

# MIAMI-DADE COUNTY SHARED-USE TRAIL MAINTENANCE STUDY (FINAL REPORT)



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Prepared by:  
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for:  
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Dear Mr. Kardys:

The FIU Metropolitan Center is pleased to present the Miami-Dade County Shared-use Trail Maintenance Study. The Miami-Dade County Park and Recreation Department (MDPR) and the Miami-Dade Metropolitan Planning Organization (MPO) initiated this Maintenance Study in order to assess the state of maintenance and operations for existing trails, learn from developed best practice case studies and plan for proposed trails. The Study includes a user survey, an inventory of facilities, responsible departments / agencies and their practices, estimated costs maintenance and operation costs, a discussion of innovative funding and administrative structures and recommendations. We believe data presented are accurate and objective and we have taken great care to lead readers to defensible findings and recommendations.

Sincerely,

Dr. Ned Murray, Ph. D., AICP  
Associate Director  
Metropolitan Center  
Florida International University

## Acknowledgements

The Miami-Dade County Park and Recreation Department (MDPR) served as the day-to-day management agency for the project. Mark Heinicke was instrumental in managing the project throughout the duration of this study providing direction.

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# Table of Contents

Executive Summary ..... 1

I. Introduction ..... 5

    A. Purpose..... 5

    B. Importance of a Sustainable Shared-use Trail System ..... 5

    C. Study Methodology ..... 7

    D. Organization of the Study ..... 7

II: Inventory and Assessment of Existing Shared-use Trails ..... 8

    A. Background ..... 8

    B. Miami-Dade County Shared-Use Trail Inventory and Assessment ..... 9

    C. General Conditions ..... 12

III: Trail Management and Operations ..... 20

    A. Key Interview Findings ..... 27

IV Miami-Dade County Trail User Survey ..... 29

    A. Background ..... 29

    B. User Survey Design and Methodology ..... 29

    C. Summary of Survey Results ..... 30

    D. Trail User Survey Key Findings..... 35

V Best Practice Case Studies ..... 37

    A. Background ..... 37

    B. 2010 Best Practice Case Studies..... 38

    C. Best Practice Focus Areas ..... 40

    D. Best Practice Applications to Miami-Dade County ..... 50

VI. Innovative Financing and Administrative Structures for Shared-use Trail Maintenance ..... 51

    A. Innovative Financing ..... 51

    B. Innovative Administrative Structures ..... 56

VII: Miami-Dade County Shared-use Trail Management and Maintenance Recommendations.. 57

Miami-Dade Park and Recreation Approval Page ..... 68

## List of Tables

Table 2.1: Inventory of Existing and Planned Paths and Trails in Miami-Dade County, 2010 .... 10

Table 3.1: Shared-Use Trails by Jurisdiction ..... 20

Table 3.2: County-wide Department/Agency Trail Maintenance Responsibilities ..... 24

Table 4.1: User Ratings of Miami-Dade County’s Trail System ..... 31

Table 4.2: Conditions Encouraging Shared-Use Trail Activity in Miami-Dade County..... 33

Table 4.3: Priority of Miami-Dade County Shared-use Trail Improvements by Survey Group ... 35

Table 6.1 Factors Affecting Maintenance Costs..... 52

Table 7.1: Annual Shared-Use Trail Routine Maintenance Activities & Estimated Costs..... 59

Table 7.2: Miami-Dade County Shared-Use Trail Maintenance Budget Framework ..... 60

Table 7.3: Estimated Annual and Life Cycle Costs 50 Mile Shared-use Trail Maintenance  
 Repair/Replacement Items.....60

**List of Figures**

Figure 4.1: Level of Satisfaction among Miami-Dade County Trail Users .....31  
 Figure 4.2: Trail User’s Acceptable Methods for Funding Trail Maintenance in Miami-Dade  
 County .....34

**Maps**

Map 1: Miami-Dade Greenways.....19  
 Map 2: Miami-Dade Greenways by Departmental / Agency Jurisdiction .....26

**Appendices**

Appendix A: Miami-Dade County Shared-Use Trail Assessment
Appendix B: Interviews Conducted with County and Municipal Personnel
Appendix C: Miami-Dade County Shared-Use Trail Maintenance Program Interview Guide
Appendix D: Miami-Dade County Shared-Use Trail User Survey Instrument
Appendix E: Miami-Dade County Shared-Use Trail User Survey Results
Appendix F: User Survey Comments
Appendix G: Shared-Use Trail Schematic Designs

## **Executive Summary**

The 2010 *Miami-Dade County Shared-use Trail Maintenance Study* was prepared in accordance with Element B: Short-Range Transportation System Planning and Management of the Metropolitan Planning Organization's (MPO) Fiscal Years 2009 and 2010 Unified Work Program. The stated purpose of the Miami-Dade County Bicycle and Pedestrian Facility Maintenance Program is to ensure the longevity and safety of the existing network of over 130 miles of shared-use trail facilities. The 2010 *Miami-Dade County Shared-use Trail Maintenance Study* provides recommendations for improving the maintenance management and operations of Miami-Dade County's existing and planned network of shared-use trails.

The effective and efficient management and operations of shared-use trail facilities is a pressing issue for systems throughout the country. Management and maintenance issues, in particular, have become more daunting as county and municipal governments are forced to deliver services and maintain facilities with reduced funding. Dedicated funding for management and maintenance operations will determine the sustainability of Miami-Dade County's Shared-Use Trail System.

The Study incorporates several layers of primary data research to support its recommendations, including field assessments of the existing shared-use trail inventory, interviews with department and agency officials charged with the management and operations of the existing trail network, a user survey and "best practice" case studies of recognized shared-use trail systems in the United States.

### **Existing Shared-use Trail Inventory**

The Study found that the typical shared-use trail facility in Miami-Dade County has few amenities, little tree shade and suffers from a general lack of continuity. Most trails have no way finding signs or other prominent signage informing users of the significance of any particular facility. Trails are often unnamed or have various names given by governmental agencies causing confusion for users of the trails. There is also a general lack of comfort and safety when using many of the County's trails. In South Florida, tree shade is essential for relief from heat and sun exposure. This issue is exacerbated by a general lack of services and amenities throughout the County's trail system.

The Study's "user survey" confirmed many of the findings from the field assessment. The Study found that Miami-Dade County's existing shared-use trails are not meeting the demands of the respondents that were surveyed. The survey found that while Miami-Dade County trail users make frequent use of trail facilities, they are generally concerned with the overall maintenance and condition of the trail system, including the paucity of trail services and amenities such as restrooms, places for food and drink and repair shops.

### **Existing Management and Operations**

Based on the Study's face-to-face interviews with department and agency officials, it was determined that trail maintenance activities in Miami-Dade County are performed by individual

department and agency operations and through various inter-departmental agreements. Significantly, these maintenance activities are performed absent a comprehensive and integrated trail maintenance management plan. The interviews substantiated previous study findings with regards to a general lack of coordination and cooperation in the management and maintenance of shared-use trail facilities. Perhaps due to multiple agency involvement and overlapping responsibilities there is no clear overall picture of the level of need and activity, standards, maintenance levels, operational costs and performance measures required to effectively manage and operate a shared-use trail maintenance program. The current study also found significant concern among department and agency officials regarding the staffing and funding of trail maintenance operations.

### **Best Practice Research**

The Study's best practice case study research found that nationally recognized and successful shared-use trail systems give high priority to the "quality" and "on-going enhancement" of their shared-use trail facilities. Successful shared-use trail systems, both nationally and within the State of Florida, have well coordinated and integrated planning and management in place and significant community-based support which has spear-headed funding efforts. The management and delivery of services are effectively streamlined with clear department and agency responsibilities. The research also found that sustainable shared-use trail systems are typically supported by dedicated funding sources for on-going and enhanced maintenance, such as the "Penny for Pinellas" program which provides maintenance funding for the Pinellas Trail in Pinellas County, Florida.

### **Study Recommendations**

Based on the aforementioned research, the Study proposes a series of recommendations that give priority to the quality and on-going enhancement of Miami-Dade County's shared-use trail system. These priorities can only be realized through the establishment and implementation of a comprehensive shared-use trail maintenance program with clear goals and responsibilities and effective coordination and integration in the management and delivery of maintenance activities. As such, the Study's recommendations include the following:

#### *Recommendation # 1: Establish Types and Frequencies of Maintenance Activities with Budget Frameworks*

The Study's recommendations for types and frequencies of maintenance activities, based on best practice research, establishes criteria for the types and frequencies of maintenance activities with associated management and operational costs. Maintenance activities include mowing, trimming and pruning of vegetation, trash removal, sweeping of trails, repaving of trails and erosion control.

#### *Recommendation # 2: Establish Shared-use Trail Maintenance Policies and Practices*

Policies and practices are recommended to improve the management and operations of Miami-Dade County's shared-use trail system, including the coordination, integration and delivery of

maintenance activities. These recommendations can also be applied by separate government and municipal agencies to address their own problems and deficiencies. Recommendations include the use of trail logs to provide on-going assessments of trail conditions and maintenance activities; the establishment of clear maintenance levels by trail type; specific maintenance standards base on “best practice;” maintenance prescriptions to correlate maintenance conditions, standards and costs; maintenance scheduling to ensure maximum efficiency and effectiveness of maintenance activities; monitoring and evaluation to document work quality and costs.

*Recommendation # 3: Incorporate Shared-Use Trail Performance Measures*

The Study recommends that Miami-Dade County’s Shared-use Trail Maintenance Program incorporate clearly stated maintenance goals and performance measures for each trail type and specific maintenance activity. A goal statement provides the basis for subsequent elements including maintenance levels, standards, scheduling and evaluation. Examples include performance measures for trail surface inspection, trail surface maintenance and repair, vegetation control, maintenance of signs, stripes and legends and grass mowing.

*Recommendation # 4: Establish Dedicated Funding for Shared-Use Trail Maintenance*

The current analysis concluded that trail maintenance funding and improved inter-departmental coordination go hand-in-hand. Dedicated funding for trail maintenance demonstrates that a high priority has been given by Miami-Dade County to the quality of its trail system. Once the trail system is made a funding priority, the roles and responsibilities of County departments and agencies can better be determined. The first step is 1) to ensure that priority for Miami-Dade County’s trail maintenance activities is provided in the County’s capital improvements program (CIP), and 2) that a specific line item for on-going trail maintenance be included.

*Recommendation # 5: Create a Division for Trail Facilities Management*

The Study recommends the establishment of a Division for Trail Facilities Management within the Miami Dade Park and Recreation Department. A fully funded and supported Division for Trail Facilities Management can provide improved coordination and integration in the delivery of Miami-Dade County’s Shared-use Trail Maintenance Program activities, and have greater focus and transparency to the public and government officials with respect to on-going trail management and maintenance.

*Recommendation # 6: Creation of a Community Public/Private Partnership*

The Study recommends the creation of a 501(c)3 public/private partnership to provide support for Miami-Dade County’s Shared-use Trail Maintenance Program. Public/private partnerships have proven successful in several of the best practice case studies researched as part of the study. Examples include Indianapolis’s Greenways Foundation, Inc. (GFI) and Pinellas Trails Inc. GFI was established in 1991 to facilitate contributions, of all forms, to central Indiana greenway projects. As an IRS-qualified 501(c)(3) entity, GFI can receive cash and in-kind donations. Such contributions can be in cash or appreciated assets such as real property or securities. The GFI holds these contributions until they are needed for greenway development, enhancement or

operation. Pinellas Trails Inc. is a registered 501(c) 3 which concentrates on providing trail amenities including benches, bike racks, exercise stations, litter receptacles, mileage markers, shelter benches and tables, water fountains, maps and trees.

## **I. Introduction**

### **A. Purpose**

The 2010 *Miami-Dade County Shared-use Trail Maintenance Study* was prepared in accordance with Element B: Short-Range Transportation System Planning and Management of the Metropolitan Planning Organization's (MPO) Fiscal Years 2009 and 2010 Unified Work Program. The stated purpose of the Miami-Dade County Bicycle and Pedestrian Facility Maintenance Program is to ensure the longevity and safety of the existing network of over 130 miles of shared-use paved paths. Millions of taxpayer dollars are being invested in the construction of new bicycle and pedestrian shared-use trails to improve mobility and promote healthy recreation. However, there is no consolidated shared-use trail maintenance program currently in place in Miami-Dade County.

Previous master plans have been developed by the MPO for the Commodore Trail in Coconut Grove, the Snake Creek Greenway in Miami Gardens, the Biscayne Trail in Cutler Bay, the M-Path in South Miami, Coral Gables and Miami and the Snapper Creek Trail in Westchester. Miami Beach's Atlantic Trail, the Miami River Greenway, the Biscayne-Everglades Greenway and FDOT's Krome Trail are all in some stage of development.

The effective and efficient management of shared-use facilities is a pressing issue for systems of trails/greenways/pathways throughout the country. Management and maintenance issues, in particular, have become more daunting as county and municipal governments are forced to deliver services and maintain facilities with reduced funding. Funding for management and maintenance operations will determine the sustainability of Miami-Dade County's Shared-Use Trail System.

The study's "best practice" research found that sustainable shared-use trail systems are typically supported by dedicated funding sources for on-going and enhanced maintenance, such as the "Penny for Pinellas" program which provides maintenance funding for the Pinellas Trail in Pinellas County, Florida. At the same time, the management and delivery of services must be coordinated and streamlined with clear departmental/agency responsibilities. Lastly, sustainable shared-use trail systems will have the continuous involvement of stakeholders and volunteers and offer a variety of activities year around.

### **B. Importance of a Sustainable Shared-use Trail System**

The best practice research found several reoccurring principles and community values that serve to promote the on-going support for a sustainable shared-use trail system. These principles and values include the following:

#### *Sense of Community*

Shared-use trail systems, i.e. trails/greenways/pathways, enhance the sense of place in a community or region. Since trail systems have many stakeholders and beneficiaries, the

planning and development of trail systems naturally lead to the formation of broad-based partnerships, bringing together various civic groups, regional planners, community leaders, educators and business owners. The partnership approach not only provides resources but also builds public support or "community capital" and consensus for trail maintenance and investment.

### *Alternative Transportation*

Shared-use trail systems provide transportation alternatives to the automobile and a chance for local residents to be more physically active. Shared-use trail systems create links and connections in places that would otherwise be reached only through automobile use. Trail systems can create alternative means to travel between residential and shopping districts, and make connections to other recreational facilities and larger green spaces. These links create a more sustainable transportation system that reduces traffic congestion and encourages people to use alternative means of transportation like walking, bicycling and running. Trail systems can be used as one way to harmonize various means of transportation and interweave the interaction of pedestrians and automobiles.

### *Public Health and Fitness*

Shared-use trail systems provide recreation opportunities for families and individuals of all ages and abilities. Accessible and well-maintained trails can be an effective strategy for fostering health and wellness in a community especially as the population ages. Trails allow people safe, accessible, attractive, and low or no cost places to bike, walk, run, hike or in-line skate.

### *Educational Opportunities*

The different types of shared-use trails bring people into direct contact with the natural environment and cultural and historic places. Many trails have signs and brochures to inform residents and tourists about natural or historic features. School or other civic groups often use trails as "outdoor classrooms" for field trips and special events. Trails can educate the public about historic sites, the protection of natural resources, environmental and scientific topics, health benefits, and promote the interaction of people and nature.

### *Economic Development*

Local governments and businesses can benefit from shared-use trail tourism dollars in the rapidly growing outdoor/adventure tourism industry. Tourism and recreation related spending is stimulated around trail systems with health, fitness and other recreational features.

### *Promotion of Sound Land Use*

Many counties and cities have acknowledged that the quality of life and character of their communities are under pressure from suburban sprawl and unplanned development. Shared-use trail systems present a significant opportunity to guide land use to help ensure that as communities grow, protected green space and recreational opportunities are built into their futures. In addition, shared-use trails can be a redevelopment tool for "greening" brownfields and depressed urban areas.

## **C. Study Methodology**

In 2000, the Florida International University Metropolitan Center prepared a *Greenways Management and Maintenance Study* on behalf of the MPO. The 2000 study reviewed policies and practices in place at the time related to the management and maintenance of shared-use multi-purpose facilities in the County and recommended improvements for these services. The study concluded that with approximately 20 percent of the County's 600 mile greenway network in operation, and detailed plans for the remaining 500 miles in place, the County had the luxury of taking an "incremental" approach to improving the management and maintenance of the trail system based upon miles added in any given year.

The 2010 *Miami-Dade County Shared-use Trail Maintenance Study* provides a current perspective on the management and maintenance issues confronting Miami-Dade County's shared-trail system. The study incorporated many of the research methods applied in the 2000 study including: 1) a field inventory and assessment of the existing trail system, 2) a "user survey" to determine current modes of activity, user satisfaction, and perspectives on maintenance and funding, 3) interviews with department/agency officials regarding management and maintenance issues, and 4) targeted "best practice" case studies to help inform the study's recommendations.

## **D. Organization of the Study**

The 2010 *Miami-Dade County Shared-use Trail Maintenance Study* is organized as follows:

- Chapter 1 – Provides an introductory statement on the purpose of the study, applied research methods, and a "best practice" perspective on the principles and values of a sustainable Shared-use Trail system.
- Chapter 2 – Provides an inventory and assessment of Miami-Dade County's existing and proposed Shared-use Trails.
- Chapter 3 – Provides an assessment of current maintenance activities and costs based on interviews with various public agencies involved in the management and operation of shared-use trails in Miami-Dade County.
- Chapter 4 – Summarizes the results of the "user survey" on trail use activity, user satisfaction and preferences for maintenance and funding.
- Chapter 5 – Provides the results of the "best practice" case study research.
- Chapter 6 – Provides innovative funding and administrative structure s recommendations based on the best practice research.
- Chapter 7 – Provides recommendations for the management and operations of Miami-Dade County's Shared-use Trail System.

## II: Inventory and Assessment of Existing Shared-use Trails

### A. Background

The following section provides an inventory and assessment of Miami-Dade County's existing shared-use trail system. The inventory includes updated ownership, design characteristics and an assessment of existing conditions. The current assessment classifies existing and proposed shared-use facilities as either "regional" or "local."

