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MIAMI-DADE
METROPOLITAN
PLANNING
ORGANIZATION

Bicycle Wayfinding
SYSTEM STUDY

Kimley»Horn

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Miami-Dade Metropolitan Planning Organization

presents

Bicycle Wayfinding System Study

Prepared by:

Kimley-Horn and Associates, Inc.

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Executive Summary

Overview

Miami-Dade County's current bicycle route numbering and wayfinding system has been in place since the early 1980s. Since its adoption, the County has seen growth in bicycle facilities and while the existing route numbering system has continued to provide route designation to several facilities, a more dynamic and expansive numbering system is needed. The current system provides even numbers to east-west routes and odd numbers to north-south routes, as well as some lettered bicycle routes for some facilities (including the M-Path, the Venetian Causeway, and Krome Avenue). Although the intent may have been to progress the numbering system in a geographic method (in ascending order north to south and east to west), a chronological system has been adopted as new facilities are built. Therefore, the existing bicycle route numbering method does not give the users of the network any information with regards to their relative location within the county. In fact, many users are familiar with the route name, but are often unaware of the route's designated number. Furthermore, the current system represents only existing and funded facilities. As a result, many of Miami-Dade County's bicycle facilities, particularly the more urban facilities, are not represented on the County's Bicycle Route System.

In fact, the current designated bicycle route network in Miami-Dade County is heavily influenced by the South Dade Greenway Network Master Plan, and consists almost exclusively of canal trails and shared-use paths. The resulting network (shown on right) represents recreational bicycle routes, but does not include routes used for more regular bicycle commuters, particularly in the central and northern parts of the County. Additionally, many of the designated bicycle routes are segments that do not provide continuous connection from origins to destinations, and therefore do not provide users with a continuous network that will guide them to where they need or want to go.

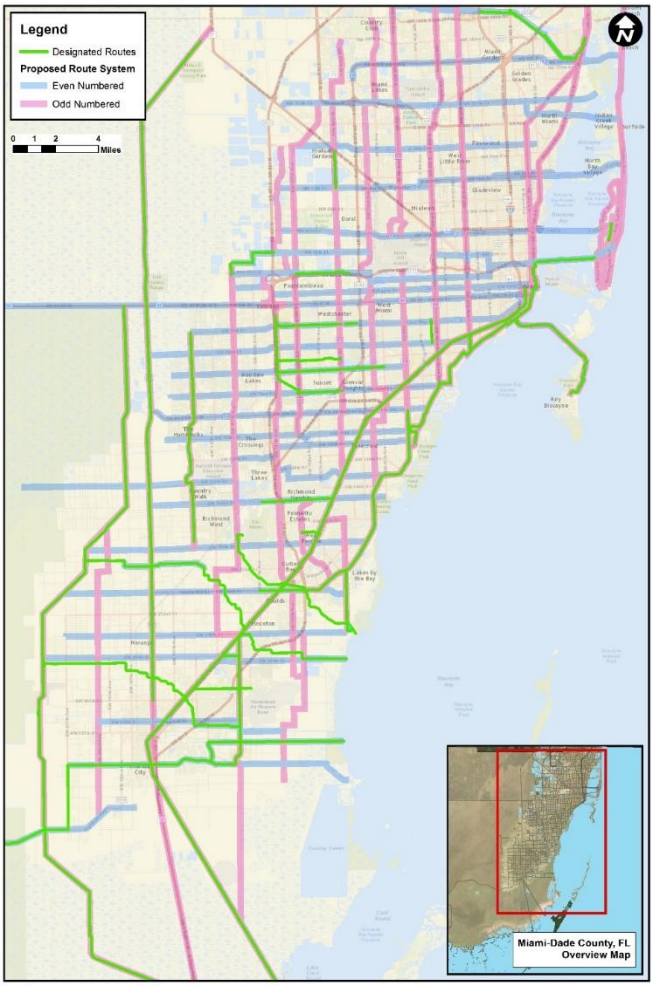
Existing Designated Bicycle Route Network in Miami-Dade County (2015)

Proposed Bicycle Route Network

The proposed bicycle route designation system accounts for geographic orientation of the routes as well as relative location within the County. Similarly to how the existing network was initially set up, the proposed Miami-Dade Bicycle Route System would assign even numbers to east-west corridors in ascending order from north to south, and odd route numbers for north-south corridors in ascending order from east to west. Numbers that are multiples of five (5, 10, 15, etc.) would be reserved for major corridors. To ensure that this new geographically based numbering system is maintained, it is crucial that such route numbers be reserved for

specific corridors, regardless of the presence of a bicycle facility today. Additionally, lettered bicycle route designations will be continue to be used for those routes that are easily recognizable by name (such as the M-path, or Bike Route V for the Venetian Causeway).

Establishing such a network would ensure that all parts of the County are equally represented. The map below displays what a potential Designated Bicycle Route Network could look like, with east-west corridors depicted in blue, and north-south corridors shown in pink. The existing designated bicycle route network, shown in green, has been overlaid onto the map to better depict those areas which are well covered, those and which are currently underserved.



Potential Designated Bicycle Route System

Bicycle Wayfinding System

In addition to establishing a new Bicycle Route Numbering System, this study provides guidelines for bicycle wayfinding signage that will complement the bicycle route network and enhance user experience. A comprehensive guide to bicycle wayfinding in Miami-Dade County will consist of decision, turn, and confirmation signs. The bicycle wayfinding guidelines provided in this study offer recommendations as to placement, spacing, and type of signs that should be installed along various types of facilities. The guidelines also provide a baseline for distances at which wayfinding to various destinations should be provided, shown below.

	Nearby (≤ 15 minutes)	Medium (15-30 minutes)	Far (> 30 minutes)
Downtowns	🚲🚲🚲🚲🚲🚲	🚲🚲🚲🚲🚲🚲	🚲🚲🚲🚲🚲🚲
Transit Stations	🚲🚲🚲🚲🚲🚲	🚲🚲🚲🚲🚲🚲	
Regional Parks	🚲🚲🚲🚲🚲🚲	🚲🚲🚲🚲🚲🚲	
Local Parks	🚲🚲🚲🚲🚲🚲		
Entertainment	🚲🚲🚲🚲🚲🚲	🚲🚲🚲🚲🚲🚲	
Key Neighborhoods	🚲🚲🚲🚲🚲🚲		
Universities	🚲🚲🚲🚲🚲🚲		
Government Buildings	🚲🚲🚲🚲🚲🚲		
Other Routes	🚲🚲🚲🚲🚲🚲	🚲🚲🚲🚲🚲🚲	
End of Line Destination	As Needed / As Applicable		

Type of attraction, surrounding environment, and the type of facility on which signage is to be placed are all considered under these guidelines.

M1-8 D11-1c

Confirmation Signs

D1-3c

Decision Signs

D1-1c D1-1b

Turn Signs

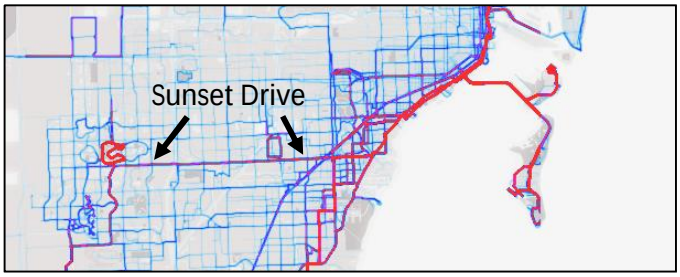
Implementation

To facilitate the adoption of the proposed Bicycle Route Numbering System and the Bicycle Wayfinding guidelines, several possible pilot projects were identified ranging from urban corridors that serve to better connect communities to surrounding parks and transit infrastructure, to rural bicycle routes aimed more at recreational riders who want to explore the County or want to reach more distant destinations through non-motorized means. A total of five pilot projects are recommended for short-term implementation. Each of the pilot projects was selected for its uniqueness, opportunity for short-term implementation, and its ability to showcase various aspects of the proposed Bicycle Route Numbering System and Bicycle Wayfinding System. The five pilot projects that were selected include:

1) Sunset Drive,
2) NW 14th Avenue within the boundaries of Model City and Brownsville,
3) "The Zig-Zag" connecting Black Point Park to Homestead Bayfront Park in the south-eastern part of the County,
4) Baywalk in Downtown Miami, and
5) County-wide signage at Tri-Rail, Metrorail, and Metromover stations.

Sunset Drive

Sunset Drive was selected as a pilot project as an example of a high-use, continuous arterial bicycle corridor. Currently, only 2.1 miles of the total 12.5 mile corridor are designated as a bicycle route (Bike Route 8). This project provides a template for renaming an existing bicycle route from Route 8 to Route 60, which more accurately represents the corridor's location in Miami-Dade County. Signage recommendations include wayfinding to nearby parks on the western end of the corridor, Metrorail stations to the east, and intersecting bicycle routes. Providing wayfinding and designating the entirety of Sunset Drive as a numbered bicycle route will improve first-mile/last-mile connectivity to transit and the non-motorized transportation network for the residents of South Miami, Coral Gables, and surrounding neighborhoods.



Sunset Drive Strava® Volumes show the corridor as a primary east-west connection.

NW 14th Avenue

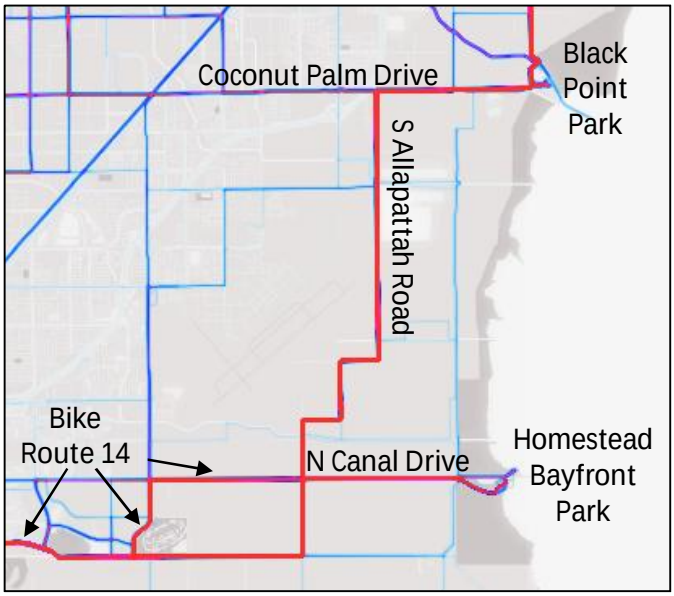
The NW 14th Avenue project is based on the recommended bicycle boulevard route presented in the *Miami-Dade County Bicycle Boulevard Planning Study: Model City/Brownsville* from 2009. This project showcases how wayfinding should be implemented along a bicycle boulevard/neighborhood greenway. This type of facility will make up much of the County's bicycle network, and is instrumental in providing first-mile/last-mile connectivity in residential areas.

The pilot project for the NW 14th Avenue project will provide a connection from Arcola Park on NW 83rd Street to the Earlington Heights Metrorail Station located on NW 41st Street and NW 21st Avenue. The corridor provides several connections through City and County parks, as well as wayfinding to several Metrorail stations.

The "Zig-Zag"

The Biscayne Trail is designated as two separate bicycle routes in Miami-Dade County: Bike Route 14 (Biscayne-Everglades Trail), and Bike Route 5 (Biscayne Trail N-S). The "Zig-Zag" is a popular connection between the two trails, and serves as a connection between Black Point Park (Coconut Palm Drive) and Homestead Bayfront Park (N Canal Drive). The pilot project would recognize the "Zig-Zag" as an extension of the Biscayne Trail (N-S) through a rural environment which is typical of South

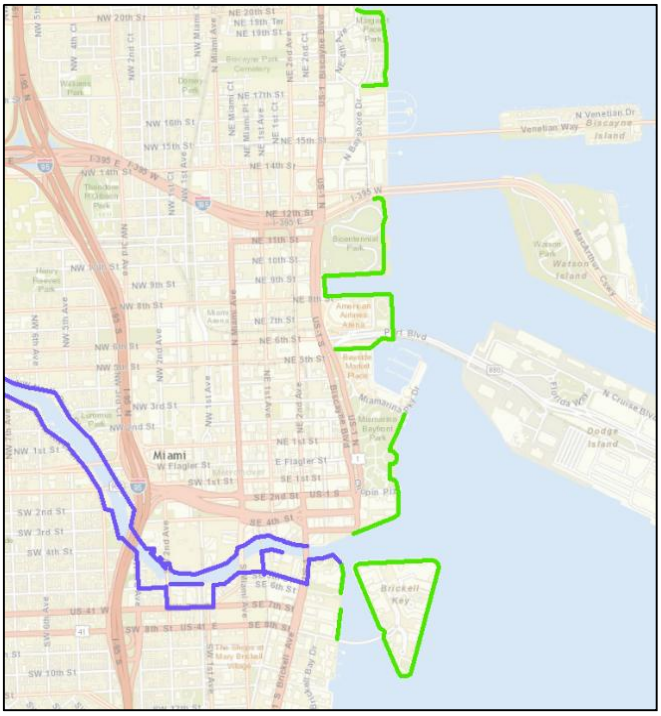
Miami-Dade County. In addition to wayfinding to connecting routes, this project provides an example of alternate route signage, as it provides wayfinding to the dirt trail that runs along the L-31E Levee.



The "Zig-Zag" Strava® Volumes between Black Point Park and Homestead Bayfront Park.

Baywalk

The urban shared use path along Biscayne Bay in Downtown Miami is a prime example of a bicycle route that serves a dense urban core. This pilot project provides wayfinding that will serve both cyclists and pedestrians, and therefore is different in nature from the wayfinding that is recommended for the other pilot projects. The wayfinding that is recommended in this pilot project aims to provide bicyclists and pedestrians with directions to nearby attractions, transit stations, parks, routes, and the several disconnected sections of the Baywalk.



Baywalk (shown in green) in downtown Miami

County-wide Signage at Transit Stations

In order for a Miami-Dade County Bicycle Network to be used to its full extent, it is important that signage be provided to make potential users aware of available, nearby facilities. Placing wayfinding at transit stations is key in improving first-mile/last-mile connectivity within the County. The type of wayfinding to be provided at transit stations is more similar to the Baywalk signage than it is to signs provided along the pilot projects. Wayfinding at transit stations should consist of decision signs that point users to nearby facilities and attractions, and no confirmation or turning signs are required. Such signage will increase awareness of nearby facilities that will allow and encourage transit users to finish their trips through non-motorized means. The goal is that more transit and potential transit users will shift modes from the private automobile to walking/bicycling as a means of connecting to transit. This has the potential to reduce the need for park-and-ride facilities, and even grow the number of 'choice' riders.

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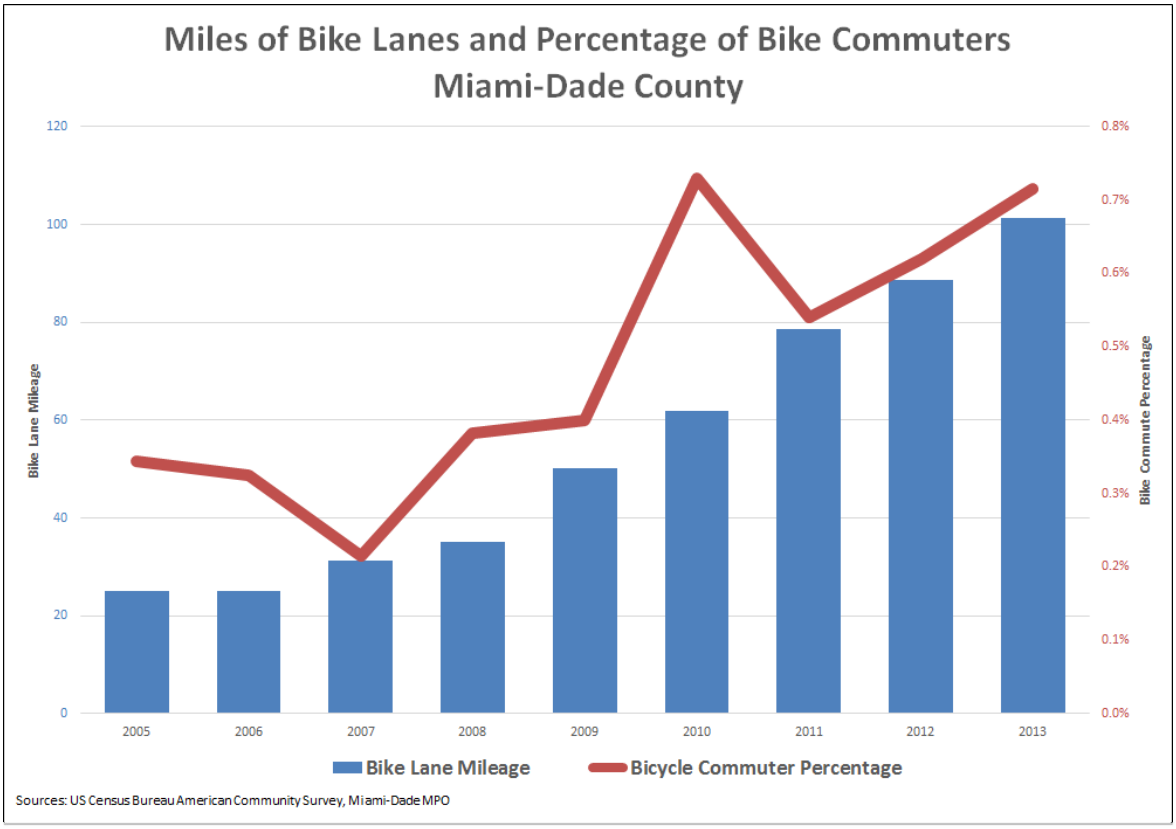
Appendices

APPENDIX A – Numbered Bicycle Routes: Description
APPENDIX B – Numbered Bicycle Routes: Maps

1 Introduction

The Miami-Dade Bicycle Wayfinding System Study provides an overview of existing bicycle wayfinding practices in the United States, Europe, and Miami-Dade County – and develops guidelines for an improved countywide network. The Miami-Dade Metropolitan Planning Organization (MPO) commissioned this Study through the MPO's Unified Planning Work Program (UPWP). Providing an improved bicycle wayfinding system is key to making the system more attractive to users and increasing mode share. Bicycle wayfinding includes signage to key destinations, as well as a bicycle route numbering system that allows users to easily navigate the available facilities and travel throughout the county on designated roadways. An improved bicycle wayfinding system that includes a complete, countywide, bicycle route network may also aid in future facility planning.

