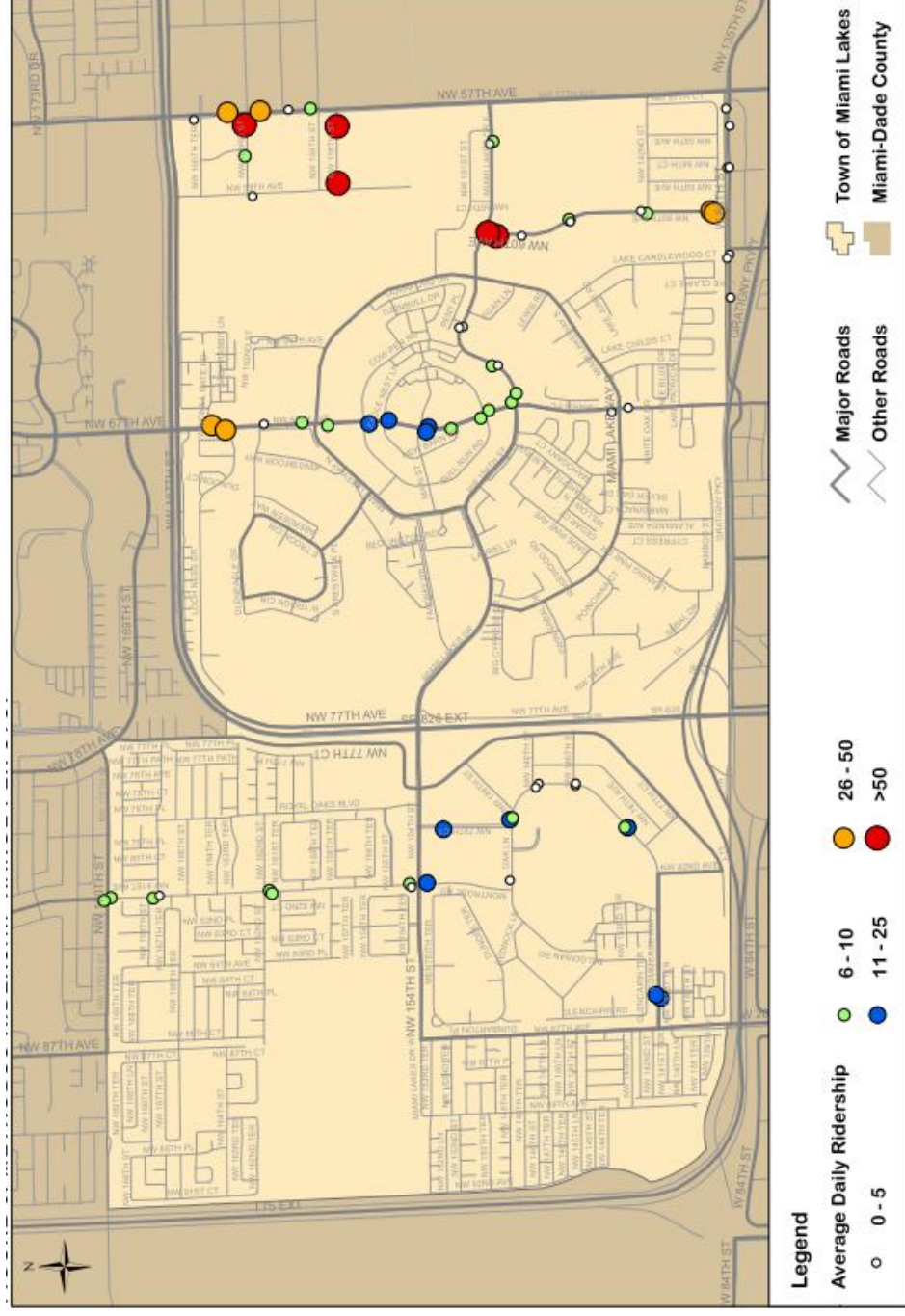


# Bicycle Level of Service (PLOS)





# MDT Metrobus Ridership Data

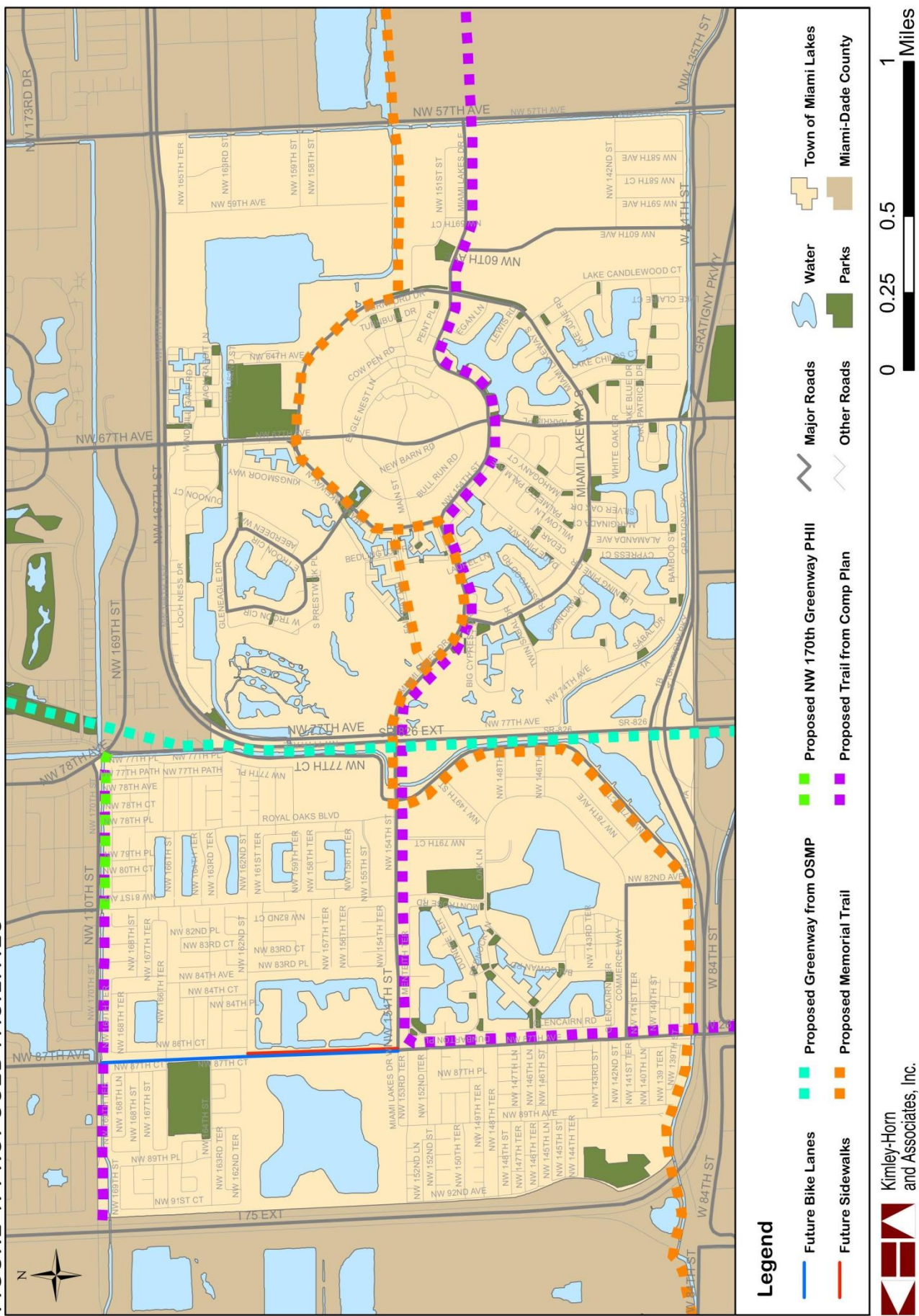




# Commute Trip Reduction Program

- Vehicular congestion is compromising the Town's quality of life
- Town study completed in 2013
- Greenways and Trails Plan is part of the non-motorized transportation strategy in addition to transportation demand management (TDM), ridesharing, flexible work schedules, etc.



