

3.4 ALTERNATIVE TRANSPORTATION ANALYSIS



“If the greenway movement can help us get back a bit of honest natural beauty and our heritage of historic place, we shall owe it much.”

– Charles Little, Greenways for America, 1990

Introduction

In a simple form, development of the ROGG will provide a wholly new and safe form of transportation that allows users to experience the Everglades in a personal and potential life impacting manner. Never before have visitors or residents of the Everglades experienced traveling parallel to the Tamiami Trail (U.S. 41) on a multi-use shared path by foot, bike or non-motorized means. Opportunities to explore and sightsee along the path will for once be unconstrained to the limited existing facilities. A better Everglades experience awaits those that will use the ROGG.

The purpose of this section is to document the alternative transportation strategies and scenarios that are potentially provided by the ROGG or could work in conjunction with the pathway to ensure higher positive environmental, social and economic benefits. To summarize these alternative transportation strategies and scenarios, this section contains four elements:

- **Overview of Managed Transportation for the ROGG** – This element summarizes the managed elements of transportation within the ROGG Study Area such as transit service, parking management and pathway amenities.
- **Current Alternative Transportation Conditions** – This element describes the existing alternative transportation conditions for such items as transit service, bicycle infrastructure and parking facilities.
- **Alternative Transportation Analysis** – This element analyzes the potential challenges and opportunities posed with the development of ROGG and looks at three scenarios to gauge the impact of ROGG on U.S. 41.
- **Investment and Policy Options** – This element summarizes potential investments and policy options that could work in conjunction with ROGG to provide ancillary benefits.

3.5.1 Overview of Managed Transportation for the ROGG

The ROGG, in addition to providing a high-quality recreational and visitor amenity in the Everglades region, offers numerous environmental and transportation benefits through providing a transportation alternative in the U.S. 41 corridor and potentially reducing vehicle use. Although the ROGG may not have substantial impacts on commuting demand in the metropolitan areas at either end of the Study Areas, strategic partnerships to develop transit service, manage parking, and promote bicycle and pedestrian access within the Naples and Miami urbanized areas can offset, and even reduce, vehicle-based travel demand along U.S. 41.

With this in mind, the introduction of these alternative transportation strategies may help to reduce need or demand to drive in order to reach the path access points. The analysis of the ROGG to reduce vehicle trips, presented in this section, suggests that it would actually increase trips without these measures in place. In order to capture the full potential for environmental benefit, the ROGG’s implementation will need to include a series of alternative transportation enhancements and policies, described briefly as follows:

Transit Service

Because of the ROGG’s alignment along U.S.41 through the Everglades, transit service intended to bring visitors to the path access points would not function in the same way as conventional urban area transit service. Instead, transit may provide focused shuttle service allowing access to major points of interest along the corridor. This may be focused on visitor services and may necessitate a partnership between public agencies and private organizations, some of which currently provide tours and more individualized access to Everglades attractions outside normal service areas for public providers.

In addition, strategic extensions of service currently provided by Miami-Dade Transit and Collier Area Transit, or through partners, could fill in gaps between existing transit service areas and the endpoints of the ROGG Study Area. With both of these service providers offering bicycle racks as standard features on their buses, this could be a short-term and relatively low-cost way of expanding access to the ROGG and allowing a greater number of year-round residents to access the pathway without requiring an automobile.

Parking Management

Existing parking facilities along U.S. 41 have extended distances between locations, which has prompted many visitors to park along the highway. This is already a dangerous practice given the high vehicle speeds on U.S. 41 and the limited widths of the roadway shoulder. It is critical for parking to be managed in a way that facilitates access but recognizes areas of greatest demand such as the Shark Valley Entrance to Everglades National Park. Strategic pricing is one of the most effective ways to achieve this, and when coupled with use of enhanced transit service to highly visited destinations, can reduce vehicle demand on U.S. 41 by keeping visitors from driving no further than needed.

Improved Cycling Amenities, Shared Bicycles and Shared Vehicles

Visitors to the ROGG will want to explore sections of its length, making cycling and driving attractive options over walking between destinations, especially outside of the cooler season when heat and humidity make walking long distances impractical and unappealing. However, with a scarcity of existing off-road parking, vehicles coming from outside of the ROGG Study Area have few options for parking. Coupling transit-based access from outside of the ROGG Study Area with available vehicles and bicycles for sharing within the corridor can further encourage visitors not to drive, but rather to use these vehicles as they desire to move from point to point along the corridor. Car2go (for shared vehicles) and DecoBike (for bicycles) are private organizations already providing these services in the Miami metropolitan area, and their point-to-point user model and successful experiences with marketing to visiting populations suggest that they could be strategic partners in developing a consolidated transportation management program for the ROGG.

Summary of Managed Transportation

The Trip Reduction Impact Analysis (TRIA) model, an analysis tool used to estimate potential for vehicle trip reduction through use of specific transportation management strategies, determined that while expected vehicle demand for accessing the ROGG could be offset using existing transportation programs and services, a more extensive and strategically organized set of transportation management measures could actually reduce traffic along U.S. 41 and improve the overall travel experience for ROGG users and travelers along U.S. 41.

An important note is that this projected reduction is a combination of all of the measures described, and not simply an application of those that are the lowest cost or least difficult to organize. Each part is key: enhanced and targeted transit service along U.S. 41 paired with strategic expansions to bicycle and pedestrian networks in the Naples and Miami urbanized areas, allowing visitors to access the path without driving, management of parking at highly visited destinations for those who choose to drive, and alternatives to external driving access for times and distances where vehicle or bicycle access are desirable can help to ensure that visitors view transit-based access as a feasible and desirable approach.

Transportation Conditions

This section focuses on the current conditions of alternative transportation forms within the ROGG Study Area. For a review of existing highway conditions and their potential implications to the planning and design of ROGG see section 2.1.7 of this report.