In the past decade, Miami-Dade County and its municipalities have invested in both infrastructure and numerous bicycle planning studies. Such efforts have resulted in increased bicycle mode share within Miami-Dade County.



Data from the American Community Survey, and from the Miami-Dade MPO shows a nearly 1-to-1 correlation between bicycle lane miles and the percent of bicycle commuters.

As the number of facilities and cyclists continues to grow, so does the need for improved bicycle wayfinding. However, only a dozen new bicycle routes have been designated in the past decade, while the number of bicycle lane miles and the number of bicycle commuters has more than tripled in that time.

2 Study Objective

The overall goal of this project is to develop guidelines for implementation of an extensive bicycle wayfinding system in Miami-Dade County. This is accomplished by studying bicycle wayfinding systems used in other cities, as well as the National Association of City Transportation Officials (NACTO) guidelines and the requirements set forth in the Manual on Uniform Traffic Control Devices (MUTCD).

This study will provide an overview of various methods for bicycle route numbering systems and propose guidelines for a new, geographically based – rather than chronologically based – system for Miami-Dade County. Numbering designation, as well as requirements for a facility to obtain a route number, will be defined in the guidelines. It is the goal of this study to establish a means for future planners to identify and assign route numbers to facilities throughout the county, as well as promote bicycle facility planning on designated corridors.

Additionally, the study will provide guidelines for various types of bicycle wayfinding signage, including information to be provided, as well as placement of the signs. This study will then identify a few routes on which to implement bicycle wayfinding signage.

3 Numbered Bicycle Systems in Use Today

The US Bike Route System (USBRS) was established by AASHTO in 1978. The system originally identified two routes: Bike Route (BR) 1 through Virginia into North Carolina, and BR 76 through Virginia, Kentucky and into Illinois. Since then the system has expanded to include over 8,000 miles of designated bicycle routes in 15 states including Alaska, Florida, Kentucky, Illinois, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, North Carolina, Ohio, Tennessee, Virginia, Washington, and the District of Columbia. As of December 2014, approximately a dozen routes were designated in the USBRS. The USBRS uses a numbering convention similar to the AASHTO numbering convention that is used for interstates: north-south routes are assigned odd numbers in ascending order from east to west, and even numbers are reserved for routes that primarily run east-west ascending from south to north. More recently, the National Corridor Plan identified numbered corridors that link major destinations, cities, and transportation hubs across the nation. The corridors are 50-mile wide areas along which a route may exist or may be developed. These corridors are intended to provide guidance to states looking to implement US Bike Routes. A map showing the United States Bicycle Route System and designated corridors is provided in Figure 1 on the following page.

As can be seen, Florida currently has two USBRs: USBR 1 runs along the east coast from Key West to South Carolina, and USBR 90 runs across the northern portion of the State from Alabama to the east coast. A corridor has also been designated for USBR 15 along the west coast of Florida.

Currently, 40 states are working to implement a USBR in. Three implementation phases are identified:

- Phase I: Planning – States begin general planning, choose a corridor to designate, and engage stakeholders.
- Phase II: Designation – States determine a route, gain agreements, and prepare AASHTO application.
- Phase III: Promotion – States and local agencies promote the bike route through maps, brochures, wayfinding signage, route markers, etc.

Figure 1: US Bicycle Route System

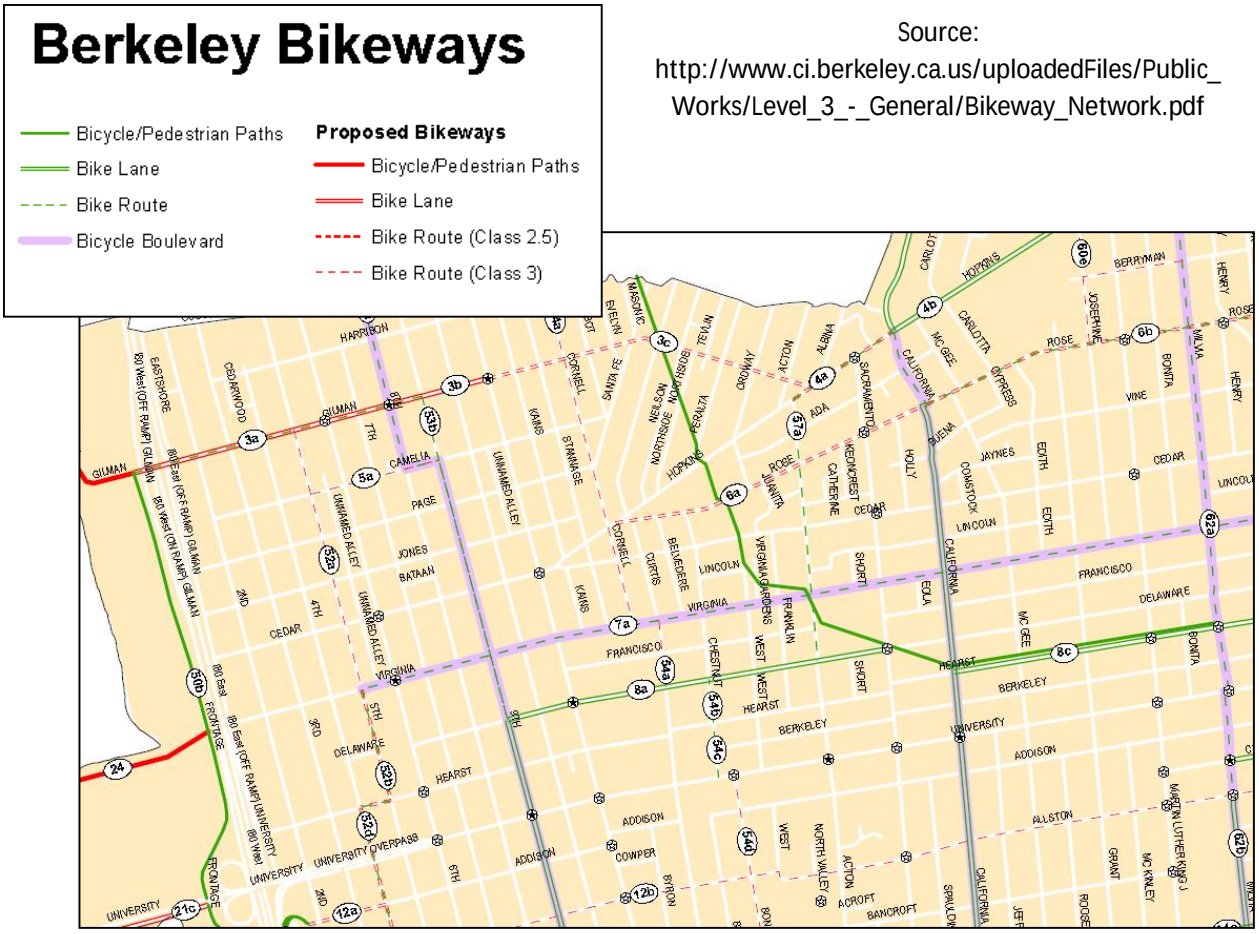
Source: http://www.adventurecycling.org/routes-and-maps/us-bicycle-route-system/national-corridor-plan/

3.1 Bicycle Route Designations in US Cities

3.1.1 Berkeley, CA

Berkeley uses an alphanumerical system for their bike routes in which the number is used to identify the route, and segments of the route are identified by letters. Letters are used to identify different phases of planned routes, or changes in facility types along a route.

Differently from Miami-Dade County and the USBRS, Berkeley's bicycle route system assigns numbers 1 to 49 to east-west routes (ascending from north to south) and numbers 50 and up to north-south routes (ascending from west to east). A zoom-in of Berkeley's bicycle route map is provided in Figure 2.



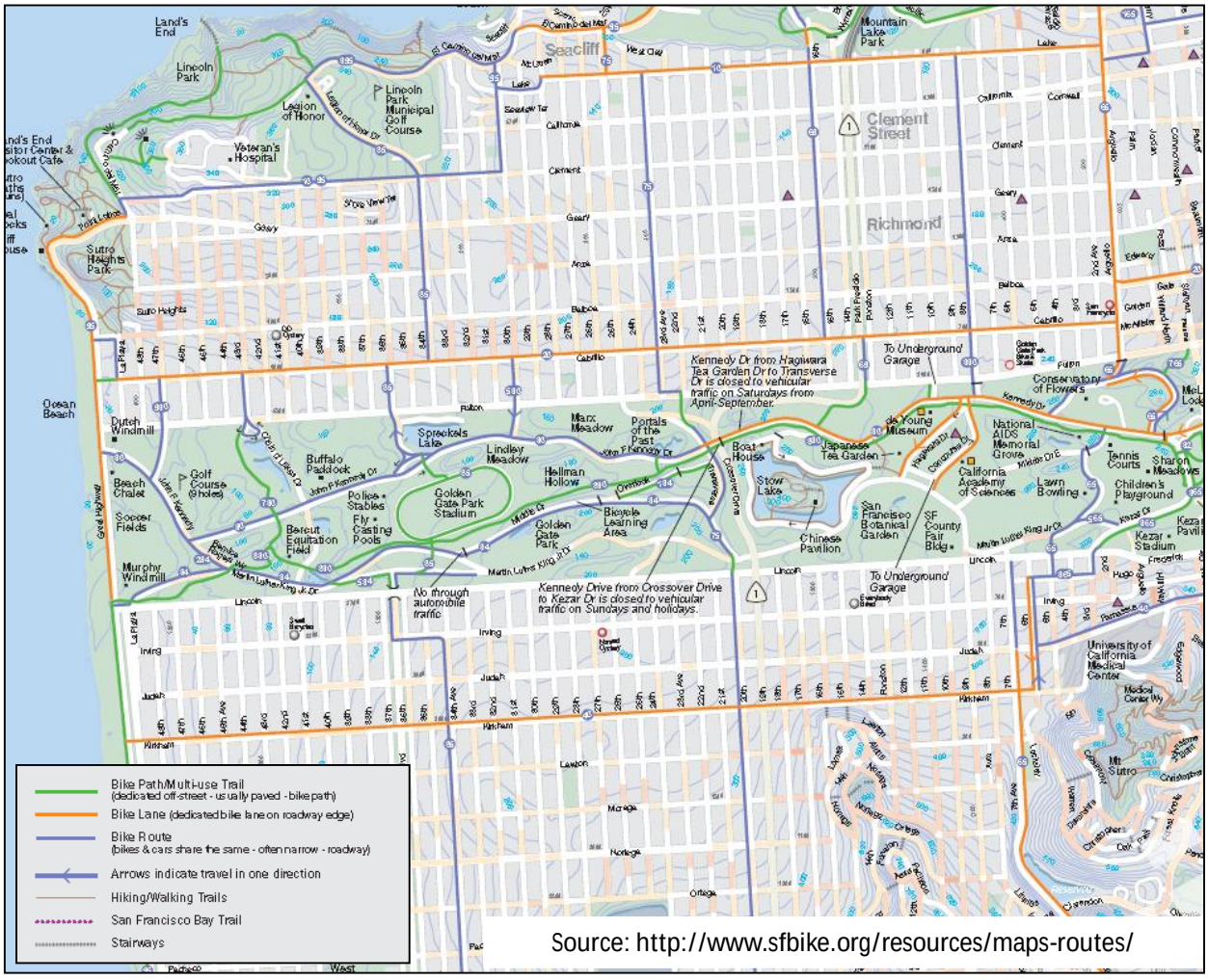
Source: http://www.ci.berkeley.ca.us/uploadedFiles/Public_Works/Level_3_-_General/Bikeway_Network.pdf

Figure 2: Berkeley Bikeways

3.1.2 San Francisco, CA

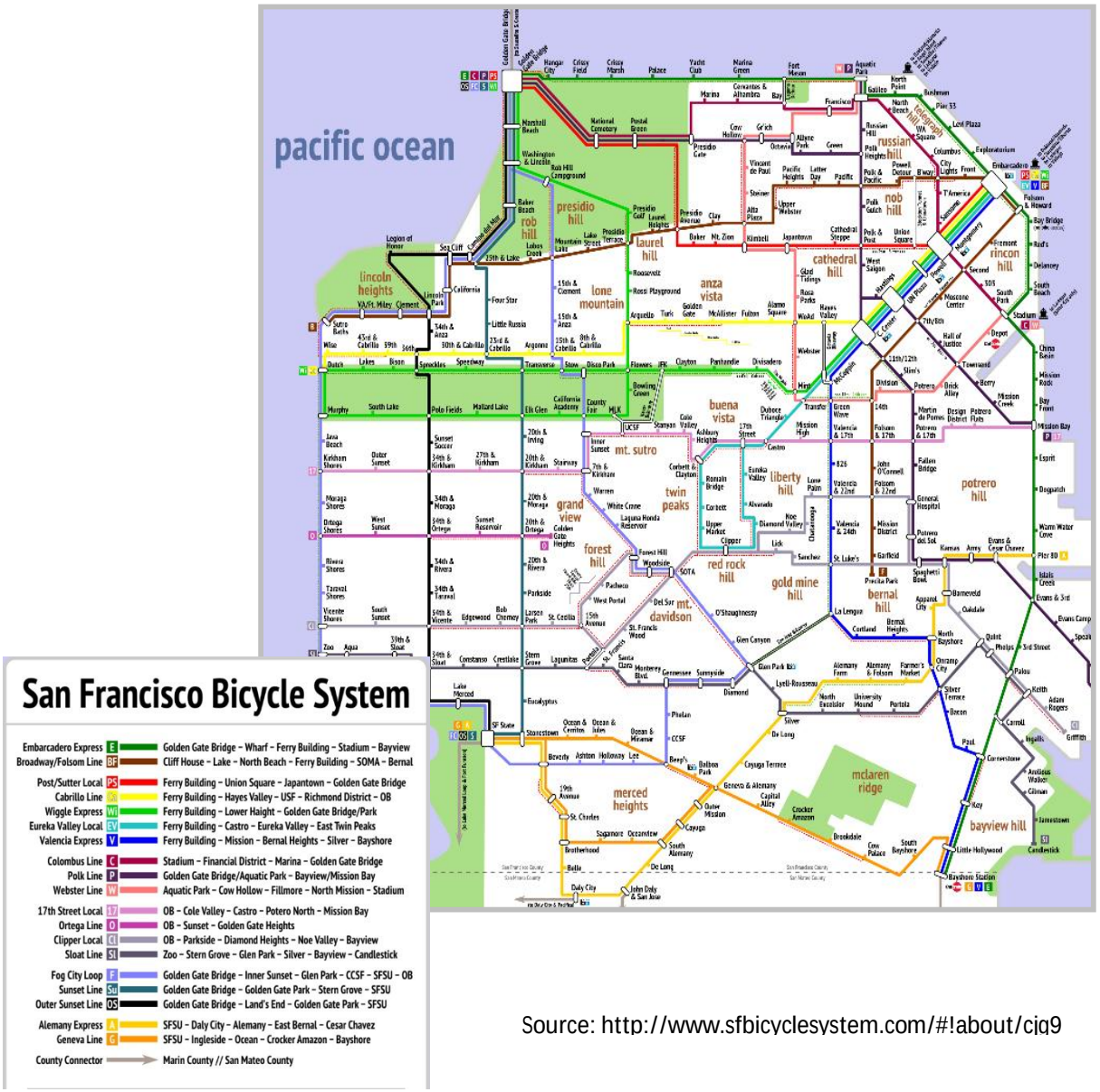
San Francisco's bicycle route system is similar to the USBRS and Miami-Dade County's numbering system where north-south routes are assigned odd numbers in increasing order from east to west, and east-west routes are assigned even numbers increasing from north to south. A zoom in of the northwest corner of the city's map is provided below. As can be seen in Figure 3, designated bike routes include various types of facilities.

In addition to a numbered bicycle route system, San Francisco has also developed a designation system that resembles a transit map (see Figure 4 on the following page). Routes, or 'lines' are identified by color and typically a letter that relates to the route's destination or location. This map provides users with a bicycle route system that is simpler and more familiar to the general public. In addition to the line's color and naming, the system map also provides key attractions or destinations along the route to help users get a better sense of where they're going – much like a transit route would list the different stations.