As noted in the 2000 *Greenways Management and Maintenance Study*, much of Miami-Dade County's existing 130-mile trail system was constructed as a result of the 1972 Decade of Progress Bond Program. This includes some of Miami-Dade County's most frequented facilities such as the Rickenbacker Trail and the Old Cutler Trail. The 1998 *Miami-Dade County Comprehensive Development Master Plan* provided the legislative impetus for expanding the existing facility network into the largest shared-use trail systems in the country. The plan would result in a 600-mile system including the 189-mile South Dade Greenway Network and the 304-mile North Dade Greenway Network.

The terms "shared-use trail," "path" and "greenway" mean different things to different people. For instance, since the 19th century, "greenway" has been used to describe a variety of linear corridors across the land that conserve natural areas and provide people with recreation and transportation opportunities. Often greenways are associated with off-road trails, such as the Appalachian Trail, though not all greenways include trails. There is a growing national movement to promote greenways, especially since 1987 when the President's Commission on American Outdoors recommended establishing a national greenways network, similar to a roadway network, connecting all kinds of destinations through a linear system. It is important to understand, however, that the real goal of a greenway network is to create sustainable and livable communities combining recreation, conservation and smart land use.

Shared-use paths/trails are multiple-use paths separated from motorized vehicular traffic by an open space, barrier or curb. Shared-use trails may be within the highway right-of-way (often termed "sidepath") or within an independent right-of-way, such as an abandoned railroad bed or along a waterway, a valley or in a park. Shared-use trails typically accommodate two-way travel and are open to pedestrians, in-line skaters, wheelchair users, joggers and other non-motorized path users. They are typically surfaced in asphalt or concrete, but may have hard-packed/all weather gravel or dirt surfaces as well. To accommodate a range of users safely, shared-use paths should be a minimum of 10 feet wide (or minimum of 8 feet in very constrained conditions).

The focus of this study is on the maintenance and management of Miami-Dade County's existing and proposed Shared-use Trail System. Shared-use trail facilities require regular and on-going maintenance whether they consist of hard or green surfaces. Paved surfaces require regular sweeping, trash pick-up and surface repairs. Greenways require regular mowing cycles and landscape maintenance and improvements. A well-coordinated and integrated shared-use trail

delivery system is fundamental to effective maintenance operations. As such, the following assessment provides an updated inventory of existing shared-use trail facilities and the level of inter-department/agency coordination in effectively managing these maintenance responsibilities.

## **B. Miami-Dade County Shared-Use Trail Inventory and Assessment**

The shared-use trail inventory was prepared using data and spatial files provided by the Miami-Dade County Metropolitan Planning Organization (MPO) and the Miami-Dade County Park and Recreation Department. The data lists the width, ownership, number of segments, length, starting and ending points, description and temporal status of each named trail segment. The baseline data was reviewed within the context of other Miami-Dade County's plans and studies, including the MPO's *Bicycle Facilities Plan*, *South Dade Greenway Network Master Plan*, *North Dade Greenway Network Master Plan* and the 2000 *Greenways Management and Maintenance Study*.

An updated inventory of Miami-Dade County's Shared-use Trail facilities was prepared for this study (Table 2.1). Planned miles are based on the lengths of trails for which funding has been secured, as listed in the 2009 Transportation Improvement Program.

**Table 2.1: Inventory of Existing and Planned Paths and Trails in Miami-Dade County, 2010**

<b>Trail</b>	<b>Location</b>	<b>existing miles</b>	<b>planned miles</b>
Atlantic Trail, existing	Several segments along beach	7.8	0.0
Atlantic Trail, extension	Connecting segments	0.0	0.4
Baywalk	Around Brickell Key, north of river to Bayside	1.6	0.0
Baywalk, extension	Along Bay from Port Boulevard, around AA Arena to Bicentennial Park	0.0	0.6
Biscayne Trail, existing	Along SW 87 Avenue from Old Cutler Road to Black Point Park	3.6	0.0
Biscayne Trail, extension	Along SW 328 Street from SW 152 Ave to SW 137 Ave and from SW 137 Ave to SW 97 Ave, then north to SW 240 Street	0.0	11.5
Black Creek Trail, existing	Along Black Creek Canal from SW 184 Street to US-1, then along canal from SW 112 Ave to SW 216 St.	4.3	0.0
Black Creek Trail, extension	Along Canal from SW 216 Street to Black Point Park	0.0	3.1
Collins Canal Trail	Along canal from Venetian Causeway to 23 Street	0.0	1.3
Commodore Trail*	Various segments from SE 32 Rd. to Ingraham Hwy	3.9	0.0
Curtiss Parkway Trail	In the median of Curtiss Parkway from traffic circle to parking lot	0.5	0.0
Deer Run Trail	Along Deer Run north of Fairway Drive	0.9	0.0
Everglades Shark Valley Trail	Tamiami Trail to Observation Tower	15.0	0.0
Grand Avenue Path	Along Grand Avenue from Lincoln Drive to SW 37 Avenue	0.4	0.0
Hialeah Gardens Greenway	Along NW 87 Avenue Canal	0.7	0.0
Hialeah Linear Park	West of I-75 between NW 138 Street and NW 170 Street	0.0	1.9
Homestead Sports Complex Path	Along SW 344 Street from SW 152 Ave to SW 137 Avenue	1.0	0.0
Kitty Roedel Trail	North of SR 836 from SW 87 Ave to SW 107 Ave	2.0	0.0
Lincoln Road Mall	Pedestrian mall from Alton Road to Washington Avenue	0.5	0.0
Ludlam Trail	Along Ludlam Drive from NW 38 Street to N. Royal Poinciana Boulevard	2.2	0.0
M Path, existing	Parallel to US1 from the Miami River to SW 67 Avenue	8.4	0.0
M Path, extension	Connecting path from SW 67 Avenue to Dadeland North Station	0.0	1.1
Miami River Greenway, existing	Segments on both sides of the Miami River	1.9	0.0
Miami River Greenway, extension	Connecting segments	0.0	0.3
North Royal Poinciana Trail	Along North Royal Poinciana Boulevard from Ludlam Drive to Albatross Street	0.9	0.0

Trail	Location	existing miles	planned miles
Old Cutler Trail, existing	Along Old Cutler Rd. from Coco Plum Circle to Snapper Creek Rd. and from SW 109 St. to SW 216 St.	12.4	0.0
Old Cutler Trail, extension	Extension from SW 216 Street to SW 220 Street	0.0	0.3
Oleta Link	Begins at FIU's Biscayne Bay Campus then runs through to NE 135 Street	2.1	0.0
Overtown Greenway	Along NW 11 Street from NW 7 Avenue to NW 3 Avenue	0.0	0.4
Red Road Trail	Connecting Old Cutler Trail to Kendall Drive	1.8	0.0
Rickenbacker Trail	From entrance to Rickenbacker Causeway to Key Biscayne City limit	6.5	0.0
Snake Creek Trail	Along Snake Creek Canal from Miami Gardens Dr. to NE 22 Avenue	5.3	0.0
Snake Creek Trail, extension	Miami Gardens Drive to FL Turnpike	0.0	2.0
Snapper Creek Trail	Along Snapper Creek Canal from SW 17th St. to Coral Way, then SW 41 St to SW 107 Ave	3.1	0.0
South Dade Trail	Parallel to US-1, from Dadeland South Station to Card Sound Rd.	20.5	0.0
SW 127 Avenue Path	Along SW 127 Avenue from SW 120 Street to SW 107 Street	0.0	0.8
SW 152 Street Path	Along SW 152 Street from US-1 to Metrozoo	3.3	0.0
SW 216 Street Path	Connecting Black Creek and Old Cutler Trails	0.7	0.0
SW 24 Street Path	Along SW 24 Street from SW 79 Ave to SW 117 Ave	3.9	0.0
SW 264 Street Path	Along SW 264 Street from US-1 to SW 137 Ave	0.8	0.0
SW 288 Street Path	Along SW 288 Street (Biscayne Dr) from US-1 to SW 132 Ave.	2.7	0.0
SW 56 Street Path	Along SW 56 Street from SW 68 Ave to SW 117 Avenue	5.0	0.0
SW 72 Street Path	Along SW 72 Street from SW 87 Ave to the 10800 Block	2.1	0.0
Turnberry Isle Path	Around golf course in Aventura	2.8	0.0
<b>Total Miles</b>		<b>128.6</b>	<b>23.7</b>

\* - Commodore Trail forms portions of Bike Route 1 and is comprised of sidewalks, paved paths and on-road facilities.

Each of the inventoried trails was assessed based on a comprehensive set of “observation criteria.” Additionally, each trail was traveled and its physical condition documented from the point of view of an adult bicyclist traveling below normal speeds or an adult casually walking the trail. The following section provides an assessment of four (4) of Miami-Dade County’s well-known and frequently used trails. The assessments highlight many of the maintenance needs of the County’s shared-use trails in general. The assessments include M-Path, Old Cutler Road Trail, Snake Creek Trail and Snapper Creek Trail. The complete shared-use trail assessment can be found in Appendix A.

## Observation Criteria:

- ▶ Clearance of vegetation
- ▶ No overgrown shrubbery from either side or above
- ▶ Width of path
- ▶ Type of barrier between path and street/park/road; e.g. fencing, traffic barrier, strip of grass
- ▶ Conditions of maintenance
- ▶ Trash, graffiti
- ▶ Surface conditions; e.g. pot holes, sizeable cracks, root of trees breaking surface
- ▶ Crosswalk markings, ramps
- ▶ Street crossing level of safety
- ▶ Intersections meeting ADA compliance
- ▶ Wayfinding signs- name of path, route, distance; location of vertical signs
- ▶ Drainage conditions
- ▶ Adequate lighting
- ▶ Shading
- ▶ Security
- ▶ Conditions of trail amenities; e.g. bathrooms, water fountains

## C. General Conditions

The physical conditions and maintenance issues affecting Miami-Dade County's shared-use trail system are well-documented. The 2000 *Greenways Management and Maintenance Study* cited many of the common maintenance problems and generally classified these as either "design," "landscaping" or "surface" problems. A common design problem cited was poor drainage, noting that the Black Creek Trail had eroded due to poor drainage design and erosion control. Other design problems related to safety issues where visibility was obstructed and trails did not provide protective barriers against traffic or other potential hazards. The 2000 study also noted how landscaping could enhance a trail facility, but if planted incorrectly could encroach on the trail causing maintenance and safety problems. Surface maintenance problems were seen as construction issues where the ground was not properly cleared and grass would take over the surface and destroy it. The study also noted that some trails were damaged because they were of insufficient width or could not withstand the weight of maintenance equipment.

The 2010 *Miami-Dade County Shared-use Trail Maintenance Study* found that the typical Miami-Dade County trail facility has few amenities, little tree shade and suffers from a general lack of continuity. Most trails have no "wayfinding" signs or other prominent signage informing users of the significance of that particular facility. Trails are often unnamed or have various names given by governmental agencies causing confusion for users of the trails. There is also a general lack of comfort and safety when using many of the County's trails. In South Florida, tree shade is essential for relief from heat and sun exposure. However, most of the County's trails have little shading. Additionally, the majority of trails are not lighted at night due to the County's sun-up to sundown hours of operation. While this defensible policy may minimize liability, unlit trails can discourage use, contribute to incidents involving trail users and motor vehicles, encourage loitering and keep trails from becoming fully integrated into the larger public space.

### *Trail # 1 – M-Path*

**Description:** The M-Path is an asphalt linear trail running parallel to U.S. 1 beneath the elevated Metrorail from the Miami River, north of South West 7th Street, to South West 67 Avenue. The trail is 8.4 miles in length and nearly connects to the South Dade Trail. It is separated from the roadway by a wide strip of grass. The Miami-Dade Transit has jurisdiction of this trail.

**Location:** M-Path

**Photo:**



**Amenities:** The M-Path has no amenities. However, restrooms and drinking fountains are available to transit users at nearby Metrorail Stations. Bicycle parking and benches are available to the public at all stations. Motor vehicle parking is available for a fee at each station. The trail is not lighted at night.

**Maintenance:** The surface of the trail is in poor condition with pot holes from normal wear and damage by heavy equipment. The roots of trees are lifting and cracking the pavement at many points. The trail's landscaping is well maintained and there is trash and graffiti removal. There is little evidence of pooling water along the trail though sprinklers are occasionally broken and watering the pavement.

**Connectivity:** The M-Path intersects with many roads, both major and minor, as it runs parallel to US-1. Intersections at major roads have clearly marked crosswalks, pedestrian signals, ADA compliant curb ramps and truncated domes. Intersections at minor roads have faded crosswalks or unmarked crosswalks. Intersections with minor streets are dangerous because of the number of high speed motor vehicles using these streets. Drivers turning at these intersections avoid coming to a full stop

and hence are not careful to watch for pedestrians and others. The M-Path begins and ends at each intersection with no safety designs in place as trail users cross intersections. This results in poor continuity and connectivity along the trail. Small, overnight, homeless camps can be found along the trail right-of-way.

### *Trail # 2 Old Cutler Trail*

Description: The Old Cutler Trail connects the Commodore Trail, Biscayne and, Black Creek Trails. Old Cutler Trail extends 12.4 miles from Cocoplum Circle to SW 224 St. It runs south as a path along Old Cutler Road from Cocoplum Circle to SW 105th St where it then runs in road along the street to a pedestrian bridge at Red Road. The trail then resumes at Red Road running south to southwest to 216th St. then west to the Homestead Extension Florida's Turnpike (HEFT) The Trail is between 8-12 feet wide and separated from the roadway by a strip of grass, guardrail or curb. The Miami-Dade Public Works Department and the Miami-Dade County Park and Recreation Department share jurisdiction of this facility.

**Location: Old Cutler Trail**

Photo:



Amenities: The Old Cutler Trail has few amenities for users. A portion of the trail runs through a Matheson Hammock Park where bathrooms and drinking water is available. Benches and trash receptacles can be found at bus stops. Portions of the trail are shaded and at night the trail is partially lighted by street lights.

Maintenance: The Old Cutler Trail surface is in need of resurfacing and repair. Tree roots have lifted the pavement, heavy machinery has created depressions in the surface and 'temporary' repairs of poor quality have become long-term solutions, detracting from the quality of the Trail. Trail users must negotiate an occasional large tree which has grown close to the center of the trail. Where this occurs, the pavement is likely lifted and cracked, making the surface unsafe for pedestrians and dangerous for persons in wheelchairs. Water pools in many areas along the trail.

Connectivity: Many intersections along Old Cutler Trail are marked with zebra crosswalks which are very worn. Stop signs halting vehicles before they reach the trail are often missing, especially at commercial driveways. Traffic creeps forward at the driveways, making the trail impossible or dangerous to cross at these locations. At many intersections, curb ramps meet ADA guidelines. However, the trail surface is in a condition which makes wheelchair usage difficult. The trail is heavily used by bicyclists, pedestrians and runners. Widening the path and removing a number of utility poles on the path could decrease conflicts between users. There are a number of signs identifying the Old Cutler Trail as 'Bike Route 1' and no signs identifying it as Old Cutler Trail. The on-road section connecting two segments is not signed. Better signage could inform users of nearby trails connecting to Old Cutler Trail and other places of interest. Commercial driveways meeting this trail are dangerous to pedestrians.

### *Trail # 3 – Snake Creek Trail*

Description: The Snake Creek Trail follows the Snake Creek Canal from North Miami Beach through unincorporated Miami-Dade County. The trail runs from West Dixie Highway to NE 2nd Av. for a length of 5.3 miles. There are plans to reconstruct 1.3 miles from NE Miami Gardens Dr. to NE 2nd Av. and add a new 2.01 mile segment from NE 2nd Av. to Florida's Turnpike on the south side of the canal. The trail is separated from the roadway by a strip of grass, parking blocks, or metal barriers. Other parts of the trail do not run near a roadway. The City of North Miami Beach and the Miami-Dade County Park and Recreation Department are responsible for this trail. In North Miami Beach, trail segments north and south of the Snake Creek Canal can be crossed by pedestrian bridges.

Photo:



Amenities: Water fountains, bathrooms, benches, gondolas are all available in sections of Snake Creek Trail in North Miami Beach. These amenities are not found in sections of the trail which fall in unincorporated Miami-Dade County. There is ample shade in portions of the trail which fall in North Miami Beach. Sections of the path in unincorporated Miami-Dade are in need of tree shade and nighttime lighting.

Maintenance: There are areas where the surface of Snake Creek Trail has been broken by tree roots and heavy equipment. Other areas, especially in unincorporated sections of Miami-Dade County, are in need of repair due to drainage and erosion problems. The trail needs redesign and repair where it travels under Interstate 95. Trail repairs need to meet the level of quality of the surrounding pavement. This trail is littered with 'temporary' repairs in areas where utility crews have installed pipes or conduits. Clearance is sufficient for users especially in North Miami Beach. Young trees have been planted within two feet or less of the trail in North Miami Beach and it is unknown if root barriers have been used to keep future root systems from damaging the trail. In North Miami Beach, trash receptacles were neither full nor overflowing with trash. In unincorporated sections of Miami-Dade County, trash receptacles were absent and litter was evident. Graffiti was evident where the trail passes under Interstate-95. Water pools in large, deep puddles in sections of the trail where it passes beneath Interstate 95.

Connectivity: Several intersections along the trail where users cross are not safe. However, the Miami Gardens Drive / Glades Drive intersection is one of the busiest and safest. The pedestrian countdown signal at this intersection stops motor vehicles one minute after it is pressed and allows sufficient time for pedestrians to completely pass through the intersection before they are warned not to enter it. Some

intersections along the trail do not facilitate safe passage of the disabled. These intersections can be improved with redesign of curb ramps fitted with truncated domes, and pedestrian-activated traffic lights at intersections. Wayfinding signs are found along portions of the trail located in North Miami Beach. Similar signs could easily be placed in more locations along the trail. These signs could also be improved to orient users to nearby points of interest including parks and corridors with bicycle lanes. There are sections of the trail that appear unsafe as they are secluded and hidden from public view.