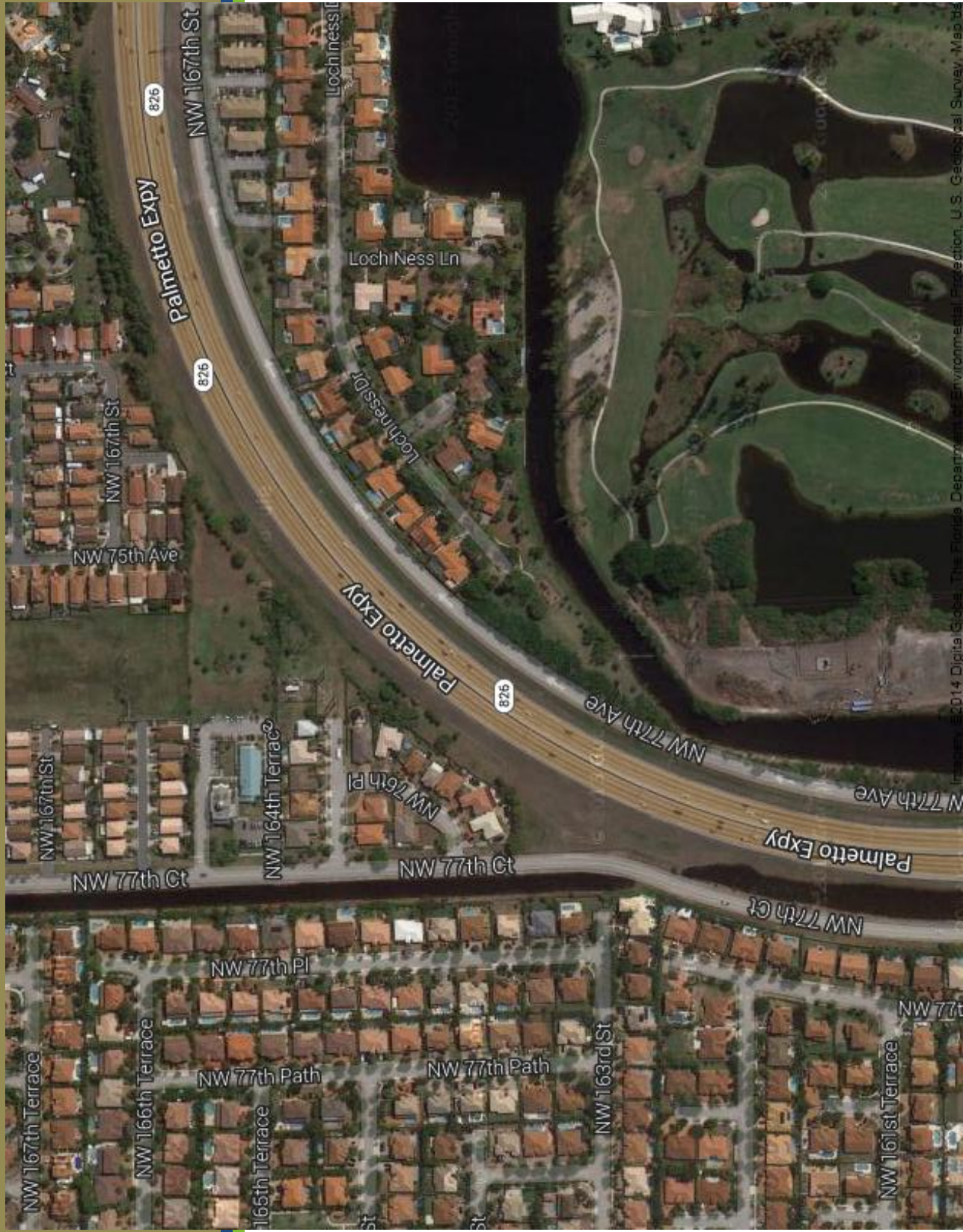




# Aerials



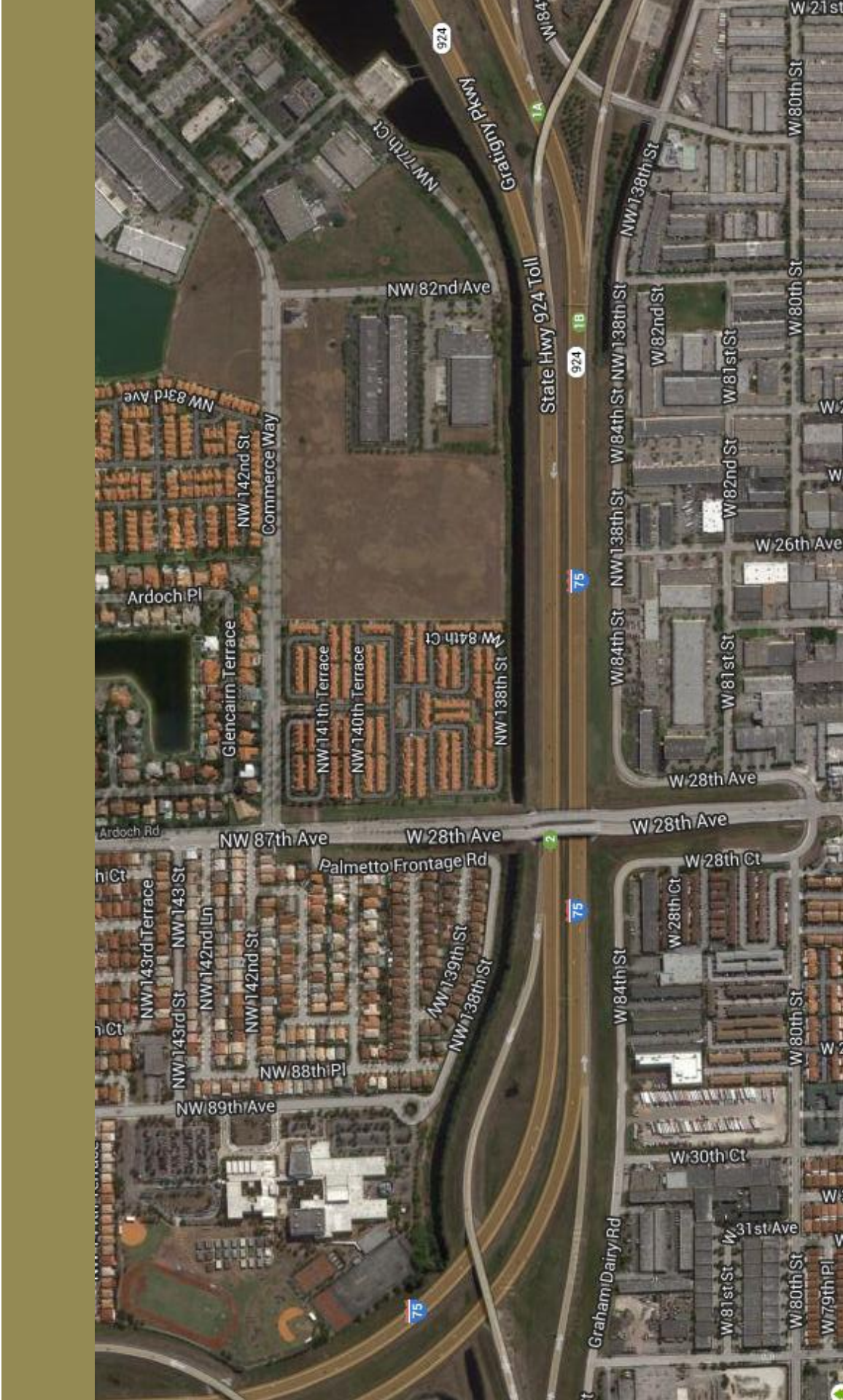














# Aerials



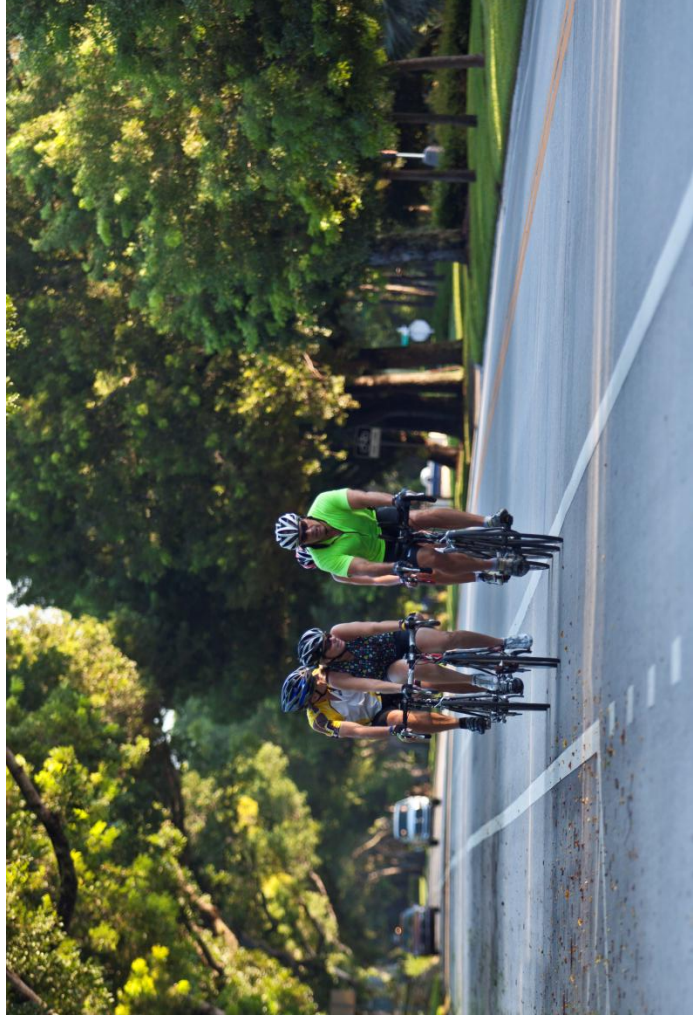






# Next Steps

- Develop network recommendations
- Prepare feasibility analysis
- Prepare draft implementation plan