Source: http://www.sfbike.org/resources/maps-routes/

Figure 3: San Francisco Numbered Bicycle System



Source: http://www.sfbicyclesystem.com/#!about/ciq9

Figure 4: San Francisco Bicycle System

3.1.3 Denver, CO

Denver's bicycle route system uses a combination of names and numbers to identify routes. A numbering convention similar to the USBRS is used for the "grid" network: odd numbers are used to designate north-south routes in ascending order from west to east, and even numbers are used for east-west routes in ascending order from north to south. The grid routes make use of sidewalks, Sharrows, bike lanes, and short sections of off-street multi-use trails in addition to designated bike routes. It should be noted, however, that the current grid system does not leave room for expansion: consecutive numbers are used and there are no gaps in the event a new route is added. However, the system appears to be quite mature and the necessity for new corridors is likely low.

Off-street multi-use trails not following the grid system are named based on geographic location. These routes often follow rivers, streams, lakes, or are in parks. Examples include Cherry Creek Trail, Platte River Trail, and Sand Creek Greenway.

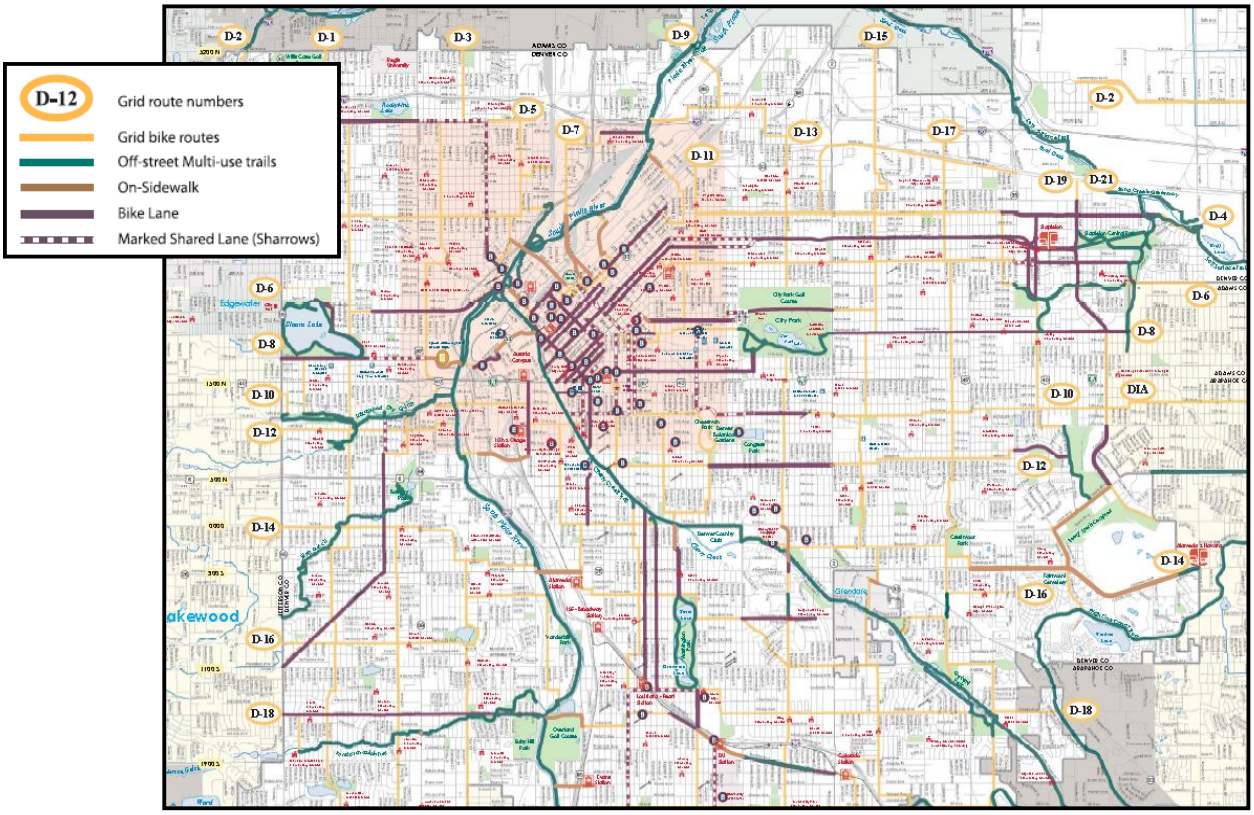


Figure 5: Denver Bicycle Route System

3.2 Bicycle Route Numbering Systems in Europe

Bicycle route numbering in Europe differs from country to country. In Italy, the national numbered bike system assigns numbers 1-6 for routes that are primarily north-south in ascending order from west to east, and numbers 7-10 are for primarily east-west routes in ascending order from north to south. A map of the Italian bicycle network is shown Figure 6. Other countries have less defined numbering systems.

Figure 6: Italy's Bicycle Route System

The Netherlands has a unique system, comprised of approximately 50 numbered regional bicycle networks. Each regional network is set up as a grid of scenic routes that are connected by numbers. The numbers represent junction points in the network. Therefore, a bicycle route depends on origin and destination, and is comprised as a series of numbers that define the route to be travelled.

4 Bicycle Wayfinding Signage

Bicycle wayfinding encompasses various types of signage that provide information useful for bicyclists to navigate an area or bicycle network. Signs may provide information about the existence of a bicycle route, directions to other routes or attractions, and distances to various key locations and routes. In addition to signs, pavement markings may be used to identify routes and provide some directional guidance.

4.1 Manual on Uniform Traffic Control Devices (MUTCD)

The MUTCD provides standards for wayfinding signage and markings related to bicycle facilities. These standards dictate placement regulations (vertical and horizontal clearance requirements), guide sign layout, and pavement marking dimensions. MUTCD regulations should be followed when implementing bicycle signage. However, jurisdictions may petition FHWA (MUTCD's governing body) for use of experimental signage.

4.1.1 Types of Signs

The MUTCD provides identification signs (M1 series) for bicycle route designation as shown in Figure 7. The M1-8 sign may be modified to include a pictograph or words specific to the jurisdiction or region in which it is located. There is also a bicycle route plaque specific to US numbered bicycle routes (M1-9). The M1-8 / M1-8a and M1-9 signs may be used in conjunction with supplemental auxiliary (M-series) plaques, which provide additional information such as direction (see Figure 8).

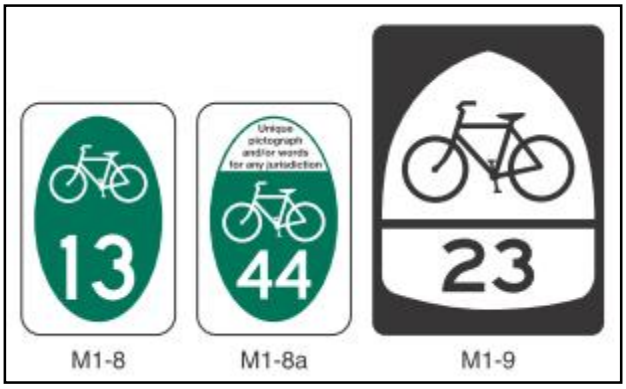


Figure 7: MUTCD Bicycle Route Markers

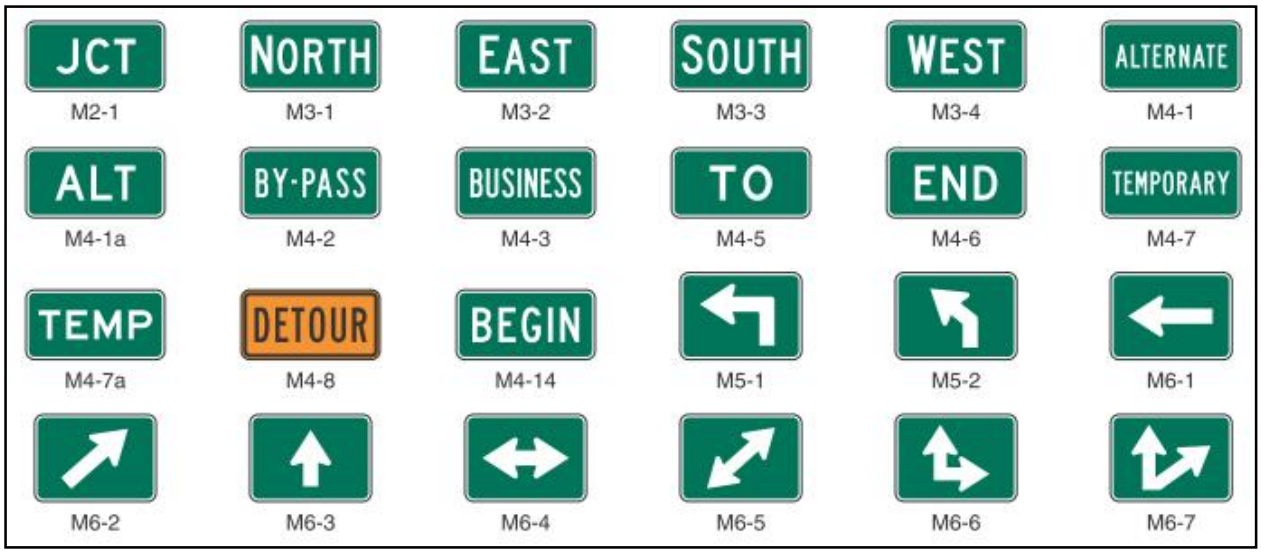


Figure 8: MUTCD Supplemental Route Signs

Guide signs (D series) are also provided in the MUTCD and typically provide destination, directional, and distance information. These are displayed in Figure 9.

Bicycle Route Guide (D11-1 series) may be used where no specific bicycle route designation (bicycle route number) is desired. In addition to destination and/or direction, the Alternative Bike Route Guide (D11-1c) may be used to provide bicycle route name. This may be particularly useful for routes that are not designated with a letter or a number.

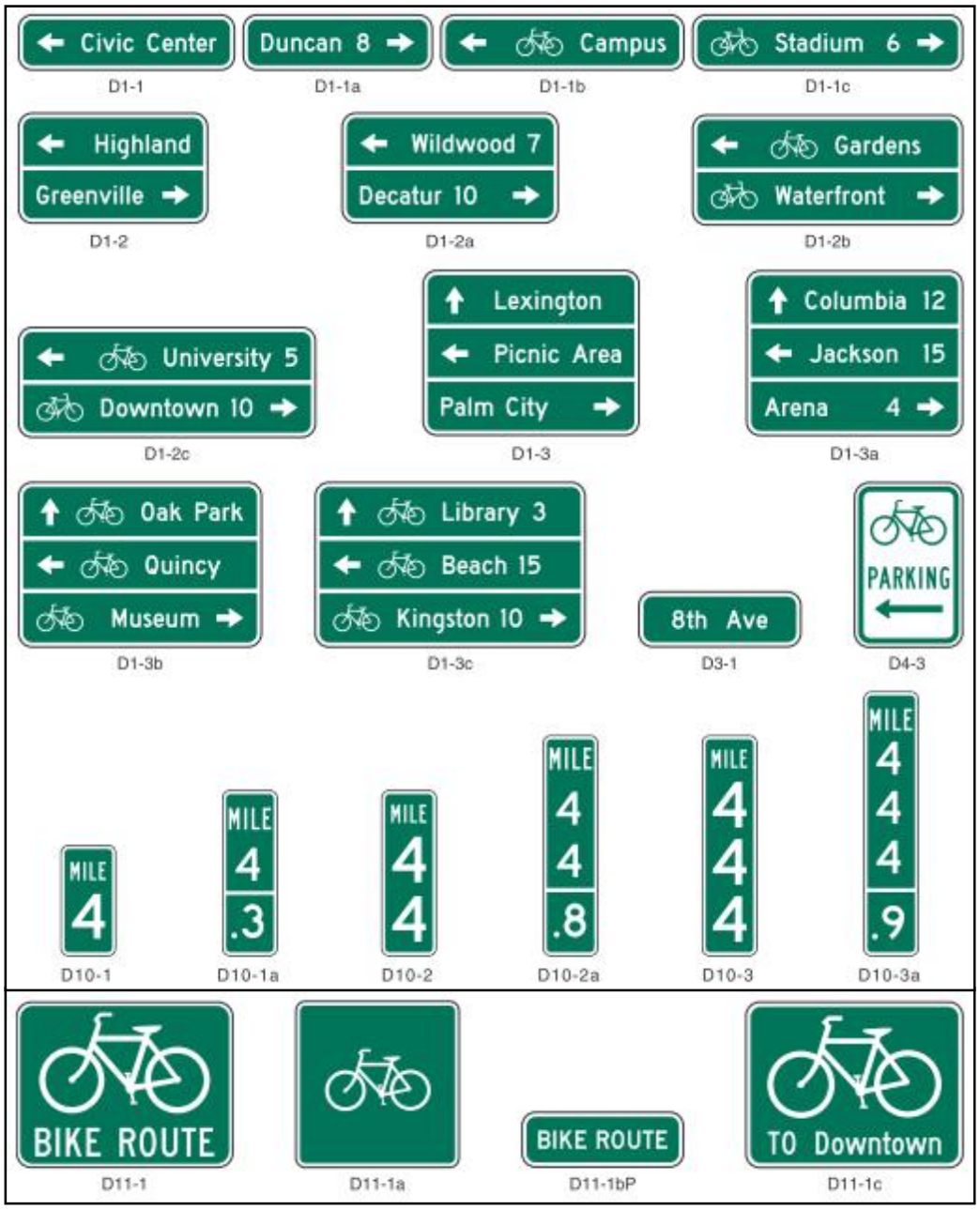


Figure 9: MUTCD D-Series Guide Signs

4.1.2 Sign Placement

Bicycle route signage should be placed at frequent enough intervals to keep bicyclist informed of changes in route direction and to remind motorists of the presence of bicyclists. There is also guidance with regards to placement in relation to regulatory signs such as Stop signs (R1-1), to ensure that visibility is not affected.

Junction (M-2-1), Cardinal Direction (M3 series), and Alternative Route (M4 series) auxiliary plaques should be placed above the bicycle route signs. Advance Turn (M5 series) and Directional Arrow (M6 series), when used, should be placed below bicycle route signs.

4.2 National City Transportation Officials (NACTO)

NACTO classifies bicycle wayfinding signs into three types: confirmation signs, turn signs, and decision signs. A confirmation sign provides indication and identification of a designated bicycle route. Turn signs (directional signs) indicate where a bicycle route turns from one street onto another, and often include destination arrows and distances. Decision signs mark the junction of two or more routes and may provide destinations, arrows, and distances.

NACTO identifies features that are required by the MUTCD, some of which are summarized above. They also provide recommended and optional features.

4.2.1 Recommended Features

NACTO provides recommendations with regards to both placement and type of information that should be provided.

It is recommended that decision and turn signs should be placed at near-side of intersections. Confirmation sings should be placed every quarter to half mile for off-road facilities, and every two to three blocks for on-street facilities. Furthermore, confirmation signs should be placed after a turn and on the far-side of intersections with major streets.

Signage should include destination, arrows, and distances. If travel time is provided, this should be based on a 10 mile per hour bicycle speed. When providing several destinations, the nearest destination should be placed on top and additional destinations should be listed below, in ascending order by distance.

4.2.2 Optional Features

Route numbering systems may be used, but are not required for designated bicycle systems. Street name signs may be redesigned to identify the street a bicycle route. An example from Berkeley, CA is provided in Figure 10.

Figure 10: Bicycle Boulevard Street Signs

In addition to bicycle route signs and bicycle guide signs identified in the MUTC, a municipality may chose to provide bicycle route map signs for additional wayfinding. Furthermore, wayfinding signs may be placed on 'feeder' streets between bicycle routes and nearby

destination to help users make their way onto the network. Lastly, pavement markings may be used to reinforce routes and directional signage.

4.3 Bicycle Wayfinding in US Cities

Berkeley, CA

The city of Berkeley has four types of bicycle boulevard signs, as seen in Figure 11. Type 1 signs are further split into four categories: 1A, 1B, 1C, and 1D. All bicycle boulevard signs are purple, and standard sizes are assigned for each.

- *Type 1A* signs let users known they are on a bicycle route.
- *Type 1B* signs provide destination and distance information to bicyclist *along* the route.
- *Type 1C* signs provide destination and distance information to bicyclists at crossings *between* routes.
- *Type 1D* signs provide route guidance at locations where the route changes direction or street.
- *Type 2* signs are off-route wayfinding signs that direct users onto the bicycle route network.
- *Type 3* signs are typical street signs that include the Bicycle Boulevard symbol, identifying the street as part of the bicycle route network.
- *Type 4* signs are advance street notification signs, meant to notify motorists that they are approaching or crossing a designated bicycle boulevard.

Figure 11: Berkeley Bicycle Wayfinding Signs

4.4 Miami-Dade Numbered Bicycle Route System

Established in the late 1970s and early 1980s, Miami-Dade County's bicycle route numbering system also uses odd numbers to designate north-south routes and even numbers for east-west routes. Initially, bike routes were numbered in ascending order from north to south and east to west. However, the system was not set up to account for the addition of future routes and has since reached limitations in the order, resulting in routes being assigned numbers in chronological order rather than keeping a geographic sequential numbering system.

Today, Miami-Dade County has approximately 30 numbered bicycle routes and three bicycle routes that are assigned a letter (see Figure 12).

Miami-Dade's bicycle route designation system is facility-based, meaning route numbers are assigned only when a bicycle facility is made available and a route designation request is received by Miami-Dade County Public Work Department.