#### *Trail # 4 – Snapper Creek Trail*

Description: The Snapper Creek Trail follows the Snapper Creek (C-2) Canal from SW 17th St. to Coral Way for a 0.5 miles and SW 41st Terrace 2.6 miles to the intersection of SW 107th Avenue with Sunset Drive. The Trail is between 8-12 feet wide and separated from the roadway by a strip of grass or guardrails. There are plans to expand the trail to the M-Path, Ludlam and Commodore Trails. Currently, the trail connects to the Southwest 56th Street Path and the Southwest 72nd Street Path. The Miami-Dade County Park and Recreation Department has jurisdiction over this trail.

**Location: Snapper Creek Trail**

Photo:

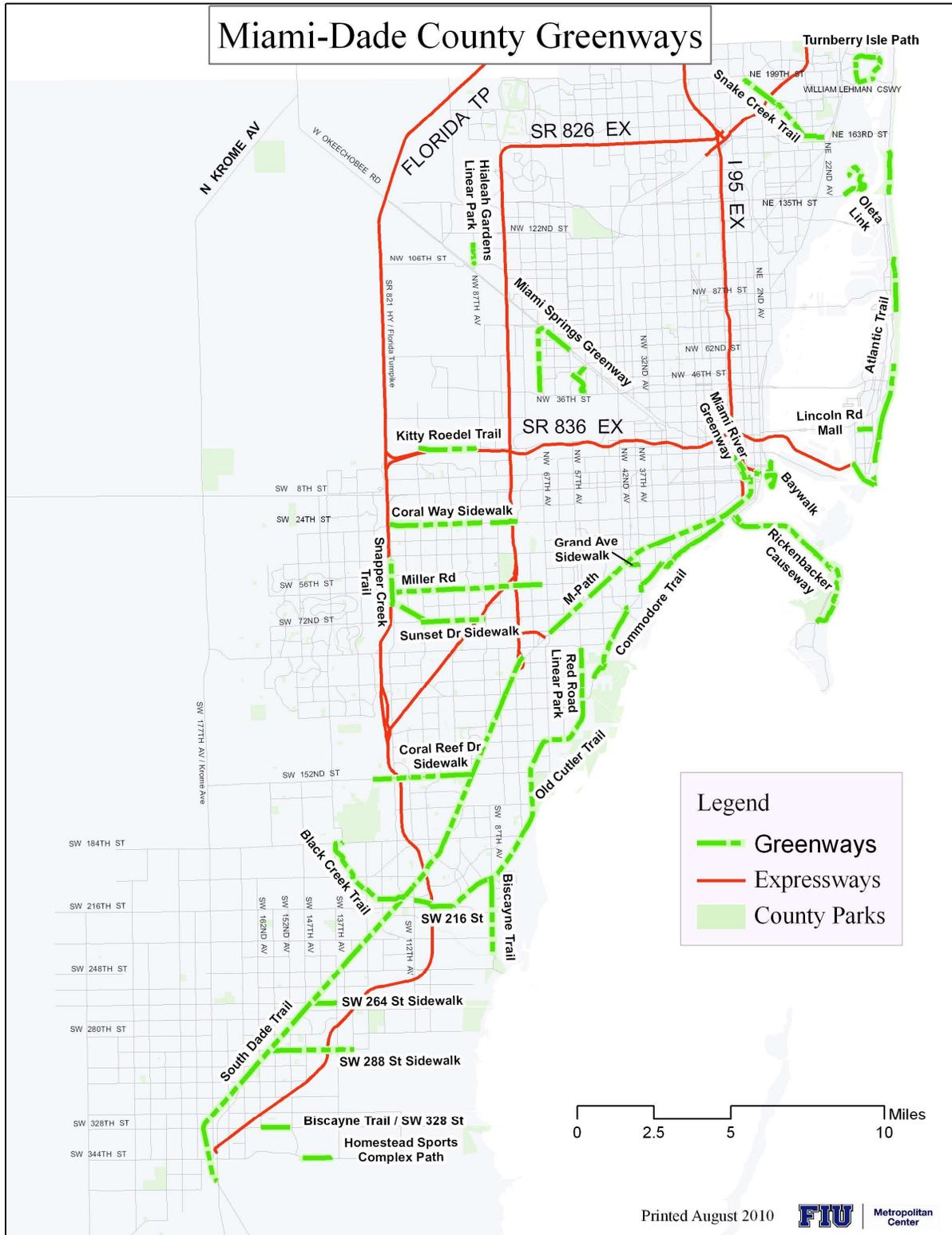


Amenities: There are no bathroom or drinking water facilities available along the Snapper Creek Trail. The trail has one shelter without a bench or table and a boat-launch ramp. Trees provide minimal shade along this trail and street lights provide the lighting.

Maintenance: The Snapper Creek Trail is beginning to show signs of wear including the formation of pot holes where water pools and cracks in the pavement from the roots of trees that have long since been removed. The trail is generally clear of vegetation and the landscaping is well-maintained.

Connectivity: The intersections that connect to the Snapper Creek Trail are well-designed. Traffic stops well before crosswalks and pedestrian-activated traffic signals are available at several intersections. These could be improved with the installation of LED displays to provide pedestrians Stop or Walk instructions. Facilities easing connectivity to the trail could be improved especially near the Florida Turnpike off-ramps. The trail begins and terminates abruptly. There is one large sign which displays the name of the trail and the name of the corporation which funded the linear park. Wayfinding signs could be improved to inform users of nearby points of interest connecting trails and parks. There is some evidence that homeless populations camp along the trail and under nearby bridges.

**Map 1: Miami-Dade Greenways**



### III: Trail Management and Operations

The following section identifies the key departments and agencies with responsibilities for managing and maintaining Miami-Dade County’s Shared-use Trail facilities, and provides an assessment of the delivery system with respect to inter-departmental/agency coordination and integration.

The 2000 *Greenways Management and Maintenance Study* noted there were “multiple players in the greenway business” in Miami-Dade County. The study found that coordination was difficult, but coordination issues had more to do with funding constraints rather than capability. The study found sufficient examples of good maintenance to conclude that “even with overlapping responsibilities, good management and maintenance of greenways are possible in the county.”

As previously noted, Miami-Dade County’s existing shared-use trail system consists of approximately 130 miles with another 500 miles planned for the future. Given these ambitious plans, it is important that a well-coordinated and integrated trail maintenance program be in place for the existing trail system. However, both the 2000 and current studies have found that despite multiple agency involvement and overlapping responsibilities there is no clear overall picture of the level of need and activity, and the maintenance and operational costs associated with the existing system.

Table 3.1 below shows Miami-Dade County’s shared-use trails by jurisdiction or ownership. Several of these trails are under shared jurisdiction with individual departments or agencies responsible for segments of a trail.

**Table 3.1: Miami-Dade County Shared-Use Trails by Jurisdiction**

<b>Shared-Use Trails by Jurisdiction</b>		<b>Miles</b>
<b>City of Aventura</b>		
Turnberry Isle Path	Around golf course in Aventura	2.8
<b>City of Hialeah Gardens</b>		
Hialeah Gardens Greenway	Along NW 87 Avenue Canal	0.7
<b>City of Homestead</b>		
Homestead Sports Complex Path	Along SW 344 Street from SW 152 Ave to SW 137 Avenue	1.0
<b>City of Miami</b>		
Baywalk	Around Brickell Key, north of river to Bayside	1.6
Miami River Greenway	Segments on both sides of the Miami River	1.9
<b>City of Miami Beach</b>		
Atlantic Trail	Several segments along beach	6.4

<b>Shared-Use Trails by Jurisdiction</b>		<b>Miles</b>
Lincoln Road Mall	Pedestrian mall from Alton Road to Washington Avenue	0.5
<b>City of Miami Springs</b>		
Curtiss Parkway Trail	In the median of Curtiss Parkway from Circle to parking lot	0.5
Deer Run Trail	Along Deer Run north of Fairway Drive	0.9
Ludlam Trail	Along Ludlam Drive from NW 38 Street to N. Royal Poinciana Boulevard	2.2
North Royal Poinciana Trail	Along N. Royal Poinciana Boulevard from Ludlam Drive to Albatross Street	0.9
<b>City of North Miami</b>		
Oleta Link	From FIU's Biscayne Bay Campus to NE 135 Street	0.4
<b>City of North Miami Beach</b>		
Snake Creek Trail	Along Snake Creek Canal from Miami Gardens Dr. to NE 22 Avenue	3.9
<b>Florida International University</b>		
Oleta Link	FIU's Biscayne Bay Campus	1.7
<b>Miami-Dade Expressway Authority</b>		
Kitty Roedel Trail	North of SR 836 between SW 87 Av. & SW 107 Av.	2.0
<b>Miami-Dade Park and Recreation</b>		
Atlantic Trail	Haulover Cut to north end of Haulover Park	1.4
Biscayne Trail	Along SW 87 Ave. from Old Cutler Road to Black Point Marina	2.5
Black Creek Trail, existing	Along Black Creek Canal from SW 184 Street to US-1, then along canal from SW 112 Ave. to SW 216 St.	4.3
Rickenbacker Trail	Crandon Park Marina to Village of Kay Biscayne	2.6
Snake Creek Trail	Along Snake Creek Canal from Sierra Park to Miami Gardens Dr.	1.4
<b>Miami-Dade Public Works</b>		
Biscayne Trail	Along SW 328 St. from SW 152 Av. to SW 162 Av.	1.0

<b>Shared-Use Trails by Jurisdiction</b>		<b>Miles</b>
Commodore Trail*	Various segments from SE 32 Rd. to Ingraham Hwy	3.9
Grand Avenue Path	Lincoln Drive to SW 37 Avenue	0.4
Old Cutler Trail	Along Old Cutler Rd. from Coco Plum Circle to Snapper Creek Rd., from SW 109 St. to SW 216 St.	12.4
Rickenbacker Trail	Entrance to Rickenbacker Causeway to Crandon Park Marina	3.9
Snapper Creek Trail	Along Snapper Creek Canal from SW 17th St. to Coral Way, then SW 41 St to SW 107 Ave.	3.1
SW 152 Street Path	SW 152 Street from US-1 to Metrozoo	3.3
SW 216 Street Path	Connecting the Black Creek and Old Cutler Road Trails	0.7
SW 24 Street Path	Along SW 24 Street from SW 79 Ave to SW 117 Ave	3.9
SW 264 Street Path	Along SW 264 Street from US-1 to SW 137 Ave	0.8
SW 288 Street Path	SW 288 Street (Biscayne Dr) from US-1 to SW 132 Ave.	2.7
SW 56 Street Path	Along SW 56 Street from SW 68 Ave to SW 117 Avenue	5.0
SW 72 Street Path	Along SW 72 Street from SW 87 Ave to 10800 Block	2.1
<b>Miami-Dade Transit</b>		
M Path	Miami River to SW 67 Avenue	8.4
South Dade Trail	Parallel to US-1, from Dadeland South Station south to Card Sound Rd.	20.5
<b>National Park Service</b>		
Everglades Shark Valley Trail	From parking lot to observation tower	15
<b>Village of Pinecrest</b>		
Red Road Linear Park	Old Cutler Path to Kendall Drive	1.8
<b>Total Miles</b>		<b>128.6</b>

\* Commodore Trail forms portions of Bike Route 1 and is comprised of sidewalks, paved paths and on-road facilities.

As was first noted in the 2000 study, there was a 1996 joint memorandum from the directors of Miami-Dade Public Works and the Park and Recreation Department that outlined some of the problems related to trail maintenance. The memorandum pointed out that neither department had

the funding or staff needed to perform the necessary trail maintenance and that neither department had the responsibility of “sweeping County bicycle paths.”

The 2000 study found that a standing agreement existed between the Miami-Dade Public Works Department and Park and Recreation for maintenance by Public Works to repair potholes in asphalt and to contract projects “that were beyond the capabilities of in-house crews”. This agreement was informal and without direct payment or reimbursement to Public Works. As budgets grew smaller, Public Works, Park and Recreation and Miami Dade Transit all began contributing to the maintenance of trails. Memorandums of understanding (MOUs) were produced to clarify departmental roles and responsibilities. However, the 2000 study recognized the limited impact of these memoranda.

The current Study initiated an assessment of Miami-Dade County’s trail management and maintenance organizational structure through a series of interviews with key personnel from various County/municipal departments and agencies responsible for the management and/or maintenance of the County’s trail system. These departments/agencies included the following:

- Miami-Dade Park & Recreation Department
- Miami-Dade Public Works
- Miami-Dade Transit Agency
- Miami-Dade Metropolitan Planning Organization (MPO)
- South Florida Water Management District
- Florida Department of Transportation
- City of Miami
- City of Miami Beach
- City of Hialeah Gardens
- City of Homestead
- City of North Miami Beach
- City of Miami Springs

The current study found that Miami-Dade County is responsible for maintaining the majority of shared-use trails. Miami-Dade Transit and Miami-Dade Public Works maintain the bulk of the trail miles inventoried in the study. Miami-Dade County Park and Recreation maintains all trails within and adjoining park boundaries with the exception of maintenance items requiring additional equipment or expertise.

**Table 3.2: County-wide Department/Agency Trail Maintenance Responsibilities**

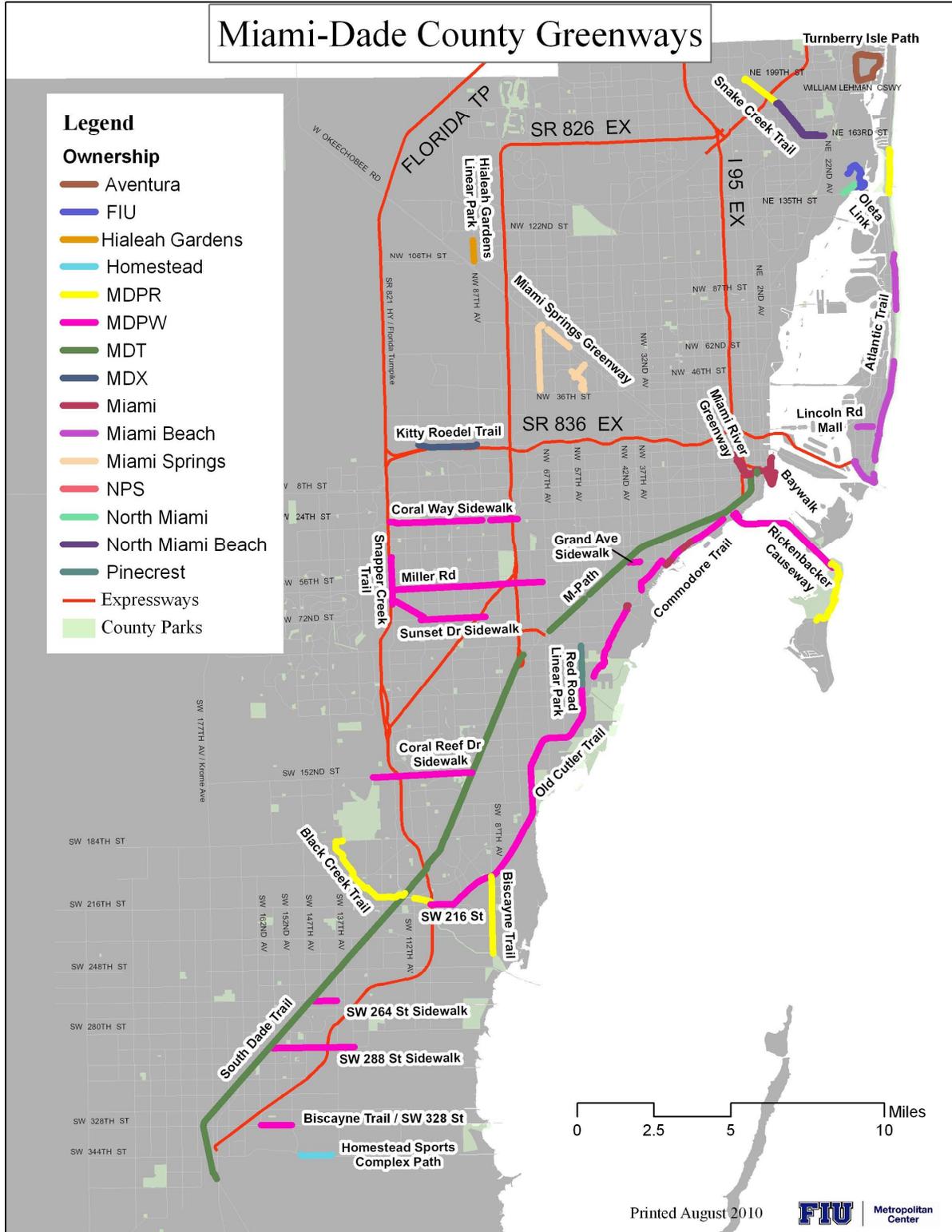
<b>Department/Agency</b>	<b>Maintenance Responsibility</b>
Miami-Dade Park and Recreation (MDPR)	Maintains facilities that are within and in close proximity to County parks and a large number of canal right-of-ways that have trails. Designs and constructs trails.
Miami-Dade Public Works Department (MDPWD)	Designs, constructs and, repairs pathway surfaces within the public right-of-way throughout the County. Contracts out landscape services for various roadways and pathways.
Miami-Dade Transit Agency (MDT)	Allows MDPW to manage contracts for landscaped areas associated with the South Dade Busway and the M-Path. Responsible for maintenance along the South Dade Trail along the Busway
Miami-Dade Metropolitan Planning Organization (MPO)	Plans and coordinates the location of non-motorized facilities. Coordinates the bicycle/pedestrian education and safety programs Oversees the activities of the Bicycle/Pedestrian Advisory Committee (BPAC) Operates and maintains the bicycle locker program.
South Florida Water Management District (SFWMD)	Permits use of right-of-ways for greenways. Requires a maintenance plan before issuing a permit for use of their rights-of-way Will not maintain trails, except for those maintenance functions directly related to its facilities.
Florida Department of Transportation (FDOT), District 6	Has built facilities, but has maintenance agreements with local jurisdictions.
Miami-Dade Expressway Authority (MDX)	Built and maintains the Kitty Roedel Bike Path.