# Miami Lakes Greenways and Trails Master Plan

## Appendix B



# Greenways and Trails Master Plan

*Interagency Coordination Committee  
Meeting 2  
Tuesday, June 3, 10:00 AM – 11:30 AM*



# Agenda



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AGENDA  
**GREENWAYS AND TRAILS INTERAGENCY COORDINATION  
COMMITTEE MEETING #2**  
Thursday, May 29, 2014  
**10:00 a.m.**  
Community Conference Room #106  
6601 Main Street, Miami Lakes, FL 33014

1. **Introductions & Welcome:** TOML, Tony Lopez
2. **Meeting # 1 Summary:** Kimley-Horn
3. **Draft Network Plan Map:** Kimley-Horn
4. **Trail Concept Designs:** Kimley-Horn
5. **Design Guidelines & Implementation Steps/Ideas:** Kimley-Horn
6. **Interagency Feedback/Ideas:** All Agencies





# Purpose

- To recommend specific feasible projects to help create a safe and convenient non-motorized transportation system
  - To connect
    - Residential communities
    - Schools
    - Parks
    - Businesses





# Approach

- Intergovernmental and Stakeholder Coordination
- Data Collection and Existing Conditions Inventory
- Network Identification and Supplemental Infrastructure
- Implementation Steps and Design Guidelines
- Final Report



# Meeting #1 Summary

- Data Collection and Analysis Map Series
  - Existing Facilities, Transit Data, Pedestrian Level of Service, Bicycle Level of Service, Crash Data
- Benefits of Greenways and Trails
  - Mobility, Health, Economic Development, Clean, Family and Community
- Types of Facilities
  - Greenways/Linear Parks, Bike Lanes, Sharrows, Sidewalks
- Commute Trip Reduction Program



**TOWN OF MIAMI LAKES GREENWAYS AND TRAILS MASTER PLAN**  
**FIGURE 8: PROPOSED NETWORK PLAN**



**Legend**

- Existing Off-Road Facility
- Existing On-Road Facility
- Future Off-Road Facility
- Future On-Road Facility
- Future Facility by Others
- Long-Range Opportunity
- Major Roads
- Other Roads
- Water
- Parks
- Town of Miami Lakes
- Miami-Dade County