Figure 12: Miami-Dade County Numbered Bicycle System

A description of all numbered bicycle routes, as of March 2015, is provided in Appendix A. A map series depicting each route can be found in Appendix B.

4.5 Bicycle Wayfinding in Europe

Many European countries, such as Switzerland, Belgium, Ireland, and the Netherlands, use bicycle routes signs that provide destination, direction, and distance. As displayed in Figure 13, these are similar to the D1-series Bicycle Route Guide signs provided in the MUTCD.

Figure 13: Bicycle Routes Signs in the Netherlands

The Netherlands has a unique bicycle route numbering system that provides numbers to junctions between routes rather than the routes themselves. Therefore, in addition to the wayfinding signs discussed above, the Netherlands has wayfinding signs that direct users to junctions. At each junction, a map or information board is often provided to let cyclists know where they are. Examples of these are provided in Figure 14.

Figure 14: Bicycle Route Junction Signs in the Netherlands

Source: http://www.holland-cycling.com/tips-and-info/finding-your-way/numbered-cycle-network

5 Limitations of Existing System

The existing Miami-Dade County Bicycle Route system follows the commonly used convention which assigns even numbers to east-west routes and odd numbers to north-south routes. However, the system assigns route numbers as facilities become available rather than reserving designations for future facilities. This facility-based designation has a few limitations:

- Designation follows north-south/east-west numbering convention, but route numbers are assigned chronologically rather than geographically;
- Designation is provided only to facilities, upon request;
- Route numbers are assigned and limited to existing facilities.

5.1 Limitations of Chronological Numbering

Assigning route numbers chronologically has some organizational advantages when considering the administrative aspect of bicycle route numbering system because it does not require advance planning. However, assigning bicycle route numbers in chronological order does not result in an intuitive system for users. Users are not concerned with which route number was assigned first, but would benefit more if a route number provided some geographic reference in comparison to other routes or relative location within Miami-Dade County.

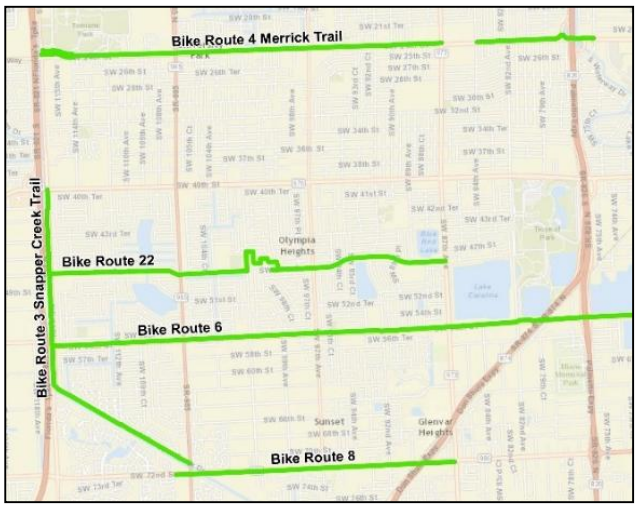


Figure 15: Example of Chronological Numbering

An example of the confusion that can result from a chronological numbering system is provided in Figure 15. As can be seen, Route 4, 6, and 8 are in ascending order from north to south. However, more recently designated routes, such as Route 22, is not consistent with this geographic pattern.

5.2 Limitations of Facility-Based Designation System

Bicycle route numbers are only assigned to existing bicycle facilities upon request. As a result, several facilities provided in Miami-Dade County are not designated bicycle routes. Furthermore, designated bicycle routes are limited to the extent of the facility. However, trips are not dictated by existing facilities, and have origins and destinations beyond the limits of existing facilities. Therefore, facility-based route designation does not adequately serve the would-be users of a complete numbered bicycle system and does not serve users for trip-planning purposes.

One of the outcomes of designating bicycle route numbers only to existing facilities upon request, is that the northern half of Miami-Dade County has gaps in the bicycle numbered route system despite the fact

bicycling does occur. Examples of such discrepancies are provided below. Figure 16 and Figure 17 compare the existing bicycle numbered system to Strava® data that displays actual bicycle use.

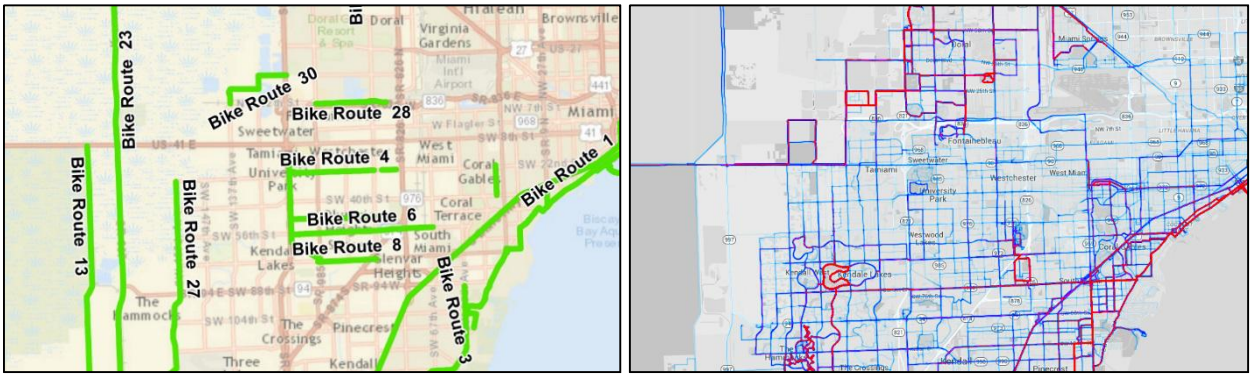


Figure 16: Numbered Bicycle Routes compared to Bicycling Activity (Central Miami-Dade County)

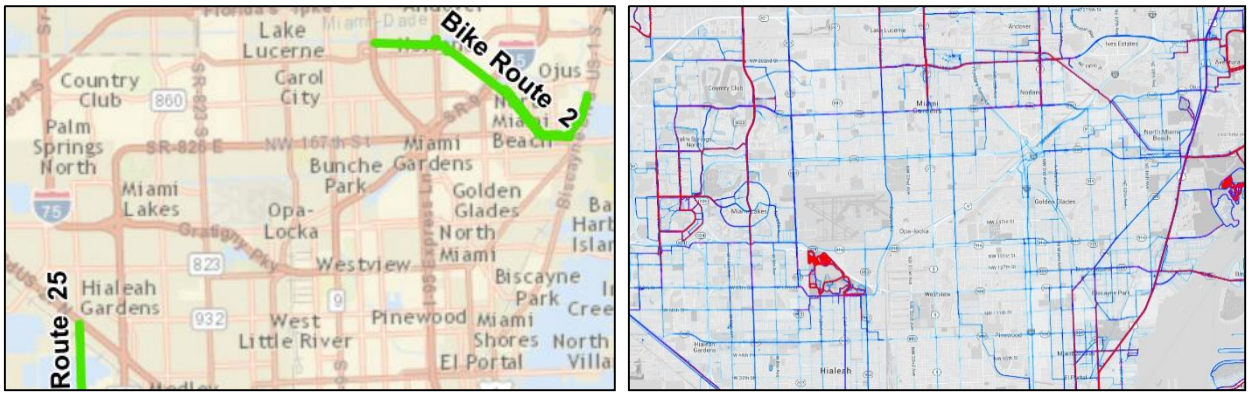


Figure 17: Numbered Bicycle Routes compared to Bicycling Activity (Northern Miami-Dade County)

Although designated bicycle routes tend to correlate to high bicycle traffic in the Strava® data, they are not always the highest used corridors. It should be noted that Strava® users are generally more experienced in-road riders, and therefore the data collected through the Strava® Application is not representative of all bicycle ridership patterns. Neverless, a county-wide numbered bicycle route system should aim to serve both experienced and recreational riders.

6 Guidelines for a Countywide Bicycle Route System

The proposed Miami-Dade County Bicycle Route System is a trip-based system, rather than the facility-based system that currently exists. This means that routes will extend along corridors and will not be restricted to the limits of an existing bicycle facility. It is recommended that corridors be designated preliminary route numbers regardless of the presence of an existing facility, so as to reserve bicycle route numbers for the future and to ensure that the bicycle route system is able to maintain a geographic organization. This will further help users with orientation and trip planning throughout the County. A map depicting the primary routes of a proposed bicycle route system is provided in Figure 18, on page 20. The map shows potential major north-south routes (pink) and major east-west routes (blue), with the existing Miami-Dade County designated routes overlaid on top (green). The map is intended to depict a complete network that provides countywide connections rather than recommend specific routes.

6.1 Route Numbering

The proposed Miami-Dade County Bicycle Route Numbering System will use similar convention as the systems reviewed previously in the report: odd numbers will be used to designated north-south routes, and even numbers used to designate east-west routes. Additionally, letters should be used to designate routes along major and widely recognized facilities.

The Miami-Dade Bicycle Route System should be composed of major and minor routes, similar to the way that roadway networks are set up with arterials and collector roadways. Major routes should be designated and planned in advance to ensure that the system maintains a geographic numbering system. Minor routes can be implemented and assigned as facilities are planned or become available.

6.1.1 Odd Numbered Bicycle Routes

Odd numbered routes should be assigned for north-south routes in ascending order from east to west. 'Major' corridors should be spaced approximately 3 miles apart and should be assigned number designations ending in '5'. For example, NE 2nd Avenue may be designated as Route Number 5, and SW 217th Avenue may be designated as Route Number 95. It is recommended that route numbers be designated or reserved for 'major' corridors to ensure that proper geographic route assignment will be provided in the future. Furthermore, currently designated routes that have high bicycle traffic and are thoroughly signed already, such as Bicycle Route 1, should maintain their designation as long as they conform to the proposed geographic orientation.

6.1.2 Even Numbered Bicycle Routes

Even numbers should be assigned to routes and corridors that are primarily oriented east-west, in ascending order from north to south. Route numbers that are multiples of '10' should be used to designate 'major' east-west corridors. These should be spaced approximately every 5 miles. 'Major' route designations should be reserved for specific corridors to ensure that the system maintains a geographically consistent numbering convention. Well recognized and highly trafficked numbered bicycle routes that fit into the described geographic convention, such as Route 2 in North Miami Beach, should maintain their existing designation.

6.1.3 Lettered Bicycle Routes

The existing bicycle route numbering system also includes lettered bicycle routes. These routes are highly used and recognized by the cycling, and in some cases recreational, community. It is recommended that the routes that are currently designated with letters continue to use their designation. Additionally, if future routes follow facilities or roadways that would be highly recognizable as letter, they should also be assigned a letter.

Some examples of existing lettered bicycle routes include:

- Bike Route M – (M-Path) following the Metrorail
- Bike Route V – Venetian Causeway
- Bike Route K – Krome Avenue (formerly Bike Route 23)

Other routes that could potentially be assigned a letter include:

- Bike Route R – Rickenbacker Causeway (currently Bike Route 11 – Commodore Trail)
- Bike Route A – State Road A1A From the MacArthur Causeway to Golden Beach. May Include Atlantic Trail in Miami Beach as a part of it.

6.1.4 Alternate Routes and Spurs

Alternate route and spur designations should be used for short segments of facilities that connect to an existing route. It is recommended that alternate route and spur designation be reserved for facilities and routes that are greater than 0.5 miles in length, as any distance shorter can be served using wayfinding measures.

6.1.4.1 Alternate Routes

Alternate routes are routes or facilities that are primarily parallel to an existing designated route. To be designated as an alternate route, at least one of the following conditions should be met:

- The route/facility connects with an existing route at both ends;
- The route/facility connects with an existing facility at one end, and deviates by no more than 0.5 miles from the existing designated route;
- The route/facility connects with an existing facility at one end, and deviates by more than 0.5 miles from the existing designated route, but no appropriate designation number is available.

A route or facility that meets the above criteria should be classified using alpha-numeric designation. For example, an alternate route to Route 2 may be designated as Route 2(a). If a route has multiple alternates, it is recommended that alternate designation be assigned in the order in which they are recognized as designated routes.

6.1.4.2 Spurs

Spurs are routes or facilities that are primarily perpendicular to an existing designated route. To be designated as an alternate route, there must not be an appropriate designation number available (perpendicular routes nearby are already designated consecutive route numbers).

A route or facility that meets the above criteria should be classified as a spur using alpha-numeric designation using the letter "s". For example, a spur to Route 5 may be designated as Route 5(s).

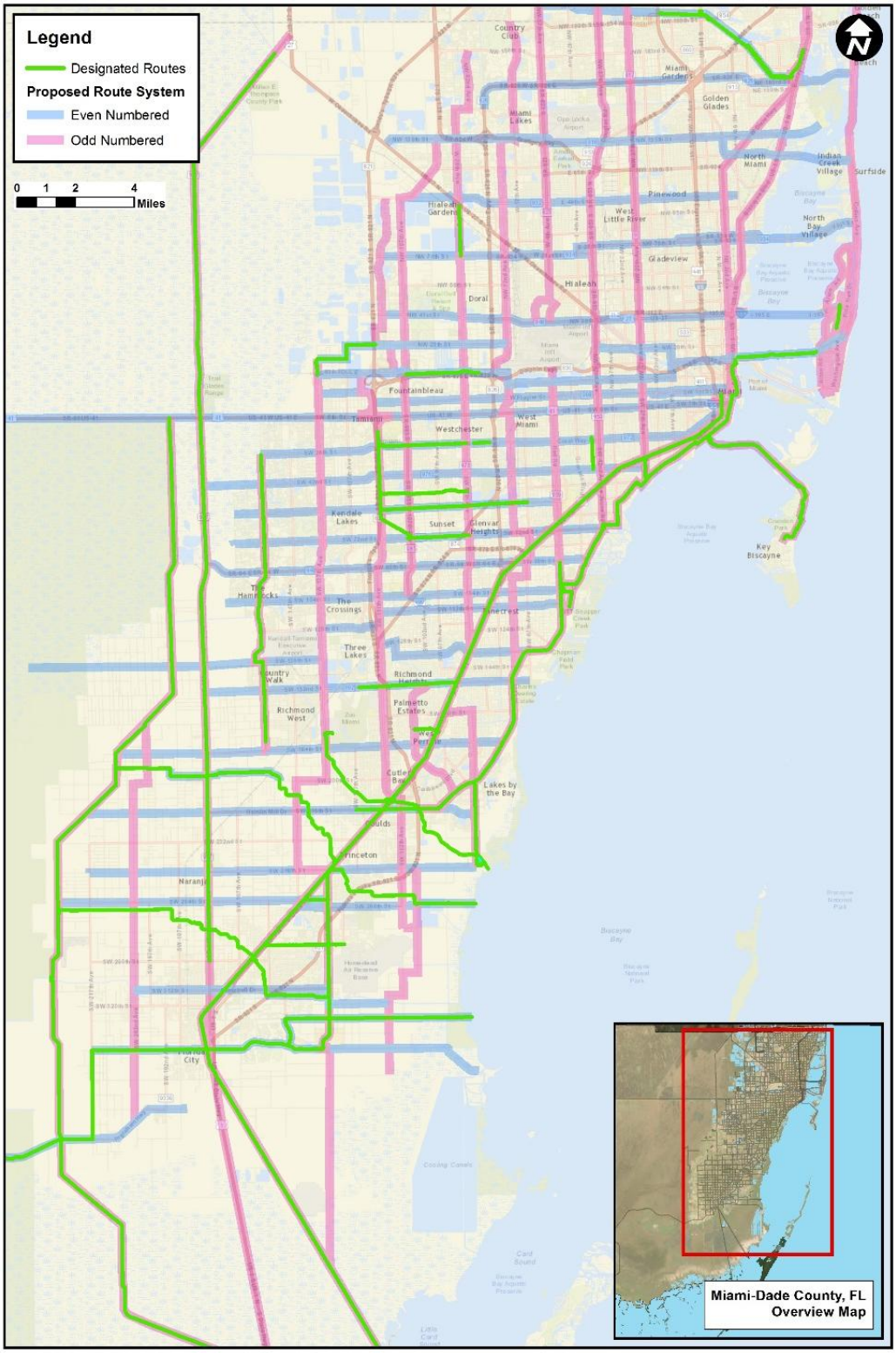


Figure 18: Potential Bicycle Route System (Major Routes)

6.2 Bicycle Wayfinding

Bicycle wayfinding signage is a crucial aspect of a bicycle network. The intent of signage is primarily to provide bicycle users with information regarding location of key destinations. Destinations should include other facilities as well as city centers, landmarks, and major public attractions. Some examples of destinations that should be included in the bicycle wayfinding system are provided below. The distance at which a destination becomes relevant for signage varies depending on the nature of the destination, as well as whether the sign is to be located on-route or off-route. On-route signage should provide destination information further out than off-route signage. Furthermore, the environment in which the sign is located, such as urban or rural, will have an impact on distance and spacing of signage. Destinations are classified into three categories based on how far signage should be provided: nearby (less than 2 miles, or about 15-minute bicycle ride), medium (up to 5 miles, or a 30-minute ride), and far (greater than 5 miles, or more than 30 minutes).

	Nearby (≤ 15 minutes)	Medium (15-30 minutes)	Far (> 30 minutes)
Downtowns			
Transit Stations			
Regional Parks			
Local Parks			
Entertainment			
Key Neighborhoods			
Universities			
Government Buildings			
Other Routes			
End of Line Destination	As Needed / As Applicable		

Wayfinding to *downtowns* may vary depending on the size of the municipality, as well as whether the route passes through or near the downtown area of the municipality. Key municipalities should be signed further out, examples of these may include but are not limited to: the City of Miami, Miami Beach, and Homestead.