Transit Service

There are two transit service operations within biking or walking range of the ROGG Study Area. Collier Area Transit provides service throughout much of Collier County and includes shared express service with Lee County, potentially expanding transit access to Lee County and beyond. Miami-Dade Transit offers the greatest extent of public transit with several routes within bicycling distance of the ROGG Study Area. Both public transit service providers have the potential to include new or expanded service on extending nearby routes to access existing trailhead facilities such as Trail Glades Range in Miami-Dade County and Collier-Seminole State Park in Collier County. A third type of transit is also present, private shuttles. This option is readily available in both Collier County and Miami-Dade County and typically includes a charge for transportation with recreation activities or amenities provided such as kayaking, biking, airboating or hiking.

Collier Area Transit

Each of the metropolitan areas at either end of the ROGG Study Area provides public transit service, though the extent and complexity of service varies with the population of each. Collier Area Transit (CAT) operates 16 fixed routes and complementary ADA paratransit in the Naples region, as well as a new connection to Lee County called LinC. Service is available seven days per week from 6:00 AM to 7:30 PM. In recent years, CAT has invested in several new technologies to make service easier and more convenient for passengers, including Next Bus technology which allows passengers to see on a map where the bus is located and when it will arrive at their stop, and electronic fareboxes which allow passengers to use electronic fare cards to pay instead of cash and coins. As is increasingly common throughout the United States, bicycle racks are available on all buses and can accommodate up to two bicycles.

CAT's Route 24 is the transit route that is closest in proximity to the ROGG Study Area, with an eastern terminus approximately 3.5 miles from the western end of the ROGG Study Area. Route 24 operates from the

Collier County Government Center at U.S. 41 and Airport Road east to the Big Cypress Marketplace at Basik Drive on U.S. 41. The bus makes eight trips per day Monday through Saturday and six on Sunday. At one time, CAT did operate a route into Everglades City, but has not for several years. In addition, LeeTran in Lee County operates 23 fixed routes, including a commuter route operated jointly with CAT that connects to CAT service, therefore extending the transit network accessible within 3.5 miles of the ROGG Study Area into Lee County.

Miami-Dade Transit

Miami-Dade Transit (MDT) is Florida's largest transit agency and one of the largest in the United States. It operates 90 routes of local and express bus service and one bus rapid transit line (the South Dade Busway), utilizing a fleet of 800 buses all equipped with bicycle racks. In addition, MDT operates Metrorail, Florida's only rapid transit heavy rail service, connecting Kendall in Southwest Miami, Downtown Miami, the Miami International Airport, and Hialeah, and the southern terminus of South Florida's Tri-Rail commuter rail service. MDT's overall network connects all portions of the urbanized area of Miami-Dade County, including locations frequented by visitors and tourists such as Miami Beach.

Several MDT bus routes terminate within a few miles of the eastern terminus of the ROGG Study Area, including Routes 24, 40, 51, 56, 72 and 137. The routes with the most direct connections to downtown Miami and Metrorail terminate slightly further east but are still potential candidates for westward extension to connect with the ROGG. This includes Route 8, which operates along SW 8th Street (Tamiami Trail/ Calle Ocho) and terminates at SW 107th Avenue, approximately seven miles east of the ROGG Study Area. Route 11 operates along West Flagler Street and also terminates at SW 107th Avenue. Route 24 operates along SW 26th Street (Coral Way) as far west as SW 147th Avenue or approximately four miles from the ROGG Study Area.

Private Shuttle Services

At least ten private shuttle operators transport visitors from Naples to the ROGG Study Area; even more do so from Miami. A majority of the tours utilize vans to take visitors into the parks to kayak, bicycle, or hike with private guides. Most of these services are priced between \$100 and \$150 per person and typically include transportation and recreation activities in the cost.



Cyclists traveling along a shoulder of U.S. 41 near the Shark Valley entrance of Everglades National Park

3.5.2 Current Alternative

Bicycle Infrastructure

Both Miami-Dade County and Collier County have made considerable efforts over the past several years to increase the miles of bike lanes and other bicycle infrastructure. Comprehensive bicycle networks are still in development. In addition, the Miami-Dade metropolitan area has recently welcomed bicycle sharing in Miami and Miami Beach. Currently, Collier County has a total of 94.6 miles of bike lanes and 31.7 miles of shared-use paths, with a majority of both types of facilities (approximately 80% in both cases) in the unincorporated parts of the county outside of the City of Naples proper. Miami-Dade County has approximately 210 miles of bike lanes and approximately 143 miles of Shared-use paths. Collier County's 2012 Comprehensive Pathways Plan listed a portion of U.S. 41 as a pedestrian need area, although this portion does not connect to the ROGG Study Area. The Miami-Dade Bicycle and Pedestrian Plan Update documents SW 8th St.(U.S. 41) as having an existing paved shoulder as part of its bicycle facility inventory, which may contribute to the reason that the U.S. 41 corridor is listed as a "Very Low Need" route for new on-road bicycle facility needs.

Bikeshare

DecoBike is a bikeshare program serving the Miami Beach area with over 1,000 bicycles offered at approximately 100 stations. The program has logged more than 2 million rides since its inception in March, 2011. The City of Miami cited bikeshare as a goal in their Automated Bicycle Rental and Parking Plan Study in 2009 and selected DecoBike as its vendor in early 2010. Although these bikeshare stations are focused on high-density urban cores in Miami-Dade County, similar models have taken advantage of visitor demand for access to parks and natural resources. One example is the Bixi bikeshare service in Montréal, which has located stations in the Parc Jean-Drapeau on one of the city's St. Lawrence River islands.

Carshare

Carsharing is a model of car rental that allows people to rent cars for short periods of time, typically by the hour. Three car sharing companies are available in Miami-Dade County: Zipcar, Hertz On Demand, and Car2Go Miami. Zipcar members pay an annual fee to use Zipcars. Reservations are typically made ahead of time, and members pay an hourly fee, which includes gas and insurance. Zipcars are parked in one consistent location; there are about six locations in Miami where Zipcars are parked. Hertz hourly rentals are also available at about 13

locations in the greater Miami area. Car2Go is a service offered by Daimler which provides a flexible, no reservation car rental without assigned parking places. Members pay by the minute, and over 200 cars are available in the Miami area. Overall, carsharing is a relatively new but fast growing segment of the car rental industry which allows for flexibility in rental location, time commitment and costs.