Miami-Dade Public Works Department (MDPWD) is responsible for the largest portion of trail maintenance. Public Works performs landscaping maintenance services in-house or contracts the work out through a bid process. Contracting services include mowing, trimming, edging, tree maintenance, weed control and litter removal. Miami-Dade Transit allows MDPWD to manage contractors performing maintenance along the Metrorail and South Dade Busway right-of-way. MDPWD also sweeps on and off road sections of the Rickenbacker Trail and repairs potholes, street furniture and lighting along the trails. These include trails on County property and those within the jurisdiction of the South Florida Water Management District, which includes trails almost exclusively running along canals. Miami-Dade Park and Recreation is responsible for similar landscape maintenance of trails in close proximity to County parks. MDPWD repairs damage to asphalt and other surfaces where specialized equipment and expertise is required. MDPWD only repairs damaged signs or traffic barrier where they have jurisdiction.

The Miami Dade Park and Recreation (MDPR) and Miami Dade Public Works Department (MDPWD) manage trail maintenance operations through “interdepartmental agreements” that define the maintenance responsibilities of each party, including the compensation MDPR pays to MDPWD. Interdepartmental agreements between the MDPR and MDPWD provide specific language with respect to maintenance services, including coordination supervision, inspections, quality control and field operations for specified trail facilities. The interdepartmental agreement also provides that MDPR and MDPWD Coordinators be assigned to the project.

In 2007, the Miami-Dade Expressway Authority (MDX) dedicated the Kitty Roedel bicycle path, which the agency built and currently maintains. This is the only trail built by the MDX, though the agency passed an Enhancement Policy in 1998 which calls for feasibility studies looking at enhancements to include bicycle/pedestrian facilities.

**Map 2: Miami-Dade County Greenways by Departmental / Agency Jurisdiction**



## A. Key Interview Findings

The face-to-face interviews with department and agency officials (Appendix B) were structured according to the approved Interview Guide (Appendix C). Officials were first contacted by email or telephone for an appointment. At that time, they were forwarded the Interview Guide and asked to fill-in specific information regarding operations and management practices, maintenance and budgeting procedures. Official's responses were later explored in further depth.

The aforementioned interviews determined that trail maintenance activities in Miami-Dade County are performed as part of individual department/agency operations and inter-departmental agreements, but absent a comprehensive and integrated trail maintenance management plan. The interviews substantiated previous study findings with regards to a general lack of coordination and cooperation in the management and maintenance of shared-use trail facilities. Perhaps due to multiple agency involvement and overlapping responsibilities there is no clear overall picture of the level of need and activity, standards and the maintenance levels and operational costs associated with the existing trail system. The current study also found significant concern among department/agency officials regarding the staffing and funding of trail maintenance operations.

The following are brief summaries of the key issues:

1) *Maintenance policies* – While no unified or comprehensive policy exist with respect to shared-use trail maintenance activities, agency staff were able to articulate policies concerning specific maintenance activities such as tree placement, the need for root barriers, and requirements to plant drought resistance grasses and plants. Staff believed high-level officials/administrators set policy concerning maintenance through the budget process.

2) *Maintenance levels* - Staff agreed that shared-use trails are destined to lower levels of maintenance than other public facilities. Users of shared-use trails are fewer than users of other public facilities. A smaller number of users corresponds with fewer people contacting elected officials and staff about shared-use trails. The conditions of these trails are almost exclusively visible to trail users. Drivers using Old Cutler Road or US-1 are not sufficiently near the Old Cutler Road Trail or the M-Path to evaluate the condition of those paths.

3) *Maintenance standards* - Though aware of trail erosion, surface cracks, and the need for trail re-designed, some staff believes there are no major problems with existing facilities and require few repairs. They're of the opinion that the major repairs of shared-use trails are considered minor patchwork relative to their overall agency responsibilities. The surface cracks or potholes on paved paths do not amount to many repairs considering the number of potholes MDPWD repairs weekly around the County.

4) *Maintenance priorities* – Public safety is a priority of most departments and agencies. Broken hand or guardrails may receive immediate attention because they contribute to unsafe conditions. However, missing hand or guardrails are more difficult to identify and would not be replaced as quickly, though they may also contribute to unsafe conditions. The differences between repair

and maintenance issues are reflected in the level of priority they receive. Maintenance issues are rarely determined to contribute to the safety of trail users. The clearing of trail obstructing trees, branches or large poles are also prioritized, as is the removal of graffiti.

5) *Maintenance activities and costs* - Staff was helpful in recommending cost-cutting measures. Suggestions included spacing palm trees further apart so that larger mowing machinery could be used and developing tree canopy so that the growth of grass is slowed. Most grounds maintenance personnel agreed that root barriers are essential. In the opinion of staff interviewed, two feet of distance between paved paths and trees is not sufficient to avoid the uprooting of trails. Root barriers protect pavement but they are not infallible. Staff interviewed also generally in favor of using the 311 information center for reports of needed maintenance and repairs. Municipalities were less experienced with perceived benefits. The City of Miami Beach relies on “Better Place” requests, which function very much like 311 requests.

The following are the key points summarized from department/agency interviews:

- Trail maintenance functions are generally performed by individual departments/agencies but lack clear coordination and integration;
- County officials expressed concern regarding reduced department/agency budgets which has resulted in increased competition and some lack of cooperation;
- County officials expressed concern that trail maintenance is not part of the County’s Capital Improvements Plan (CIP);
- Some County officials recommended the formation of a centralized, independent agency for trail management maintenance with its own dedicated funding source;
- County officials generally concur that most trail maintenance is minor in nature requiring only routine maintenance;
- More costly maintenance involves areas where trees are planted too close together necessitating the use of smaller, more expensive machinery;
- Some County officials argue that arborists should be involved in tree planting planning and not rely simply on donated trees that may be inappropriate in terms of canopy and maintenance;
- County officials suggested that trails should provide minimal services and that individual communities and neighborhoods should contribute to trail maintenance within their jurisdictions.

## **IV Miami-Dade County Trail User Survey**

### **A. Background**

This section of the Study provides a summary of the key findings from the “user survey.” The twofold purpose of the user survey was to: 1) elicit the opinion of Miami-Dade County residents who use the shared-use trails, paths, and greenways on the maintenance and quality of the facilities; and 2) determine preferred options by the trail users regarding solutions to improving the maintenance, operations and management of the facilities. The survey design was prepared by the Florida International University Metropolitan Center with guidance and input from the Miami-Dade County Park and Recreation Department and Metropolitan Planning Organization.

The previous user survey designed and implemented as part of the 2000 *Greenways Management and Maintenance Study* involved four (4) organizations (focus groups) consisting of approximately 5,750 members. The organizations included the Miami Running Club (5,000 members), South Florida Trail Riders (310 members), Everglades Bicycle Club (240 members) and Team Foot Works Walkers (200 members). The study noted that since only hobby club enthusiasts were queried, the survey results were not necessarily representative of the general population. Further, the response rate was very low, as only 40 users agreed to participate in the focus group meetings and answer the survey.

The 2000 user survey focused on both “expenses related to trail use” and “trail use patterns” and “attitudes toward trail maintenance.” While the current Study does not examine the issue of trail use expenses, the 2000 trail user survey findings regarding trail use patterns and attitudes toward trail maintenance were informative in designing the current user survey.

Significantly, the 2000 user survey queries regarding “trail use patterns” found that 52 percent of respondents used Miami-Dade County trails/greenways/paths at least 1-2 times per week. The survey also noted that the most frequented facilities were: Old Cutler Trail, the Everglades Trail and Key Biscayne. Canal Banks ranked high among equestrians who complained that there were not enough trails for riding.

Regarding queries on “attitudes toward facility maintenance,” the 2000 user survey found “general dissatisfaction” with trail amenities and facilities and with the overall maintenance of trails.

### **B. User Survey Design and Methodology**

The current user survey was designed as both a “face-to-face” and “online” survey. The face-to-face survey method applied a “purposive, non-probability sampling.” Purposive sampling is appropriate when a sample is selected based on knowledge of a population or group, its elements or key characteristics and the purpose of the study. The online survey was designed to capture users “at-large” or those users at key locations and events who weren’t willing to participate in face-to-face interviews.

The face-to-face survey method had FIU Metropolitan Center staff “intercepting” users at key shared-use trail locations and events in Miami-Dade County. The key locations and events were selected by the Miami-Dade County Park and Recreation Department and Metropolitan Planning Organization. The events were typically organized weekend bicycling fairs promoting alternatives to motorized transportation in Miami-Dade County.

### **C. Summary of Survey Results**

The user survey resulted in 497 responses from the combination of key trail location intercepts, events and online survey. The largest number of user responses (289/58 percent) was received from “event” locations followed by “online” (165/33 percent) and “key trail locations” (43/9 percent) responses. The results of the field and online surveys were entered into a SPSS format and analyzed. The SPSS file will also serve as a database and benchmark for further survey research.

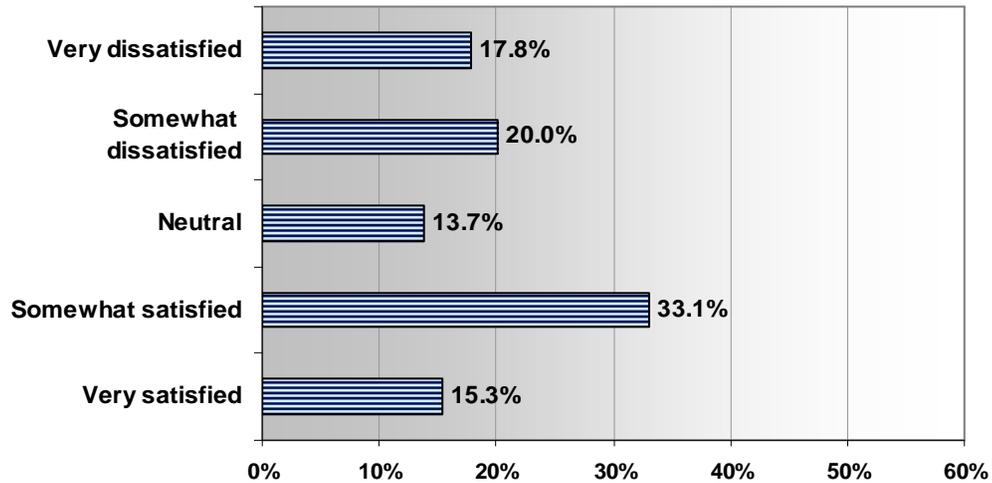
The survey questionnaire (see Appendix D) developed for the study’s “user survey” was framed to elicit the opinions and attitudes of Miami-Dade County residents who use the shared-use trails, paths, and greenways on the maintenance and quality of the County’s facilities and to determine preferred options by the trail users regarding solutions to improving the maintenance, operations and management of the County’s facilities. The following is a summary of the key user survey results regarding: 1) satisfaction levels of trail maintenance, and 2) preferred options regarding solutions to improving maintenance, operations and management

#### *1. Trail User Satisfaction*

The user survey questionnaire/instrument posed a series of questions to determine the “satisfaction” level of trail users with respect to the County’s trails and facilities. The survey found that 48.4 percent of the user respondents are either “very satisfied” or “somewhat satisfied” with Miami-Dade County’s trail system (Figure 4.1). However, 37.8 percent of the user respondents are either “somewhat dissatisfied” or “very dissatisfied” with the County’s trail system.

A cross-tabulation of the three survey groups found significant variations. The vast majority (76.5 percent) of the users surveyed at “key locations” are either “very satisfied” or “somewhat satisfied” with Miami-Dade County’s trail system. This is a significant finding as users at key locations are perhaps the most knowledgeable of Miami-Dade’s trail system.

**Figure 4.1: Level of Satisfaction among Miami-Dade County Trail Users**



The user survey posed questions that allowed respondents to rate (good to poor) the physical conditions of Miami-Dade County’s trail system. Survey respondents were asked to rate the trails they use on issues such as accessibility, condition, security and amenities provided (Table 4.1).

“Accessibility from place of residence” (59.5 percent good/fair) received the highest positive rating from trail user respondents. “Dangerous roads and intersections” received the highest negative rating with 67.2 percent of the survey respondents rating this physical condition as either “needing improvement” or “poor.” The issue of “poor surface – pot holes, exposed tree roots” also received high negative (55.6 percent) and low positive (38.2 percent) ratings as did “availability of services” (55.1 percent negative/27.8 percent positive).

**Table 4.1: User Ratings of Miami-Dade County’s Trail System**

	Good	Fair	No Opinion	Needs Improvement	Poor
<b>Accessibility from where I live</b>	34.2%	25.3%	4.1%	23.1%	13.2%
<b>Access to useful destinations</b>	19.4%	26.6%	9.6%	28.5%	16.0%
<b>Parking at access points</b>	18.0%	23.6%	20.7%	23.1%	14.7%
<b>Dangerous roads and intersections</b>	4.9%	19.4%	8.4%	37.9%	29.3%
<b>Personal safety from other users</b>	12.2%	29.1%	11.0%	31.2%	16.4%
<b>Poor surface - pot holes, exposed tree roots</b>	13.6%	24.6%	6.1%	35.4%	20.2%
<b>Overgrown trees or plants</b>	18.8%	31.3%	11.5%	26.2%	12.3%
<b>Vandalism</b>	23.4%	23.4%	28.7%	14.5%	10.1%
<b>Narrow width</b>	14.3%	26.1%	11.4%	31.4%	16.9%
<b>Lack of services - food, drink, restrooms, etc.</b>	9.5%	18.3%	17.1%	37.8%	17.3%

A cross-tabulation of the three survey groups found a fairly consistent response pattern with respect to the positive rating given to “accessibility from place of residence” and the negative

rating given to “availability of services.” Respondents at “key locations” gave the highest positive rating (68 percent “good”) for accessibility from place of residence. “On-line” users (74.5 percent) gave the highest negative rating for “availability of services.”

Trail users were then asked to consider the importance of certain physical or supporting conditions that could encourage greater use of trails in Miami-Dade County. The survey respondents attached the greatest importance to “paved paths physically separated from motor vehicles” (60.4 percent) followed by “secure parking at destinations” (54.1 percent) and “paved trails along canals and scenic areas” (53.7 percent).

A cross-tabulation of the three survey groups found a fairly consistent response pattern with respect to “paved paths physically separated from motor vehicles” and “paved trails along canals and scenic areas.” However, “on-line” (56.8 percent) and “key location” (56.3 percent) user respondents attached slightly higher importance to the need for “secure parking at destinations.”

**Table 4.2: Conditions Encouraging Shared-Use Trail Activity in Miami-Dade County**

	Very Important	Important	Moderately Important	Of Little Importance	Unimportant
<b>Shaded paths</b>	34.2%	28.7%	24.4%	9.4%	3.3%
<b>More trail amenities - benches, rest rooms, bike racks...</b>	33.2%	35.1%	19.8%	9.1%	2.8%
<b>Lighting on trails and paths</b>	47.3%	29.9%	13.2%	8.2%	1.4%
<b>Paved trails along canals and scenic areas</b>	53.7%	31.0%	10.6%	3.0%	1.6%
<b>Way finding signs and maps</b>	35.6%	32.7%	20.1%	9.4%	2.1%
<b>Paved paths physically separated from motor traffic</b>	60.4%	24.3%	9.4%	3.8%	2.1%
<b>Marketing and advertising on paths/trails</b>	19.2%	20.6%	13.1%	23.7%	23.4%
<b>Increased enforcement of traffic laws</b>	45.8%	27.5%	14.8%	8.2%	3.7%
<b>Secure bike parking at destinations</b>	54.1%	28.5%	12.1%	4.2%	1.2%
<b>Less criminal activity on the streets</b>	50.1%	27.7%	12.5%	6.8%	3.0%
<b>Significant increase in the cost of living</b>	26.7%	26.2%	23.2%	11.4%	12.4%
<b>Better access to Metrorail and Metrobus</b>	38.0%	25.6%	18.0%	11.5%	6.9%

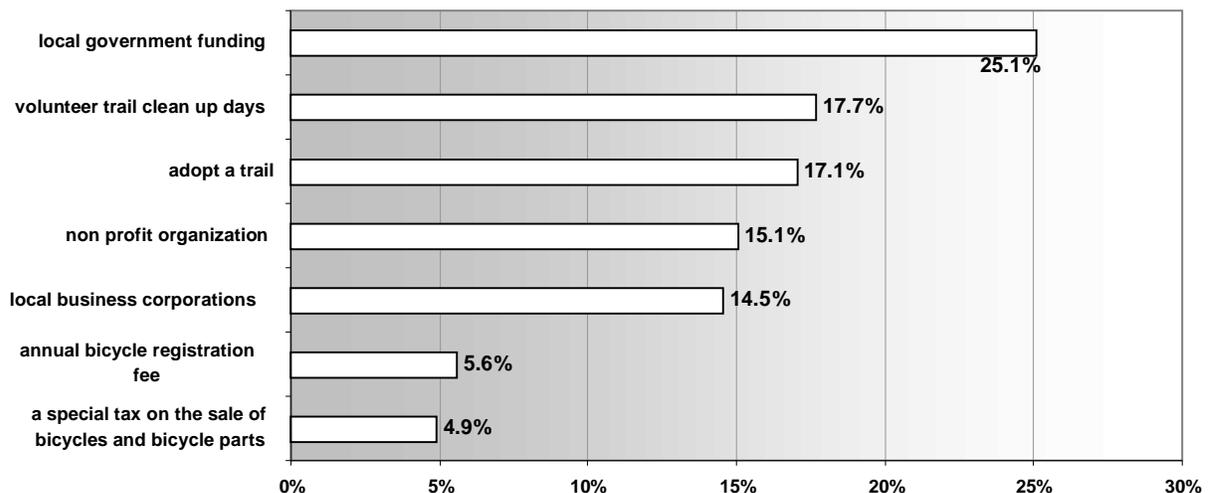
## 2. User Preferred Options Regarding Solutions to Improving Maintenance, Operations and Management

The final section of the user survey focused on the preferred options of Miami-Dade’s trail users with respect to improving the maintenance, operations and management of the trail system. A series of questions addressed the issue of funding trail maintenance. Users were asked whether they would be willing to pay a recreational fee to help maintain Miami-Dade County’s trails and paths. Significantly, 59.2 percent of the users responded they would be willing to pay a recreational fee to address this funding need. A cross-tabulation of the three survey groups found “event” goers (61.2 percent) the most willing to pay a recreation fee and “key location” users (47.9 percent) the least willing.