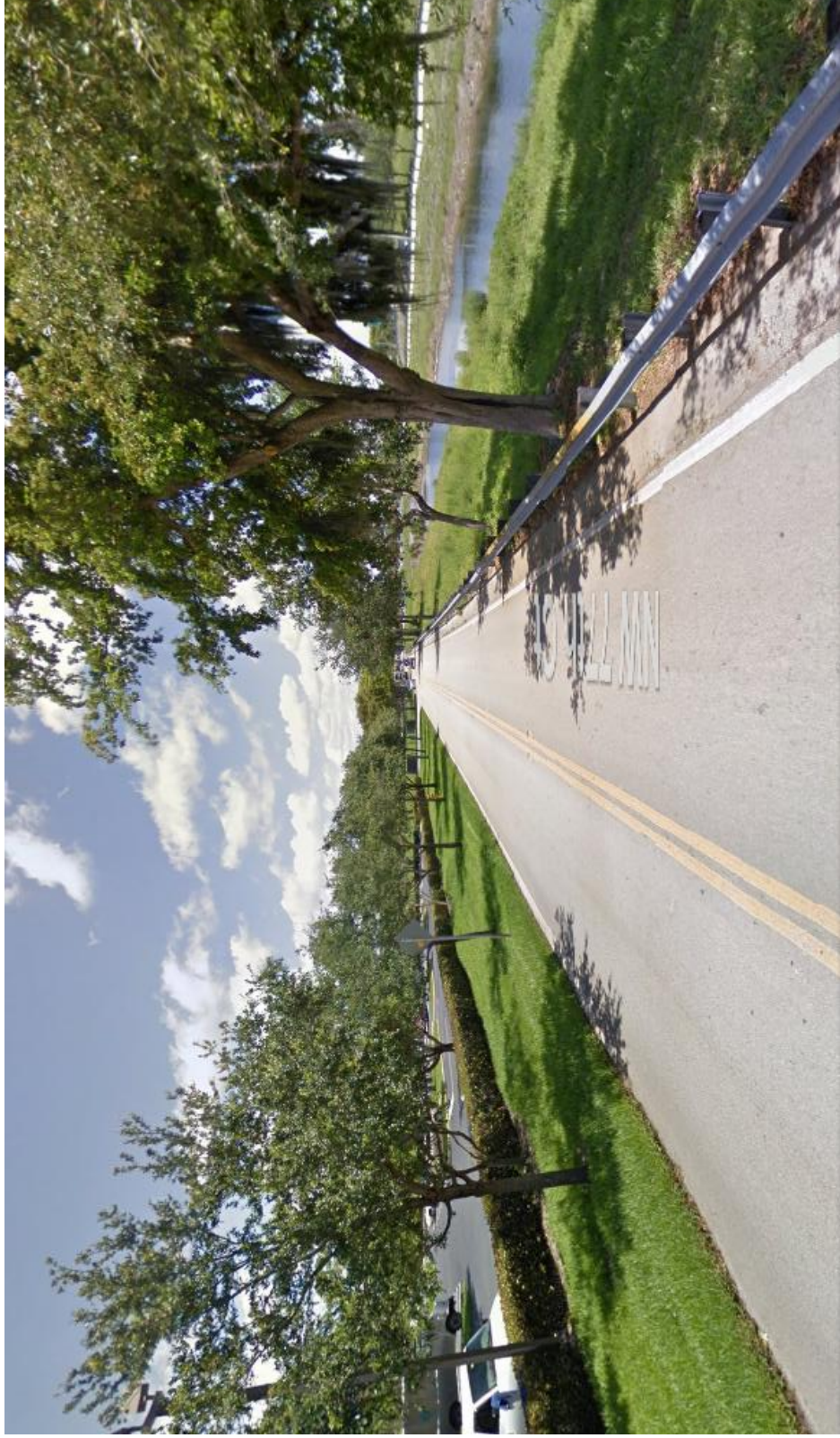


# Trail Concepts



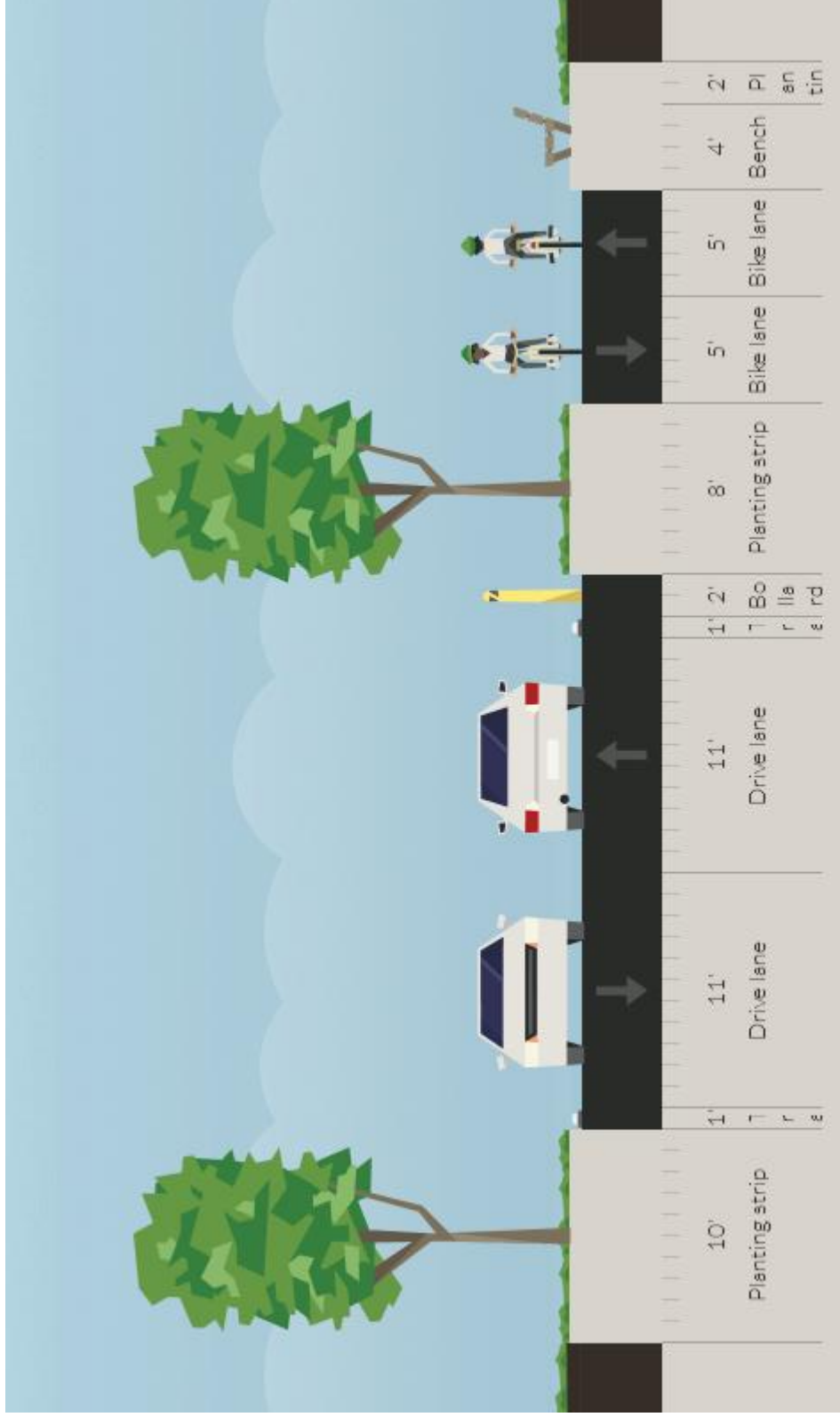


# NW 77<sup>th</sup> Court





# NW 77<sup>th</sup> Court – Typical Section



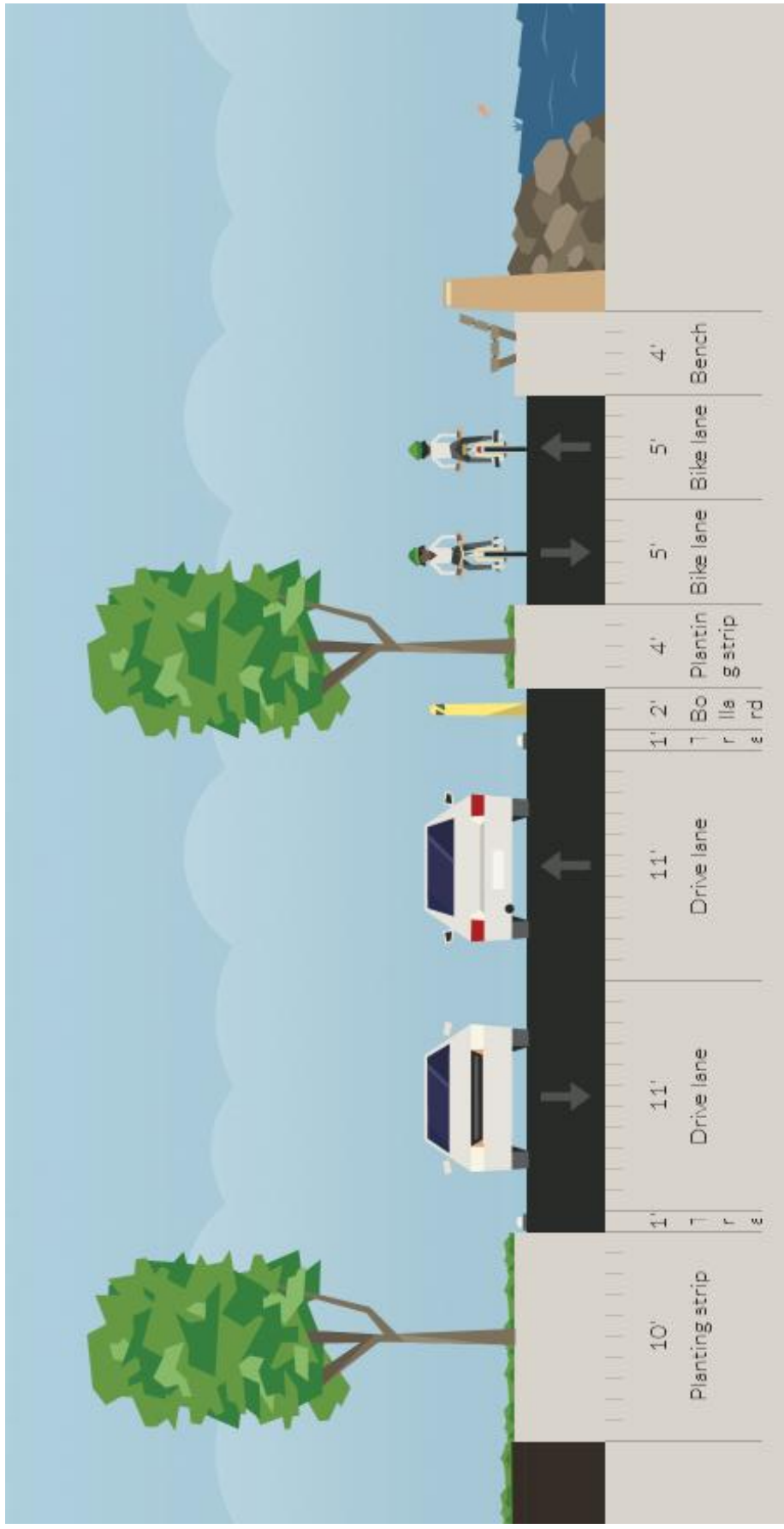


# NW 77<sup>th</sup> Court – between NW 146<sup>th</sup> Street and NW 148<sup>th</sup> Street





# NW 