Parking Facilities

At most sites along the corridor, parking is constrained due to the numerous environmental, spatial, and cultural limitations to construction or filling in wetlands. Parking facilities are full or overflowing in some areas, especially on weekends during peak season, typically November to April. On peak season days, the Shark Valley Entrance to Everglades National Park often features lines of cars parked parallel to U.S. 41 outside of the gate. Even when lots are not full, many visitors park along the edge of the road to view wildlife or take photographs. These conditions are having a negative impact to the surrounding environment due to the creation of erosion from vehicles disturbing non-stabilized soils near wetlands, unsafe conditions due to vehicles parking in emergency shoulders along U.S. 41 and backing out into travel lanes, and by creating a poor visitor's experience at the entrances of destinations.

Summary of Alternative Transportation Conditions

Alternative transportation conditions near the ROGG Study Area are comprehensive. Two public transit providers service areas within biking distance of either terminus of the ROGG Study Area. Through a combination of modifying current transit routes and/or extension of the potential ROGG service could be directly provided and in the case of Collier Area Transit, has historically been offered. Aside from the use of transit, other alternative transportation options are present including bikeshare and carshare providers. These providers are typically located in urban areas, but are accessible to users who may choose to visit the Everglades area.

Several examples exist of successful bikeshare providers operating in natural environments and may serve as a model for future programs along ROGG. Parking facilities remain constrained through the Study Area due to the limitations, primarily environmental, of creating additional impervious parking lots at destinations adjacent to wetlands. The greatest concerns regarding uncontrolled parking facilities are due to unsafe conditions created by visitors parking along U.S. 41 in close proximity to travel lanes, backing into travel lanes and blocking emergency pull-off access, in addition to environmental concerns of erosion and pollution impacting stormwater quality adjacent to sensitive wetlands.



DecoBike Station in Miami Beach (Source: www.spokenfolks.blogspot.com)



Visitors walking on Tram Trail at Shark Valley Entrance, ENP



Mix of pedestrian and vehicle traffic on U.S. 41 at Shark Valley Entrance, ENP

3.5.3 Alternative Transportation Analysis

Three alternative transportation analyses were conducted as part of this feasibility study and master plan. Each analysis builds upon the previous starting with a scenario of minimum development consisting of construction of only the ROGG, ranging to construction of the pathway, supporting policies and management programs. In order to conduct these analyses, the planning team first had to establish a projected number of users for the ROGG. The planning team relied on user figures provided through the use of the FDOT Conserve by Bicycle and Pedestrian Study Benefits Calculator. This model estimates the number of potential pathway users based on input from five variables in regard to recreation users. These five variables are:

- Proximity of potential users (population),
- Quality of service that would be provided by the potential path facility,
- Aesthetics along the path facility,
- Points to interest,
- Facility Length.

An additional important factor in the estimation of potential pathway users is the separation of the path facilities from vehicle traffic. As documented in the Comparables section Part 2, a best practice of pathway design is spatial or physical separation of path facilities from travel lanes. The distance of spatial separation also has an impact on the number of potential path users with greater numbers projected for paths with the greatest distance between facilities. A range of 20 feet for a minimum distance to a maximum of 120 feet, which is the typical greatest distance achievable within the existing U.S. 41 ROW, were used.

Estimate of Annual Pathway Users/ Visitors

Distance of Separation (based on distance from U.S. travel lane)	Projected Annual User Volume for ROGG	Projected Trips per Mile
20 feet	337,950	4,506
Mean	503,250	6,710
120 feet	668,475	8,913

Data Source: FDOT Conserve by Bicycle and Pedestrian Study Benefits Calculator, 2014.

Based on projections by the FDOT Conserve by Bicycle and Pedestrian Study Benefits Calculator, over 500,000 users may visit a portion of ROGG annually. This estimate does not include visitors to existing facilities such as Everglades National Park, Big Cypress National Preserve, state parks and preserves, wildlife refuges, and private destinations. The daily bicycle and pedestrian traffic may average as many as 1,375 users per day or equal to more than 50% of the daily vehicle traffic during the non-peak months (May through October).

Methodology

Three scenarios were used to estimate potential impact of traffic on ROGG and surrounding transportation modes. These three scenarios consisted of the following:

1. The **Pathway Only** scenario (scenario #1) which assumes only the physical construction of the ROGG and no other policy or alternative transportation enhancements.
2. The **Basic Initiatives** scenario (scenario #2) which 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.
3. The **Progressive Demand Management** scenario (scenario #3) which 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.

Each analysis used a Trip Reduction Impact Analysis (TRIA) methodology to evaluate the trip reduction impacts of various transportation and parking policies and programs. This model makes order-of-magnitude comparisons between different policy alternatives and their effect on vehicle trips. The analyses is based on available research describing the effects of programs and policies in other regions, with judgment-based assignments of how effective a policy or program will be in a given application that considers the robustness of regional transit, distance between destinations, regional familiarity with transportation management programs, and other factors.

It is important to note that for a majority of the programs, available research typically has highly varied results; thus, the TRIA model is meant to illustrate orders of magnitude effects more than predict daily automobile counts.

Scenario descriptions, basic assumptions, and results are detailed as follows. In the section following these descriptions, each program is described in more detail, including estimated cost and implementation measures.