Users were then asked to select which from a list of potential methods for funding the maintenance of Miami-Dade County’s trails and paths would be acceptable to them (Figure 4.2). Significantly, 25.1 percent of the users responded “local government funding” would be acceptable followed by “volunteer trail clean-up days” (17.7 percent” and “adopt a trail program” (17.1 percent).

A cross-tabulation of the three survey groups found a very consistent response pattern. Users at “key locations” (27.2 percent) gave the highest positive response to “local government funding.”

**Figure 4.2: Trail User’s Acceptable Methods for Funding Trail Maintenance in Miami-Dade County**



The trail users were then asked what was the “one” thing Miami-Dade County could do to improve the condition of its trail system. Significantly, this question had a high non-response rate (38.6 percent). However, of those trail users who did respond to this survey question, “maintenance - pot holes, paving, remove trash” (29.8 percent) and “additional bike lanes” (26.6 percent) received the highest response rates.

A cross-tabulation of the three survey groups found a fairly consistent response pattern but with some variations (Table 4.3). Users at “key locations” gave the highest response rate (34.3 percent) with respect to “maintenance – pot holes, etc.,” but cited improvements to “trail amenities” (17.1 percent) as their second highest priority. “Event” goers, as expected, cited “additional bike lanes” (31.7 percent) as their first priority followed by “maintenance – pot holes, etc” (30 percent). “On-line respondents cited “maintenance – pot holes, etc.” (27.8 percent) and “additional bike lanes” (22.2 percent) as their highest priorities.

**Table 4.3: Priority of Miami-Dade County Shared-use Trail Improvements by Survey Group**

Categories	Key Location	Event	Online	Overall
<b>Additional bike lanes</b>	11.40%	31.70%	22.20%	26.60%
<b>Safety</b>	5.70%	11.10%	1.10%	7.50%
<b>Maintenance (pot holes, paving, remove trash, etc.)</b>	34.30%	30.00%	27.80%	29.80%
<b>Access to Trails (Connectivity)</b>	0.00%	3.90%	7.80%	4.60%
<b>Enforcement of Traffic Laws</b>	8.60%	2.20%	18.90%	7.90%
<b>Better Marketing (Educating the Community)</b>	2.90%	6.70%	10.00%	7.20%
<b>Landscaping (Shaded areas)</b>	2.90%	1.10%	1.10%	1.30%
<b>Intersections and Crosswalks (Traffic Signals)</b>	11.40%	3.90%	5.60%	5.20%
<b>Lighting on Trails</b>	5.70%	3.90%	4.40%	4.30%
<b>Trail Amenities</b>	17.10%	5.60%	1.10%	5.60%
<b>Non-response</b>	31.40%	35.90%	45.50%	38.60%

#### **D. Trail User Survey Key Findings**

The 2000 *Greenways Management and Maintenance Study* found that Miami-Dade County’s existing trails and pathways “are not meeting the demands of the respondents that were surveyed.” The user surveys performed in 2000 and as part of the current Study both reach three very important conclusions: 1) Miami-Dade County trail users make frequent use of trail facilities, 2) Miami-Dade County’s trail user respondents are generally concerned with the overall maintenance and condition of the trail system, and 3) Miami-Dade County’s trail services and amenities such as restrooms, places for food and drink and repair shops are significantly lacking.

The 48.7 percent overall favorable level of satisfaction expressed by survey respondents is concerning given the high level of use of Miami-Dade County’s trail facilities. However, there appears to be some variation of opinion based on level of use and/or type of trail use. As was previously noted in the survey results, user respondents at “key locations” gave a significantly higher 76.5 percent favorable level of satisfaction rate.

Trail users expressed general concern with Miami-Dade County's shared-use trail system with regard to safety, conditions and the availability of services. From a safety standpoint, most trail users (67.2 percent) expressed their dissatisfaction concerning "dangerous roads and intersections." "Surface conditions," including potholes and exposed tree roots, were given high negative ratings by 55.6 percent of user respondents. Lastly, 55.1 percent of the user respondents gave high negatives to the "availability of services" along the shared-use trail system.

Regarding the issue of funding the maintenance of Miami-Dade County's shared-use trail facilities, the survey results suggest that users understand that on-going trail maintenance will require a range of funding options, including government funding, volunteer efforts and financial/material support from local businesses and corporations.

## V Best Practice Case Studies

### A. Background

The following section provides “best practice” case study research on the successful establishment and implementation of Shared-use Trail Maintenance Programs in the United States. The research focused on key aspects of shared-use trail maintenance including maintenance activities, maintenance levels, standards and priorities, management of maintenance activities, costs, budget planning, funding and performance measures.

Best practices are innovative, dynamic management tools available to practitioners to help ensure that Miami-Dade County’s shared-use trail system is managed as efficiently and effectively as possible. Best practice is generally defined as the most efficient and effective way of accomplishing a task based on repeatable procedures with proven success over time for large numbers of people. Best Practices can offer practical guidelines as opposed to rigid standards of what is working well in the current state of governmental organization that are worth sharing among the parks and recreation community. Practitioners are challenged to improve upon existing best practices and to document and share their improvements with colleagues.

The current Study reviewed the best practice case studies included in the 2000 *Greenways Management and Maintenance Study* prepared by the FIU Metropolitan Center. The previous study selected five (5) metropolitan areas (Indianapolis, Phoenix, Pinellas Trail, FL, Portland, OR and Seattle) around the country that have been recognized as “best practice” greenway/trail/pathway systems. The study also identified six (6) areas or characteristics used for evaluating them as best practice systems. These characteristics included the following:

- System for interagency coordination
- Dedicated funding
- Scheduled maintenance
- Privatized maintenance
- Advocacy groups
- 100+ miles of greenways/trails/pathways

The previous study found areas in which best practice trail systems had in common included “scheduled maintenance” and the presence of “advocacy groups.” The previous study found, however, that only two of the five systems (Indianapolis, IN and Phoenix, AZ) had formal systems in place for “interagency coordination” and only one system (Indianapolis) had a source of “dedicated funding.” Pinellas County, FL was the only best practice system that had “privatized maintenance.”

The following is a brief summary of the 2000 *Greenways Management and Maintenance Study* best practice findings:

## **Interagency Coordination**

Interagency coordination in the planning, construction, and maintenance of the “best practice” shared-trail systems in Seattle and Indianapolis have helped to minimize maintenance costs. However, the 2000 study found that best practice systems, as a whole, generally use multiple departments for planning, construction, management and maintenance of shared-trails with said activities coordinated through memorandums of understanding (MOUs) that outline each department’s responsibilities in terms of geographic areas and tasks. The Indianapolis Greenway Project has been successful in using volunteers to help build and maintain greenways. The project conducted four volunteer workdays per year.

## **Dedicated Funding**

Except for Indianapolis and Portland, OR, the “best practice” shared-use trail systems examined in the 2000 study did not have budget line items or other designated funding sources for the maintenance and management of the systems. The Indianapolis Greenway Project was receiving an annual budget of \$220,000 for administration and maintenance and \$800,000 in 1998 for capital projects. Marion County earmarked Cumulative Building Funds from property taxes to fund these projects. In the case of Portland, the \$500,000 to \$1 million annual capital budget is the result of a state law that requires 1 percent of general transportation revenue (GTR) go to bicycle transportation.

## **Scheduled Maintenance**

The 2000 study found that regularly scheduled maintenance and inspections were common practice in each of the “best practice” shared-use trail systems examined. The Pinellas County Trail system was found to have a well-designed “privatized” scheduled maintenance system. The private maintenance provider services the entire trail five days a week and is responsible for cleaning asphalt, litter removal, trimming, installing signs, minor repairs and trash removal once a week. The provider does flat mowing 35 times a year and slope mowing 5 times a year. Seattle’s key to good maintenance was attributed to their planning and construction. City officials believe good drainage and landscaping are critical. The city uses native materials and sets plants and trees as least six feet back from the pavement. The city also builds its trails wide enough to fit and withstand motorized vehicles.

## **B. 2010 Best Practice Case Studies**

The criteria used in developing a current “best practice” case study analysis included the following:

- Nationally recognized Shared-use Trail Systems
- State of Florida recognized Shared-use Trail Systems
- Shared-use trail systems with laudable management and maintenance operations

Three (3) “expanded” best practice case studies were selected based on the above criteria. The case studies include Seattle, WA, Indianapolis, IN and Pinellas County, FL. In addition to the expanded case studies, best practice “focus areas” were selected of shared-use trail systems that have incorporated innovative management and maintenance operations that are noteworthy and potentially transferable to Miami-Dade County. These best practice examples include Chicago, IL, San Francisco, CA, Indianapolis, IN and Seminole County, FL.

## **Seattle, Washington**

### *Background*

The Seattle Department of Transportation (SDOT) Bicycle Program has been working steadily toward developing an “urban trail system” to accommodate bicyclists. Seattle’s urban trails system includes shared-use paths, bike lanes, signed bike routes, arterials with wide shoulders, and pedestrian pathways. Seattle has about 45 miles of shared use paths, 120 miles of on-street, striped bike lanes and sharrows, and about 120 miles of signed bike routes. The City of Seattle and surrounding Puget Sound Region has been recognized as one of the best areas in the country for bicycling. The Seattle Department of Transportation (SDOT) estimates that about 36 percent of its 520,000 citizens engage in recreational bicycling, and between 4,000 and 8,000 people bicycle commute in Seattle each day, depending on the time of year and weather conditions.

The goals of the Urban Trails system are to:

- Facilitate bicycling as a viable transportation choice;
- Afford citizens the opportunity to experience the City's unique scenic and natural amenities;
- Provide access to healthful recreational activities; and
- Link major parks and open spaces with Seattle neighborhoods.

When completed, the City will have established a bicycle facility network linking neighborhoods and activity centers, as well as providing connections with recreational and natural areas within the Puget Sound Region.

## **Indianapolis, Indiana**

### *Background*

Indy Parks Greenways currently operates and maintains the 39 miles of greenway trails through the City of Indianapolis. The Greenways system encompasses streams, old railroad, utility, and historic corridors, such as the 1836 Canal Tow Path. Eventually, it will encompass more than 150 miles of interconnected trails throughout Marion County. This plan also builds on initiatives established in the *Pathways to the Future- Indianapolis-Marion County Park, Recreation & Open Space Plan*, published by Indy Parks for the City of Indianapolis in 1999 and the *Indianapolis Metropolitan Bicycle and Pedestrian Plan*, prepared by the Metropolitan Planning Organization and adopted in 2000.

The Indianapolis Greenways System provides essential natural and cultural resources to the citizens of Marion County and to millions of Indianapolis visitors each year. Comprising 13 of the 20 greenways, the river and stream ecosystems allow habitat for a diversity of plant and

animal species. These areas also provide water for our daily use and serve as natural purifiers for our environment. In conjunction with the waterways, Greenway conservation and trail corridors serve as passageways, food sources and breeding grounds for fish and wildlife. All of the greenways are significant for their historic place in this region's development. In addition to these inherent benefits, the rivers and Greenway corridors provide users with opportunities for environmental education and social interaction. They also supply an invaluable urban asset to the communities of Indianapolis.

## **Pinellas County, Florida**

### *Background*

The Fred Marquis Pinellas Trail is a linear park and recreation trail currently extending from St. Petersburg to Tarpon Springs. The trail system currently is 44 miles in length and traverses through 7 municipalities in Pinellas County. The Trail, which was created along an abandoned railroad corridor, provides protected greenspace for walking, jogging, skating, and biking. The Pinellas County Trail was identified in the 2000 *Greenways Management and Maintenance Study* as a "best practice" model for privatized maintenance. The trail system was also noted for its regularly scheduled maintenance program and strong volunteer component. These efforts were enhanced through the work of many volunteers who helped with litter removal, security and public information.

According to the *Pinellas Trail Guide*, the Fred Marquis Pinellas Trail began as a vision in 1983. A man whose son was killed while riding his bike helped form the Pinellas County Metropolitan Planning Organizations Bicycle Advisory Committee which consisted of bicycle enthusiasts. The committee, in conjunction with the Pedestrian Safety Committee, wanted a safe place to enjoy bicycle riding, strolling or jogging. The committees worked with Pinellas County in acquiring and converting a 34-mile corridor of abandoned CSX railroad right-of-way into the trail system. The Pinellas Trail was named in honor of Fred Marquis, former Pinellas County Administrator who served from 1979 until 2000. Mr. Marquis is cited as "a tireless proponent for the conversion of the abandoned railroad corridor to the Pinellas Trail."

## **C. Best Practice Focus Areas**

### *1. Trail Management Policies & Procedures*

Trail management policies and procedures vary somewhat from one best practice location to another. However, policies for trail maintenance activities typically emanate from master plans, e.g. *Seattle's Transportation Strategic Plan (TSP)*, *Chicago Bike Plan 2015*, *Indy Greenways Master Plan* or major voter funding initiatives, e.g. Penny for Pinellas, Seminole County's Natural Land Program. In all cases, however, there exists clear policies and procedures for trail management and maintenance. In Seattle, the Seattle Department of Transportation (SDOT) oversees the planning, construction, and management of all bicycles facilities. The SDOT and Department of Parks & Recreation are both responsible for maintenance. A formal memorandum of understanding (MOU) clearly outlines each department's maintenance responsibilities. The Department of Parks & Recreation is responsible for all off-street areas and

provides mowing and tree trimming services. The SDOT is responsible for on-street and capital projects and perform the sweeping of bike lanes and are responsible for repairs and signage.

In Indiana, Marion County's Department of Parks & Recreation (Indy Parks) is responsible for managing all greenways including the Indianapolis Greenways project. As noted in the 2000 *Greenways Management and Maintenance Study*, Marion County consolidated all greenway maintenance functions within the Department of Public Works through an interdepartmental agreement between the Department of Parks & Recreation, Public Works and the Water Company. Under this agreement, the Public Works Department performs regularly scheduled maintenance and is responsible for mowing, sweeping, trash pick-up, surface cleaning and signage along all greenways. Significantly, each Greenway corridor maintained has a prescribed maintenance plan with a schedule for each activity on a year round basis.

In Pinellas County, Florida, the Parks & Recreation Department manages the Pinellas Trail system. There continues to be a Trail Interagency Task Force which focuses primarily on interagency coordination and security issues. According to the Parks & Recreation Department, interagency coordination is best achieved by identifying and employing the strengths of other County departments. As examples, the Highway Department handles traffic issues; the Engineering Department, drainage issues, while law enforcement agencies at the County and municipal levels handle various policing issues.

In Seminole County, the trail system is managed by the Parks and Recreation Department's Greenways and Natural Lands Division. The Greenways and Natural Lands Division manages the 35-mile trail system (40 miles upon completion). The Greenways and Natural Lands Division responsibilities includes operations and programming of "natural lands," trails, landscaped roadway medians, neighborhood/community parks and boat ramps.

## 2. Maintenance Levels

Maintenance levels are typically assigned to trails based on a set of criteria including type of trail, amount of trail use, safety and funding levels. Maintenance levels also vary according to climate, vegetation and paving materials. The Seattle Department of Transportation (SDOT) and Department of Parks & Recreation developed a nine-year maintenance, repair and construction schedule. Maintenance levels for shared-use trail facilities include the following:

- Resurface, restore, or replace approximately 200 lane-miles of arterial streets.
- Repair or restore 144 blocks of sidewalks.
- Build 117 blocks of new sidewalks.
- Restripe 5,000 crosswalks.
- Create "safe routes to schools" near 30 elementary schools.
- Replace over 150,000 small, faded street and regulatory signs.
- Prune 25,000 street trees to prevent safety and security hazards.
- Plant 8,000 new street trees.

Seattle's Bicycle Spot Improvement Program makes low cost improvements to enhance bicycle safety and convenience for bicyclists by allowing them to use the existing street system more comfortably. Projects include, surface improvements - pothole patching, drain grate replacement; signing and striping - motor vehicle warning signs at trail crossings, bicycle lane

striping and stenciling; access improvements - adjusting of electronic detection for bicyclists at traffic signals, traffic island modification; and sidewalk bike rack installation - over 2,300 sidewalk bicycle racks have been installed in business districts since September of 1993.



Seattle's Bicycle Spot Improvements fixes pavement problems

The Pinellas Trail in Pinellas County, FL provides a “lesson learned” example of how maintenance levels are required to be adjusted due to budget cuts. The Parks & Recreation Department is responsible for the Trail's maintenance and operating costs. Due to recent budget cuts, the Parks & Recreation Department has had to eliminate contracts with private vendors, cut the number of maintenance cycles in a year and rely more heavily on volunteers. However, the Department believes that the frequency of maintenance can be separated by only as few as 15-21 days. The Parks & Recreation Department is currently budgeting for 3 year cycles. Scheduled maintenance includes flat mowing 28-30 times a year and slope mowing 5 times a year. One private contractor mows one-third of the trail (13-14 miles) with the balance of the trail maintenance (30 miles) performed in-house. Officials note that typically paved asphalt has a lifespan of 10-15 years. Experimentation with other materials has shown that asphalt is ‘more forgiving’ or tolerant of stressors that would create cracks in cement.

Significantly, the Parks & Recreation Department has developed a “work order system” which keeps track of jobs in all their stages. This experience has enabled the Department to become more efficient in their service delivery.

### 3. Standards and Priorities

Maintenance standards are generally established based on acceptable “best practice” for particular maintenance activities and to document work requirements or the acceptable end product for a specific maintenance level based on trail type and location. For example, Seattle's City Light right-of-way is a 3.6 mile trail that varies in different neighborhoods. In general, the

pathway curves between gently sloped and seeded hills and mounds. The asphalt paved trail is 10 feet wide, with a two foot gravel shoulder on each side. The completed trail includes pedestrian and bicycle signage and markings to clarify the multi-use trail purpose. No motorized vehicles are permitted within the corridor. Since the trail is within the City Light Corridor, there is limited flexibility in landscaping or other beautification options. Seattle City Light must maintain easy access to their power facilities for maintenance, repairs, and emergency access. This, combined with ease of landscape maintenance objectives, prevents planting large or medium sized vegetation. The new portions of the trail were seeded with low-growing grass and groundcover.

