River of Grass Greenway

FEASIBILITY STUDY and MASTER PLAN

Executive Summary

WHAT IS THE ROGG?

'The River of Grass Greenway is a non-motorized transportation and recreation corridor across the Everglades, connecting Naples and Miami, that promotes enhanced opportunities for education and stewardship of the environmental and cultural assets of this unique area.'

RESEARCHING THE RIVER OF GRASS GREENWAY (ROGG) CORRIDOR

HISTORY

More than 12,000 years old, the interaction of Native Americans with the Everglades system is defined by four distinct periods; the hunter/gatherer Paleo-Indians, followed by the Archaic period, and the Formative period. The Seminole/ Miccosukee Period was the last of the four groups to inhabit the region, from 1825 and extending into the present day. They maintain a significant presence within the ROGG corridor. The Native American cultural use of the ROGG corridor affected feasibility assessments, potential alignment selection, construction requirements, and material selection for the ROGG feasibility study and master plan efforts.

GEOGRAPHY, GEOLOGY, AND SOILS

Existing soil types, drainage conditions, and geographical elements, like the Faka Union Canal, are relevant in determining alignment selection, construction requirements, and material selection for ROGG feasibility and planning efforts.

ECOLOGY

Due to the corridor's location in a sensitive ecosystem several ecological elements were studied for the ROGG feasibility and planning report: vegetation communities (freshwater, tidally connected, upland and transitional habitats, open water), listed wildlife species, exotic invasive species, wetlands, and ecological processes (fire, hydrology, wind, tidal influences, sea level rise, and succession).

CLIMATE

The region exhibits a subtropical to temperate climate conditions with pronounced wet and dry seasons. This would primarily effect the material selection and shelter requirements for ROGG feasibility and planning efforts.

HYDROLOGY AND HYDROGEOLOGY

Hydrological alterations in the ROGG study area- the Everglades and the Big Cypress Swamp watershed areas began in the 1880s to accommodate development activities and agriculture, which changed flow conditions, and direction, water quantity, and quality. Understanding historic and current conditions coupled with the hydrological improvements anticipated from the regional restoration projects that are proposed or underway was a critical aspect of the ROGG feasibility study.

PUBLIC AND TRIBAL OWNERSHIP

Public landholdings and their associated managing agencies within the ROGG Study Area maintain natural lands that could be accessible from ROGG, and they could serve as potential partners for the implementation of ROGG but routing ROGG through these landholdings will require extensive regulatory and public review. The lands held in public and tribal ownership within the ROGG Study Area affected feasibility assessments for routing options and regulatory review as well as opportunities for long-term partnerships for operation and maintenance.

TRANSPORTATION

U.S. 41 is an important connection between the east and west coasts of Florida. It is a significant corridor for access to parks, preserves and other conservation areas and is also the access to tribal lands and individual parcel owners. Bicycling is an activity that occurs regularly within the ROGG Study Area, primarily as a shared-road facility, although there are limited facilities to accommodate bicycling separate from the U.S. 41 roadway and motorized vehicular traffic, especially for long distance cycling.

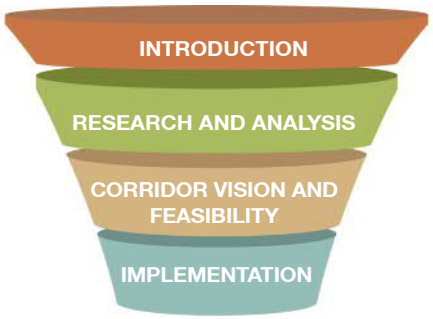
PLANNING PROCESS

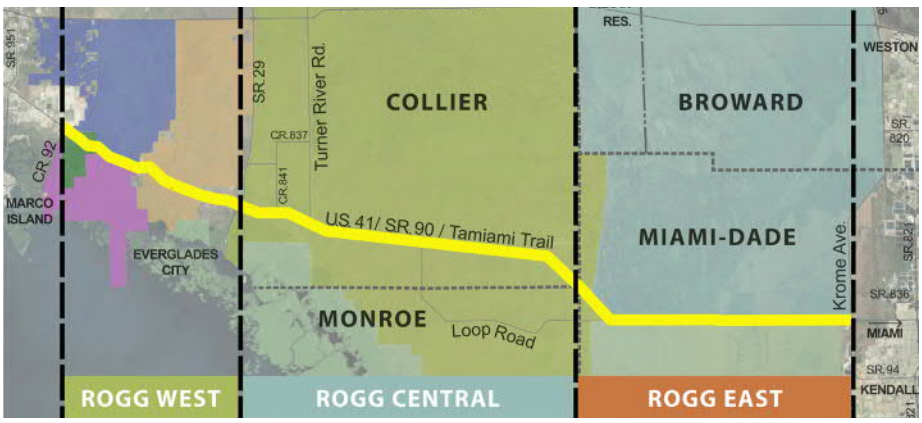
The idea for the proposed River of Grass Greenway (ROGG) is to provide an alternative transportation public access to the Everglades that will increase people's awareness about the region. Drawing upon the historical corridor of the Tamiami Trail, designated as U.S. 41 /Tamiami Trail/S.R. 90 (hereafter U.S. 41), the proposed ROGG links seven national and state parks, preserves, forests, and wildlife refuges.