Existing U.S. 41 Annual Average Daily Trips (AADT)

U.S. 41 Segment	Traffic	Trucks	Truck %
Hwy S.R. 92 to Hwy S.R. 29	2,700	251	9%
Hwy S.R. 29 to C.R. 839	2,400	288	12%
C.R. 839 to C.R. 94	2,477	263	11%
C.R. 94 to Krome Avenue	1,900	285	15%
Average U.S. 41 AADT	2,369	272	11%
Annual Traffic	864,776		

Data Source: FDOT Florida Traffic Online, access June, 2013 (<http://www2dot.state.fl.us/FloridaTrafficOnline/viewer.html>)

Existing Mode Share for U.S. 41 Traffic and Projected New Trips

Mode Share Type	Mode Share %	Mode Share Number
New annual visitors to ROGG		503,250
Existing Bike Mode Share	0.7%	3,523
Existing Walk Mode Share	1.7%	8,555
Existing Motorized Vehicle Mode Share	97.6%	491,172
Potential New Annual Trips^		213,553

Data Source: Vehicle occupancy is based on FDOT Travel Behavior Report, 2011 with an average occupancy for recreation/social trips of 2.3 persons per vehicle. Florida average vehicle occupancy for all uses is 1.58 persons.

^Note: Potential New Annual Trips is an order-of-magnitude projection that does not factor vehicle trips to existing destinations which could reduce the total potential new trips total.

Scenario 1: Pathway Only

Scenario 1 assumes the construction of ROGG, but with no supportive alternative transportation policies that could encourage people to access the path in a mode other than their personal vehicle. Research has documented that for each additional mile of bike lane or bicycle facility constructed per 100,000 inhabitants, mode share increases 0.075% across the entire area. The same concept applies for pedestrian mode share, with volumes increasing between 46% and 400% when a new sidewalk or option for walking is installed or improved. These two effects combine to produce a 1% travel mode shift away from motorized vehicle use in the Study Area; however, this shift may not offset the demand generated by the presence of the path.

Scenario 1: Projected Bike Share Mode

	Total
Miami-Dade County Population	2,794,763
Collier County Population	320,087
Total Population	2,794,763
Miles of ROGG	75
Existing U.S. 41 Bike Mode Share*	0.7%
Add'l share for every ROGG mile/100,000	0.075%
Additional Bike Mode Share	0.2%
Total Bike Mode Share	0.9%

Data Source: Nelson, Arthur and David Allen (1997). 'If You Build Them, Commuters Will Use Them; Cross-Sectional Analysis of Commuters and Bicycle Facilities.' Transportation Research Record 1578.

Scenario 1: Projected Pedestrian/Walking Share Mode

	Total
Miami-Dade County Population	2,794,763
Collier County Population	320,087
Total Population	2,794,763
Miles of ROGG	75
Existing U.S. 41 Pedestrian Mode Share *	1.7%
Percentage Increase (minimum)	46%
Additional Bike Mode Share	0.8%
Total Bike Mode Share	2.5%

Data Source: TCRP Report 95 'Traveler Response to Changes,' Chapter 16 'Bicycle and Pedestrian Facilities,' p. 16-37.

*Note: In order to use mode share figures from the US Census, which are based on counties, demand is attributed to each county based on percentage of total tourism. Total tourism in Miami-Dade County and Collier County is a combined 15,473,000; with 89.8% or 13,900,000 visitors in Miami-Dade County and 10.2% or 1,573,000 in Collier County. Source: FHWA National Household Travel Survey, 2008 (<http://www.fhwa.dot.gov/policy/2008cpr/chapt15.htm>)

Scenario 2: Basic Initiatives

Building on Scenario 1 results, the second scenario includes several initiatives that can improve the utilization of other modes of travel, such as transit and bicycle. Four initiatives used in Scenario 2, with supportive research, are:

1. Bike Facilities and Services – such as bicycle parking, lockers, showers, and other amenities;
2. Bike Share – similar to the Deco Bike system in Miami Beach;
3. Car Share – a system in which users can rent cars on an hourly basis;
4. Provide Transit – extend existing transit routes in Collier and Miami-Dade counties out to points of interest along the ROGG Study Area.

In Scenario 2, the estimated motorized vehicle trip reduction is approximately 8.9% with bike share contributing as much as half of the decrease. Note that the model does not account for the existence of services such as bike share in only one of the communities in the greater ROGG service area; the model can only analyze the presence or absence of a bike share system. Existing research is not nuanced enough to enable more detailed analysis of the location of bike share stations or breadth of program adoption. The model is multiplicative and not additive; in order to ensure the percentage reductions are not over-stated.

Scenario 2: Projected Mode Share Impacts

Basic Demand Management	Potential % Mode Share Increase
Blke Amenities and Services	0.1%
Bike Share	5.0%
Car Share	0.3%
Extend Existing Transit Routes	3.5%
Total:	8.9%

Data Source: TCRP Report 95' Traveler Response to Changes,' Chapter 16 'Bicycle and Pedestrian Facilities,' p. 16-37.

Scenario 2: Costs and Potential Responsible Agency for Basic Program Initiatives

Strategy	Cost	Responsible Agency
Bike Services	Small Project \$50,000	Miami-Dade County, Collier County, National Park Service, Private Section- retail
Bike Share	\$50,000-\$75,000 per station	Deco Bikes, Miami-Dade County, City of Naples and/or Collier County, National Park Service
Car Share	Staff time to work with companies	Private car share companies
Extend Existing Transit (8 trips/day, 5 days/week)	\$750,000 Miami-Dade County \$500,000 Collier County	Miami-Dade Transit, Collier Area Transit, Private Partner

Scenario 3: Progressive Demand Management

In a continuation of Scenarios 1 and 2, the last scenario includes aggressive initiatives to manage travel demand along U.S. 41. Two of the programs that have the most potential to shift people away from using their automobiles are parking management and a transit pass program.

1. Premium Transit – high frequency, branded, and intensely marketed transit;
2. Transit Pass Program – partnership with cruise lines, hotels, and education institutions to create pass packages;
3. Parking Management – comprehensive, corridor-wide parking policies and pricing;
4. Marketing and Information – targeted marketing with a slogan and branding of the car-free greenway experience.

Combined with elements from Scenario 2, the programs in Scenario 3 have the potential to decrease the automobile mode share from its current 97.6% to less than 65%. This results in a net auto traffic decrease of nearly 15% on U.S. 41 when potential new trips generated by ROGG are included.