77<sup>th</sup> Court – between NW 146<sup>th</sup> Street and NW 148<sup>th</sup> Street



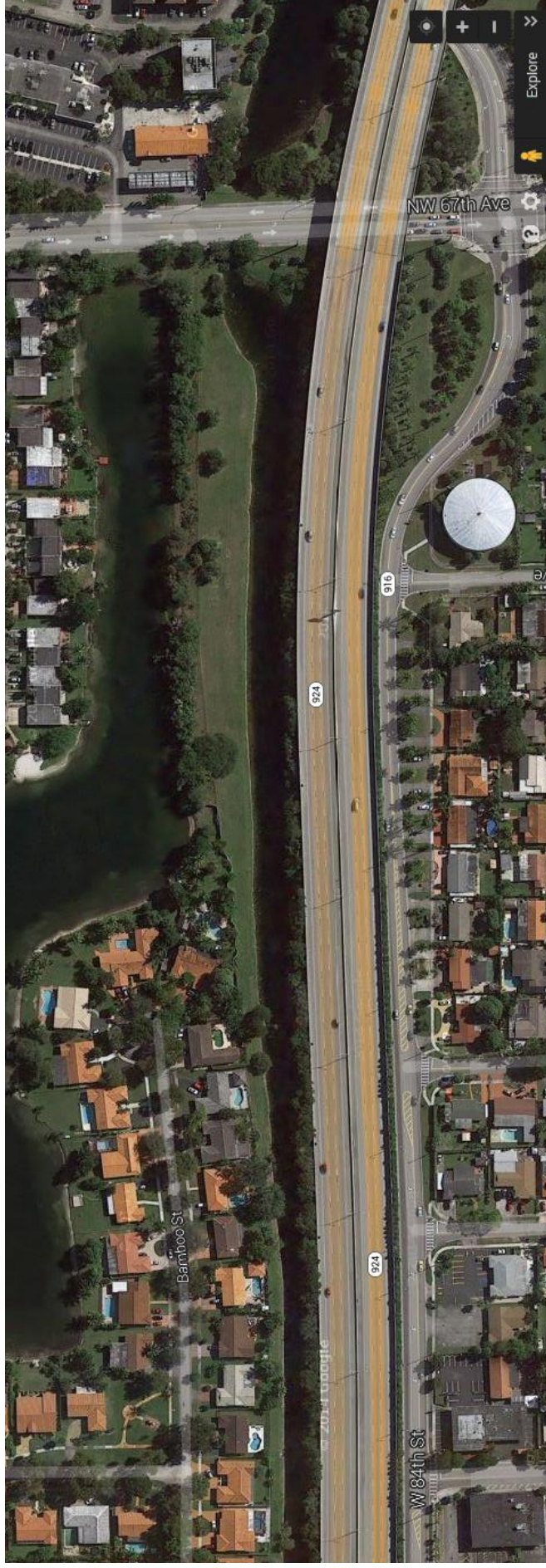


# Trail Concepts



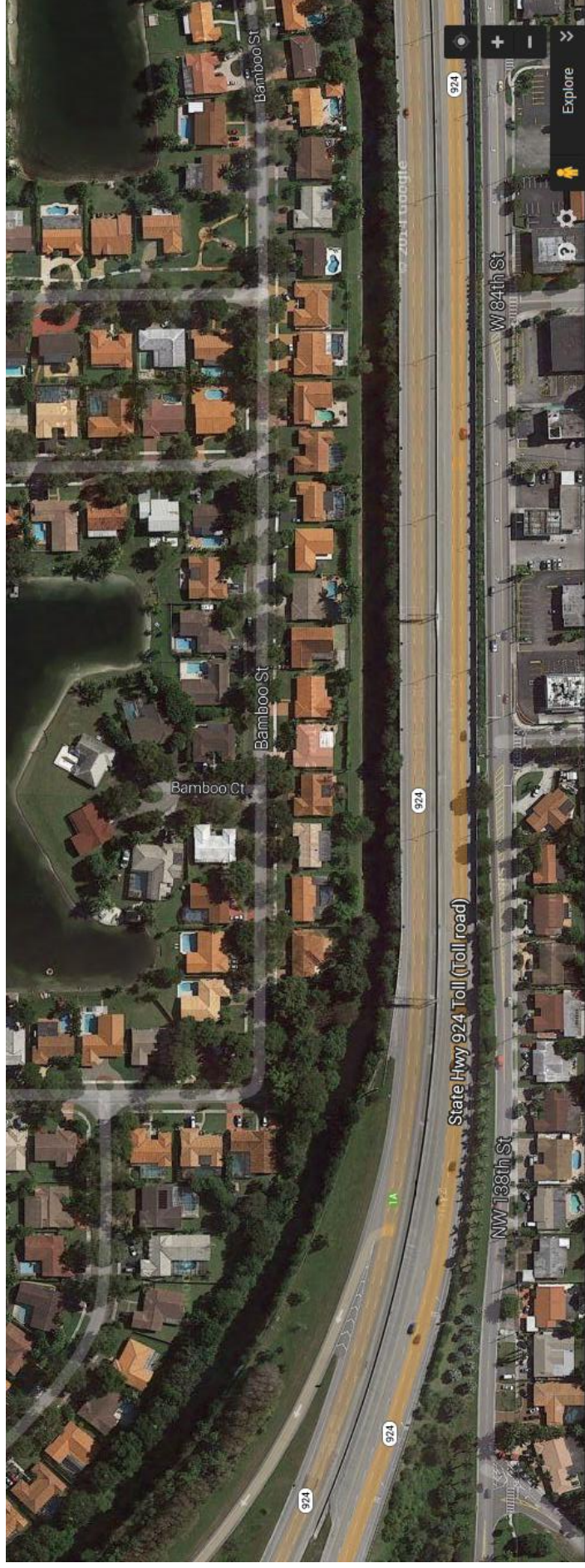


# Trail Concepts





# Trail Concepts



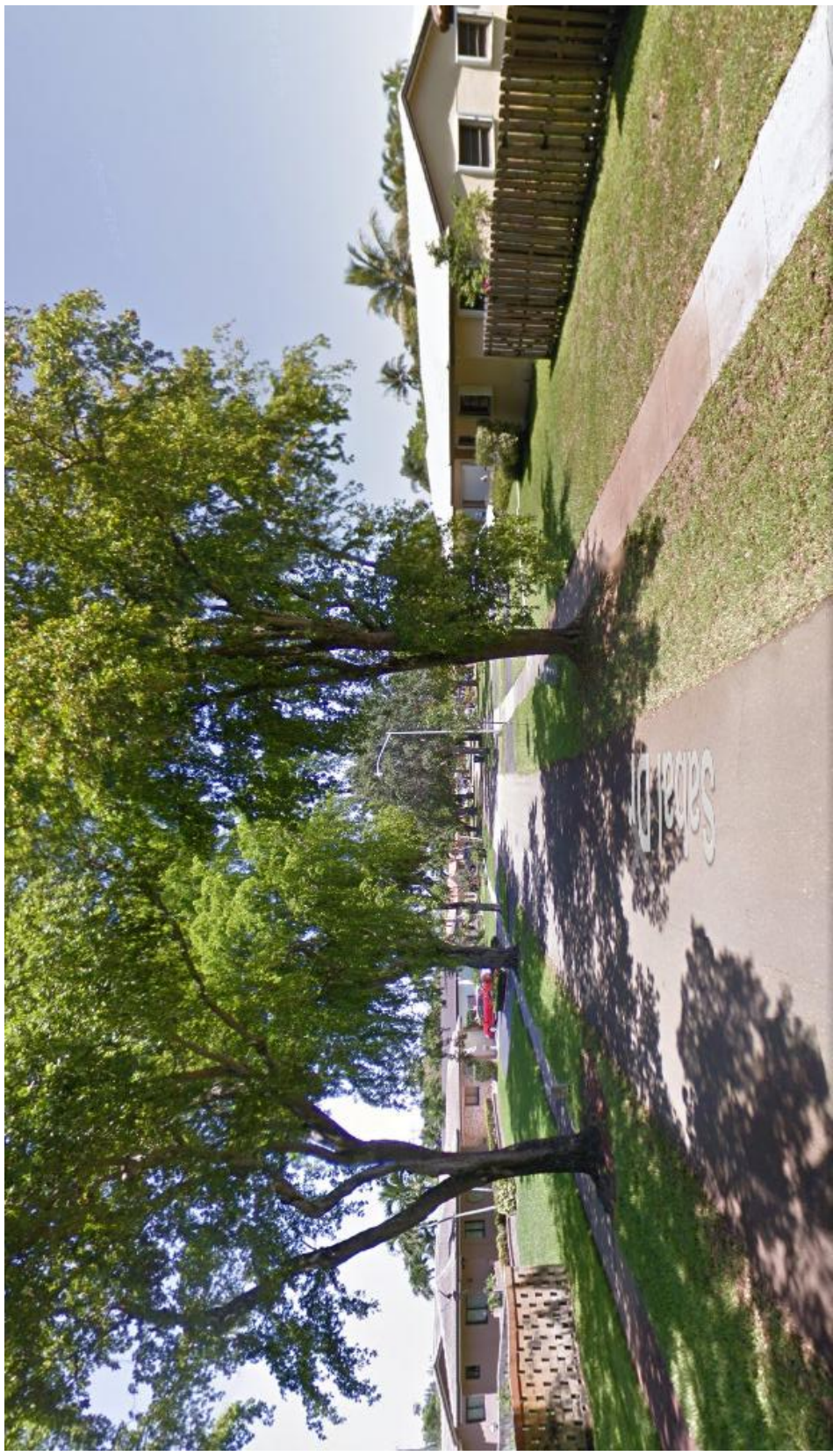


# Trail Concepts



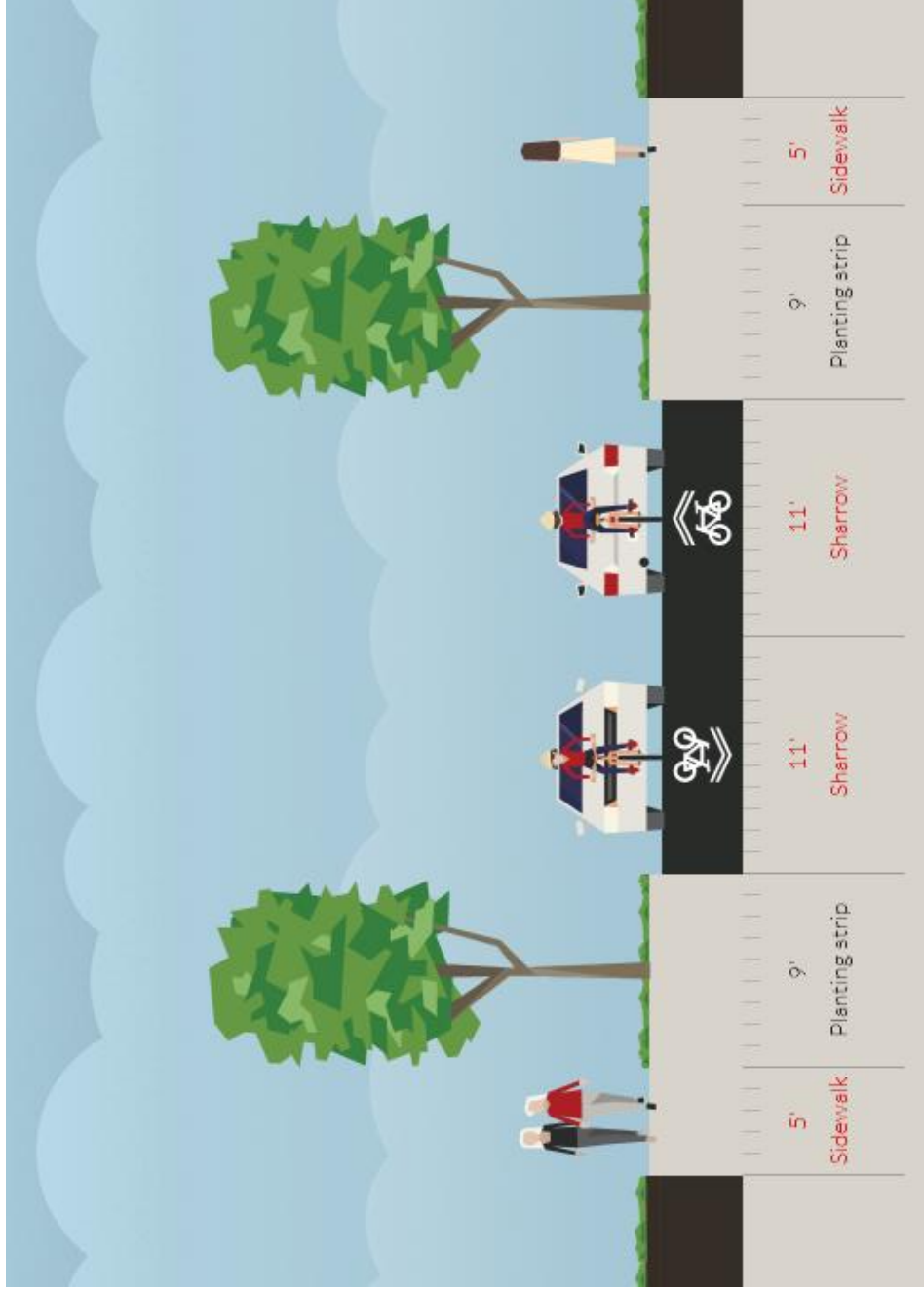