Research documentation consisted of context, existing conditions, relevant aspects from published studies and records and comparable projects study.

A vision for ROGG was developed through extensive public involvement. Building upon the research and analysis completed, the planning team refined and analyzed the feasibility of each publicly developed concept based on a criteria established during the workshops with public and Steering Committee members' input. Feasibility study evaluates pathway concepts and alternative routes through analysis of opportunities, constraints and fatal flaws.

A detailed implementation planning would involve a benefit-cost analysis, funding opportunities, implementation phasing, and the setting up of a Projects Management working group.





Thunderstorm over Everglades National Park (nps.gov)

EXISTING CONDITIONS - SITE

ROGG West - C.R. 92 / San Marco Road to S.R. 29 / C.R. 92

Typical U.S. 41 paved ROW with narrow paved shoulder on north side in ROGG West Area

Fresh water marsh and wet prairie

Beginning at San Marco Road (C.R. 92), east of the city of Naples, the western portion extends for **15.73 miles** to S.R. 29/ C.R. 29. U.S. 41, crossing 12 roadway intersections and 37 waterways with associated bridges. Potential connections include six adjacent private attractions, four local and state parks and three existing trailheads. Major road interchanges include: S.R./C.R. 29 and C.R. 92 / San Marco Road.

Unique ecological systems of the ROGG West segment include the Picayune and Fakahatchee Strands, which are comprised of cypress strands, wet prairie, and pine flatwoods in lowland areas and subtropical hardwood hammock in upland areas. Florida panther habitat exists in the area.

ROGG Central - S.R. 29 / C.R. 29 to Miami-Dade County Line

A narrow shoulder at one of the U.S. 41 bridge crossings in ROGG Central

Typical Cypress habitat

ROGG Central spans from S.R. 29 / C.R. 29 to the Miami-Dade County Line, covering a total distance of **32.20 miles**. U.S. 41 within this portion of the Study Area includes at least ten roadway intersections and 28 bridges. Three private attractions, two housing communities, seven parks and six trailheads facilities are located along or adjacent to U.S. 41. Major road intersections in ROGG Central include C.R. 84 / Birdon Road, C.R. 839 / Turner River Road and C.R. 94.

This segment of the Study Area is dominated by one large ecologically significant area: Big Cypress National Preserve. The primary ecological communities consists of wet prairie and cypress forest, while areas of mangrove are present near the coast.

ROGG East - Miami-Dade County Line to Krome Avenue

Typical U.S. 41 roadway section lacking guardrails

Looking west from atop the L-29 Levee in the ROGG East Area

The ROGG East segment spans a distance of **28.54 miles**, from the Miami-Dade County Line to Krome Avenue (SW 177th Ave.). U.S. 41 exhibits 27 roadway intersections or driveways and five waterways with associated bridges in this portion of the Study Area. Connections include nine private attractions, private residences, one park and one trailhead. Krome Avenue and Loop Road are the two primary road intersections within the ROGG East segment.

Bordered primarily by Everglades National Park to the south, the ROGG East segment contains vast swaths of sawgrass and marsh ecological communities with scattered tree islands. Viewsheds are typically wide and far reaching, while views within the U.S. 41 corridor are largely contained by invasive vegetation or levees. Extensive restoration projects associated with the Comprehensive Everglades Restoration Plan (CERP) are proposed throughout this segment of the ROGG Study Area.

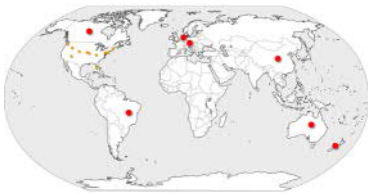
LITERATURE REVIEW

Extensive review of 110 existing studies provided the literature base to assess the planning implications for the feasibility and master plan of the ROGG.

Guiding document categories reviewed:

- Governing Codes and Ordinances,
- Master Plans and Management Plans,
- Transportation Studies and Plans,
- Environmental and Cultural Recourse Documents,
- Design Guidelines and Methodologies.

COMPARABLES

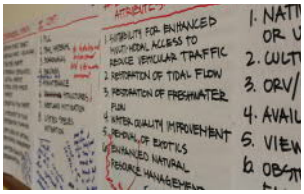


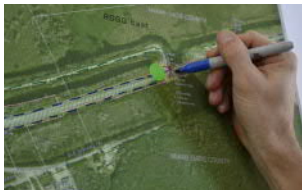
There are a variety of projects around the world that offer successful solutions to issues relevant to the ROGG. The purpose was to review best practices used in the design and implementation of comparable greenway projects and assess lessons learned that can be applied to ROGG. Comparable greenway projects within the following categories were reviewed as part of the feasibility study and master plan process:

Cyclists on the Danube River Trail, Europe

1. Inspirational/ iconic paths;
2. Paths of significant scale;
3. Paths within two-lane highway right-of-way;
4. Paths located on retrofitted highway bridges (culverts and large length bridges);
5. Paths associated with levee rights-of-way, water control structures, and canals;
6. Paths in environmentally sensitive landscapes, including wetlands;
7. Heritage paths.