Scenario 3: Projected Mode Share Impacts

Progressive Initiatives	Potential % Mode Share Increase
Premium Transit	5.0%
Transit Pass Program	11.0%
Parking Management	12.3%
Marketing and Information	0.2%
Total:	28.5%

Scenario 3: Costs and Potential Responsible Agency for Progressive Demand Management

Strategy	Cost	Impact Potential	Responsible Agency
Premium Transit	\$2 million - \$4 million (varies by frequency and season)	High	Miami-Dade County, Collier County, Hospitality industry, Private concessionaires
Transit Pass Program	Staff time to plan and implement	Medium	Miami-Dade Transit, Collier Area Transit, National Park Service, Hospitality institutions
Parking Management	Staff time to work with companies	High	Miami-Dade County, Collier County, National Park Service, Property owners
Marketing and Information	\$50,000-\$150,0000	Low-Medium	Multi-agency, public and private
Multimodal Gateways	\$15-\$75 million	High	Miami-Dade County, Collier County, South Florida Water Management, National Park Service, Private Vendors

High Frequency Transit

Scenario 3: High Frequency Transit Impact on Mode Share

Transit Impact	Collier County	Miami-Dade County
Existing Transit Mode Share	1.8%	5.2%
Existing Transit Frequency of routes on/near U.S. 41 (in minutes)	90	45
New Frequency Low (20 min) % Change	350%	125%
New Frequency High (15 min) % Change	500%	200%
(% Change Mode Share (0.5 Elasticity) Low Frequency	3.07%	3.2%
% Change Mode Share (0.5 Elasticity) High Frequency	4.4%	5.2%
New % of All U.S. 41 Trips - High Frequency	1.1%	3.9%
Total New Transit Mode Share	5.0%	

Notes: Multimodal Transit Hub not included in model due to lack of research to estimate impact.

Subsidized Transit Passes

Subsidized transit passes can potentially decrease mode share for motorized vehicles. Most areas with pass programs have a university or other type of central institution with a high potential for transit propensity. In this scenario, the pass program reduction was halved to account for the difference in community type.

Scenario 3: Subsidized Transit Pass Impact on Mode Share

Type of Impact	Impact
Existing Auto Mode Share	97.6%
Potential Reduction	-11.0%
New Auto Mode Share	86.6%
Existing Transit Mode Share	3.5%
Potential Increase	11.0%
New Transit Model Share	14.5%

Scenario 3: Examples of Impacts from Subsidized Transit Passes on Mode Share

Drive Alone to Work			
Municipalities	Before	After	% Change
Santa Clara (County)	76%	60%	-21%
Bellevue, Washington (Downtown)	81%	57%	-30%
Ann Arbor, Michigan (Downtown)	N/A	N/A	-4%
Boulder, Colorado (Downtown)	56%	36%	-36%
Average Percent Change	3.5%		-23%
Transit to Work			
Municipalities	Before	After	% Change
Santa Clara (County)	11%	27%	145%
Bellevue, Washington (Downtown)	13%	18%	38%
Ann Arbor, Michigan (Downtown)	20%	25%	25%
Boulder, Colorado (Downtown)	15%	34%	127%
Average Percent Change			84%

Data Sources: Santa Clara Valley Transportation Authority (1997). Eco Pass Pilot Program Survey Summary of Findings.; King County Metro (2000) FlexPass: Excellence in Commute Reduction, Eight Years and Counting. www.commuterchallenge.org/cc/newsmar01_flexpass.html; Christopher White, Jonathan Levine, and Moira Zellner (2002). Impacts of an Employer-Based Transit Pass Program: The Go Pass in Ann Arbor, Michigan. www.apta.com/research/info/briefings/documents/white.pdf; Appendix B: Pasadena Traffic Reduction Study, Nelson\Nygaard (2006)

Parking Management and Pricing

Studies have shown in similar conditions to those found in the ROGG Study Areas that charging for parking reduces motorized vehicle use. The amount of reduction depends on the amount charged and the conditions of how it is applied. The ROGG Study Area is analogous to an 'Activity Center,' but typically has more rural conditions. Therefore, percentages used have been reduced by 50% from source data to reflect the conditions found in the Study Area.

Scenario 3: Parking Management and Pricing Impact on U.S. 41

Parking Fee	% Reduction	Of Existing Auto Share
Low - \$3	12.6%	12.3%
Medium - \$4.50	18.5%	18.1%
High - \$6	23.4%	22.8%
Mode Share Impacts		
Existing Auto Mode Share	97.6%	
Potential Reduction	-12.3%	
New Auto Mode Share	85.4%	
% Reduction (90% use transit, 10% use bike)		
90% to transit	11.0%	
10% to bike	1.2%	

Scenario 3: Example of Vehicle Trip Percent Reduction by Daily Parking Fee Amount

Work Setting	\$3.00 Parking Fee	\$4.50 Parking Fee	\$6.00 Parking Fee
Low Density Suburb	15.1%	25.3%	36.1%
Activity Center	25.1%	37.0%	46.8%
Regional CBD/Corridor	31.8%	42.6%	50.0%

Data Source: Comsis Corporation, 1993 (in 2010 dollars); Victoria Transport Policy Institute (2008), Land Use Impacts on Transport, http://www.vtppi.org/landtravel.pdf

Marketing

Marketing and promotions can increase transit ridership between 3 and 11% in the long-term and 33%-50% for short-term, resulting in reduction to auto mode share by 1% in the short-term and 0.2% in the long-term. For ROGG a long-term 0.2% mode share reduction for motorized vehicle is assumed.

Data Source: TCRP Report 95 "Traveler Response to Changes," Chapter 11 "Transit Information and Promotion."

Potential Challenges and Opportunities

Induced Demand

On the basis of its funding through the Paul S. Sarbanes Transit in Parks Program, the planning of the ROGG must account for the magnitude of reduction in automobile traffic that might be expected to result from its completion. While there is reason to expect that the implementation of the path itself, as well as a number of related investments and policies, has the potential to generate a significant reduction in the existing vehicle traffic in the corridor, the potential for popularity of the path may create a net addition of traffic if no transportation alternatives are provided and incentivized.