Wayfinding to *transit stations* should primarily be located along routes, and should be geared towards Tri-Rail, Metrorail, and Metromover stations – though in the future this may also include the All-Aboard Florida Station, and Bus Rapid Transit (BRT) stations.

Wayfinding to *regional and local parks* may be placed both on- and off-route depending on proximity to the park.

Entertainment venues include sporting arenas, zoos, museums, and other amusement or themed parks.

Wayfinding to *key neighborhoods* such as Wynwood, Midtown, and South Beach should be provided both on- and off-route.

End of line destinations should be signed along respective routes.

Wayfinding signs should not be limited to bicycle routes only. Bicycle wayfinding should also be placed at major destinations, transit stations, and bicycle parking stations (such as City Bike® stations), and should direct pedestrians and bicyclists to nearby bicycle routes and attractions. Signs placed off bicycle routes will be different in nature, and may be more similar to pedestrian wayfinding signs.

As recommended in the NACTO guidelines, three types of signs are necessary for bicycle wayfinding: (1) confirmation signs, (2) turn signs, and (3) decision signs. The following sections provide a description of the purpose for each sign, as well as guidelines for placement and use. While the following guidelines provide placement guidelines for signs, the exact placement should take into consideration facility type and other roadway signage in the immediate vicinity to avoid sign clutter that could be confusing to all road users.

6.2.1 Confirmation Signs

M1-8 D11-1c

Confirmation signs are verification that the cyclist/user is on a specific route, or heading towards a specific destination, and should be used to let users know to continue along their existing route in order to reach a destination. A confirmation sign may be a route marker that identifies a facility as a bicycle route, such as the MUTCD M1-8 series. Confirmation signs may also provide destinations, such as the D11-1 series from the MUTCD. Confirmation signs may also include distances for specific destinations.

Confirmation signs should be placed after a turn, and at the far side of an intersection with a major street or intersection with another bicycle route. Along a route, confirmation signs should be placed at regular intervals, depending on urban context: every ¼ mile to 1 mile for suburban areas, every 2-3 city blocks for dense urban cores.

6.2.2 Turn Signs

Turn signs differ from confirmation signs in that they let users know when they need to change direction of travel to reach a destination. Turn signs may be used when a route changes from one roadway to another, or when a user needs to turn off a route to reach a destination or to reach an alternate route or spur. Turn signs are often D1-1 series signs from the MUTCD (shown to the right) but may also be a combination of the verification signs (M1-8 or D11-1 series) with arrows (such as the M5 and M6 series signs).

Turn signs should be placed approaching a turn, spur, alternate route, or intersection on which a user should turn off a route or facility to reach their destination.

6.2.3 Decision Signs

Decision signs are intended to provide information when two or more potential trips diverge. Signs may include route markers with arrows for routes intersecting current route or nearby routes, and may include distance and/or travel time for destinations that are on or near the current route. Examples of decision signs include the D1-3b and D1-3c series in the MUTCD.

D1-3b D1-3c

Furthermore, decision signs may be at the approach to a route, such as to let users know which way to go for Route 7 North versus Route 7 South. Decision signs may also be used when two or more routes intersect, as well as when two or more co-located routes split. An example of the latter occurring in Miami-Dade County is provided in Figure 19.

Figure 19: Bicycle Route Decision Signs

7 Recommended Pilot Projects

Four pilot projects are identified for implementation. The goal is to select projects that would provide examples of varying types of signage requirements and serve as examples of the types of routes that comprise a complete bicycle route network.

Sunset Drive – a continuous arterial bicycle route corridor.

- High bicycle volume corridor;
- Common characteristics with several other major corridors;
- A template for renaming an already designated bicycle route.

NW 14th Avenue – bicycle boulevard/neighborhood greenway routing and wayfinding.

- This pilot project would provide an example of a bicycle boulevard, a facility type which will make up a significant portion of the Miami-Dade County Bicycle Network;
- The Miami-Dade County Bicycle Boulevard Planning Study: Model City/Brownsville (2009) identified this segment for implementation of a bicycle boulevard.

"The Zig-Zag" – popular bicycle route through a primarily rural environment.

- The 'Zig-Zag' route is popular among cyclists but not currently a designated bicycle route;
- Provides examples of using various road types and turning signs;
- Rural environment for different sign spacing and placement guidelines;
- Showcase for 'alternate route' designation.

Baywalk – wayfinding in an urban core setting.

- Pedestrian wayfinding signage to key destinations and attractions.
- Urban path connecting two major activity centers in the city.

First Mile/Last Mile Signage – wayfinding at transit hubs.

- Helps travel understand the surrounding area.
- Can serve a welcoming function.

In addition to the above projects, a list of other potential routes were identified for future implementation.

- *Pine Tree Drive/La Gorce Drive* – Popular bicycle route along a 2-lane divided roadway that serves the residential neighborhood of Miami Beach.
- *Collins Avenue/Indian Creed Drive/A1A* – popular bicycle route serving the commercial areas of Miami Beach including Miami Beach's historic downtown area.
- *Atlantic Trail* – Shared-use path for recreational users and tourists.

- *NE 2nd Avenue* – Minor Arterial connecting northern residential municipalities to Downtown Miami.
- *Bike Route 14 /Biscayne Trail* - This project would provide an example for renaming an existing bicycle route, as well as how signage can be implemented in both rural and suburban environments
- *SR 916/NW 135th Street* – As a primary east-west route connecting Amelia Earhart Park in Hialeah to North Miami.

7.1 Proposed Bike Route 60: Sunset Drive

7.1.1 Background

Sunset Drive serves as a major east-west corridor for cyclists in south Miami-Dade County. Figure 20 depicts the relatively high volume of Strava® users along Sunset Drive compared to surrounding roadways. The data suggests that this corridor is used as a primary east-west connector between SW 142nd Avenue and Cocoplum Circle.

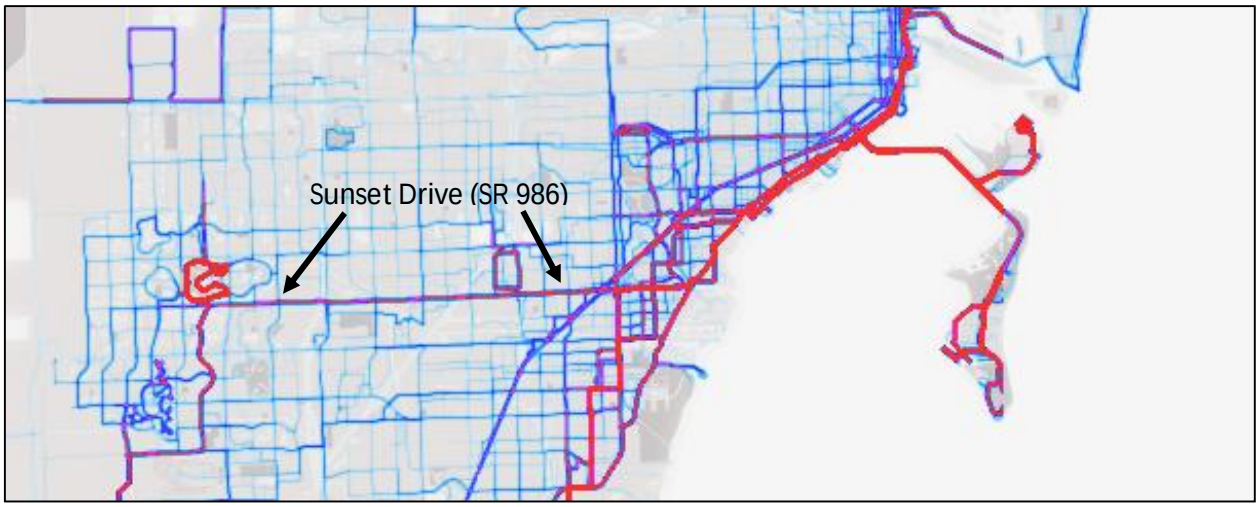


Figure 20: Sunset Drive Strava® Volumes

Historically, bicycle route designation in Miami-Dade County has been limited to existing bicycle facilities. This has resulted in a segmented system with routes that do not extend the entire length of the corridor, and do not reflect the bicycle trips that are being made along such routes/corridors. Sunset Drive is an example of such a corridor, and therefore its selection as a pilot project will aim to provide examples of how such an obstacle can be overcome when designating and signing a route. Sunset Drive is approximately 12.5 miles long from SW 167th Avenue to Cocoplum Circle, of which approximately 10 miles are heavily used by recreational riders (shown in Figure 20). Depicted in green in Figure 21 is the segment that has been designated as Route 8, which extends only as far as the "Green and White" shared use path that was installed between just west of SW 107 Avenue and SW 87 Avenue (approximately 2.1 miles in length).

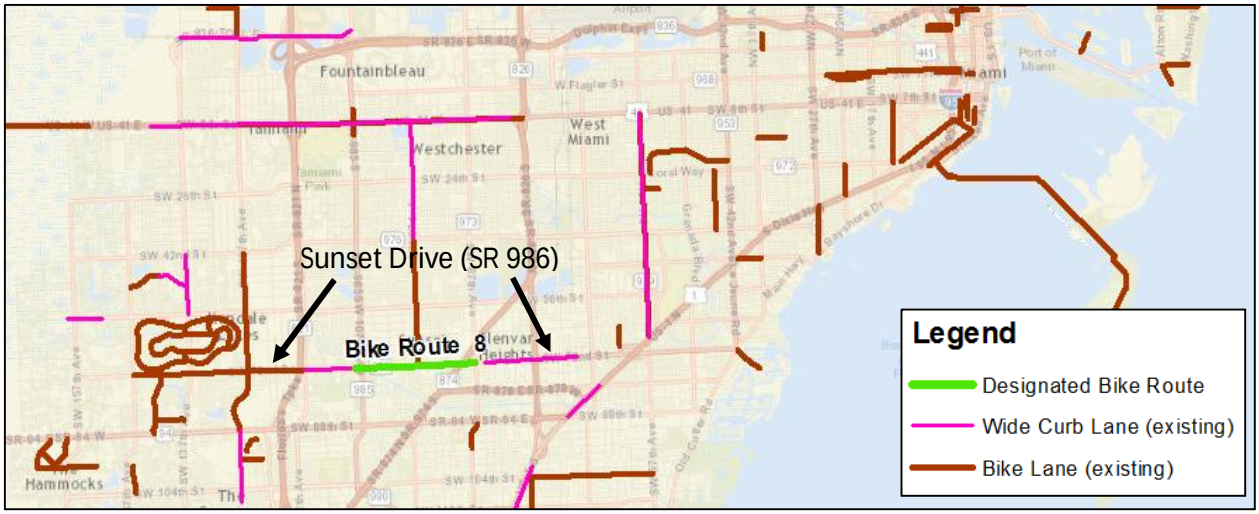


Figure 21: Sunset Drive Bicycle Facilities

Currently, bicycle lanes are provided on Sunset Drive between SW 147th Avenue and SW 118th Avenue, and wide curb lanes are also present along the corridor (Figure 21). As previously discussed, bicycle trips are not limited to the boundaries of available facilities, and therefore it is important that the entire length of Sunset Drive (SW 72nd Street) is designated as a bicycle route. Confirmation and guide signs can be used to indicate to cyclists that although the bicycle facility (in this case, a bicycle lane or the green and white path) has ended, the route continues and additional facilities exist along the corridor. This may aid in making more cyclists feel comfortable along the route, and may even result in additional facilities being planned and funded along the corridor.

Bike Route 8 was designated as a Miami-Dade County bicycle route in 1980. Since then, several other east-west routes have been designated, resulting in a non-consecutive numbering system. Currently, Bike Route 8 is located north of Bike Route 10, but south of Bike Routes 6, 22, 4, and 28. Such a numbering system does not provide a geographic reference to a cyclist who is unfamiliar with the existing system. For a geographically organized bicycle route system, several routes will need to be renamed. Signage is sparse along the short segment of Sunset Drive that is designated as Bike Route 8, which makes this an ideal candidate for transition. It is recommended that, as one of the highest volume east-west corridors in the County, a route number ending in '0' be assigned to signify a major corridor (see Section 6.1 Route Numbering). Sunset Drive is located approximately in the middle of Miami-Dade County, and therefore Bike Route '60' would be a good candidate for designation.

7.1.2 Implementation

The proposed Bike Route 60 will extend from SW 167th Avenue to SW 42nd Avenue. Decision signs, turn signs, and confirmation signs should all be implemented along the corridor. The following tables identify the type and location for guide signs.

Notes:

- Remove all signs for "Bike Route 8".

- All sign assemblies should be placed so that signs are visible to both in-road cyclists and cyclists riding on the sidewalk.
  EXCEPTION: Signs for Route 60 West along the Green and White shared use path (south side of SW 72nd Street) only need to be visible to path users, as there should not be any westbound on-road cyclists on the south side (eastbound lanes) of SW 72nd Street.
- When two sign assemblies are recommended at the same location, the destination sign (D1-3) should be placed upstream of the route signs.
- Spacing of sign assemblies, horizontal and vertical clearances, and exact location of sign posts should follow applicable standards set forth by the MUTCD, FDOT Design Standards, or any other applicable local guidance.

Table 1: Eastbound Signage

Type	Sign / Sign Assembly	Location	Comment
Confirmation	M3-2 / M1-8 (Route 60) / M4-14	Southeast corner of SW 167th Avenue and SW 72nd Street.	
Confirmation	M3-2 / M1-8 (Route 60) / M6-3	Southeast corner of SW 72nd Street and: • All section line roads (SW 157th Ave, SW 147th Ave, SW 137th Ave, etc.), • SW 72nd Street and the Palmetto Expressway northbound ramps, • S Dixie Highway, • And Maynada Street/Ponce De Leon Road.	
Decision (Route)	M3-1 / M1-8 (Route 27) / M6-1(L) M3-2 / M1-8 (Route 60) / M6-3 M3-3 / M1-8 (Route 27) / M6-1(R)	Southwest corner of SW 72nd Street and SW 157th Avenue.	Signs for: • Bike Route 27 (Newton Trail) North and South, • Bike Route 60 (Sunset Drive) East.
Decision (Destination)	D1-3c	Southwest corner of SW 72nd Street and SW 157th Avenue.	Signs for: • South Miami (forward, 10 miles) • The Hammocks (right, 2 miles)
Decision (Destination)	D1-3c	Southwest corner of SW 72nd Street and SW 117th Avenue.	Sign for: • Kendall Indian Hammocks Park (right, 1 mile) • South Miami (forward, 6.5 miles)

Type	Sign / Sign Assembly	Location	Comment
Decision (Route)	M3-1 / M1-8 (Route 3) / M5-1(L) M3-2 / M1-8 (Route 60) / M6-3 M3-3 / M1-8 (Route 3) / M6-1(R)[1]	Midblock on SW 72nd Street between SW 107th Avenue and N Snapper Creek Drive.	Signs for: • Bike Route 3 (Snapper Creek Trail) North, • Bike Route 60 (Sunset Drive) East, • Future1 Bike Route 3 (Snapper Creek Trail) South.
Decision (Route)	M3-1 / M1-8 (Route 3) / M6-1(L) M3-2 / M1-8 (Route 60) / M6-3	On SW 72nd Street, at crosswalk for N Snapper Creek Drive.	Signs for: • Bike Route 3 (Snapper Creek Trail) North, • Bike Route 60 (Sunset Drive) East.
Decision (Destination)	D1-1c (R)	Southwest corner of intersection between SW 72nd Street and SW 72nd Court.	Sign for: • Trinity Pineland County park (right, 0.25 miles)
Decision (Route)	M3-2 / M1-8 (Route 60) / M6-3 M3-3 / M1-8 (Route M) / M6-1(R)	Southwest corner of SW 72nd Street and SW 67th Avenue.	Signs for: • Bike Route M (M-Path) South, • Bike Route 60 (Sunset Drive) East.
Decision (Destination)	D1-3c	Southwest corner of SW 72nd Street and SW 67th Avenue.	Signs for: • South Miami (forward, 0.8 miles) • South Miami Metrorail Station (forward, 0.8 miles) • Dadeland North Metrorail Station (right, 1 mile)
Decision (Route)	M3-1 / M1-8 (Route M) / M6-1(L) M3-2 / M1-8 (Route 60) / M6-3 M3-3 / M1-8 (Route M) / M6-1(R)	Southwest corner of SW 72nd Street and S Dixie Highway.	Signs for: • Bike Route M (M-Path) North and South, • Bike Route 60 (Sunset Drive) East,

[1] Sign to be added when continuation of Snapper Creek Trail south is built.

Type	Sign / Sign Assembly	Location	Comment
Decision (Destination)	D1-3c	Southwest corner of SW 72nd Street and South Dixie Highway.	Signs for: • Downtown Miami (left, 8.5 miles) • South Miami Metrorail Station (left, 0.1 mile) • Homestead (right, 20 miles)
Confirmation	M3-2 / M1-8 (Route 60) / M4-6	South side of roadway approaching Cocoplum Circle.	
Decision (Route)	M3-1 / M1-8 (Route 1) / M5-1 (L) M3-3 / M1-8 (Route 1) / M6-1(R)	South side of roadway approaching Cocoplum Circle.	Signs for: • Bike Route 1 (Old Cutler Trail) North and South.