# Sabal Drive





# Sabal Drive – Typical Section



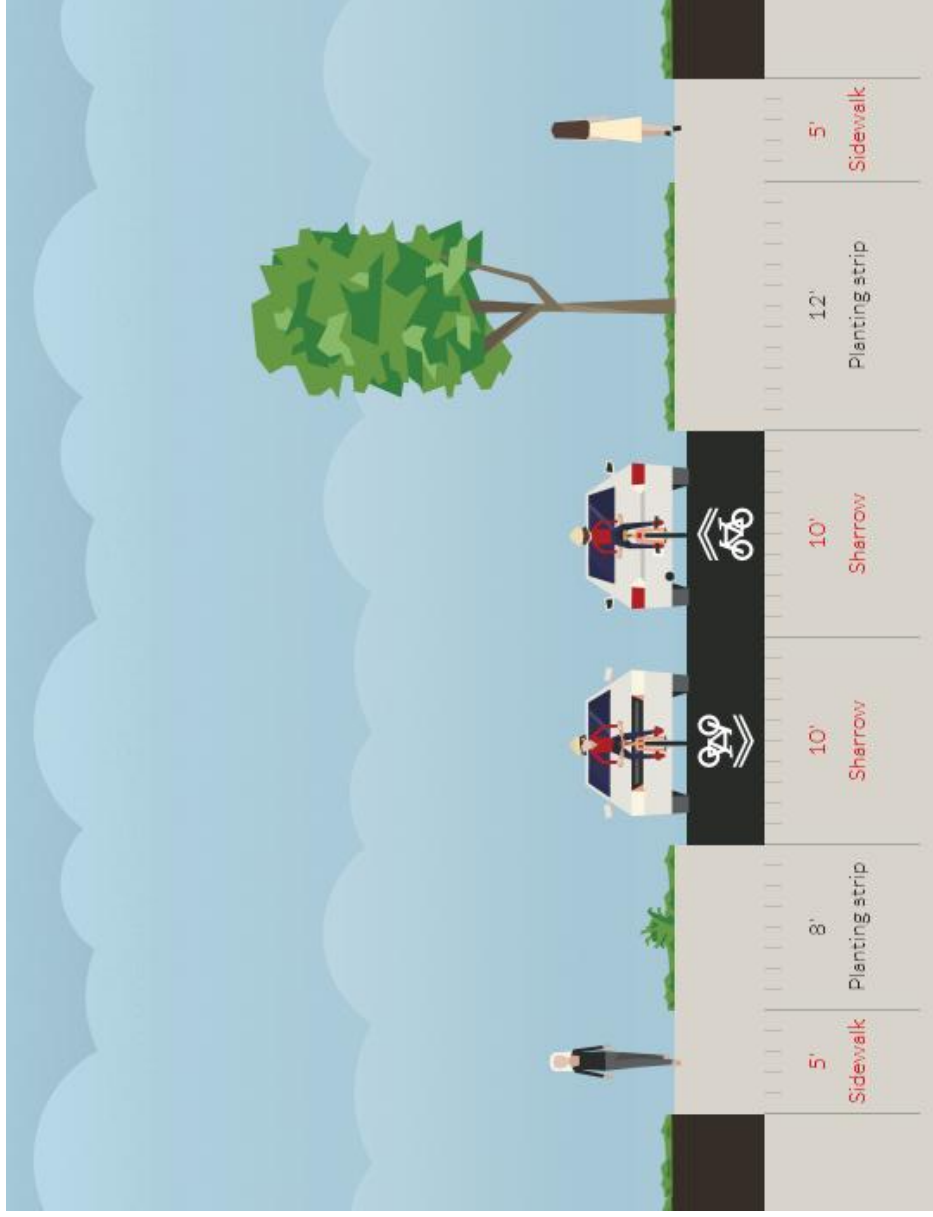


# Twin Sabal Drive



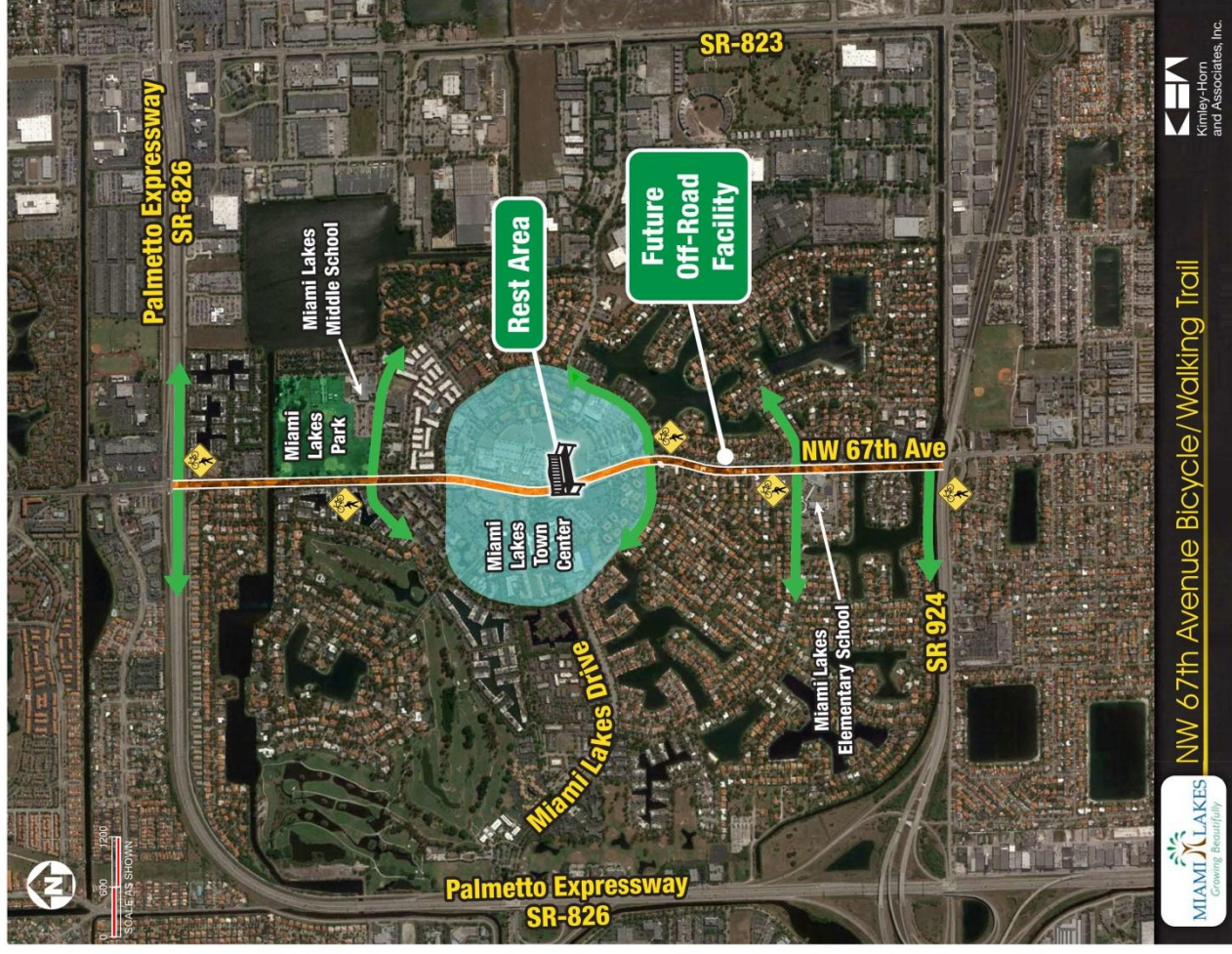
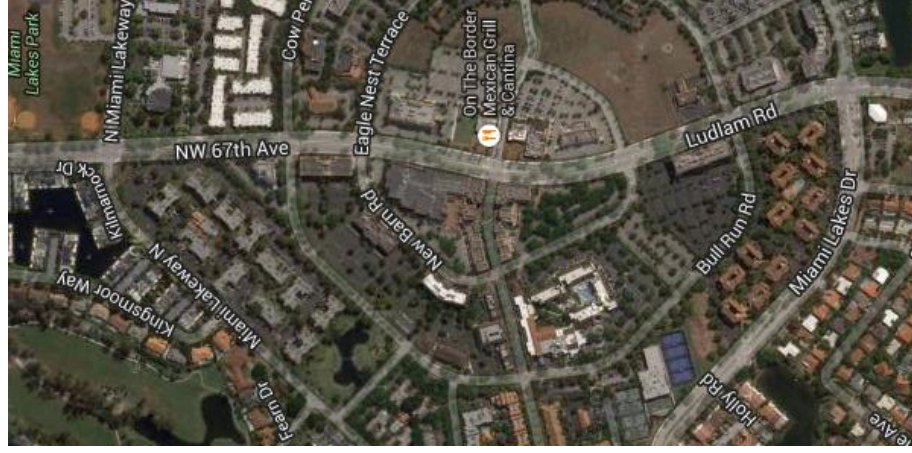


# Twin Sabal Drive – Typical Section





# Trail Concepts



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and Associates, Inc.