Parking Lot Expansion

Though many existing parking lots are physically constrained, several are located where expansion may be possible in the future. For many, such as sites within Big Cypress National Preserve or near protected cultural resources and sites, expansion is highly unlikely. Several sites, however, are privately held and could potentially be expanded. More availability of parking would induce more drivers to drive private vehicles along U.S. 41. In nearby Osceola County, private RV park owners are converting their land to private parking lots. The RV business has experienced reduced profitability with many private parks empty except for during peak season times. This trend may impact the ROGG Study Area as several private RV parks may come under pressure to convert into parking lots. A matrix of parking lot expansion/development potential analysis is available in the report Appendix.

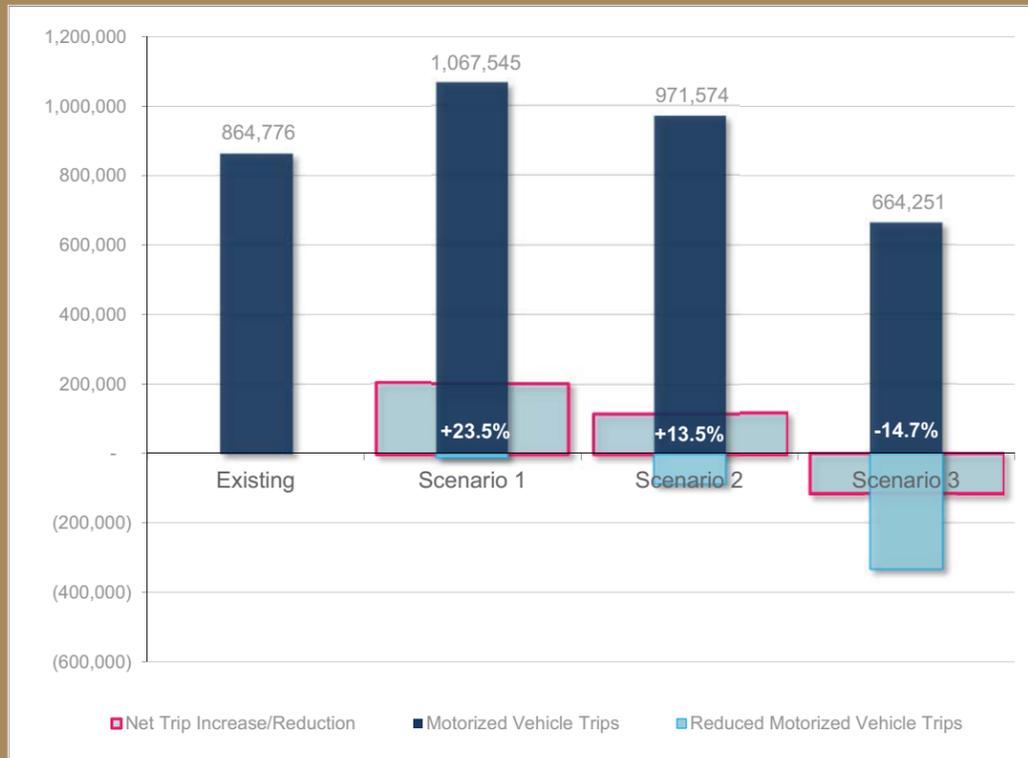
Summary of Alternative Transportation Analysis

Through the construction and implementation of progressive alternative transportation strategies the potential impact of additional motorized vehicle use linked to the development of the ROGG can be fully offset and further reduced to below current levels by approximately 15%. As noted, the development of ROGG may potentially increase the number of visitors to the Study Area which is perceived to be a beneficial element for most businesses and destinations along U.S. 41. This increase can be offset by incorporating amenities for users of ROGG, bikeshare, carshare and enhanced transit operations, leading to a reduction of 8.9% in AADT on U.S. 41.

transit, parking and traffic on U.S. 41. and could realize a further 28.5% mode share reduction for motorized vehicles, resulting in an overall reduction of 39.5% from net levels. When additional trips generated by users of the ROGG are factored in, the overall results equals a 14.7% reduction in vehicle traffic on U.S. 41.

The final scenario is a progressive approach at managing

Projected Vehicle Mode Share Impacts by Proposed Scenario



3.5.4 Investment and Policy Options

In order to counteract the potential for gains in traffic by the ROGG’s popularity and success, a number of related investments and policies might be considered. While these actions would advance the goal of reducing motorized vehicle traffic along U.S. 41, many would provide ancillary benefits to the community beyond the ROGG.

Transit Service Along U.S. 41

Scenarios 2 and 3 include transit as a primary element of programming. Since only 7% of cycling trips are over 10 miles (Pedestrian and Bicycle Information Center <http://www.bicyclinginfo.org/facts/statistics.cfm>), many cyclists may make only short trips into the park, or drive their car to a central point such as Shark Valley Entrance at Everglades National Park or the Big Cypress National Preserve Oasis Visitor Center and launch their bike ride from one of these hub areas. A cycling-friendly transit option will play a critical role in mitigating the induced traffic of U.S. 41, along with a robust bikeshare program sited at convenient locations along the ROGG.

Scenario 2 assumes an extension of the existing transit routes into the ROGG Study Area, with no service or frequency improvements, no pass agreements, and no branding component. Scenario 3 assumes a fully branded, premium transit service that is part of the visitor experience of the ROGG. In other highly visited national and international destinations, such as the Grand Canyon National Park or Walt Disney World, visitors who are normally not transit users give up the independence of driving their own private vehicle and use special transit to navigate the sites. Marketing the transit service with a brand such as “ROGG Ride” or another slogan, can make a difference in visitor mode choice.



Yosemite Hybrid Shuttle (Source: Flickr user - dwb transport photos)

Service Design and Alignment

Premium transit service is best adopted in conjunction with parking management and multimodal gateway strategies. The multimodal gateway can serve as a terminus, with the “ROGG Ride” or transit service operating exclusively along U.S. 41 between hubs, instead of as a local bus route in Miami or Naples before traveling out to the corridor.