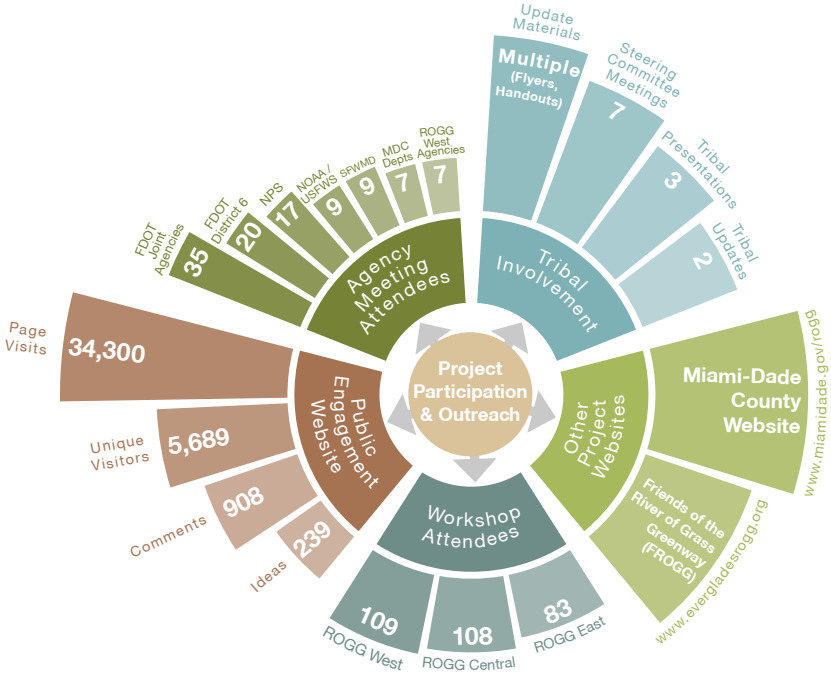
PUBLIC INVOLVEMENT





Four types of public involvement techniques were utilized:

- **Corridor Workshops**- Extensive, week-long public workshops with kick-off presentations, and multi-day planning sessions.
- **Websites**- Three project websites were developed in order to effectively engage the public and distribute information.
- **Public Agencies**- individual meetings with multiple public agencies that represent the public on a vast array of public safety, environmental, land and transportation management and stewardship issues.
- **Open House Meetings**- Concluding open house meetings were conducted in or near each planning segment of the ROGG Study Area.

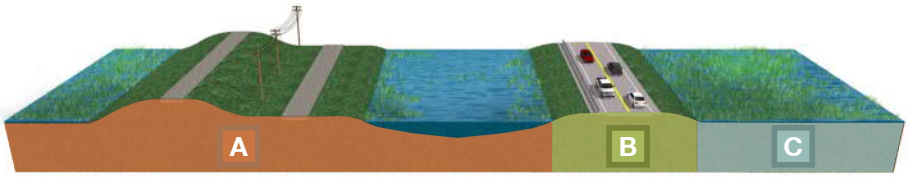


Project Participation and Outreach Diagram

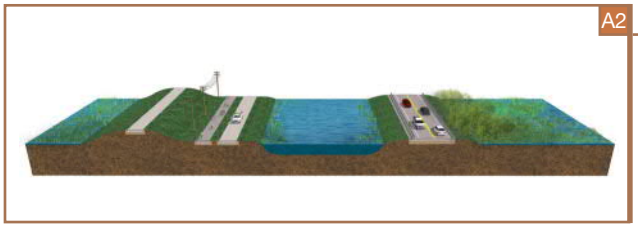
VISION CONCEPTS

Based on ideas provided from the public, 28 cross-section concepts were created The conceptual cross-sections are not intended to be applied as one type of path development across the entire **76.47** miles, but instead applied to a specific condition and location. To this end, the conceptual cross-sections are presented in three categories:

A. Levee and Canal
B. Highway and Shoulders
C. Separated Path



Existing Conditions with Locations of Path Alternatives



A2 **Path on Levee Bench:** *Applicable primarily in the ROGG East area.*

Elements:

- 12' hard-surfaced non-motorized shared-use path located at bench of existing L-29 levee;
- Two foot stabilized shoulders on either side of path;
- Separation of primary public motorized-vehicle traffic to top-of-levee maintenance road and adjacent 16' gravel maintenance road;
- Eight foot spatial separation between path and adjacent maintenance road;
- Provides a high-level of separation from U.S. 41 traffic.

Path Between Cable Barrier and Canal: *Potentially applicable in ROGG East.*

Elements:

- 12' hard-surfaced non-motorized shared-use path between existing cable barrier and Tamiami Canal;
- Two foot stabilized shoulders on either side of path;
- Spatial allowance for minimum meandering of pathway;
- Provides a medium-level of separation with spatial and physical barrier from U.S. 41 traffic.

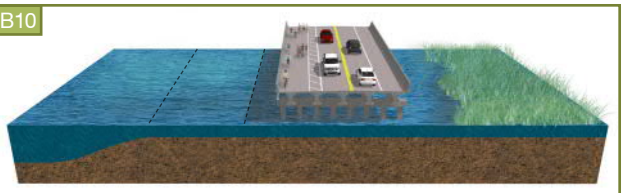
B9 **Path on Expanded Shoulder:** *Potentially applicable in select areas.*

Elements:

- 12' hard-surface pathway on U.S. 41 located on south-side of highway;
- Provides a low to medium-level experience for users highlighted by opportunities to observe open views to the south of highway;
- Provides a medium-level of separation with spatial barrier separation from U.S. 41 traffic.