# Ludlam Road (SW 67<sup>th</sup> Avenue)





# Ludlam Road (SW 67<sup>th</sup> Avenue)





# Potential Intersection Improvements



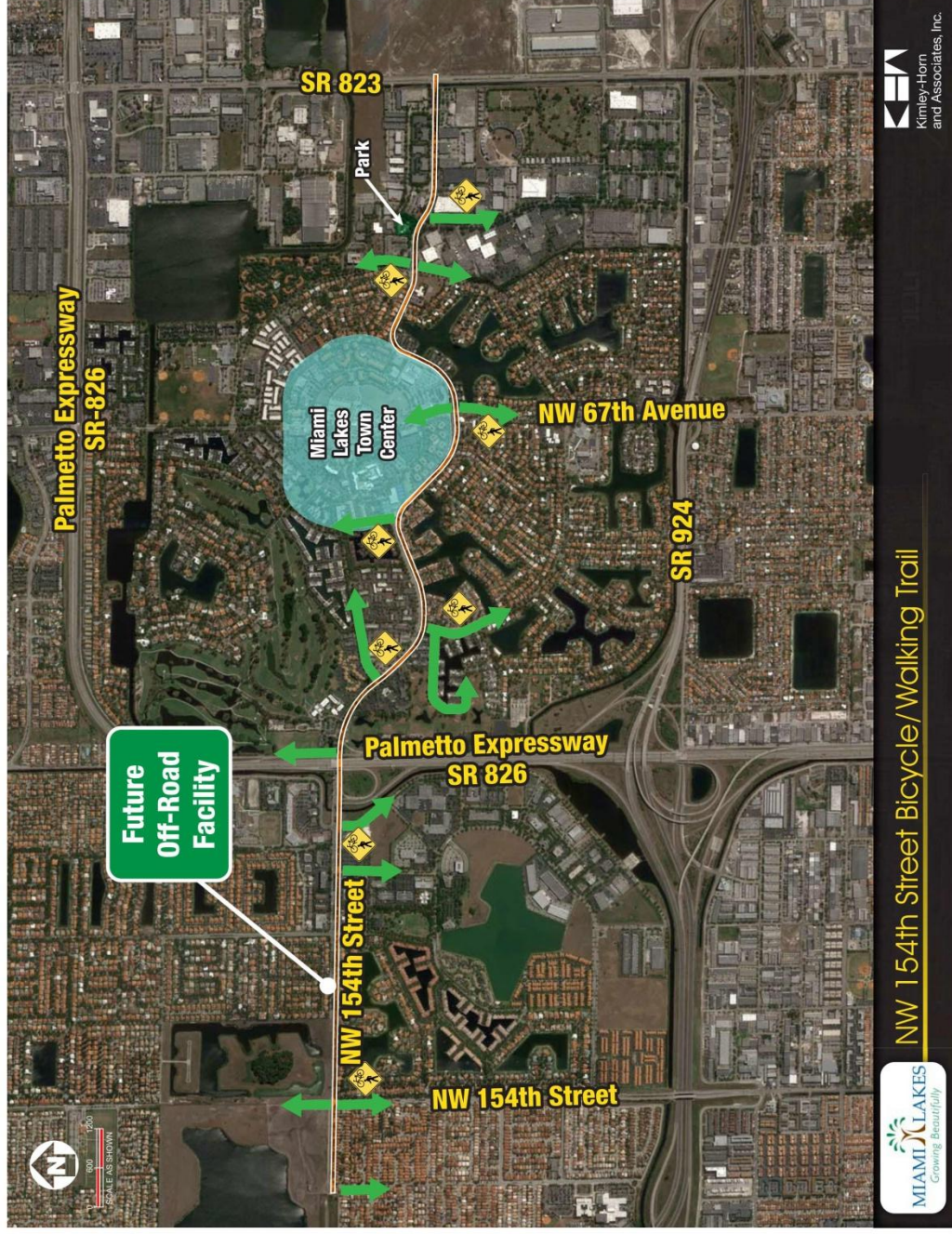


# Spot Improvements



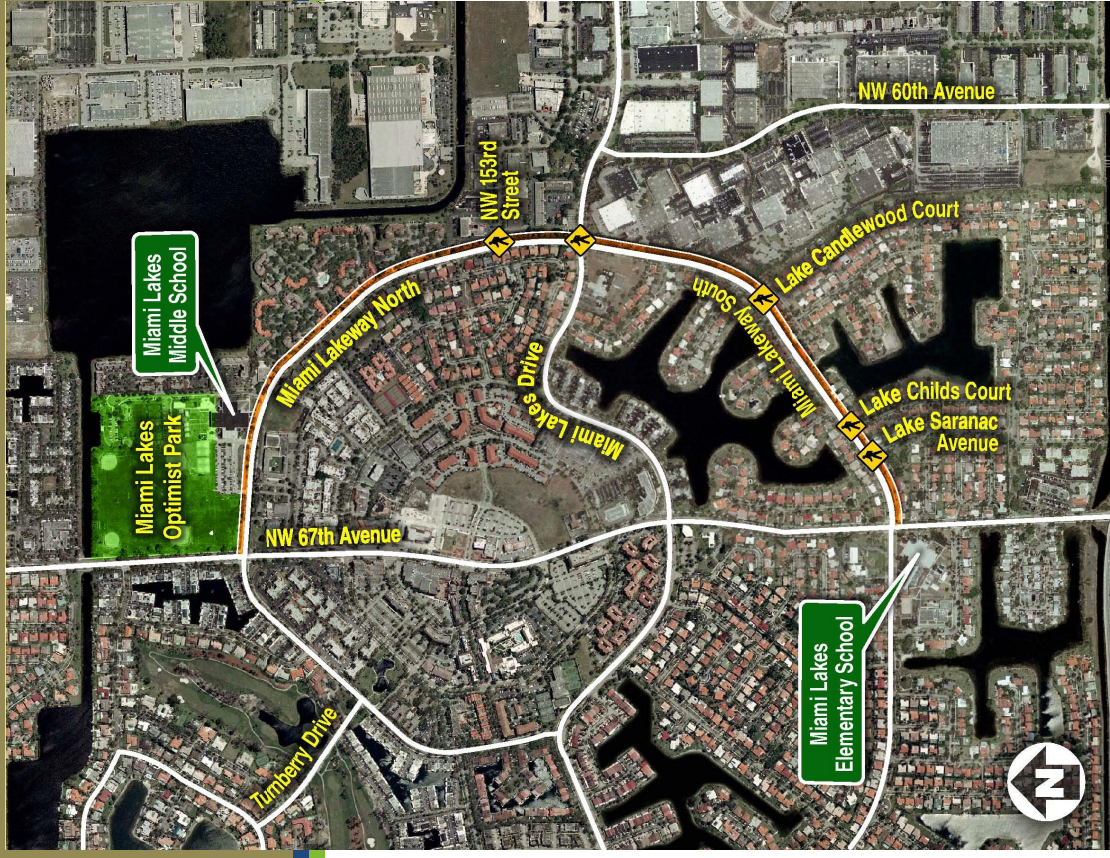


# Trail Concepts





# Trail Concepts



Miami Lakeway Safe Route to School



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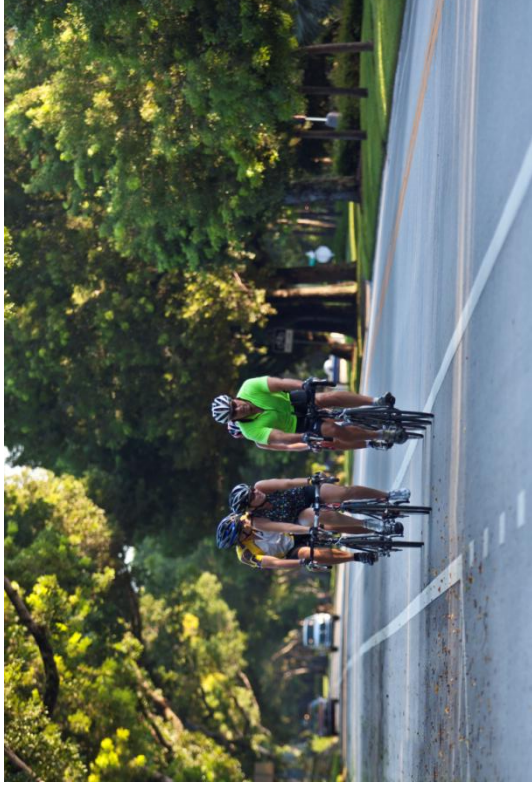
# Trail Concepts