Table 2: Westbound Signage

Type	Sign / Sign Assembly	Location	Comment
Confirmation	M3-4 / M1-8 (Route 60) / M4-14	North side of roadway, at Cocoplum Circle.	
Confirmation	M3-4 / M1-8 (Route 60) / M6-3	Northwest corner of SW 72nd Street and: • Maynada Street/Ponce De Leon Road, • S Dixie Highway, • Palmetto Expressway southbound ramps, • Section line roads (SW 57th Ave, SW 67th Ave, SW 77th Ave, etc.).	
Decision (Destination)	D1-1c (R)	Northeast corner of SW 72nd Street and Mayanada Street/ Ponce De Leon Road.	Sign for: • University of Miami (right, 1 mile)
Decision (Route)	M3-3 / M1-8 (Route M) / M6-1(R) M3-4 / M1-8 (Route 60) / M6-3	Northeast corner of SW 72nd Street and S Dixie Highway.	Signs for: • Bike Route M (M-Path) North and South,

Type	Sign / Sign Assembly	Location	Comment
	M3-1 / M1-8 (Route M) / M6-1(L)		• Bike Route 60 (Sunset Drive) West.
Decision (Destination)	D1-3c	Northeast corner of SW 72nd Street and South Dixie Highway.	Signs for: • Homestead (left, 20 miles) • South miami Metrorail Station (right, 0.1 mile) • Downtown Miami (right, 8.5 miles)
Decision (Destination)	D1-1c (L)	Southwest corner of intersection between SW 72nd Street and SW 72nd Avenue.	Sign for: • Trinity Pineland County park (left, 0.25 miles)
Turn	M3-4 / M1-8 (Route 60) / M6-1 (L)	Northeast corner of SW 72nd Street and SW 87th Avenue.	Indication for users to use the Green and White shared use path on the south side of SW 72nd Street.
Confirmation	M3-4 / M1-8 (Route 60) / M6-3	Southwest corner of SW 72nd Street and: • Section line roads (SW 87th Ave and SW 97th Ave).	Signage will be on southwest corner while riders use Green and White shared use path on south side of SW 72nd Street.
Decision (Route)	M3-1 / M1-8 (Route 3) / M6-1(R) M3-2 / M1-8 (Route 60) / M6-3 M3-3 / M1-8 (Route 3) / M5-1(L)[1]	At crosswalk for N Snapper Creek Drive	Signs for: • Bike Route 3 (Snapper Creek Trail) North, • Bike Route 60 (Sunset Drive) East, • Bike Route 3 (Snapper Creek Trail) South1.
Decision (Route)	M3-2 / M1-8 (Route 60) / M6-3 M3-3 / M1-8 (Route 3) / M6-1(L)[1]	West of bridge over Snapper Creek Canal	Signs for: • Bike Route 60 (Sunset Drive) East, • Bike Route 3 (Snapper Creek Trail) South1.
Decision (Destination)	D1-3c	Southeast corner of SW 72nd Street and SW 107th Avenue.	Sign for: • Route 27 – Newton Trail (forward, 5 miles) • Kendall Indian Hammocks Park (left, 0.9 miles).

Type	Sign / Sign Assembly	Location	Comment
Turn	M3-4 / M1-8 (Route 60) / M6-1 (R)	Southeast corner of SW 72nd Street and SW 107th Avenue.	Indication for users to use the north side of SW 72nd Street.
Confirmation	M3-4 / M1-8 (Route 60) / M6-3	Northwest corner of SW 72nd Street and: • Section line roads (SW 107th Ave, SW 117th Ave, SW 127th Ave, etc.).	Signage will be on southwest corner while riders use Green and White shared use path on the south side of SW 72nd Street.
Decision (Route)	M3-3 / M1-8 (Route 27) / M6-1(R) M3-4 / M1-8 (Route 60) / M6-3 M3-1 / M1-8 (Route 27) / M6-1(L)	Northeast corner of SW 72nd Street and SW 157th Avenue.	Signs for: • Bike Route 27 (Newton Trail) North and South, • Bike Route 60 (Sunset Drive) West.
Decision (Destination)	D1-1c (L)	Northeast corner of SW 72nd Street and SW 157th Street	Sign for: • The Hammocks (left, 2 miles)
Confirmation	M3-4 / M1-8 (Route 60) / M4-6	Northeast corner of SW 167th Avenue and SW 72nd Street.	

Table 3: Other Signage

Type	Sign / Sign Assembly	Location	Comment
Decision (Route)	M3-2 / M1-8 (Route 60) / M6-1(R) M3-3 / M1-8 (Route 27) / M6-3 M3-4 / M1-8 (Route 60) / M6-1(L)	Northwest corner (for southbound traffic) of SW 72nd Street and SW 157th Avenue.	Signs for: • Bike Route 27 (Newton Trail) South, • Bike Route 60 (Sunset Drive) East and West.
Decision (Route)	M3-4 / M1-8 (Route 60) / M6-1(R) M3-1 / M1-8 (Route 27) / M6-3 M3-2 / M1-8 (Route 60) / M6-1(L)	Southeast corner (for northbound traffic) of SW 72nd Street and SW 157th Avenue.	Signs for: • Bike Route 27 (Newton Trail) North, • Bike Route 60 (Sunset Drive) East and West.
Decision (Route)	M3-2 / M1-8 (Route 60) / M6-1(R) M3-3 / M1-8 (Route 3) / M6-3[1] M3-4 / M1-8 (Route 60) / M5-1(L)	Northwest corner (for southbound traffic) of N Snapper Creek Drive and SW 107th Avenue.	Signs for: • Bike Route 3 (Snapper Creek) South1, • Bike Route 60 (Sunset Drive) East and West.
Decision (Route)	M3-2 / M1-8 (Route 60) / M6-1(R) M3-3 / M1-8 (Route M) / M6-3 M3-4 / M1-8 (Route 60) / M6-1(L)	Northwest corner (for southbound traffic) of S Dixie Highway and SW 72nd Street.	Signs for: • Bike Route M (M-Path) South, • Bike Route 60 (Sunset Drive) East and West.
Decision (Route)	M3-4 / M1-8 (Route 60) / M6-1(R) M3-1 / M1-8 (Route 27) / M6-3 M3-2 / M1-8 (Route 60) / M6-1(L)	Southwest corner (for northbound traffic) of S Dixie Highway and SW 72nd Street.	Signs for: • Bike Route M (M-Path) North, • Bike Route 60 (Sunset Drive) East and West.
Decision (Route)	M3-2 / M1-8 (Route 60) / M6-1(R) M3-3 / M1-8 (Route 1) / M6-3	Old Cutler Road (for southbound traffic), north of Cocoplum Circle.	Signs for: • Bike Route 1 (Old Cutler Trail) South, • Bike Route 60 (Sunset Drive) West.
Decision (Route)	M3-1 / M1-8 (Route 1) / M6-3 M3-3 / M1-8 (Route 60) / M5-1(L)	Old Cutler Road (for northbound traffic), South of Cocoplum Circle.	Signs for: • Bike Route 27 (Newton Trail) North, • Bike Route 60 (Sunset Drive) West.

7.2 Proposed Bike Route '19': NW 14th Avenue – Between Earlington Heights Metrorail Station and Arcola Lakes Park

7.2.1 Background

NW/SW 14th Avenue should serve as a north-south bicycle route in Miami-Dade County. The NW/SW 14th Avenue corridor should be designated bicycle route number such as Bike Route '19' as it is one of the eastern-most north-south corridors in Miami-Dade County (see Section 6.1.1 Odd Numbered Bicycle Routes). Although the designated corridor should follow NW/SW 14th Avenue, the designated bicycle route does not necessarily have to run along this roadway for its entirety– parallel avenues may be used when facility conditions are preferable. For the purpose of this study, a portion of the NW 14th Avenue (Bike Route '19') corridor will be implemented as a bicycle boulevard/neighborhood greenway between Earlington Heights Metrorail Station and Arcola Lakes Park.

NW 14th Avenue was a proposed corridor for a bicycle boulevard in the Miami-Dade County Bicycle Boulevard Planning Study: Model City/Brownsville. Figure 22 shows the corridors identified in the study, with NW 14th Avenue depicted in purple. The proposed bicycle boulevard would run from Little River Drive (north of the Little River Canal) to NW 43rd Street. Corridor 3, shown in red in Figure 22, was designated as an east-west bicycle boulevard between NW 14th Avenue and NW 21st Avenue, and would serve as a connection to the Earlington Heights Metrorail Station.

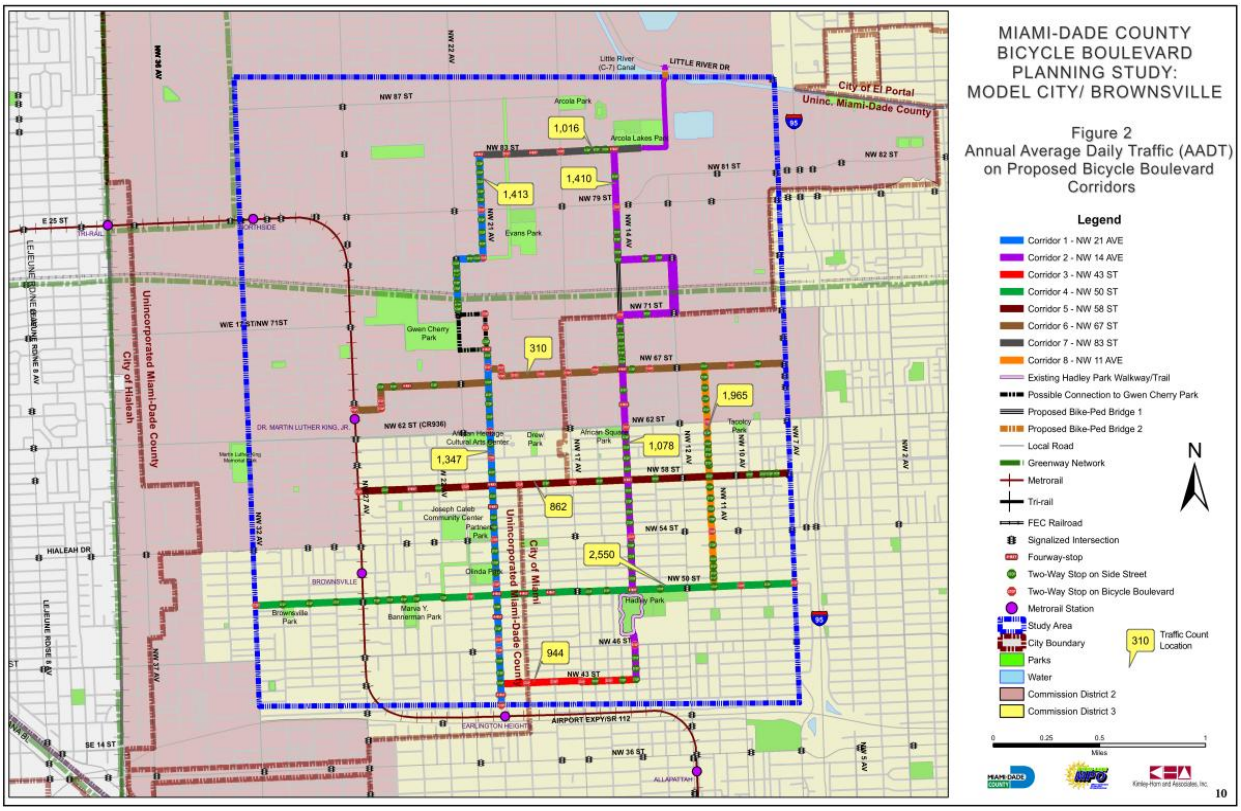


Figure 22: Miami-Dade County Bicycle Boulevard Planning Study: Model City/Brownsville

7.2.2 Implementation

The termini for this project are the intersection of NW 41st Street and NW 21st Avenue, and the intersection of NW 83rd Street and NW 14th Avenue. In addition to confirmation, turning, and decision signs, pavement markings ("sharrows") should be used as a means of confirmation that the user is on a bicycle boulevard/neighborhood greenway. The following tables provide wayfinding improvements along the selected corridor. Additionally, recommendations identified in the Miami-Dade County Bicycle Boulevard Planning Study: Model City/Brownsville should be considered for facility improvements.

Notes:

- All sign assemblies should be placed so that signs are visible to both in-road cyclists and cyclist riding on the sidewalk.
- When two sign assemblies are recommended at the same location, the destination sign (D1-3) should be placed upstream of the route signs.
- Spacing of sign assemblies, horizontal and vertical clearances, and exact location of sign posts should follow applicable standards set forth by the MUTCD, FDOT Design Standards, or any other applicable local guidance.
- Shared lane markings ("sharrows") should be placed immediately after intersections, and approximately every 250 to 300 feet. Green thermal plastic background should also be used to improve visibility. The MUTCD and the ASHTO Guide for Development of Bicycle Facilities should be referenced for more information.

Table 4: Northbound Signage

Type	Sign / Sign Assembly	Location	Comment
Confirmation	M3-1 / M1-8 (Route 19) / M6-3	Northeast corner (for northbound traffic) of NW 21st Avenue and NW 41st Street.	
Confirmation (Destination)	D1-2c	South side (for northbound traffic) of NW 41st Street, across from NW 21st Avenue.	Signs for: • Charles Hadley Park (forward, 1 mile), • Arcola Lakes Park (forward, 3.8 miles).
Turn	M3-1 / M1-8 (Route 19) / M6-1(R)	Southeast corner (for northbound traffic) of NW 21st Avenue and NW 43rd Street.	Sign for: • Bike Route 19 North.
Confirmation (Destination)	D1-2c	Southwest corner (for eastbound traffic) of NW 43rd Street and NW 17th Avenue.	Signs for: • Charles Hadley Park (forward, 0.5 miles), • Arcola Lakes Park (forward, 3.3 miles).
Confirmation	M3-1 / M1-8 (Route 19) / M6-3	Southeast corner (for eastbound traffic) of NW 43rd Street and NW 17th Avenue.	Intersection improvements need to be provided for crossing of NW 17th Avenue at this intersection.
Turn	M3-1 / M1-8 (Route 19) / M6-1(L) D1-2c	Southwest corner (for eastbound traffic) of NW 43rd Street and NW 14th Avenue.	Sign for: • Bike Route 19 North, • Charles Hadley Park (left, 0.2 miles), • Arcola Lakes Park (left, 3 miles).
Confirmation	M3-3 / M1-8 (Route 19) / M6-3	Southeast corner (for northbound traffic), of NW 14th Avenue and NW 47th Street.	Directing users into Charles Hadley Park. Currently, only a goat path exists to serve entrance. This path should be paved for continuity. The Miami-Dade County Bicycle Boulevard Planning Study: Model City/Brownsville recommends an intersection improvement at NW 51st Street and NW 14th Avenue.

Type	Sign / Sign Assembly	Location	Comment
Confirmation	M3-1 / M1-8 (Route 19) / M6-3	North end of Charles Hadley Park (for northbound traffic, south of NW 50th Street.	
Decision (Destination)	D1-3c	Southeast corner of NW 14th Avenue and NW 54th Street.	Signs for: • Brownville Metrorail Station (left, 1.4 miles), • Arcola Lakes Park (forward, 2.5 miles).
Confirmation	M3-1 / M1-8 (Route 19) / M6-3	Northeast corner (for northbound traffic) of NW 14th Avenue and NW 54th Street.	
Decision (Destination)	D1-3c	Southeast corner of NW 14th Avenue and NW 62nd Street.	Signs for: • Martin Luther King Jr. Plaza Metrorail Station (left, 1.3 miles), • Arcola Lakes Park (forward, 1.8 miles).
Confirmation	M3-1 / M1-8 (Route 19) / M6-3	Northeast corner (for northbound traffic) of NW 14th Avenue and NW 62nd Street.	The Miami-Dade County Bicycle Boulevard Planning Study: Model City/Brownsville calls for elimination of left-turn lanes on NW 62nd Street, installation of a crosswalk with a pedestrian refuge, and the use of RRFBs to aid bicycle and pedestrian crossings at this intersection.
Decision (Destination)	D1-3c	Southeast corner (for northbound traffic) of NW 14th Avenue and NW 71st Street.	Signs for: • Gwen Cherry Park (left,, 0.8 miles), • Arcola Lakes Park (right, 1.2 miles).
Turn[2]	M3-1 / M1-8 (Route 19[2]) / M6-1(R)	Southeast corner (for northbound traffic) of NW 14th Avenue and NW 71st Street.	Sign for: • Bike Route 19[2] South.