Path on Proposed Bridge: *Potentially applicable in select areas in ROGG East.*

B10



Elements:

- 12' hard-surfaced non-motorized shared-use path on proposed U.S. 41 bridges;
- Provides a low to medium-level experience for users highlighted by opportunities to observe views from the bridge to the north;
- Provides a low-level of separation with minimum spatial separation from U.S. 41 traffic.

B12

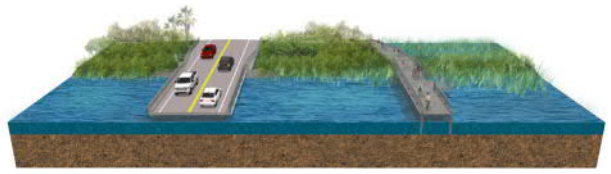
Path Next to Existing Bridge/ Separate Facility: *Potentially applicable where existing bridges and spillways are located*

Elements:

- 16' hard-surface shared-use bridge next to existing U.S. 41 bridges;
- Two foot shy-zones on both sides of shared-use path;
- Provides a medium to high-level experience for users highlighted by opportunities to observe open views from the bridge to the south;
- Provides a medium to high-level of separation with physical separation from U.S. 41 traffic.

Path on Separate Boardwalk Facility Next to Existing Bridge: *Potentially applicable where existing bridges and spillways are located*

B13



Elements:

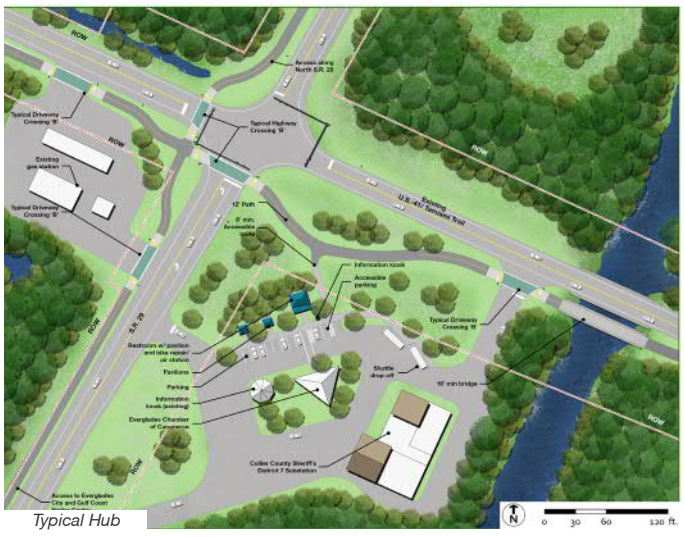
- 16' hard-surfaced non-motorized shared-use boardwalk path near existing U.S. 41 bridges;
- Two foot shy-zones on both sides of boardwalk;
- Provides a medium to high-level experience for users highlighted by opportunities to observe open views from the bridge to the north and south;
- Provides a high-level of separation with physical and spatial separation from U.S. 41 traffic;
- Safety railing.

C2

Path on High Boardwalk Facility: *Potentially applicable in select areas in ROGG Central and West*

Elements:

- 14-16' hard-surfaced shared-use boardwalk path;
- Two foot shy-zones on both sides of shared-use path;
- Provides a high-level experience for users highlighted by opportunities to observe open views from the boardwalk to the north and south;
- Flexibility to respond to environmental constraints easily;
- Provides a high-level of separation with physical and spatial separation from U.S. 41 traffic.



Typical Hub

Trailhead and Hubs Concepts

Series of full service **trailheads**, spaced approximately 10 to 12-miles apart. Existing Facilities would be used **extensively.**

Hubs include the minimum amenities of a major trailhead with added features-transit access, visitor centers, food vending, and/or expanded parking capacity. Hubs serve as primary destinations along the path with significant numbers of visitors.

Potential Trailhead Services:

- Drinking fountains
- Trash receptacles
- Picnic shelters
- Seating areas
- Air station and bike repair station
- Wayfinding and interpretive signage
- Bike Racks
- Parking

Six Hub facilities were identified (all existing):

- Shark Valley Entrance at Everglades National Park
- Big Cypress National Preserve - Oasis Visitor Center
- Big Cypress Swamp Welcome Center
- Everglades Chamber Welcome Station
- Fakahatchee Strand Preserve State Park Welcome Center (under design)
- Port of the Islands Marina.