Best practice shared-use trail systems have begun to adopt green design standards. The Seattle Department of Transportation (SDOT) has recently installed “green bike lanes” at 16 locations in Seattle with more planned for the coming years. Green bicycle lanes highlight conflict areas – where bicycles and cars cross paths. They are intended to reinforce good behavior for all road users. SDOT has also incorporated “sharrows,” a new kind of bicycle facility. Shared lane pavement markings or sharrows are bicycle symbols that are placed in the travel lane. Unlike bicycle lanes, they do not designate a particular part of the roadway for the exclusive use of bicyclists. They are simply a marking to help motorists expect to see and share the lane with bicyclists. Sharrows are carefully placed to guide bicyclists to the best place to ride. Sharrows are often installed in the opposite direction of an uphill climbing lane where there is not enough room to install bike lanes on both sides of the street. More than 30 miles of sharrows have been installed over the past two years.

#### *4. Maintenance Activities*

Shared-use trail maintenance activities typically include mowing, trimming/pruning, re-paving, drainage control, sign repair, erosion control and trash removal. The Indianapolis Greenways Project lists the following maintenance activities for all proposed and existing greenways:

- Mowing according to prescribed standards for each corridor
- Removal of flood debris from trail and structures
- Stabilize, maintain and control erosion problems
- Remove illegally dumped material
- Remove and haul debris
- Install, repair and maintain fences
- Tree trimming and removal of dead trees
- Develop and maintain planted areas
- Apply watering and fertilizing as directed
- Provide cleaning and janitorial service of public facilities within the Greenway system
- Inventory and stock supplies and material for greenway support

The Indianapolis Greenways Project includes additional activities for areas of the greenway system where a trail is operational:

- Landscape designated areas
- Control weeds and invasive plants
- Trim and remove brush

- Remove graffiti
- Pick-up trash and litter
- Produce, install, maintain and repair signage
- Maintain, replace and repair trail surface
- Install, replace and maintain delineators, bollards, reflectors, striping, lights, and other warning devices
- Assist with special events, activities and programs

### 5. Costs

The costs associated with shared-use trail maintenance can vary according to a number of variables. Trail surface, width, location, needed structures, signage, and amenities all affect total construction cost. For example, maintenance of asphalt, concrete and crushed gravel trails differs due to the different properties of the materials. Periodic maintenance of a crushed gravel trail is greater since it is more susceptible to adverse weather conditions such as rainstorms and run-off. Heavy amounts of water running on the trail can cause ruts to form and soften the trail as a whole. More use on a soft trail will cause greater damage to the overall smooth surface and require grading. Regardless of trail surface type, there are many other factors that can affect cost of maintenance. The main factor affecting cost is the difference in agencies that maintain and operate trails. Each agency will have different labor costs, access to different machinery and equipment, and may or may not have a volunteer base to offer assistance.

Maintenance and operation costs can also have a broad definition. Routine maintenance can be defined as maintenance that is needed to keep the trail operating in a safe and usable condition and not involving major trail development for reconstruction. Below is a list of routine maintenance activities:

- Yearly facility evaluation to determine the need for minor repairs
- Removing encroaching vegetation
- Mowing
- Map/signage updates
- Trash removal/litter clean-up
- Flood or rain damage repair: silt clean up, culvert clean out, etc.
- Patching, minor repaving, or concrete panel replacement
- Planting, pruning, and general landscaping

### 6. Budget Planning

Budget planning is a critical element of a shared-use trail maintenance program as the life cycles of various trail facilities are typically 10-15 years. As such, “best practice” shared-use trail locations generally have master plans in place with complete sections addressing on-going maintenance activities and responsibilities. This provides the planning nexus to capital improvement programs (CIPs) and the dedicated funding required to do long term budget planning. Budget planning for shared-trail maintenance activities must calculate revenue and expenditure factors and conditions. From the revenue side of the equation, it is clear from

talking with agency officials that it is unrealistic in these restrictive budget times to anticipate maintenance funding from traditional tax revenue sources.

In the case of Pinellas County, FL, trail maintenance and repairs is budgeted through “Penny for Pinellas” (aka, the “Penny”) which funds approximately 75 percent of Pinellas County’s Governmental capital improvements programs (CIP). This funding source was first established as an alternate means of funding Pinellas County’s capital improvement program in 1989 and is approved for 10 years periods. The last renewal of the Penny for Pinellas took place on March 13, 2007 which extended the Penny for a third decade, 2010-2020. With Penny extended for another decade, Pinellas County was able to submit its “Revised Allocations for 2010-2020 Penny Program” and new Pinellas County Capital Improvement Program (CIP). Based on current funding from Penny for Pinellas, the County’s CIP includes \$2.14 million for the re-surfacing of Pinellas Trail. These funds have been allocated for FYs 2011 and 2013 of the CIP. Additionally, the Trail has received \$3 million for repairs in FY 2010 and \$1.06 million in FY 2011 for drainage work at the 54<sup>th</sup> Avenue overpass. The \$2.14 million allocated for re-surfacing during the 6-year term of the CIP averages approximately \$350,000 per year.

The *2002 Indy Greenways Master Plan* notes that while local tax moneys have never been a major source of the funding to develop the Indy Greenway System, they have played a key catalytic role. Many external grants have required 20-50 percent “matching” funds that have primarily come from local tax revenue. Given that Indy’s greenways are on properties under mixed jurisdiction, using municipal staff and budgets to coordinate greenway maintenance and capital improvements have proven to be the most efficient course. Local budgets also provide for the small professional staff to manage Indy Greenways.

The 2002 Master Plan also recommended that a variety of local and national endowments be tapped for funding of Greenway projects and further recommended that these sources be explored more fully in order to identify which projects might be most applicable to each grant source’s objectives. Proposed development projects have identified sources of funds which are applicable to the specifics of each project and that funding sources are targeted in advance of project planning.

### *7. Funding*

As previously noted, long-term, dedicated funding is viewed as an integral component of effective and sustainable shared-use trail programs. In 2006, Seattle, WA voters passed a nine-year, \$365 million levy for transportation maintenance and improvements known as “Bridging the Gap.” Bridging the Gap is seen as an opportunity for SDOT to improve Seattle’s transportation system for all users with realistic and achievable goals and objectives with built-in systems of accountability. The levy is complemented by a commercial parking tax (\$127.5 million) and an employee hours tax (\$51.5 million). Over the life of the levy the total expected revenue from the three sources is projected at \$544 million. Together they added approximately \$80 million to the SDOT’s budget in 2008, dramatically increasing available funds for transportation capital projects and needed infrastructure maintenance.

As noted above, the Pinellas County, Florida’s Parks and Recreation Department has been the beneficiary of “Penny for Pinellas” for the operations and maintenance of Pinellas Trail.

However, other “best practice” shared-use trail systems have been successful in securing alternative funding sources. While the principal funding source for the Indianapolis Greenway projects since 1993 has been federal transportation enhancement (TE) funds, non-profit foundations, such as the Lilly Endowment, have been important financial supporters of Indy Greenways. The *2002 Indy Greenways Master Plan* noted that corporate contributions, individual contributions and bequests have been underutilized in past funding of Indy Greenway projects.

Greenways Foundation, Inc. (aka White River Greenway Foundation, Inc.) (GFI) was established in 1991 to facilitate contributions, of all forms, to central Indiana greenway projects. As an IRS-qualified 501(c) (3) entity, GFI can receive cash and in-kind donations. Such contributions can be in cash or appreciated assets such as real property or securities. The GFI can hold these contributions until they are needed for greenway development, enhancement or operation. As a private, permanent, on-going entity, the GFI doesn’t have the bureaucratic burdens of annual re-appropriation, or the cumbersome and inflexible procurement regulations, which must be followed by city-county government. Non-partisan and non-political, the GFI can focus exclusively on the needs of greenway projects on a regional basis for cross county coordination.

The *San Francisco Bicycle Plan* cites a number of non-traditional funding sources that may be appropriate for the long-term implementation of project and program recommendations contained in the Plan. While some of these examples are specific to the San Francisco Bay Area, comparable foundations, organizations and corporations can be found throughout the United States. Non-traditional funding sources cited in the *San Francisco Bicycle Plan* include:

- San Francisco-based foundations such as Bechtel Foundation, S.H. Cowell Foundation, Swig Foundation and the National Energy Foundation;
- Alliances with organizations such as the San Francisco Convention and Visitors Bureau; corporations such as Sports Basement, Levi Strauss Company, Nike, Gap and Bank of America; and agencies such as the National Park Services/Golden Gate National Recreation Area that have related interests;
- Development or redevelopment projects such as development impact fess or tax increment financing (TIF);
- Adopt-a-Trail programs; and
- Memorial funds

Other locations have initiated various “fundraising programs” to address shared-use trail maintenance needs. Through a fundraising program devised by local mountain bicyclists, the resort area of Ketchum/Sun Valley, Idaho yielded over \$70,000 for local trail maintenance. The bicyclists considered many ways to educate users to maintain trails, but realized that volunteer efforts would not be sufficient. They decided that maintenance efforts must include all trail users. The group launched a fundraising effort and named it the Big Wood Backcountry Trails Maintenance Fund. At the same time several local bicycle dealers had begun to address the problem by organizing a system akin to “self-taxation.” The dealers agreed that each would donate five dollars for every bicycle sold and 25¢ for every rental of a bicycle or in-line skate. The money went to either the USFS trails, or to a paved bike path system which runs throughout

the resort area. Also assisting is an Adopt-A-Trail program wherein fifteen trails have been adopted by local bike shops, backpacking stores, hotels, equestrian groups, and construction companies. From four to 35 employees in each company go out with Forest Service supervisors once or twice each year. Sun Summit helped launch the larger, community-wide, Big Wood Backcountry Trails Fund by inviting a variety of trail users to a meeting to develop their common interest in the local trails resource. Sun Summit agreed to provide logistical support, such as use of their graphic artist to create a brochure.

The group gave \$25,000 to the USFS Ketchum Ranger District to fund a three-person trail crew, which maintained 185 miles this year. That work cost only \$20,000, so the crew was able to add intensive maintenance, bridges, and trail re-routes in some areas. Additional money went to purchase materials to harden trails at points of greatest erosion. The Big Wood group is considering what to do with the remaining funds. One option is to set up an endowment, so that a pool of invested funds provides interest money for trail maintenance every year. Meanwhile, the Forest Service has designated the Ketchum Ranger District as a site for the user fees demonstration program authorized by Congress last year.

#### 8. Performance Measures

The Seattle Department of Transportation (SDOT) has incorporated “strategic performance measures” into the Bicycle Spot Improvement Program. The performance measure tracks the number of Bicycle Spot Improvements Completed. The measure tracks SDOT’s responsiveness to public requests for bicycle spot improvements. SDOT completed 49 spot bicycle and pedestrian improvements in 2005 (bicycle and pedestrian improvements were reported together). The performance measure assigns data collection responsibility to the SDOT Pedestrian and Bicycle Program with an annual data collection and reporting frequency.

The City of Chicago, Illinois *Bike Plan 2015* also serves as a “best practice” case study for incorporating performance measures into the ongoing maintenance and repair of a bikeway network. The Plan makes maintaining bike lanes in excellent condition a clear priority and establishes performance measures for various aspects of scheduled maintenance and repair. The Plan borrows from best practices around the country and the world including Boulder, Colorado, San Francisco, CA, Calgary, Alberta and York England. The strategies and performance measures include the following:

##### *Strategy #1 - Maintain bike lanes in excellent condition*

Proper maintenance of bike lanes is an important consideration in people’s decision to bicycle and a key factor in bicycle safety. Ensure safety through enhanced maintenance, including regular inspections, replacing worn pavement markings and bike symbols, replacing damaged signs, sweeping away debris, repaving streets and repairing potholes.

*Performance Measures:* Inspect the bike lane network 3-4 times per year, issuing work orders to address maintenance issues, beginning in 2006. Sweep streets with bike lanes at the same frequency as the sweeping of arterial streets, beginning in 2006. Best Practice: Boulder, CO

*Strategy #2 - Ensure prompt repair of pavement cuts on streets with bikeways*

Pavement cuts can cause bicyclists to lose control, resulting in accidents and injuries. Require private contractors and utility companies that damage bikeways to repair them immediately to a specified standard. Where necessary, require non-skid plates with beveled edges or edges built up with asphalt. Place plates to cover the pavement cut with minimum gap openings (to prevent catching bicycle tires) and with proper securing so that motorized vehicles cannot knock the plates loose.

*Performance Measures:* Bikeways repaired to a designated standard within 4 weeks of pavement cuts.

*Strategy #3 - Upgrade the on-street bikeway network on a regular basis*

Opportunities exist to establish continuous bikeways by narrowing or, where appropriate, removing travel lanes, and upgrading older bike lanes to current standards. Identify and fill in gaps in the network to provide continuous routes. Where possible, extend bike lanes to intersections.

*Performance Measure:* Upgrade 10-25 locations per year, beginning in 2006. Best Practice: York, England

*Strategy #4 - Identify and immediately replace grates that trap bicycle wheels*

Sewer grates currently installed in Chicago are “bicycle friendly.” Some existing grates are dangerous, however. Place new and replacement grates outside the bikeway, where possible.

*Performance Measure:* Establish and implement procedures in 2006 to identify dangerous grates and have them replaced as soon as possible. Best Practices: San Francisco, CA; Calgary, AB

*Strategy #5 - Retrofit metal grate bridges to make them safer for bicycling*

Grooves on some metal grate bridges can cause bicycle tires to pull, creating a “channeling effect,” making bicycling uncomfortable, even dangerous. Also, under wet conditions the metal grates can become slippery, especially for narrow bicycle tires.

*Performance Measures:* Retrofit 5-10 priority metal grate bridges by 2010. Ensure that the remaining bridges on bikeways identified in the *Streets for Cycling Plan* are bicycle-friendly by 2015. Best Practice: Chicago, IL

9. Per Mile Costs

Per mile costs vary considerably among the “best practice” examples. Pinellas and Seminole Counties in Florida provide perhaps the best indices given the types of shared-use trails in each County and the fact they share the same climate and vegetation conditions as Miami-Dade County. Seminole County Florida’s estimated per mile costs for managing and operating its 35-mile trail system totals \$17,285 annually. The FY 2010 \$605,000 budget included \$250,000 for staff (3 maintenance workers/1 inspector) \$315,000 for contract maintenance and trail repairs and \$40,000 for operations. Pinellas County’s per mile cost for operating its 44-mile trail system totaled \$19,295 in FY 2010. Pinellas County’s \$849,000 includes \$582,000 for staff and

\$267,000 for operations. The maintenance staff includes 1 supervisor, 1 crew chief, 3 maintenance workers and 8 rangers.

#### *10. Activities Performed for Each Cycle*

As previously noted, shared-use trail maintenance activities typically include mowing, trimming/pruning, re-paving, drainage control, sign repair, erosion control and trash removal. Trail inspections and maintenance activities are generally coordinated with follow-up inspections after each activity. In Pinellas County, FL the Parks and Recreation Department is currently budgeting for 28-30 cycles of flat mowing and 5 cycles of slope mowing annually. The County currently performs 5-7 miles of asphalt re-surfacing annually. According to the Parks & Recreation Department, segments of Pinellas Trail are replaced as funding becomes available. Parks & Recreation officials noted that paved asphalt has a lifespan of 10-15 years. Experimentation with other materials has shown that asphalt is “more forgiving” or tolerant of stressors that would create cracks in cement.

#### *11. Community Partnerships*

The Indy Greenways Project is a best practice example of maximizing the use of community partnerships. Partnering has become a sustaining tool in the advancement of Indy Greenway Projects by sharing resources to accomplish common goals. Partnerships are actively sought in many cases through contact with interested groups, neighbors and stakeholders. Other partnerships evolve out of the desire for specific improvements or amenities on particular greenways that go beyond the core services provided. Whether the partnerships are sought or come to Greenways voluntarily the results are similar in that advocacy for greenways is enhanced, outside funds, materials or labor are leveraged to accomplish projects and an atmosphere of cooperation is created. Indianapolis believes partnering is contagious for successful partnering projects provide positive examples for others to follow and encourage others to participate. All partnerships are documented through a unique and detailed system of reports. Examples of the many forms of partnerships occurring within the Indianapolis Greenways system include:

- Development of amenities such as drinking fountains, gazebos or park structures, interpretive signage, etc.
- Trail access areas
- Lease properties
- Landscaping
- Art projects
- Clean-ups
- Trail and conservation corridor clean-ups
- Volunteer trail monitors
- Medical service coordination
- Law enforcement patrol coordination
- Land /easement acquisition
- Environmental education
- University doctoral and masters thesis projects
- Native plant restoration/introduction program

- Indianapolis Trees For Tomorrow
- Academic research such as visual preference study, user surveys and studies, strategic management planning, economic development evaluation, design charrettes, aquatic life studies and homebuyer study

#### **D. Best Practice Applications to Miami-Dade County**

The Study's best practice research provides lessons learned and guidance on a variety of shared-use trail maintenance issues. The most important lesson learned is perhaps the recurring emphasis given to the quality and on-going enhancement of best practice shared-use trail facilities. Successful shared-use trail systems, both nationally and within the State of Florida, have well coordinated and integrated planning and management in place and significant community-based support which has spear-headed funding efforts. The management and delivery of services are effectively streamlined with clear department and agency responsibilities. The Seminole County Parks and Recreation Department's Greenways and Natural Lands Division provides a best practice example of how best to coordinate and integrate shared-use maintenance activities. The research also found that sustainable shared-use trail systems are typically supported by dedicated funding sources for on-going and enhanced maintenance, such as the "Penny for Pinellas" program which provides maintenance funding for the Pinellas Trail in Pinellas County, Florida.

## **VI. Innovative Financing and Administrative Structures for Shared-use Trail Maintenance**

### **A. Innovative Financing**

Funding is perhaps the most critical component for ensuring the on-going success of a shared-use trail maintenance program. In fact, funding must be given the highest priority thus requiring local governments identify and pursue all new and existing federal, state and local funding sources. As noted in the key findings section of Chapter V – Shared-use Trail Maintenance Best Practice, on-going funding is a major issue and priority for shared-trail systems throughout the country, including nationally recognized best practice trail systems. The funding challenge going forward is essentially twofold: 1) traditional funding sources for the planning, acquisition and construction of trail facilities generally do not fund the on-going costs of trail maintenance, and 2) current economic conditions and concomitant revenue shortfalls have resulted in reduced budgets for trail operations and maintenance. Further, state and local government revenue shortfalls are anticipated well into the foreseeable future.