[2] Route 19 turns onto NW 71st Street and uses NW 12th Avenue to cross over the FEC Railroad. This route will be renamed Route 19a if/when a pedestrian bridge over the FEC Railroad is provided at NW 14th Avenue. Route 19 will then continue south on NW 14th Avenue, and the assembly will be modified to provide Decision (Route) signs

Type	Sign / Sign Assembly	Location	Comment
Turn[2]	M3-1 / M1-8 (Route 19[2]) / M6-1(L)	Southwest corner (for eastbound traffic) of NW 71st Street and NW 12th Avenue.	Sign for: • Bike Route 19[2] South.
Turn[2]	M3-1 / M1-8 (Route 19[2]) / M6-1(L)	Southeast corner (for northbound traffic) of NW 12th Avenue and NW 75th Street.	Sign for: • Bike Route 19[2] South.
Turn[2]	M3-1 / M1-8 (Route 19[2]) / M6-1(R)	Northeast corner (for westbound traffic) of NW 75th Street and NW 14th Avenue.	Sign for: • Bike Route 19[2] South.
Confirmation (Destination)	D1-2c	Southeast corner of NW 14th Avenue and NW 79th Street.	Signs for: • Arcola Lakes Park (forward, 0.3 miles).
Confirmation	M3-1 / M1-8 (Route 19) / M6-3	Northeast corner (for northbound traffic) of NW 14th Avenue and NW 79th Street.	The Miami-Dade County Bicycle Boulevard Planning Study: Model City/Brownsville calls for elimination of left-turn lanes on NW 79th Street, installation of a crosswalk with a pedestrian refuge, and the use of RRFBs to aid bicycle and pedestrian crossings at this intersection.
Confirmation	M3-1 / M1-8 (Route 19) / M4-6	Southwest corner (for southbound traffic) of NW 14th Avenue and NW 83rd Street.	

Table 5: Southbound Signage

Type	Sign / Sign Assembly	Location	Comment
Confirmation	M3-3 / M1-8 (Route 19) / M4-14	Southwest corner (for southbound traffic) of NW 14th Avenue and NW 83rd Street.	
Confirmation (Destination)	D1-2c	Northwest corner of NW 14th Avenue and NW 79th Street.	Signs for: • Charles Hadley Park (forward, 2.3 miles), • Earlington Heights Metrorail Station (forward, 3.6 miles).
Confirmation	M3-3 / M1-8 (Route 19) / M6-3	Southwest corner (for southbound traffic) of NW 14th Avenue and NW 79th Street.	The Miami-Dade County Bicycle Boulevard Planning Study: Model City/Brownsville calls for elimination of left-turn lanes on NW 79th Street, installation of a crosswalk with a pedestrian refuge, and the use of RRFBs to aid bicycle and pedestrian crossings at this intersection.
Turn^2	M3-3 / M1-8 (Route 19^2) / M6-1(L)	Northwest corner (for southbound traffic) of NW 14th Avenue and NW 75th Street.	Sign for: • Bike Route 19^2 South.
Turn^2	M3-3 / M1-8 (Route 19^2) / M6-1(R)	Southwest corner (for eastbound traffic) of NW 75th Street and NW 12th Avenue.	Sign for: • Bike Route 19^2 South.
Turn^2	M3-3 / M1-8 (Route 19^2) / M6-1(R)	Northwest corner (for southbound traffic) of NW 12th Avenue and NW 71st Street.	Sign for: • Bike Route 19^2 South.
Decision (Destination)	D1-3c	Northeast corner of NW 71st Street and NW 14th Avenue.	Signs for: • Gwen Cherry Park (forward, 0.8 miles), • Charles Hadley Park (left, 1.3 miles), • Earlington Heights Metrorail Station (left, 2.6 miles).

Type	Sign / Sign Assembly	Location	Comment
Turn[2]	M3-3 / M1-8 (Route 19[2]) / M6-1(L)	Northeast corner (for westbound traffic) of NW 71st Street and NW 14th Avenue.	Sign for: • Bike Route 19[2] South.
Confirmation	M3-3 / M1-8 (Route 19) / M6-3	Southwest corner (for southbound traffic) of NW 14th Avenue and NW 71st Street.	
Decision (Destination)	D1-3c	Northwest corner of NW 14th Avenue and NW 62nd Street.	Signs for: • Martin Luther King Jr. Plaza Metrorail Station (right, 1.3 miles), • Charles Hadley Park (forward, 0.8 miles), • Earlington Heights Metrorail Station (forward, 2 miles).
Confirmation	M3-3 / M1-8 (Route 19) / M6-3	Southwest corner (for southbound traffic) of NW 14th Avenue and NW 62nd Street.	The Miami-Dade County Bicycle Boulevard Planning Study: Model City/Brownsville calls for elimination of left-turn lanes on NW 62nd Street, installation of a crosswalk with a pedestrian refuge, and the use of RRFBs to aid bicycle and pedestrian crossings at this intersection.
Decision (Destination)	D1-3c	Northwest corner of NW 14th Avenue and NW 54th Street.	Signs for: • Brownville Metrorail Station (right, 1.4 miles), • Charles Hadley Park (forward, 0.3 miles), • Earlington Heights Metrorail Station (forward, 1.5 miles).
Confirmation	M3-3 / M1-8 (Route 19) / M6-3	Southwest corner (for southbound traffic) of NW 14th Avenue and NW 54th Street.	
Confirmation	M3-3 / M1-8 (Route 19) / M6-3	South side of NW 50th Street (facing southbound traffic), across from NW 14th Avenue.	Directing users to entrance to Charles Hadley Park.

Type	Sign / Sign Assembly	Location	Comment
Confirmation	M3-3 / M1-8 (Route 19) / M6-3	South end of Charles Hadley Park (for southbound traffic), north of NW 47th Street.	Currently, only a goat path exists to serve this route from NW 47th street to the path within Charles Hadley Park. This path should be paved for continuity. The Miami-Dade County Bicycle Boulevard Planning Study: Model City/Brownsville recommends an intersection improvement at NW 51st Street and NW 14th Avenue.
Turn	M3-3 / M1-8 (Route 19) / M6-1(R) D1-1c	Northwest corner (for southbound traffic) of NW 14th Avenue and NW 43rd Street.	Sign for: • Bike Route 19 South. • Earlington Heights Metrorail Station (right, 0.8 miles).
Confirmation (Destination)	D1-1c	Northeast corner (for westbound traffic) of NW 43rd Street and NW 17th Avenue.	Signs for: • Earlington Heights Metrorail Station (forward, 0.5 miles).
Confirmation	M3-3 / M1-8 (Route 19) / M6-3	Northwest corner (for westbound traffic) of NW 43rd Street and NW 17th Avenue.	Intersection improvements need to be provided for crossing of NW 17th Avenue at this intersection.
Turn	M3-3 / M1-8 (Route 19) / M6-1(L) D1-1c	Northeast corner (for westbound traffic) of NW 43rd Street and NW 21st Avenue	Sign for: • Bike Route 19 South. • Earlington Heights Metrorail Station (left, 0.05 miles)
Confirmation (Destination)	D1-1b	Northwest corner of NW 21st Avenue and NW 41st Street	Signs for: • Earlington Heights Metrorail Station (forward).
Confirmation	M3-3 / M1-8 (Route 19) / M4-6	Northwest corner of NW 21st Avenue and NW 41st Street	End of Bike Route 19.

7.3 "The Zig-Zag"

7.3.1 Background

"The Zig-Zag", as it is commonly referred to, is a popular bicycle route located in the south-eastern part of Miami-Dade County. The route received its name from its alignment, which includes several turns from one roadway to another, giving it a step-like appearance on a map, as shown in red in Figure 23. The Zig-Zag connects Homestead Bayfront Park to Black Point Park. The southern-most portion of the route, which runs along North Canal Drive and the North Canal Path, is co-located with the western terminus of Bike Route 14 (Biscayne Trail E-W). The Zig-Zag then heads north to provide a connection to Black Point Park, at the southern terminus of both Bike Route 5 (Biscayne Trail N-S) and Bike Route 7 (Black Creek Trail).

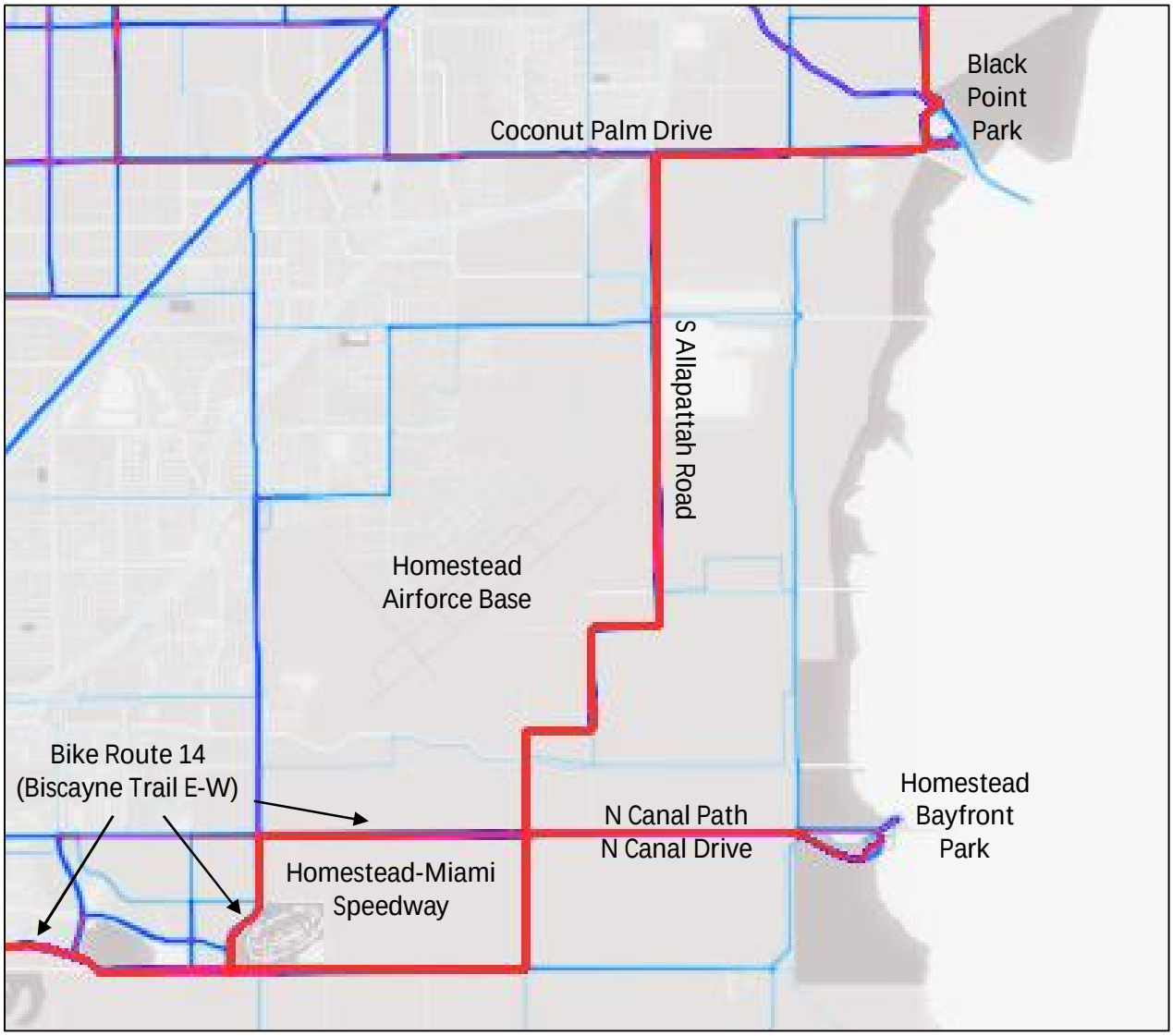


Figure 23: The "Zig-Zag" Strava® Volumes

The Zig-Zag is the missing piece that would connect the two separate Biscayne Trail Bike Routes (Bike Route 5 and Bike Route 15). It also provides an example of a bicycle route in a rural environment.

Lastly, this project is an ideal candidate for implementation of an alternate route. While the majority of the Strava® population depicted above choses to ride on-road, there is a distinct path that runs along the L-31E Levee. This alternate path, shown in light blue along the east coast in Figure 23, provides a more direct connection between the two parks.

7.3.2 Implementation

The Zig-Zag should be considered a continuation of the existing Bike Route 5 (Biscayne Trail N-S). It is recommended that Bike Route 5 be re-designated with a more geographically appropriate number, such as Bike Route 67. As a continuation of the Biscayne Trail (N-S), the Zig-Zag should be marked and designated as an official bicycle route. For the purpose of this study, the project will be include only the Zig-Zag route from Homestead Bayfront Park to Black Point Park. Decision signs, turn signs, and confirmation signs should all be implemented along both the Zig-Zag and the alternate route along the L-31E Levee. The following tables identify the type and location for guide signs.

Notes:

- When two sign assemblies are recommended at the same location, the destination sign (D1-3) should be placed upstream of the route signs.
- Spacing of sign assemblies, horizontal and vertical clearances, and exact location of sign posts should follow applicable standards set forth by the MUTCD, FDOT Design Standards, or any other applicable local guidance.

Table 6: Bike Route 67 (The Zig-Zag) Northbound Signage

Type	Sign / Sign Assembly	Location	Comment
Confirmation	M3-1 / M1-8 (Route 67) / M4-14 M3-4 / M1-8 (Route 14) / M4-14	Homestead Bayfront Park Exit.	Signs for: • Bike Route 67 (Biscayne Trail) North, • Bike Route 14 (Biscayne Trail) West.
Confirmation	M3-1 / M1-8 (Route 67) / M6-3 M3-4 / M1-8 (Route 14) / M6-3	Homestead Bayfront Park Exit.	Signs for: • Bike Route 67 (Biscayne Trail) North, • Bike Route 14 (Biscayne Trail) West.
Decision (Route)	M3-1 / M4-1 / M1-8 (Route 67a) / M6-1(R) M3-1 / M1-8 (Route 67) / M6-3 M3-1 / M1-8 (Route 14) / M6-3	Northeast corner of SW 328th Street and SW 97th Avenue (entrance to Convoy Point).	Signs for: • Bike Route 67a (Biscayne Trail- Alternate) North, • Bike Route 67 (Biscayne Trail – "Zig-Zag") North, • Bike Route 14 (Biscayne Trail) West.
Decision (Destination)	D1-2c	Northeast corner of SW 328th Street and SW 117th Avenue.	Signs for: • Homestead-Miami Speedway (forward, 2.6 miles), • Downtown Homestead (forward, 6 miles)
Decision (Route)	M3-1 / M1-8 (Route 67) / M6-1(R) M3-1 / M1-8 (Route 14) / M6-3	Northeast corner (for westbound traffic) of SW 328th Street and SW 117th Avenue.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North, • Bike Route 14 (Biscayne Trail) West.
Confirmation	M3-1 / M1-8 (Route 67) / M6-3	Northeast corner (for northbound traffic) of SW 117th Avenue and SW 328th Street.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Turn	M3-1 / M1-8 (Route 67) / M6-1(R)	Southeast corner (for northbound traffic) of SW 117th Avenue and SW 316th Street.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Confirmation	M3-1 / M1-8 (Route 67) / M6-3	Southeast corner (for eastbound traffic) of SW 316th Street and SW 117th Avenue.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.

Type	Sign / Sign Assembly	Location	Comment
Turn	M3-1 / M1-8 (Route 67) / M6-1(L)	Southwest corner (for northbound traffic) of SW 316th Street and SW 112th Avenue.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Confirmation	M3-1 / M1-8 (Route 67) / M6-3	Northeast corner (for northbound traffic) of SW 112th Avenue and SW 316th Street.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Turn	M3-1 / M1-8 (Route 67) / M6-1(R)	Southeast corner (for northbound traffic) of SW 112th Avenue and SW 304th Street.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Confirmation	M3-1 / M1-8 (Route 67) / M6-3	Southeast corner (for eastbound traffic) of SW 304th Street and SW 112th Avenue.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Turn	M3-1 / M1-8 (Route 67) / M6-1(L)	Southwest corner (for eastbound traffic) of SW 304th Street and SW 107th Avenue.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Confirmation	M3-1 / M1-8 (Route 67) / M6-3	Northeast corner (for northbound traffic) of SW 107th Avenue and SW 304th Street.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Decision (Route)	M3-2 / M1-8 (Route 16) / M6-1(R) M3-1 / M1-8 (Route 67) / M6-3 M3-4 / M1-8 (Route 16) / M6-1(L)	SW 107th Avenue, south of C-102 Canal/Princeton Trail	Signs for: • Bike Route 16 (Princeton Trail) East, • Bike Route 67 (Biscayne Trail – "Zig-Zag") North, • Bike Route 16 (Princeton Trail) West.
Turn	M3-1 / M1-8 (Route 67) / M6-1(R)	Southeast corner (for northbound traffic) of SW 107th Avenue and Coconut Palm Drive.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Confirmation	M3-1 / M1-8 (Route 67) / M6-3	Southeast corner (for eastbound traffic) of Coconut Palm Drive and SW 107th Avenue.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.

Type	Sign / Sign Assembly	Location	Comment
Turn	M3-1 / M1-8 (Route 67) / M6-2(L)	Southwest corner (for eastbound traffic) of Coconut Palm Drive (South of the canal) and SW 97th Avenue.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Confirmation	M3-1 / M1-8 (Route 67) / M6-3	Southeast corner (for eastbound traffic) of Coconut Palm Drive (north of the canal) and SW 97th Avenue.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Decision (Route)	M3-3 / M4-1 / M1-8 (Route 67a) / M6-1(R) M3-1 / M1-8 (Route 67) / M6-3	Coconut Palm Drive (for eastbound traffic), approximately 750 feet west of SW 87th Avenue.	Signs for: • Bike Route 67a (Biscayne Trail – Alternate) South, • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Turn	M3-1 / M1-8 (Route 67) / M6-2(L)	Southwest corner (for eastbound traffic) of Coconut Palm Drive and SW 87th Avenue.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Confirmation	M3-1 / M1-8 (Route 67) / M6-3	On SW 87th Avenue (for northbound traffic), north of Coconut Palm Drive.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Decision (Destination)	D1-2c	On SW 87th Avenue (for northbound traffic), 400 feet north of Coconut Palm Drive.	Signs for: • Black Point Park (right, 0.15 miles), • Downtown Cutler Bay (forward, 4.2 miles).
Decision (Route)	M3-1 / M1-8 (Route 7) / M6-1(L) M3-1 / M1-8 (Route 5) / M6-1(L) M3-3 / M1-8 (Route 7) / M6-1(R)	On SW 87th Avenue (for northbound traffic), south of the Black Creek Canal.	Signs for: • Bike Route 7 (Black Creek Trail) North, • Bike Route 5 (Biscayne Trail) North, • Bike Route 7 (Black Creek Trail) South.
Confirmation	M3-1 / M1-8 (Route 67) / M4-6	On SW 87th Avenue (for northbound traffic), south of the Black Creek Canal.	