In order to ensure efficiency and speed, the bus would only make select stops at major sites along U.S. 41, primarily at tourist and cyclist destinations along the corridor. The stops would be integrated with trailheads and existing facilities and could be located at:

- Collier-Seminole State Park
- Fakahatchee Strand Preserve State Park Visitor Center
- Everglades Welcome Station/ S.R. 29
- Big Cypress Swamp Welcome Center
- HP Williams
- Monroe Station
- Big Cypress National Preserve - Oasis Visitor Center
- Shark Valley Entrance – Everglades National Park
- Spillway S333 L-29/ ValuJet Flight 592 Memorial
- Micosukee Resort & Gaming

To be a viable option, transit service must be convenient, comfortable, fast, and easy to use. Reliability and comfort are key service design factors. On-time performance can be hampered by traffic congestion, especially along rural roads. Since signal priority and use of the shoulder are not options for most of the Study Area, as they are in many places to help speed buses along, planning enough cushion in the schedule to maintain schedule adherence is important.

Operators

A public transit operator alignment is likely too expensive for Miami-Dade Transit or Collier Area Transit to operate and manage alone or may be outside their established service area. Moreover, private concessionaires are already operating bicycle and bus tours in the Study Area, charging premium fares. A public-private partnership would bring together the transit agencies, the parks, the tourism industry, and potentially the private operating sector to plan and operate a visitor-focused service. Both public and private agencies are critical to planning the service in order to ensure planning and marketing flexibility, to leverage private tourism funding, and to provide high-

quality service at a price point that will attract maximum private vehicle drivers.

A new public transit service was developed by the City of Homestead in coordination with the National Parks Conservation Association, National Park Service staff and community stakeholders, that connects the city, the ENP Visitor Center and Anhinga Trail, and the Biscayne National Park Visitor Center via a trolley. Service was started in the winter of 2013 and operates during peak season (October to April).



City of Homestead National Parks Trolley to Biscayne and Everglades National Parks (Source: Miami Herald)

Vehicles offer the most visible branding opportunity for a service. Yosemite’s shuttle states “FREE SHUTTLE” and “HYBRID” on the bus, along with its destination. Comfortable, modern buses are the most desirable for attracting new transit riders. All transit buses in the region are equipped with bike racks, but these typically only hold two or three bicycles. For this service to really serve path users, bikes should be accommodated in larger numbers, either with a trailer or as part of the vehicle itself.



Bike Rack on Public Transit: Brecon Beacons National Park, Wales Source: Travel Breton Beacons

Case Studies

Transit in Zion National Park

Zion National Park has prioritized alternative transportation modes, making cycling easy and also making transit simple to understand and use. The Park operates 21 buses at seven minute headways all day long during peak tourism season (April-October). About half of the service operates in the nearby town of Springdale and half within the park itself.

The Park estimates that this reduces more than 50,000 vehicle miles per day and more than 10.5 million annually. Among the other benefits is traffic congestion relief, safer hiker/pedestrian crossings, and more naturalistic vistas. The park’s transit system prevents more than 5 million pounds of CO₂ annually from being released into the atmosphere. The system costs approximately \$2.5 million to operate annually; initial capital costs (in 2000) totaled \$12 million.

Using the shuttle is incorporated into the visitor experience of Zion-National Park with 75% of the park’s 2.5 million visitors riding the shuttle, according to FHWA Office of Operations. The park’s website shares this quote from a visitor: “Being able to park your vehicle at your motel and not worry about traffic is a godsend.”

Transit for Bicycles in Snoqualmie National Forest

Snoqualmie National Forest in Washington State is a popular hiking and cycling area. A private vendor, Agate Pass Transportation, operates a bus to shuttle bicycles and cyclists up to the Snoqualmie Pass, charging users \$22 for a one-way trip. The shuttle makes three round trips per day, during spring, summer, and fall only. (Photo Below)



Frequency and Cost

High-frequency transit service is a strong factor in attracting ridership. For recreational trips that are somewhat longer, more than 35-miles to the Big Cypress National Preserve Oasis Visitor Center from either terminus, demand is not likely to be high enough to warrant higher than 20-minute frequencies. Based on broad estimates for transit operations and cost of current transit service, operating 30-minute frequencies during tourist season and at 60 minute frequencies during the remainder of the year would cost just under \$3 million total.

Estimated Costs for Transit Service Operations on U.S. 41

Headways	Tourist Season		Off-Season	
	Buses	Cost	Buses	Cost
20 Minute	9	\$3.14m	N/A	N/A
30 Minute	6	\$2.1m	6	\$1.5m
60 Minute	N/A	N/A	3	\$750k

Assumptions/ Notes:

Operational costs are estimates only, based on National Transit Database operating costs per hour for Miami-Dade Transit (\$125) and Collier Area Transit (\$79). The costs are based on eight hours/day of service, seven days/week. Tourist season is assumed to be October-April (seven months). Buses are assumed to operate at 25 mph.

For cost assumption only, Miami-Dade Transit and Collier are assumed to operate from their respective termini to Big Cypress National Preserve - Oasis Visitor Center, which is in the center of the corridor (note that this means Miami-Dade Transit is operating 11 miles into Collier County). Miami-Dade Transit does not provide service outside of the Urban Development Boundary (UDB).

New buses are typically \$400,000-\$600,000, depending on the model and fuel type. Hybrid diesel vehicles are between \$600,000 and \$700,000. Electric buses make a bold environmental statement and are becoming popular for premium transit circulators as part of different cities’ environmental branding. As they become more available, the price is beginning to drop, but most are still nearly \$1 million each, with the additional cost of charging stations.

Potential Costs and Trip Reduction

For extension of the transit routes in Scenario 2, the transit mode share from American Community Survey (ACS) 5-year estimates (2007-2011) was 3.5% with no additional increase or assumed reduction in auto trips. For the

premium transit service, research is available to support elasticity of transit rider response to increased frequency, though the other elements of premium transit, such as special branding and modern buses, are more difficult to isolate. Increased frequency increases transit mode share, with an average elasticity of 0.5, resulting in an auto trip reduction of 5%.