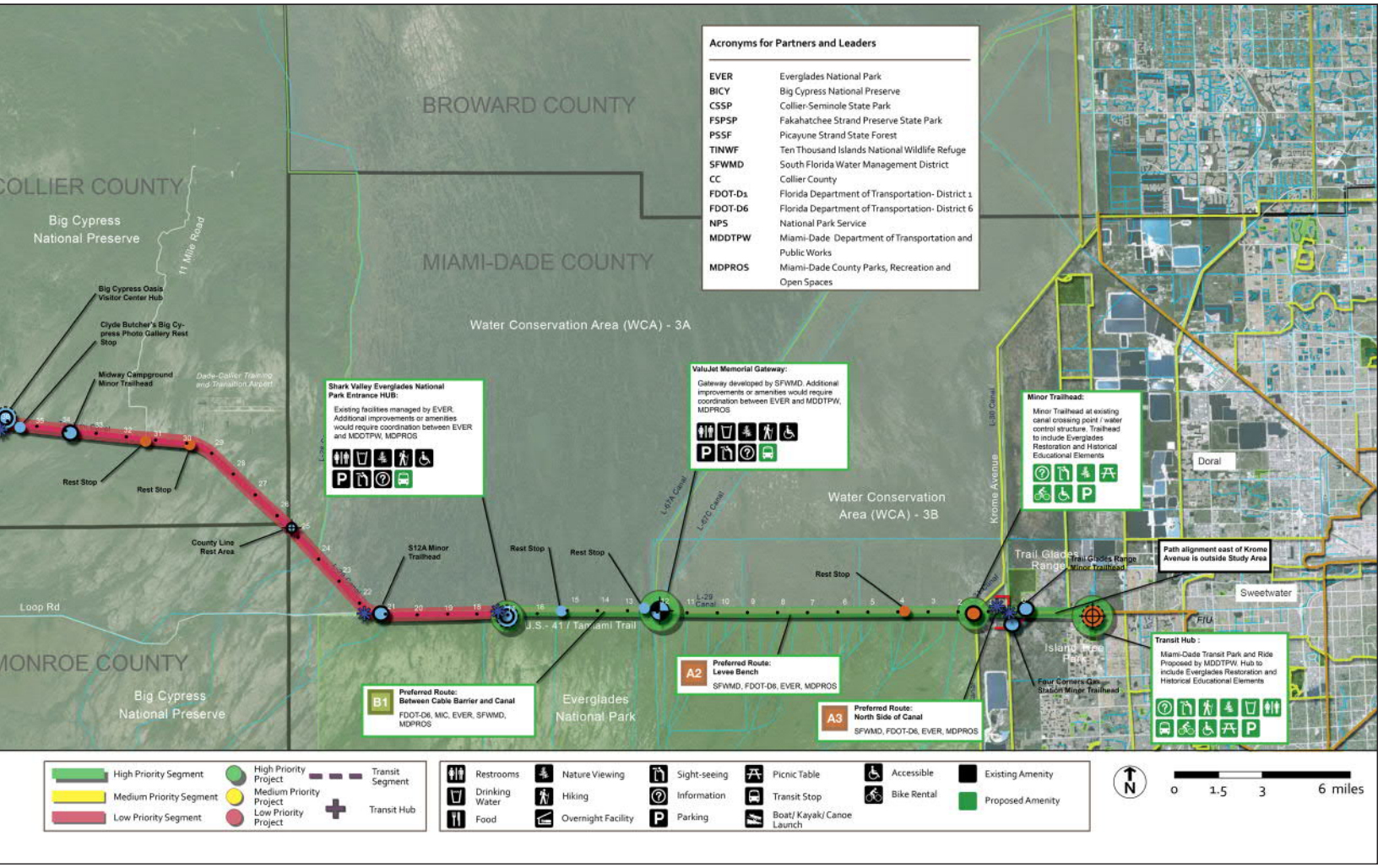
PRIORITY PROJECTS MAP

01 Path on Separate Boardwalk Facility Next to Bridge (ROGG West)

(within FDOT right-of-way)

02 Typical Minor Trailhead (BICY Midway

(within FDOT right-of-way)



y Campground - ROGG Central)

03 Path on Levee Bench (L-29 Levee - ROGG East)

(within SFWMD right-of-way)

ALTERNATIVE TRANSPORTATION STRATEGIES

Development of the ROGG will provide wholly new and safe forms of transportation alternatives that allows users to experience the Everglades.

Three alternative transportation analyses were conducted, each alternative building upon the previous scenario starting with a scenario of minimum development consisting of construction of the ROGG, ranging to construction of the pathway.

Each analysis used a Trip Reduction Impact Analysis (TRIA) methodology to evaluate the trip reduction impacts of various transportation and parking policies and programs.

Scenario 1: Pathway Only

The **Pathway Only** scenario assumes only the physical construction of the ROGG and no other policy or alternative transportation enhancements.

Scenario 2: Basic Initiatives

The **Basic Initiatives** scenario assumes construction of the ROGG as well as supportive policy measures such as extending transit routes along U.S. 41 and creating bikeshare and carshare programs.

Scenario 3: Progressive Demand Management

The **Progressive Demand Management** scenario assumes construction of the ROGG and supportive policies, as well as parking management strategies, premium transit, transit pass programs and tie-ins with the hospitality industries on both coasts.