Table 7: Bike Route 67 (The Zig-Zag) Southbound Signage

Type	Sign / Sign Assembly	Location	Comment
Confirmation	M3-3 / M1-8 (Route 67) / M4-14	SW 87th Avenue (for southbound traffic), north of the Black Creek Canal	
Decision (Route)	M3-3 / M1-8 (Route 7) / M6-1(L) M3-3 / M1-8 (Route 67) / M6-3 M3-1 / M1-8 (Route 7) / M6-1(R)	On SW 87th Avenue (for southbound traffic), south of the Black Creek Canal.	Signs for: • Bike Route 7 (Black Creek Trail) South, • Bike Route 67 (Biscayne Trail) North, • Bike Route 7 (Black Creek Trail) South.
Decision (Destination)	D1-2c	On SW 87th Avenue (for southbound traffic), approximately 900 feet north of Coconut Palm Drive.	Signs for: • Black Point Park (left, 0.25 miles)
Turn	M3-3 / M1-8 (Route 67) / M6-2(R)	Northwest corner (for southbound traffic) of SW 87th Avenue and Coconut Palm Drive.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South.
Decision (Route)	M3-3 / M1-8 (Route 67) / M6-3 M3-3 / M4-1 / M1-8 (Route 67a) / M6-1(L)	Coconut Palm Drive (for westbound traffic), approximately 600 feet west of SW 87th Avenue.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South, • Bike Route 67a (Biscayne Trail – Alternate) South.
Turn	M3-3 / M1-8 (Route 67) / M6-2(L)	Northeast corner (for westbound traffic) of SW 97th Avenue and Coconut Palm Drive.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South.
Confirmation	M3-3 / M1-8 (Route 67) / M6-3	Northwest corner (for westbound traffic) of Coconut Palm Drive (south of the canal) and SW 97th Avenue.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South.
Turn	M3-3 / M1-8 (Route 67) / M6-1(L)	Northeast corner (for westbound traffic) of Coconut Palm Drive and SW 107th Avenue.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South.

Type	Sign / Sign Assembly	Location	Comment
Confirmation	M3-3 / M1-8 (Route 67) / M6-3	Southwest corner (for southbound traffic) of SW 107th Avenue and Coconut Palm Drive.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South.
Decision (Route)	M3-4 / M1-8 (Route 16) / M6-1(R) M3-3 / M1-8 (Route 67) / M6-3 M3-2 / M1-8 (Route 16) / M6-1(L)	SW 107th Avenue, north of the C-102 Canal/Princeton Trail	Signs for: • Bike Route 16 (Princeton Trail) West, • Bike Route 67 (Biscayne Trail) South, • Bike Route 16 (Princeton Trail) East.
Turn	M3-3 / M1-8 (Route 67) / M6-1(R)	Northwest corner (for southbound traffic) of SW 107th Avenue and SW 304th Street.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South.
Confirmation	M3-3 / M1-8 (Route 67) / M6-3	Northwest corner (for westbound traffic) of SW 304th Street and SW 107th Avenue.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South.
Turn	M3-3 / M1-8 (Route 67) / M6-1(L)	Northeast corner (for westbound traffic) of SW 304th Street and SW 112th Street.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South.
Confirmation	M3-3 / M1-8 (Route 67) / M6-3	Southwest corner (for southbound traffic) of SW 112th Avenue and SW 304th Street.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South.
Turn	M3-3 / M1-8 (Route 67) / M6-1(R)	Northwest corner (for southbound traffic) of SW 112th Avenue and SW 316th Street.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South.
Confirmation	M3-3 / M1-8 (Route 67) / M6-3	Northwest corner (for westbound traffic) of SW 316th Street and SW 112th Avenue.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South.
Turn	M3-3 / M1-8 (Route 67) / M6-1(L)	Northeast corner (for westbound traffic) of SW 316th Street and SW 117th Avenue.	Sign for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South.

Type	Sign / Sign Assembly	Location	Comment
Confirmation	M3-3 / M1-8 (Route 67) / M6-3	Southwest corner (for southbound traffic) of SW 117th Avenue and SW 316th Street.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") North.
Decision (Destination)	D1-3c	Northwest corner (for southbound traffic) of SW 117th Avenue and SW 328th Street.	Signs for: • Homestead-Miami Speedway (right, 2.6 miles), • Downtown Homestead (right, 6 miles), • Homestead Bayfront Park (left, 2.75 miles).
Decision (Route)	M3-3 / M1-8 (Route 67) / M6-1(L) M3-2 / M1-8 (Route 14) / M6-1(L) M3-4 / M1-8 (Route 14) / M6-1(R)	Northwest corner (for southbound traffic) of SW 117th Avenue and SW 328th Street.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South, • Bike Route 14 (Biscayne Trail) East, • Bike Route 14 (Biscayne Trail) West.
Confirmation	M3-3 / M1-8 (Route 67) / M6-3 M3-2 / M1-8 (Route 13) / M6-3	Southeast corner (for eastbound traffic) of SW 328th Street and SW 117th Avenue.	Signs for: • Bike Route 67 (Biscayne Trail – "Zig-Zag") South, • Bike Route 14 (Biscayne Trail) East.
Decision (Route)	M3-1 / M4-1 / M1-8 (Route 67a) / M6-1(L) M3-3 / M1-8 (Route 67) / M6-3 M3-2 / M1-8 (Route 14) / M6-3	Northwest corner (for westbound traffic) of SW 328th Street and SW 97th Avenue (entrance to Convoy Park).	Signs for: • Bike Route 67a (Biscayne Trail – Alternate) North, • Bike Route 67 (Biscayne Trail – "Zig-Zag") South, • Bike Route 14 (Biscayne Trail) East.
Confirmation	M3-3 / M1-8 (Route 67) / M6-3 M3-2 / M1-8 (Route 14) / M6-3	Homestead Bayfront Park Exit.	Signs for: • Bike Route 67 (Biscayne Trail) South, • Bike Route 14 (Biscayne Trail) East.
Confirmation	M3-3 / M1-8 (Route 67) / M4-6 M3-2 / M1-8 (Route 14) / M4-6	Homestead Bayfront Park Exit.	Signs for: • Bike Route 67 (Biscayne Trail) South, • Bike Route 14 (Biscayne Trail) East.

7.4 Baywalk

7.4.1 Background

Baywalk is a shared use path along Biscayne Bay in downtown Miami and surrounding neighborhoods. Though not completely continuous, Baywalk provides connectivity to some of downtown Miami's greatest attractions, as well as several parks. The facility was selected as a pilot project as it provides an opportunity for wayfinding implementation within a heavily-utilized downtown core setting with iconic views of Biscayne Bay. Baywalk can be used as an example for wayfinding in other parts of the County with high pedestrian traffic such as Little Havana and Miami Beach.

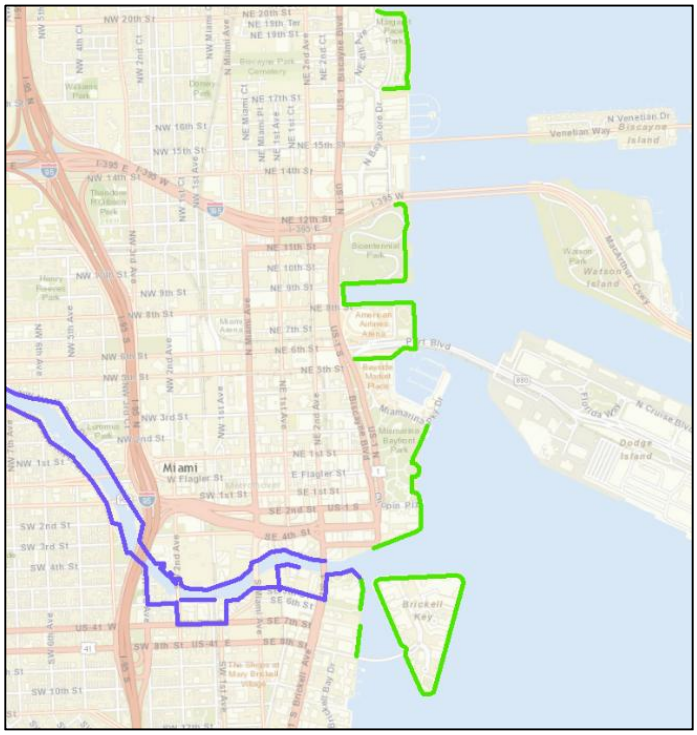


Figure 24: Baywalk and Miami River Greenway

Existing portions of Baywalk (shown in green in Figure 24) total approximately 3 miles in length. Baywalk provides connections to many of Miami's top cultural attractions, business districts, and neighborhoods. Destinations include Miamarina, Bayfront Park, American Airlines Arena, Museum Park, and Margaret Pace Park. The Miami River Greenway (shown in purple in Figure 24) provides connectivity and opportunities for wayfinding signage to direct users between the two facilities.

The ultimate plan for Baywalk is a 7-mile connected path from Alice Wainwright Park in the south to Albert Pallot Park in the north. According to the City of Miami's Baywalk Mobility Plan, goals for Baywalk align with developing a wayfinding demonstration project.

- Create public access to the waterfront.
- Determine optimal entry points.
- Establish a "Baywalk Brand" that is easily recognizable.
- Establish graphic design standards, logos, fonts, colors and materials to use for signage throughout the project.
- Use colors or in-ground stamping in paving and site materials to emphasize key nodes and transitions between districts.

7.4.2 Implementation

Wayfinding in an urban core, particularly for pedestrian use, is best provided through the combined use of maps, information kiosks, and decision signage. Figure 26 shows the various types of wayfinding signs used in London. Maps for pedestrians should show approximately a 1/2- to 1-mile radius, with insets showing the immediate surroundings within a 1/4-mile (5 minute walking) distance. These maps/kiosks should be located at high pedestrian traffic locations and cross-roads of various trips such as at the main path into Bayfront Park, between the American Airlines Arena and Museum Park, and at Brickell Point. Signs for key attractions should be placed at locations where the Baywalk runs near Biscayne Boulevard. This would provide wayfinding to pedestrians on both Baywalk and along Biscayne Boulevard.

Figure 25: Cyclists along Baywalk

The Baywalk Mobility Plan recommends that the development of a signage and wayfinding system for the Baywalk should be produced after the establishment of the "Baywalk Brand." This new brand will give the project a unique identity and will be the basis for a Baywalk signage and wayfinding program. District-specific signage will allow different neighborhoods to have their own unique character while still remaining within the Baywalk family of signage. The Plan recommends a signage and wayfinding system that covers placement of signage in relation to Baywalk as to be visible, but not conflict with safety. Furthermore, the range of signs to be utilized within Baywalk includes directional signage, historical markers, information signage, and mile markers.

Figure 26: Pedestrian Wayfinding in London

Some of the locations to which wayfinding should be provided include:

- Parks:
    a. Museum Park,
    b. Margaret Pace Park,
    c. Bayfront Park,
- Attractions:
    a. American Airlines Arena,
    b. Miami Convention Center (James L. Knight International Center),
    c. Performing Arts Center – PAC (Adrienne Arsht Center for Performing Arts),
- Transit:
    a. Fifth Street Metromover Station,
    b. Riverwalk Metromover Station,
    c. Knight Center Metromover Station,
    d. Bayfront Park Metromover Station,
- Pedestrian Paths and Bike Routes:
    a. Baywalk,
    b. Venetian Causeway (Bike Route V),
    c. Miami River Greenway,
    d. Bike Route 1,
- Other Destinations:
    a. Government Center,
    b. Miami-Dade College – Wolfson Campus,
    c. Other.

Notes:

- Signs should be provided for destinations that are 1/4- to 1/2- mile (5-10 minute) walk from the sign location.
- Placement of signs should follow any applicable regulations set forth by the FDOT Design Standards, the MUTCD, or guidelines for provided by the NACTO.
- This project should be implemented with collaboration of the Miami Downtown District Authority (Miami DDA).

7.5 First Mile/ Last Mile Signage

7.5.1 Background

The Miami-Dade Bicycle Network can be instrumental in addressing the first mile/last mile connectivity gap between transit and a trip's origin or destination. Providing infrastructure and wayfinding to address this gap would allow for increased transit ridership and increased multimodal trips. Likewise, bicycle wayfinding at key locations throughout Miami-Dade County has the potential to increase the use of Miami-Dade County's Bicycle Network by increasing awareness of available and nearby bicycle facilities.

Figure 27: Wayfinding at Transit Hubs

7.5.2 Implementation

Wayfinding signage should be placed at transit stations, bicycle stations, and major attractions throughout Miami-Dade County. Signage should be provided to nearby attractions, government buildings such as town halls and public libraries, and nearby bicycle routes. The type of signage that should be provided will vary depending on the location. Kiosks and maps depicting the surrounding area (½ mile to 1-mile radius) are recommended for dense urban locations such as Downtown Miami and South Beach. For less dense urban locations, less graphical signage (such as directional signs mounted on a post) is appropriate to guide users onto nearby routes.

Figure 28: Wayfinding Map

Wayfinding to nearby destinations and bicycle facilities should be provided countywide. Wayfinding at major transit hubs, such as Tri-Rail, Metrorail, and Metromover stops should be prioritized. Additional locations should include major attractions such as stadiums, entertainment venues, and convention centers.

Figure 29: Wayfinding To Nearby Attractions

8 Conclusion

Miami-Dade County current bicycle route numbering and wayfinding system has been in place since the early 1980s. Since its adoption, the County has seen growth in bicycle facilities and while the existing route numbering system has continued to provide route designation to several facilities. The current system was established to provide a chronological route numbering and designation to facilities as they are built. However, using a chronological designation method has limitations: primarily, it does not give the users of the system any information with regards to their relative location within the county. Furthermore, the existing system relies on existing and funded facilities, and does not establish a method for designating corridors that may receive bicycle infrastructure improvements in the future. As a result, many of Miami-Dade County's bicycle facilities, particularly the more urban facilities, are not represented on the County's Bicycle Route System.

Through researching other bicycle designation methods in the United States and Europe, a new bicycle numbering system is recommended for adoption. The new designation method accounts for geographic orientation of the routes as well as relative location within the County. Similar to conventions adopted by several transportation systems including the United States National Bicycle Corridor Plan, the proposed Miami-Dade Bicycle Route System would assign even numbers to east-west corridors in ascending order from north to south, and odd route numbers for north-south corridors in ascending order from east to west. Numbers that are multiples of five (5, 10, 15, etc.) would be reserved for major corridors. To ensure that this new geographically based numbering system is maintained, it is crucial that such route numbers be reserved for specific corridors, regardless of the presence of a bicycle facility today. Additionally, lettered bicycle route designations will be used for those routes that are easily recognizable by name (such as the M-path, or Bike Route V for the Venetian Causeway).

In addition to establishing a new Bicycle Route Numbering System, this study provides guidelines for bicycle wayfinding signage that will complement the bicycle route network and enhance user experience. Wayfinding methods and bicycle route signage from several cities within the United States were considered, as well as the National City Transportation Officials (NACTO) guidelines. From these, a comprehensive guide to bicycle wayfinding is proposed for Miami-Dade County consisting of decision, turn, and confirmation signs. The bicycle wayfinding guidelines provided in this study offer recommendations as to placement, spacing, and type of signs that should be installed along various types of facilities. The guidelines also provide a baseline for distances at which wayfinding to various destinations should be provided. Type of attraction, surrounding environment, and the type of facility on which signage is to be placed are all considered under these guidelines.

To facilitate the adoption of the proposed Bicycle Route Numbering System and the Bicycle Wayfinding guidelines, several possible pilot projects were identified ranging from urban corridors that serve to better connect communities to surrounding parks and transit infrastructure, to rural bicycle routes aimed more at recreational riders who want to explore the County or want to reach more distant destinations through non-motorized means. A total of ten potential routes were identified, of which four are recommended as pilot projects for more rapid implementation. Additionally, the study recommends placing wayfinding

signage at major transit stations and attractions throughout the county. The five pilot projects that were selected include:

1) Sunset Drive,
2) NW 14th Avenue within the boundaries of Model City and Brownsville,
3) "The Zig-Zag" connecting Black Point Park to Homestead Bayfront Park in the south-eastern part of the County,
4) Baywalk in Downtown Miami, and
5) County-wide signage at Tri-Rail, Metrorail, and Metromover stations.

Each of the pilot projects was selected for its uniqueness, opportunity for short-term implementation, and its ability to showcase various aspects of the proposed Bicycle Route Numbering System and Bicycle Wayfinding System.