The 2000 *Greenways Management and Maintenance Study* addressed the issue of maintenance funding through “best practice” research and an assessment of budget allocations in Miami-Dade County. The key findings from the 2000 study’s best practice research included the following:

- Most best practice locations use general funds budgeted for road and sidewalk maintenance or park and recreation activities to carry out their trail/greenway/pathway functions. Except for Indianapolis, IN and Portland, OR, the metropolitan areas identified did not have a budget line item or a designated funding source for the maintenance and management of trails, greenways, and pathways. They often use a gas tax as a revenue source;
- It is possible to create a non-profit agency to conduct fundraising activities as means of generating additional revenue for the trail/greenway/pathway system. Indianapolis served as the example;
- Privatization may provide a cost-effective method of providing maintenance functions, and, in some cases, privatization may reduce maintenance costs. Pinellas County, Florida was selected as an example of privatized maintenance.

The “best practice” research performed for the 2010 *Miami-Dade County Shared-use Trail Maintenance Study* makes a clear case for the high priority that must be given to the on-going and proper maintenance of shared-use trail systems. As noted in the 2000 study, the success or failure of a trail system often hinges on whether they are maintained or allowed to deteriorate.

In developing a funding program for trail maintenance it is important to first identify the factors that affect maintenance costs. The 2000 study summarized the physical, operational and managerial factors that impact maintenance costs (Table 5.1). The maintenance factors are

delineated into three main categories – physical, operational and managerial. The following discussion expounds upon these factors based on the most recent best practice research.

**Table 6.1 Factors Affecting Maintenance Costs**

Physical	Operational	Managerial
Number of Miles	Usage	Staffing
Design	Jurisdiction	Intergovernmental
Construction	Equipment	Privatization
Landscaping	Amenities	Funding

The single greatest challenge going forward for Miami-Dade County is the need to identify trail maintenance funding for the planned 600-mile trail system, of which, only 130-miles have been built. Further, the County faces current trail maintenance demand and cost issues for the existing 130-mile trail system. The “user survey” conducted for this study clearly determined that Miami-Dade County users have concerns with deteriorating conditions an lack of services and amenities within the existing trail system.

The 2000 study prepared an extrapolation of “best practice” case studies to develop estimated annual maintenance cost and staffing levels per mile for Miami-Dade County’s planned 600-mile trail system. The estimated annual maintenance cost of \$4,347 per mile was based on the average annual costs per mile of four (4) best practice trail systems (Portland, OR, Pinellas County, FL, Indianapolis, IN and Seattle, WA). The estimated staffing (1:25 miles/24 total staff) were base on “rough approximations” from the same best practice case study extrapolations. The total annual budget for the 600-mile trail system was estimated at \$2.61 million.

The current Study also reviewed maintenance costs associated with “best practice” case studies. However, the focus of the current study was on recognized trail systems in the State of Florida where climate conditions, soils, materials and construction costs are most similar to Miami-Dade County. Pinellas and Seminole Counties in Central Florida have received state-wide recognition for the quality of their trail systems. Pinellas County was previously identified as a best practice example in the 2000 *Greenways Management and Maintenance Study*.

Pinellas and Seminole Counties offer very important “lessons learned” on trail funding. In both cases, there is clear “constituent” or “voter” support for the respective development and quality of the trail systems which translate into funding support during County legislative budget deliberations. In the case of Pinellas County, trail maintenance has become a priority in the capital improvements program (CIP) planning process. In Seminole County, a 1990 voter-approved referendum followed by a 2000 bond issuance has given clear funding priority to the Parks and Recreation Department’s Greenways and Natural Lands Division for the on-going maintenance and repair of the County’s trail system.

The aforementioned best practice case studies argue the importance of having local, dedicated funds for trail maintenance. However, the establishment of dedicated funding sources at the local level emanates from strong constituent involvement and support for the development and on-going enhancement of the county’s trail system. Absent this support, Miami-Dade County

will need to focus on both traditional and non-traditional sources of funding. The following is a brief summary of these potential funding sources:

### *1. Traditional Funding Sources*

The Miami-Dade MPO 2001 *Bicycle Facilities Plan* includes a “minimum revenue plan.” The plan notes that bicycle projects are funded from a variety of local, state and federal sources. Funding sources identified as contributing to funding for projects included in the 2025 Bicycle Plan are Surface Transportation Program (STP) funds, Transportation Enhancement funds, and Congestion Mitigation and Air Quality Improvement Program (CMAQ) funds. The plan notes that previous Long Range Transportation Updates have established a funding level of 1.5 percent of STP and CMAQ funds for bicycle and pedestrian improvements. Maintaining this funding level of 1.5 percent and recognizing the MPO’s historical allocation of Enhancement funds for bicycle/pedestrian facilities of 80 percent, a total 2006-2025 funding level of \$62.15 million is projected for bicycle and pedestrian facilities. These funds are allocated as a percent of the total bicycle/pedestrian funds for this period by facility type: bicycle on-road projects; pedestrian on-road projects; and off-road projects (Greenways). The plan notes that nearly \$28 million or forty-five percent of the funds available for the above facility types were allocated to on-road bicycle facilities.

### *2. Non-Other Federal Sources of Funds*

#### Federal Stimulus Program

It is important that Miami-Dade County establish on-going communications with the Florida Department of Transportation (FDOT) with respect to potential projects to be funded with Federal Stimulus Funds. Many “shovel-ready” state highway projects in Florida are being considered for Federal Stimulus Program funding. Miami-Dade County needs to be aware of any potential FDOT highway projects that have adjoining shared-use trail facilities in need of maintenance improvements.

#### Community Development Block Grant (CDBG) Program

The Department of Housing and Urban Development’s Community Development Block Grant (CDBG) Program has long been utilized by county and municipal governments for public infrastructure improvements. CDBG program funds have been used across the country for streetscape revitalization and pedestrian improvements. As a federal entitlement community, Miami-Dade County may use these funds for “activities that include (but not limited to): acquiring real property; reconstructing or rehabilitating housing and other property; building public facilities and improvements such as streets, sidewalks, community and senior citizen centers and recreational facilities, paying for planning and administrative expenses, such as costs related to developing a consolidated plan and managing CDBG funds; providing public services for youths, seniors, or the disabled; and initiatives such as neighborhood watch programs.” For shared-use trail facilities to be eligible for CDBG funding, the trail must be located in low- and moderate-income areas of Miami-Dade County.

The CDBG program is a likely source of funds for community-based projects such as commercial district streetscape improvements, sidewalk improvements; safe routes to school, or

other neighborhood-based bicycling and walking facilities that improve local transportation options or help revitalize neighborhoods. The National Transportation Enhancements Clearinghouse (NTEC) has prepared a useful Technical Brief: Financing and Funding for Trails which cites over thirty federal and national funding sources that could be used to help fund bicycling and walking facilities and/or programs, especially trails.

#### Local Funding Sources

As noted in the 2000 *Greenways Management and Maintenance Study*, only Indianapolis, IN and Portland, OR had budget line items or other dedicated funding sources for the maintenance and management of their trail systems. Pinellas County, FL had been identified in the previous study as a “best practice” trail system for having privatized maintenance activities. As noted above, Pinellas County now performs trail maintenance functions in-house, while reducing privatized maintenance to one-third of the trail system. However, in the case of both Pinellas and Seminole Counties, local dedicated funding for trail maintenance and repairs is in place.

As previously discussed, funding will continue to be a significant obstacle in the planning and management of shared-use trail maintenance. Florida’s revenue shortfalls at the state and local levels are anticipated for the next several years, thereby necessitating alternative and non-traditional funding sources be fully explored. Alternative and non-traditional funding sources include the following:

- Corporate Funding
- Foundation Funding
- County/municipal tax increment financing (TIF) funds
- Impact Fees
- Self-taxation and user fees
- Community partnership donations (money, land, materials, sweat equity) and advocacy programs

#### Corporate Funding

Miami-Dade County is home to many large private corporations, including major hospital and healthcare organizations that are vested in the community. As previously noted, San Francisco has identified several corporations, including Sports Basement, Levi Strauss Company, Nike, Gap and Bank of America as potential funding partners. Other examples of corporate funding include a boardwalk built in Evansville, Indiana with corporate donations from Indiana Power and Light Co. and the Wal-Mart Foundation, and in Arizona where trail directional and interpretive signs were provided by the Salt River Project, a local utility. Other corporate sponsors of the Arizona Trail included the Hughes Missile Systems, BHP Cooper and Pace American, Inc. It should be stressed, however, that potential corporate support for the maintenance of Miami-Dade County’s Shared-use Trail System should be part of a larger trail management plan that identifies all stakeholder groups in the community as “partners” in this on-going effort.

#### Foundation Funding

National and local foundations are a potential funding source for Miami-Dade County’s Shared-use Trail System. Foundations, including corporate and bank foundations, often target their

resources to urban areas to improve neighborhood connectivity and the health and well-being of low-income children.

A wide range of foundations have provided funding for bicycling and walking. A few national and large regional foundations have supported the national organizations involved in bicycle and pedestrian policy advocacy. However, it is usually regional and local foundations that get involved in funding particular bicycle, pedestrian or trail projects. These same foundations may also fund statewide and local advocacy efforts as well. The Foundation Center maintains a large store of information including the guidelines and application procedures for most foundations and their past funding records. [www.fdncenter.org](http://www.fdncenter.org)

#### *Tax Increment Financing (TIF) Funding*

Tax Increment Financing (TIF) Funding can be used for public infrastructure projects in community redevelopment areas (CRAs) and downtown development districts designated by Downtown Development Authorities (DDAs). TIF is a tool to use future gains in taxes to finance current improvements. TIF is designed to channel funding toward improvements, e.g. streets, sidewalks, etc. in distressed or underdeveloped areas where development might not otherwise occur. TIF creates funding for "public" projects that may otherwise be unaffordable to localities by borrowing against future property tax revenues.

#### *Developer Impact Fees*

Impact fees are already widely used for road construction and maintenance in Miami-Dade County. Impact fees have become an integral part of local government infrastructure financing. Impact fee accounts for transportation improvements have generally accumulated in South Florida and often go unspent for significant periods. Miami-Dade County should consider how a portion of these funds can be directed to shared-use trail maintenance. Developer impact fees for parks and recreation could also be used as local matching funds to attract other grant sources.

#### *Self-Taxation and User Fees*

The Ketchum/Sun Valley best practice case study demonstrated how effective trail users can be in self-fundraising when the common interests of various trails users are united. The creation of the Big Wood Backcountry Trails Maintenance Fund yielded over \$70,000 for local trail maintenance with contributions from local bicycle dealers who agreed to donate five dollars for every bicycle sold and 25¢ for every rental of a bicycle or in-line skate. The money went to the shared trails and paved bike path system which runs throughout the resort area.

#### *Community Partnership Support*

Community Partnerships that provide advocacy, volunteers and general support for trail systems are perhaps the most essential and valuable component of a local trail system. Not only are community partnerships a source for volunteers and contributors of materials and other contributions, they also provide the institutional "constituent" support that can pave the way for more wide-scale community support and funding for the County's trail system. Pinellas and Seminole Counties provide excellent examples in Florida of the critical role of community partnerships.

Other community partnership funding examples include:

- The Ashtabula, Ohio “300 Club,” is a local trail organization which raised one-third of the money they needed to buy the land for the trail. Three hundred acres were needed for the trail and they set a goal of finding 300 local residents who would finance one acre each. The land price was \$400 an acre and they found just over 100 people to buy an honorary acre, raising over \$40,000;
- The Bear Creek Greenway Foundation in Jackson County, Oregon held a “Yard Sale” where they sold symbolic “yards” of the trail and placed donor’s names on permanent markers that are located at each trailhead. At \$40 a yard, they raised enough in private cash donations to help match their \$690,000 foundation;

## **B. Innovative Administrative Structures**

As previously noted, the “best practice” research found that successful shared-used trails in the United States typically demonstrate high levels of coordination and communication among the various agencies and departments in the delivery system. However, two shared-use trail programs are particularly noteworthy, Indy Parks and Seminole County’s

Indy Parks Greenways currently operates and maintains the 39 miles of greenway trails through the City of Indianapolis. Indy Parks is responsible for managing all greenways including the Indianapolis Greenways project. Through an interdepartmental agreement between the Departments of Parks & Recreation and Public Works, the Public Works Department performs regularly scheduled maintenance and is responsible for mowing, sweeping, trash pick-up, surface cleaning and signage along all greenways. The clear authority given to Indy Parks was articulated in the *2002 Indy Greenways Master Plan*. This case study shows the importance of having a shared-use trail maintenance management element included in a master plan with a clear delineation of authority in terms of management and operation of the trail system.

As previously noted, Seminole County, Florida’s trail system is managed by the Parks and Recreation Department’s Greenways and Natural Lands Division. The Greenways and Natural Lands Division encompasses operations and programming of “natural lands,” trails, landscaped roadway medians, neighborhood/community parks and boat ramps. The Natural Lands Program was established in 1990 by a voter-approved referendum. The Natural Lands now consist of over 6,600 acres of land stretched across Seminole County. The largest parcels are called wilderness areas. The Natural Lands Division manages a 35-mile trail system (40 miles upon completion). Much of trail system was constructed through a 2000 Seminole County bond passage that earmarked 75 percent of funds to the County’s trail system.

Seminole County offer a very important “lessons learned” on trail funding. Clear “constituent” or “voter” support for the respective development and quality of the trail system translate into funding support during County legislative budget deliberations. The 1990 voter-approved referendum and subsequent 2000 bond issuance has given clear funding priority and authority to the Parks and Recreation Department’s Greenways and Natural Lands Division for the on-going maintenance and repair of the County’s trail system.

## **VII: Miami-Dade County Shared-use Trail Management and Maintenance Recommendations**

The final section of the study provides recommendations to improve the management and maintenance of Miami-Dade County's Shared-use Trail facilities. The recommendations were formulated based on: 1) a review of past studies, including the 2000 *Greenways Management and Maintenance Study* and 2001 *Bicycle Facilities Plan*, 2) a current inventory and assessment of Miami-Dade County's Shared-use Trail System, 3) key findings from the "User Survey," 4) interviews with Miami-Dade County and municipal officials, and 5) "best practice" case study research.

The study found that many of the trail management and maintenance issues identified in past studies remain pressing concerns. The trail inventory and assessment revealed numerous maintenance and repair problems. The inventory and assessment also found that Miami-Dade County's trail system is severely lacking in amenities and other services that would attract users. These findings were substantiated in the Trail User Survey. User survey respondents expressed concerns with the overall conditions of trails and the general lack of amenities and services.

Both the 2000 *Greenways Management and Maintenance Study* and the current study found that the majority of trail systems are managed by several departments/agencies within the same government. Interdepartmental agreements delineate each department/agency's role and responsibility with respect to trail maintenance. While a management system is currently in place for trail maintenance, there is a general sense among County and municipal officials that interdepartmental/agency coordination and communication could be improved. As previously noted, lack of funding for trail maintenance has contributed to this problem.

The 2000 study identified five (5) possible options for managing Miami-Dade-County's trail system:

1. Continue the status quo with blurred lines of responsibility and no identifiable source of funding.
2. Strengthen the current situation by clarifying MOUs.
3. Strengthen the current situation by clarifying MOUs providing earmarked funding for carrying out these roles among various departments with current responsibility.
4. Create a special county agency charged with the responsibility of managing the greenway network with its own budget and staff.
5. Create a special county or quasi-county agency (authority) charged with the responsibility of managing the greenway network with its own dedicated funding source.

The 2000 study made a very important finding that holds true in the current analysis. The study noted that the critical issue is not any one organizational structure, per se, but "how best to ensure that the greenway system gains a significant voice in fighting for and obtaining funding and other resources to operate and maintain" the trail system.

The current analysis and supporting best practice research found that a shared-use trail maintenance program must be effectively planned and managed. Coordination and integration of operations and maintenance activities are critical given the number of departments and agencies involved in shared-use trail maintenance and the importance of cost efficiencies during the current period of severe budget constraints. Perhaps the most important findings from the “best practice” case study research are that successful shared-use trail systems, both nationally and within the State of Florida, have discernible levels of coordinated/integrated planning and management in place and significant community-based support which has spear-headed funding efforts. The research concluded that the quality and on-going enhancement of shared-use trail systems is given high priority in best practice locations. It is critical, therefore, that Miami-Dade County’s shared-use trail maintenance program be effectively coordinated and integrated with clear goals and responsibilities.

A comprehensive shared-use trail maintenance management program will determine the activities, maintenance levels and maintenance frequency of the trail system based on expected trail use. The program will identify tasks, operational policies and procedures, standards, and routine and remedial maintenance goals. At a minimum, the program must identify cost estimates, funding sources, and the party responsible for performing the work on the trails. This will provide the basis for determining annual funding and assignment of personnel and equipment from trail to trail while providing for necessary adjustments. The following recommendations provide the elements of a comprehensive shared-use trail maintenance program.

***Recommendation # 1 – Establish Types and Frequencies of Maintenance Activities and Costs and Staffing***

The “best practice” research in Chapter 5 of the study provided several examples of the types and frequencies of shared-use trail maintenance activities. The major activities include the following:

Mowing - Includes mowing of grass with riding or walk behind equipment. Trail maintenance personnel should mow vegetation along trail corridors on a scheduled basis only where mowing is not performed by other agencies or park districts.

Trimming/Pruning - Includes trimming, cutting and pruning of weeds, vines, brush and trees. Tree and shrub pruning should be performed for the safety of trail users. Pruning should be performed in accordance with established specifications on a scheduled and “as needed” basis, the frequency of which will be fairly low.

Trash Removal - Includes removal of trash from park-owned receptacles; pick up/disposal of any trash or debris on trail or trail edges. Trash removal from trail corridors is important from both a safety and an aesthetic viewpoint. Trash removal will take place on a regularly scheduled basis, the frequency of which will depend on trail use and location.

Sweeping - Involves sweeping got dirt and debris from trails with various forms of machinery and equipment. Sweeping should take place following major wind storms and in combination with other routine maintenance activities such as mowing.