BENEFITS ANALYSIS

Development of ROGG, along with implementation of the alternative transportation strategies, have the potential to be a regional amenity that promotes environmental health and increases the accessibility and quality of amenities in the Everglades. Besides bringing Miami-Dade and Naples communities closer to one of the nation's greatest natural resources, the benefits that south Florida may experience from the development of the ROGG and corresponding alternative transportation strategies can be quantified in order to assess the value the path may have compared to costs. Benefits resulting from the development of the ROGG fall into three categories:

- **Social Benefits** (Accessibility, Health & Wellness)
- **Environmental Benefits** (Reduced Annual Average Daily Vehicle Trips (AADTs), Reduced Vehicle Miles Traveled (VMTs), Emissions Reduction, Reduced Fossil Fuel Use)
- **Economic Benefits** (Potential tourism expenditures, Potential Florida State sales tax revenue, Potential Miami-Dade County sales tax revenue, Potential Collier County hotel tax revenue, Potential Miami-Dade County hotel tax revenue)

Social Benefits

Accessibility

Annual Visitation Estimates by Destination

Health and Wellness

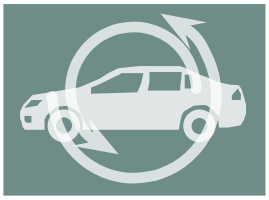
Estimated Calories Burned and Pounds Lost Annually^

kcal - 30,035,707
lbs- 8,581

Environmental Benefits

Annual Average Daily Vehicle Trips (AADTs)

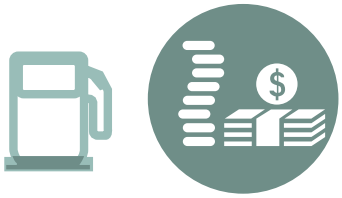
Estimated Annual Average Daily Vehicle Trips (AADTs) Reduction



Net AADTs Reduction: +114,913
Alternative Transportation Strategies AADTs Reduction: -332,074

Reduced Fossil Fuel Use

Estimated Fossil Fuel Reduction (Over 25 Years)



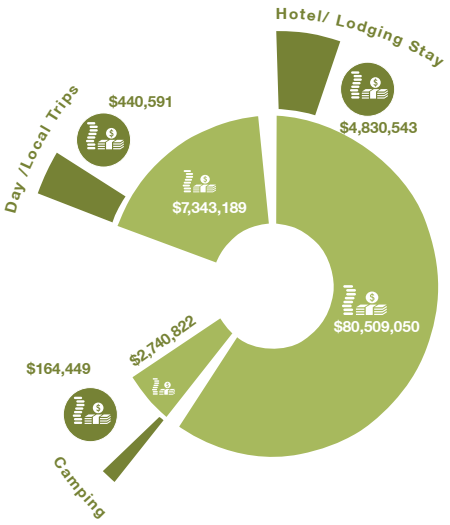
Gallons of Gasoline Reduced: 6,318,525
Gasoline Reduction: $23,252,1716

Assumptions/ Notes: Total of 8,618,475 VMTs reduced annually with an average MPG of 34.1. AAA average gasoline price of $3.68 as of June, 2014.

Economic Benefits

Potential Florida State Sales Tax Revenue

Estimated Annual ROGG Visitor Groups



$90,593,061

Total Visitor Group Annual Taxable Direct Expenditures

$5,435,583

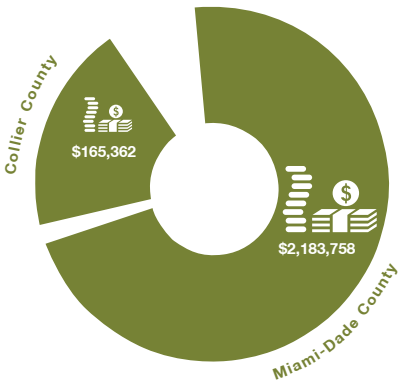
Total Florida State Annual Sales Tax Revenue

Estimated Annual Jurisdictional Tax Revenue

Potential Collier County and Miami-Dade County Hotel Tax Revenue

Annual Sales Tax Revenue

County Hotel Tax Revenue



$6,249,105

Annual Sales Tax Revenue (State of Florida and Miami-Dade County)

$2,349,120

County Hotel Tax Revenue

Assumptions/ Notes: State of Florida collects a 6% sales tax as of 2014 on non-grocery expenses.

BENEFITS-COST ANALYSIS (BCA)

A Benefit-Cost Analysis (BCA) is a primary tool used for regulatory analysis of alternatives to determine net benefits to society. It is important to identify the limitations of BCAs such as; not all benefits can be expressed in monetary units; and the most efficient alternative may not be the one with the largest monetized net-benefit.

BCAs function on a concept of valuing benefits and costs equally as a 'willingness-to-pay' concept which is a notion of measuring what individuals are willing to forgo to enjoy a particular benefit.

Safety benefits in the reduction in crashes and fatalities due to the construction of ROGG and the resulting reduction in use of motor vehicles. Health benefits are calculated as the savings on medical costs due to regular physical activity that can be acquired by visitors who go to ROGG. Recreation benefit is based on the assumption that walkers and bikers value their recreation time and experience. Construction of ROGG would also result in monetary benefits in terms of reduced vehicle use and avoidance of associated congestions. This reduced vehicle use would also help calculate the vehicle maintenance costs that people avoided due to reduced vehicle miles traveled.