# On-Road Facilities

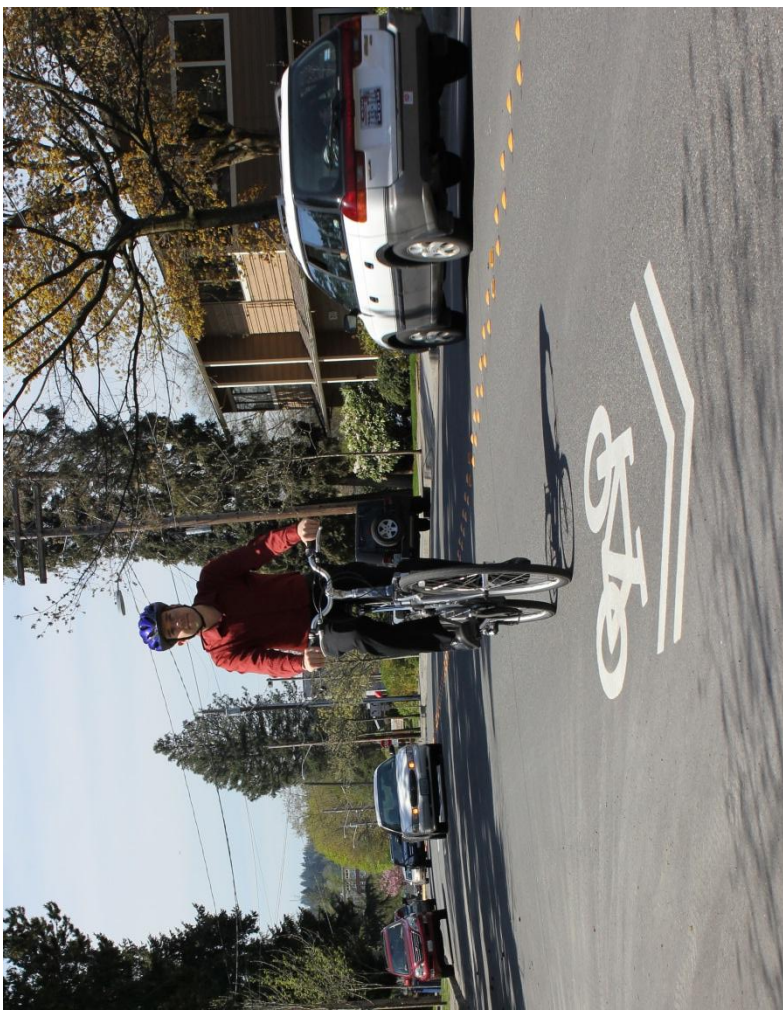
- On-Road Bike Lanes
  - NW 87<sup>th</sup> Avenue (existing)
  - NW 60<sup>th</sup> Avenue
  - NW 142<sup>nd</sup> Street
  - NW 59<sup>th</sup> Avenue
  - NW 158<sup>th</sup> Street
  - NW 163<sup>rd</sup> Street





# On-Road Facilities

- On-Road Sharrows
  - Commerce Way
  - NW 79<sup>th</sup> Court
  - NW 80<sup>th</sup> Avenue
  - Sabal Drive
  - Twin Sabal Drive
  - NW 89<sup>th</sup> Avenue
  - NW 146<sup>th</sup> Terrace
  - NW 149<sup>th</sup> Terrace
  - NW 153<sup>rd</sup> Terrace





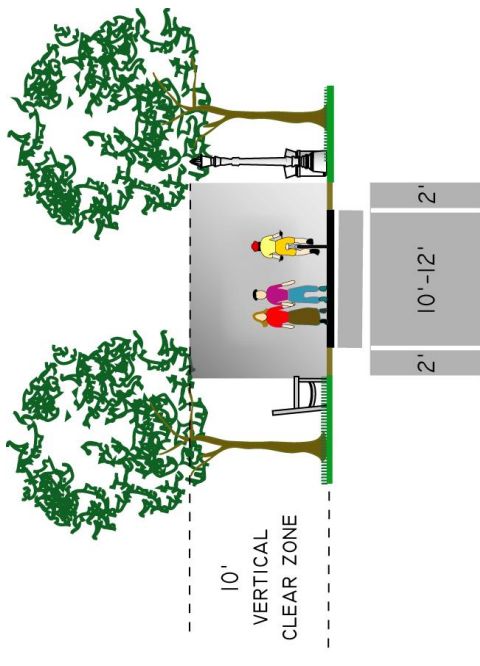
# Design Guidelines

- National Association of City Transportation Officials (NACTO)
  - Bikeway Design Guide
  - Urban Street Design Guide
- American Association of State Highway Transportation Officials (AASHTO)
  - Guide for the Development of Bicycle Facilities, Fourth Edition
- Florida Greenbook
  - Chapters 8, 9, and 19
- Manual on Uniform Traffic Control Devices (MUTCD)
  - Includes standards and guidance

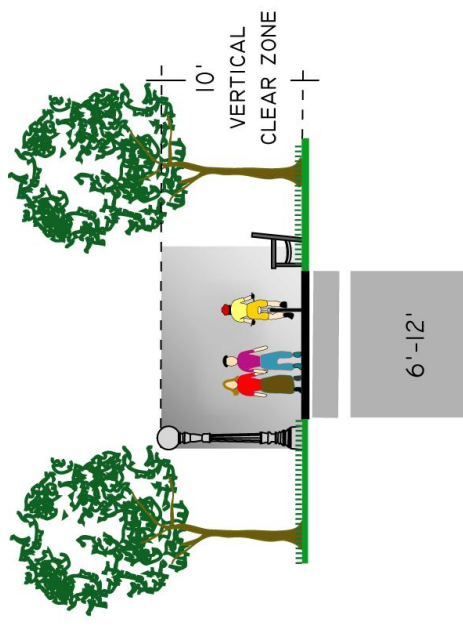


# Design Guidelines

- Shared Use Paths



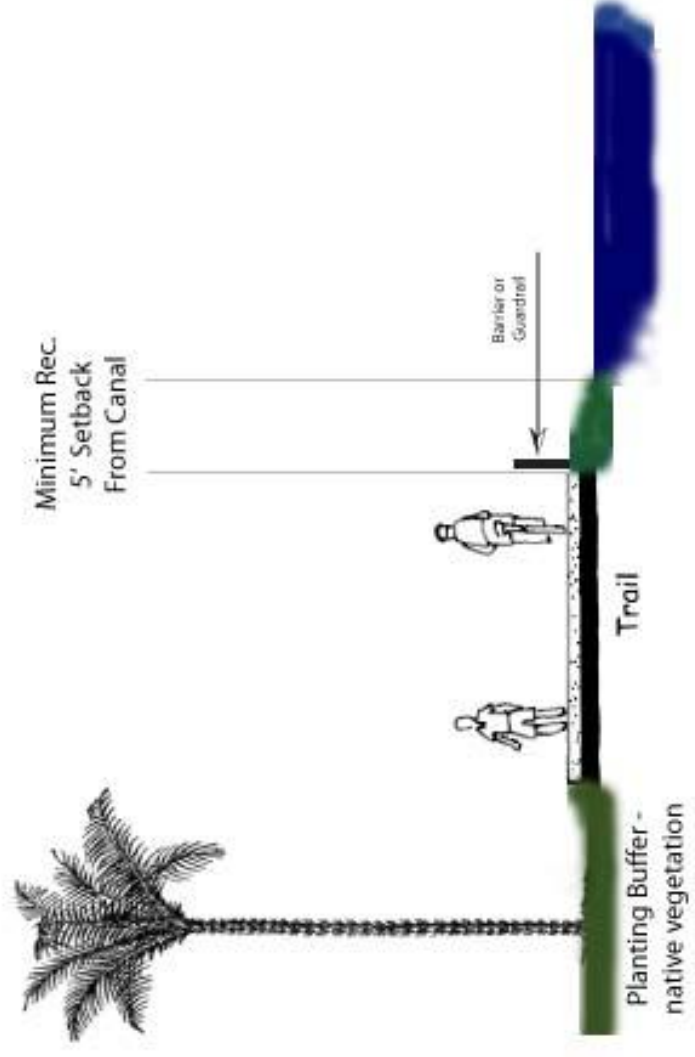
- Neighborhood Access Paths





# Design Guidelines

- Canal Trails



Trail Adjacent to Canal



# Next Steps

- Revise recommendations per meeting discussion
- Prepare draft report
- Submit for review