Repaving – Repaving of trails should be performed periodically based on the life cycle of the asphalt paving in place. Given the cost of repaving, an annual increment should be planned and budgeted.

Erosion Control - Any work related to erosion and/or stabilization on the trail including drainage, pavement/pothole repairs, vegetative planning and re-seeding.

The study’s recommendations for types and frequencies of maintenance activities (Table 7.1) are based on best practice research and interviews with Miami-Dade County agency and municipal officials. While the types and frequencies of activities are fairly standardized, the study relied more heavily on shared-use trail maintenance activities in Pinellas and Seminole Counties in Florida. The two Counties have been lauded for their shared-use trail programs and offer case study examples with climate and vegetation similarities to that of Miami-Dade County.

**Table 7.1: Annual Shared-Use Trail Routine Maintenance Activities & Estimated Costs**

Maintenance Activity	Annual Frequencies/ Cycles	Estimated Cost per Mile	Estimated Annual Cost per Mile
Mowing	30 flat	\$300.00	\$9,000.00
	5 slope	\$300.00	\$1,500.00
Trimming/ Pruning	30	\$500.00	\$15,000.00
Trash Removal	30	\$450.00	\$13,500.00
Sweeping	30	\$1,500.00	\$45,000.00
Erosion Control	As Required	Varies	Varies
		\$3,050.00	\$84,000.00

An estimated budget framework (Table 7.2) for the “in-house” management and operations of a shared-use trail maintenance program for Miami-Dade County is based on the case study examples of Pinellas and Seminole Counties in Florida with position titles, salaries and operating costs based on phone interviews with both Counties and information received from Miami-Dade County and municipal agency officials. The proposed budget framework for the Miami-Dade County Shared-use Trail System is shown in 50, 100 and 150 mile increments. The budget framework provides a base level of operations and management at the 50 mile increment. The budget includes essential maintenance personnel and operational costs at the 50 mile increment. Also included is the purchase of a street sweeper at \$100,000. Significantly, the estimated budget framework shows an overall O&M increase at the 100 and 150 mile increments but a coincidental decrease in the O&M’s cost per mile.

**Table 7.2: Miami-Dade County Shared-Use Trail Maintenance Budget Framework  
For 50, 100 and 150 Mile Shared-Use Trail Systems**

<b>Budget Line Item</b>	<b>50-Mile Maintenance Management Cost</b>	<b>100-Mile Maintenance Management Cost</b>	<b>150-Mile Maintenance Management Cost</b>
<b>Operations &amp; Maintenance Staff</b>			
Supervisor	(1) @ \$85,000	(1) @ \$85,000	(1) @ \$85,000
Crew Chief	(1) @ \$75,000	(2) @ \$150,000	(3) @ \$225,000
Inspector	(1) @ \$55,000	(2) @ \$110,000	(3) @ \$165,000
Maintenance (mowing)	(1) @ \$45,000	(2) @ \$90,000	(3) @ \$135,000
Maintenance (sweeping)	(1) @ \$45,000	(2) @ \$90,000	(3) @ \$135,000
Maintenance (signs & litter removal)	(1) @ \$45,000	(2) @ \$90,000	(3) @ \$135,000
<b>Operating Costs</b>			
Fleet maintenance	\$2,500	\$5,000	\$7,500
Chemicals	\$6,000	\$12,000	\$18,000
Tree/shrub replacement	\$4,000	\$8,000	\$12,000
Bench, trash receptacle replacements	\$7,500	\$15,000	\$22,500
Sign repair	\$2,000	\$4,000	\$6,000
Miscellaneous supplies (plastic bags, paint, etc.)	\$1,500	\$3,000	\$4,500
Capital Equipment Purchase: Street Sweeper	\$100,000	\$0	\$0
<b>Total O &amp; M Costs</b>	<b>\$473,500</b>	<b>\$662,000</b>	<b>\$950,000</b>
<b>O &amp; M Cost Per Mile</b>	<b>\$9,470</b>	<b>\$6,662</b>	<b>\$6,336</b>

Note: Maintenance levels based on frequencies/cycles shown in Table 7.1.

The following life cycle costs are provided for maintenance activities involving major repair (repaving of asphalt trails) or replacement of objects or amenities such as signage, trash receptacles and park benches. These life cycle costs need to be factored into the above budget framework of an “in-house” Shared-use Trail Maintenance Program.

**Table 7.3: Estimated Annual and Life Cycle Costs 50 Mile Shared-use Trail Maintenance Repair/Replacement Items**

<b>Maintenance Activity</b>	<b>Frequencies/Cycles/Miles</b>	<b>Life Cycle Cost</b>	<b>Annual Cost</b>
Pavement	Surface re-paving every 15 years	\$17,500 @ \$350 per linear foot	\$1,167.00
Signage	Replace every 10 years	\$300.00 per sign	Varies
Trash Receptacles	Replace every 10 years	\$350.00 per receptacle	Varies
Benches	Replace every 10 years	\$500.00 per bench	Varies
Trees & Shrubs	Replace as needed	Varies	Varies

## ***Recommendation # 2 – Establish Shared-use Trail Maintenance Policies and Practices***

As noted in Chapter 3 of the study, interviews with Miami-Dade County department and agency officials determined that trail maintenance activities in the County are performed as part of individual department/agency operations and inter-departmental agreements, but absent a comprehensive and integrated trail maintenance management plan. The interviews determined there is no clear overall picture of the level of need and activity, standards and the maintenance levels and operational costs associated with the existing trail system. As such, the following policies and practices are recommended to improve coordination and integration in the delivery of the County's shared-use trail maintenance activities. These recommendations can also be applied by separate government and municipal agencies to address their own problems and deficiencies.

### *1. Use of Trail Logs*

The usage of trail logs provides an on-going inventory of trail conditions located in miles or increments from the beginning of the trail. Trail logs should be updated when inventoried trail conditions are maintained or modified. Trail logs are in determining the total dollar amount needed to fully maintain the trail system. By comparing the needed funds to available funds, deferred maintenance can be better determined.

### *2. Establish Clear Maintenance Levels by Trail Type*

Maintenance levels should be assigned to each trail based on a set of criteria including type of trail, amount of trail use, safety, etc. The trail assessment and user survey findings from this study should provide useful supporting documentation for determining maintenance priorities. It is important that once maintenance levels are established, they should be reviewed and updated annually.

### *3. Establish Clear Maintenance Standards*

Maintenance standards should be established based on acceptable "best practice" for particular maintenance activities and to document work requirements or the acceptable end product for a maintenance level. The maintenance standard is met when all the work activities listed on the standard are completed. Condition surveys should be performed on trails on which maintenance needs are anticipated. The trail condition survey documents the condition of an entire trail and it may include an explanation of the work required to bring the trail to standard.

### *4. Utilize Maintenance Prescriptions*

A maintenance prescription, based on the condition survey, is written to document the work that is required to bring the trail to standard and to estimate the associated cost.

### *5. Establish Maintenance Scheduling*

Scheduling maintenance tasks is a key item towards the goal of consistently clean and safe trails. It establishes and documents maintenance work schedules to ensure high

priority work is accomplished first and to determine if the required work is being accomplished on time. Inspections, maintenance and repair of trail-related concerns should be regularly scheduled. Inspection and repair priorities should be dictated by trail use, location, and design.

6. *Perform Monitoring and Evaluation*

Following a field review of the completed work is a system of work reporting and evaluation. The maintenance management system provides a way to document maintenance costs. It may be most efficient to report the accomplished work on the same document that the work was authorized. For example, if the crew day card was used, the same card may be used to report accomplishments and establish associated costs. Personnel need to be assigned to evaluate the quality of the work reported with respect to specific design and construction standards.

7. *Initiate Public Education and Awareness Activities*

Include a Public Education and Awareness element to create an understanding among trail users of the purpose of the trails and their proper use. Many segments of the trail system contain a wealth of opportunities for education and interpretation. Basic concepts of trail use include resolution of user conflicts, and speed limitations. The Public Education and Awareness element also provides the underpinning for volunteerism and on-going advocacy initiatives in support of the County's shared-use trail maintenance plan.

8. *Perform Volunteer Coordination*

Volunteer Coordination is important as the use of volunteers can help increase public awareness of trails, and provide a good source of labor for the program. Sources of volunteers include coalitions of trail users, Boy Scouts, school groups and church groups. Understanding volunteers' concerns is important, as are possible incentives or recognition of the work they perform. Implementation of an "Adopt-a-Trail" program should be considered.

***Recommendation # 3 – Incorporate Shared-Use Trail Performance Measures***

The following performance measures are recommended based on the Study's "best practice research. Miami-Dade County's Shared-use Trail Maintenance Program should incorporate clearly stated maintenance goals and performance measures for each trail type and specific maintenance activity. A goal statement provides the basis for subsequent elements including maintenance levels, standards, scheduling and evaluation. Performance measures should include the following:

Maintenance Activity: Trail Surface Inspection

Trail Type: All trail types

*Goal: Regularly inspect all trails to ensure acceptable standards*

Trails inspections are integral to all trail maintenance operations. Inspections should occur on a regularly scheduled basis. The frequency of inspections will depend on the amount of trail use, location, age and the type of construction. All trail inspections should be documented.

*Performance Measures:*

- Perform regular trail inspections 30 times per year and extra inspections for trails with high levels of use;
- Provide documentation of all inspections;
- Schedule inspections to coincide with trail repair work.

Maintenance Activity: Trail Surface Routine Maintenance and Repair

Trail Type: Asphalt Trails

*Goal: Maintain Shared-use Trails in Excellent Condition*

Maintaining trail surfaces to acceptable standards is important for attracting potential trail users and providing for their safety. Trail sweeping is one of the most important aspects of trail maintenance which helps ensure trail user safety. Accumulated debris at the roadway edge or in a bicycle lane is one of the most common obstacles to safe use of facilities by bicyclists and pedestrians. A regular inspection and maintenance program is important to prioritize limited sweeping resources, and helps identify other problem conditions including potholes and cracks.

*Performance Measures*

- Respond to service requests based upon priority, and repair potentially hazardous conditions within 48 hours;
- Sweep arterials and collectors (including the bike lane area) 30 times per year, or more frequently, as needed, based on inspections and service request;
- Remove debris from the curb and gutter pan area;
- Perform annual repaving based on 15 year life cycle of asphalt;
- Repair bikeways for surface problems when identified or requested. Seal pavement cracks including between the asphalt pavement and gutter pan, and grind down surface bumps and ridges in the pavement which may develop in this area. Cut back on intrusive tree roots and repave or grind pavement to provide a rideable/walkable surface;
- Repair pavement edge raveling on uncurbed roadways on a timely basis to help extend the life of the pavement and to maintain a rideable/walkable surface area.

Maintenance Activity: Vegetation Control

Trail type: All trails with heavy vegetation

*Goal: Control and enhance vegetation along the trail system*

Plantings along the side of a bikeway or shared-use trail may encroach or cause sight distance problems for motorists or bicyclists/pedestrians at driveways or intersections. Encroachment causes bicyclists to ride further into the travel lane to avoid branches or to swerve unexpectedly. Plants blocking motorists' views may cause them to extend their vehicles further into the travel lane or block a bike lane or multi-use trail. Trail enhancement is achieved by planting vegetation along trails, mainly trees and shrubs. This can improve the aesthetics of the trail, help prevent erosion, and provide for wildlife habitat.

*Performance Measures*

- Maintain trees and shrubs along bikeways and shared-trails to prevent encroachment from branches;
- Respond to maintenance requests for trimming of branches within 48 hours, or sooner if warranted;
- Trim trees and shrubs to provide adequate sight distances at street intersections;
- Require property owners to maintain vegetation satisfactorily to County standards, where applicable;
- Cut back on intrusive tree roots and repave or grind pavement to provide a rideable/walkable surface. Utilize appropriate treatments to prevent pavement breakup caused by weeds or other plants growing through the pavement;
- Re-vegetate along trails regularly to enhance aesthetics and provide for erosion control
- Weed control along trails should be limited to areas in which certain weeds create a hazard to users. Environmentally safe weed removal methods should be used, especially along waterways.

Maintenance Activity: Signs, Stripes and Legends

Trail type: Mainly bike trails

*Goal: Inspect and maintain signs, stripes and legends to maximize visibility and safety*  
Signs, stripes and legends fade over time as they are exposed to the elements and, for stripes and legends, to traffic traveling over their surface. Regular inspection and maintenance is important to support regulatory and advisory functions of signs, to increase the visibility of bikeway facilities, and to reduce liability of responsible agencies.

*Performance Measures*

- Inspect signs, stripes and legends on shared-use trails 30 times per year or as part of service requests;
- Replace defective or missing signs as soon as possible;
- Repaint bike lane stripes, legends and crosswalks once per year, and in high bicycle/walking-use areas potentially twice per year.

## Maintenance Activity: Grass Mowing

Trail type: All trails with grass on flat and slope surfaces

*Goal: Maximize mowing cycles in the most cost-efficient manner*

Grass along trails requires regular mowing cycles, particular during the rainy season when grass grows most quickly. Grass can grow on to trails causing unsightliness, thereby detracting from trail use.

*Performance Measures*

- Plan for a minimum of 30 cycles per year for flat mowing;
- Plan for a minimum of 5 cycles per year for slope mowing.

### ***Recommendation # 4 – Establish Dedicated Funding for Shared-Use Trail Maintenance***

The Study concluded that trail maintenance funding and improved inter-departmental coordination go hand-in-hand. Dedicated funding for trail maintenance activities demonstrates that a high priority has been given by Miami-Dade County to the quality of its trail system. Once the trail system is made a funding priority, the roles and responsibilities of County departments and agencies can better be determined. The first step is 1) to ensure that priority for Miami-Dade County's trail maintenance activities is provided in the County's capital improvements program (CIP), and 2) that a specific line item for on-going trail maintenance be included.

It is important that Miami-Dade County's planned maintenance activities and funding be included in the Miami-Dade County's Capital Improvement Program (CIP). As is the case in Pinellas County, Florida, trail maintenance and repair would need to be part of the CIP's "governmental projects" priorities. While Miami-Dade County does not have the funding advantage of "Penny for Pinellas" to support these projects, funds can be allocated from transportation impact fees, grants and reimbursements and other tax revenues.

It is critical that Miami-Dade County's overall CIP schedule is formulated to reflect County priorities and needs with respect to trail maintenance and repair. Trail projects included in the CIP should have input from trail user constituencies, County staff, Metropolitan Planning Organization's (MPO) Long Range Transportation Plan, and other County master plans. In order for trail maintenance to become a priority in Miami-Dade County's CIP, specific objectives may need to be added or modified within the CIP.

CIP objectives may include the following:

- To preserve and improve the basic infrastructure of Miami-Dade County through the maintenance and repair of trail system facilities;
- To maximize the useful life of trail facility investments by scheduling regular maintenance and repair at the appropriate time in the life-cycle of the facility;

- To identify and examine current and future trail facility needs and establish priorities among projects so that available resources are used to the community’s best advantage; and
- To improve financial planning by comparing needs with resources, leveraging public and private funds and identifying alternative funding sources to enhance the quality of Miami-Dade County’s trail facilities.

***Recommendation # 5 – Create a Division for Trail Facilities Management***

The 2000 *Greenways Management and Maintenance Study* recommended a four-phase process for improving Miami-Dade County’s management and maintenance of its trail system. The recommendation called for an “incremental” approach as the County moves forward with its detailed plans for the completion of a 600-miles system. The phases include the following:

- Phase 1: Strengthen and clarify agreements and memorandums of understanding and establish an interagency coordinating committee to improve immediately the current system;
- Phase 2: Provide dedicated funding to carry out the functions outlined in the memorandums of understanding within the current multi-organizational framework;
- Phase 3: Create a County agency with its own budget and staff charges with the responsibility of managing and maintaining the trail/greenway/pathway network; and
- Phase 4: Create a quasi-County agency (authority) with its own dedicated source of funding, charged with the responsibility of managing and maintaining the trail/greenway/pathway network.

The current recommendation modifies the 2000 four-phase process by combining several of the critical components. The best practice research performed for this study strongly supports the merit of a fully-supported and well-staffed “division” within the Miami Dade Park and Recreation Department. Strong community support and dedicated funding are keys, however, to the on-going success of this management model. As such, it is recommended that a new “Division for Trail Facilities Management” within the Miami Dade Park and Recreation Department be considered that would provide greater focus and transparency to the public and government officials with respect to on-going trail management and maintenance.

A new Division for Trail Facilities Management would function much like the Seminole County Parks and Recreation Department’s Greenways and Natural Lands Division. As previously noted the Greenways and Natural Lands Division encompasses operations and programming of “natural lands,” trails, landscaped roadway medians, neighborhood/community parks and boat ramps. The Greenways and Natural Lands Division currently manages the County’s 35-mile trail system (40 miles upon completion).

### ***Recommendation # 6 – Creation of a Community Public/Private Partnership***

A public/private partnership will provide support for Miami-Dade County's Shared-use Trail Maintenance Program. 501(c) 3 public/private partnerships have proven successful in several of the best practice case studies. Examples include Indianapolis's Greenways Foundation, Inc. (GFI) and Pinellas Trails Inc. GFI was established in 1991 to facilitate contributions, of all forms, to central Indiana greenway projects. As an IRS-qualified 501(c) (3) entity, GFI can receive cash and in-kind donations. Such contributions can be in cash or appreciated assets such as real property or securities. The GFI holds these contributions until they are needed for greenway development, enhancement or operation. Pinellas Trails Inc. is a registered 501(c) 3 which concentrates on providing trail amenities including benches, bike racks, exercise stations, litter receptacles, mileage markers, shelter benches and tables, water fountains, maps and trees.

Rather than a four-phase process as recommended in the previous study, the above recommendations would need to be considered collectively, as they are intertwined and provide mutual support for one another. Together, they provide a holistic and comprehensive approach for addressing the long-term sustainability of Miami-Dade County's Shared-use Trail System.

## Miami-Dade Park and Recreation Approval Page

This report for the Shared-use Trail Maintenance Study has been reviewed and accepted as presented:

Name / Title	Department / Division	Signature	Date
Jack Kardys <i>Director</i>	Park and Recreation		
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