Costs	7% Disc. Rate	3% Disc. Rate
Capital Costs	$ 122.72M	$ 134.92M
Operations & Maintenance	$ 31.31M	$ 49.29M
Total Costs	**$ 154.02M**	**$ 184.20M**
Benefits	**7% Disc. Rate**	**3% Disc. Rate**
Health	$ 26.95M	$ 42.43M
Recreation	$ 46.41M	$ 73.06M
Safety	$ 18.43M	$ 29.01M
Congestion Avoided	$ 4.46M	$ 7.02M
Vehicle Costs Avoided	$ 15.45M	$ 24.32M
Emissions Avoided	$ 1.06M	$ 1.67M
Total Net Benefits	**$ 112.76M**	**$ 177.51M**
Benefit-Cost Ratio	**0.73**	**0.96**

Recreation

40-60 Minutes of Activity	7-12 mile Bike Ride	40-60 Minutes of Activity	4-6 mile Walk
Value of Recreation Benefits over 20 Years	$107.32 M		
Discounted at 7%	$46.41M		
Discounted at 3%	$73.06 M		

*Annual per capita recreation cost savings on 2014 - **$10**
(NCHRP Report 552

Health

75 minutes of Vigorous Activity per week	12-15 mile Bike Ride	150 minutes of Moderate Activity per week	6-8 mile Walk
Value of Health Benefits over 20 Years	$62.33 M		
Discounted at 7%	$26.95 M		
Discounted at 3%	$42.43 M		

*Annual per capita health cost savings for 2014 - **$322**
(U.S. Bureau of Labor Statistics Consumer Price Index)

Safety

Safety Costs Avoided over 20 Years	$42.62 M
Discounted at 7%	$18.43 M
Discounted at 3%	$29.01 M

Typical Canal Crossing (ROGG Central) *(within FDOT right-of-way)*

FUNDING OPPORTUNITIES

Funding for development of ROGG will have to come from several sources, such as federal, state, and local funding. The main elements of development would be: acquiring the land or Rights-of-way for construction where applicable; design, permitting, construction and inspection of the shared-use path; construction of trailheads and other path amenities.

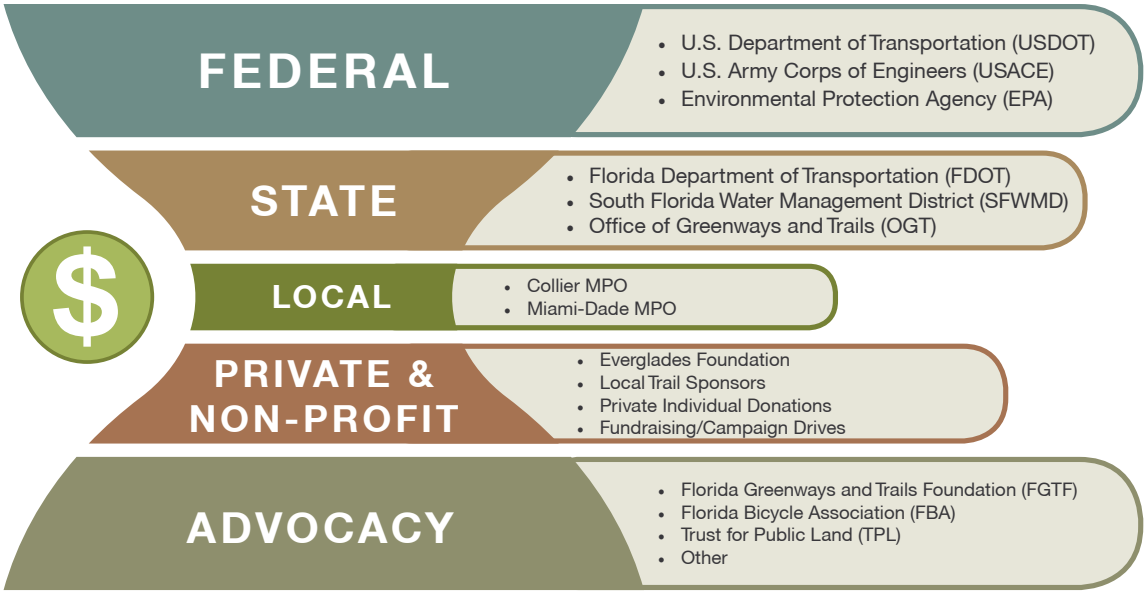
Federal funding is typically made available to local project sponsors as pass-through funding from State agencies, either in the form of grants or direct appropriations. Federal funding will usually require a local match of between five to 50 percent.

The State of Florida has legislation that offers funding, independent of federal sources that can be used to support future development of the River of Grass Greenway project.

Local governments in Collier County and Miami-Dade County can plan for the funding of River of Grass Greenway path facilities improvements through Capital Improvement Programs (CIP).

Private foundations and other conservation-minded benefactors also fund shared-use path projects like ROGG.

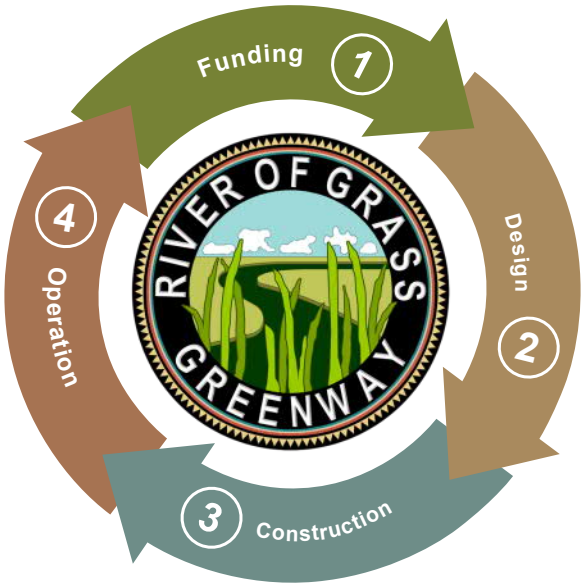
Support/Advocacy Organizations don't provide funding, they are valuable as advocates and organizations that can "lobby" in support of a specific funding application.



WORKING GROUPS

WHERE ARE WE IN THE PROCESS?

- Each phase will require additional funding and approval in order to proceed
- Future phases will include additional public involvement and coordination
- Future phases will answer important remaining questions

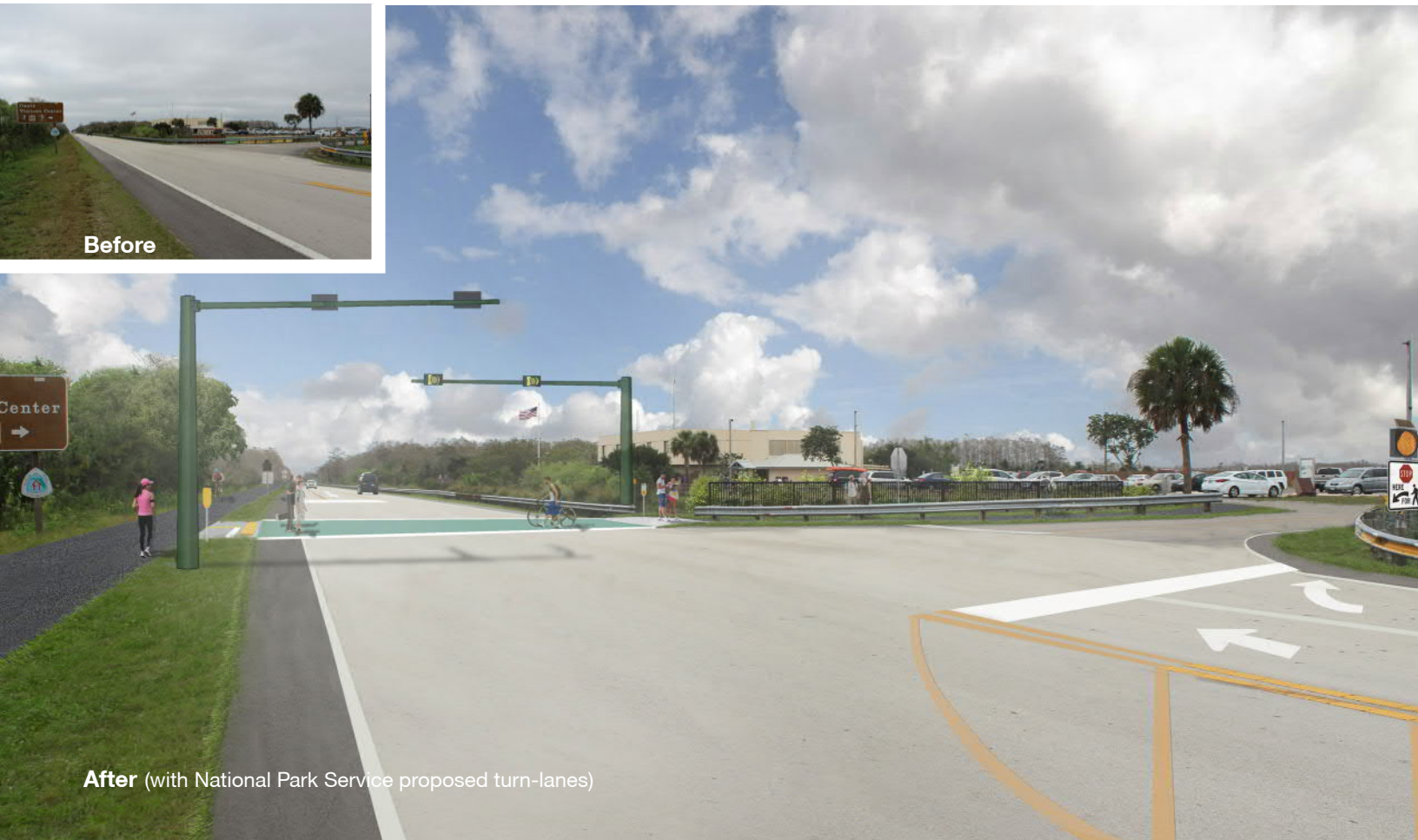


Current Phase

1. **Feasibility Study and Master Plan**
2. ETDM / PD&E Study
3. EIS / EA
4. Design and Engineering
5. Permitting
6. Bidding
7. Construction
8. Path Segment Opening

EDTM = Efficient Transportation Decision Making
PD&E = Project Development & Environment
EIS = Environmental Impact Study
EA = Environmental Analysis

Typical Crossing (to Big Cypress National Preserve Oasis Visitor Center - ROGG Central) *(within FDOT right-of-way)*



Contact:

Friends of the River of Grass Greenway (FROGG)
P.O. Box 5031
Everglades City, FL 34139
www.evergladesROGG.org

To request materials in an accessible format, please contact Miami-Dade County Parks Recreation and Open Spaces Department Disability Services Section at (305) 755-7848