Transit Passes/Integrated Payment

In most pass programs, institutions provide passes to all of their employees, guests, students, or affiliates. The passes provide unlimited transit service, often across a number of transit providers. Because they make transit more affordable, available, and competitive, these passes increase transit ridership. Not only does the increased ridership relieve the roadway demand volumes, but it also helps the transit operator with stable revenue sources. Passes can be paid for through very modest student or employee fees, supplemented by employers or institutions, or in the case of ROGG, agencies and businesses in the hospitality sector. To the rider, the pass should feel like a fare-free system. Ideally, this pass program would integrate payment with the bikeshare and/or carshare programs. The ROGG Pass could be part of tourism packages offered by the hospitality industry or cruise lines.

Potential Costs and Trip Reduction

Subsidized passes can potentially decrease auto demand by 23%. Most areas with pass programs have a university or other type of central institution with a high potential for transit propensity. In this scenario, the pass program reduction was halved to account for the difference in communities, so auto trips were calculated to be reduced by approximately 11%. Pass programs cost staff time to develop and negotiate with private institutions that will purchase passes. Printing passes and data and record keeping are the only substantial costs of implementing the program.

Parking Management

Parking management is one of the most powerful ways to manage auto demand along a corridor. Parking management is a general term for strategies that encourage more efficient use of existing parking facilities, reduce parking demand, and/or shift travel to non-motorized vehicle modes. The supply of free or inexpensive parking at the final destination is a key decision factor cited for choosing to drive a personal auto rather than taking a bus, bike, walk, or carpool.

Along the U.S. 41 corridor, there exists a potential for additional free or low-priced parking to be created on privately-owned properties along the corridor if demand is great enough. This parking supply, if created, would likely entice even more auto trips along the U.S. 41. Opportunities may exist to influence or manage both the supply and pricing of parking along the corridor. There may also be opportunities to use part of the revenue generated by parking to help offset the costs of some of the other services, such as transit. Working with agencies and property owners along U.S. 41 to manage parking can create a win-win for the public sector that wants to manage traffic and the private sector that wants to generate revenue.

Working together to price parking and manage other travel options produces the best results. For instance, at Zion National Park, free parking is available in the shopping area in Springdale one-mile from the park entrance. Cars must pay \$25 to enter and park inside the park boundaries and the lots are often full. ROGG has a similarly constrained environment where only a few areas could really be expanded for additional parking facilities.

For parking management to work, other options must be available to visitors. The dangerous practice of parking along the shoulder of U.S. 41 could potentially worsen if parking restrictions are laid out but no other options are marketed to visitors. The shuttle and multimodal hubs, which include park and ride lots, become vitally important to the safety of corridor users.

- Strategic Pricing, setting parking rates to match desired volumes at different points along the corridor. Like in Zion National Park, free or cheap parking at the hubs at each end of the corridor, so visitors can park for free and take the shuttle instead;
- Shared Parking/ Park Once is a strategy that seeks to shift parking demand into shared, public facilities rather than a proliferation of dedicated, accessory lots, reducing the volume of parking and local vehicle trips;
- Park-and-ride lots can intercept traffic outside of highly congested areas and transfer them to transit or carpools for the final leg of the journey;
- Parking enforcement and education can help manage the on-street supply and free spaces for short term parkers;
- Corridor- or area-wide parking cap keeps the supply at an acceptable level.

Potential Costs and Trip Reduction

In the absence of any major government parking decks or the formation of a parking authority, parking management typically requires only staff time to meet with and work with property owners and develop area-wide policies. Parking has the potential to reduce auto trips substantially. The amount of reduction depends on the land uses and density in the area as well as the price. For ROGG, the reduction was estimated to be up to 12%.*

Note: *Victoria Transport Policy Institute (2008), Land Use Impacts on Transport, <http://www.vtpi.org/landtravel.pdf>

Bicycle Programs and Amenities

Availability of bicycle facilities can make cycling an easy choice for visitors instead of an activity available only to the dedicated and experienced cyclist. Some amenities are important to have frequently along a path such as places to obtain/buy water and snacks and restrooms are the most necessary amenities. Others can be concentrated at the hubs or other activity areas along the Study Area, such as Shark Valley Entrance at Everglades National Park, the Big Cypress National Preserve - Oasis Visitor Center, and the S.R. 29 intersection to Everglades City. See section 3.2.3 - Typical Trailheads for a list of bicycle amenities and features.



Bike Shop and Rentals one mile from Zion National Park, Springdale, Utah (Source: Zion Cycles)

Potential Costs and Trip Reduction

Bicycle parking costs between \$150 and \$300 per rack. Bike lockers can cost \$1,500-\$2,000 per unit. A full-service bike center, with air, parking, repairs, and

concessions, is estimated to cost about \$5,000 per square foot to construct. The McDonald's Bike Center in Chicago cost approximately \$3.2 million and received FHWA and FTA funding to offset some costs. The presence of facilities at the end of bike trips can increase bike mode share. Research has found that mode share can increase between 8.6% and 22% if end-trip facilities such as bike parking or showers are provided. The ROGG model used the conservative figure of an 8.6% increase in bike mode share, resulting in an auto trip reduction of 0.1%.

Bikeshare

In January 2014, the City of Miami awarded a bike share contract to DecoBike to expand from Miami Beach into Miami. The 50 planned stations are in Coconut Grove, Omni, Little Havana, Midtown, Design District, and the Brickell Financial District. Though no stations are planned in the ROGG Study Area, the city could establish bikeshare stations at strategic locations to connect with transit traveling to ROGG. To create even more opportunities for riders, the city, partnering with Miami-Dade County, could create bikeshare stations along the corridor, accommodating out-and-back riders, but more likely, riders who travel out using bicycles and back on transit, or vice versa.

Potential Costs and Trip Reduction

Bikeshare stations generally cost \$50,000-\$75,000 per station. Expansion also takes staff time and support from the surrounding community/ stakeholders. Successful bike sharing programs have resulted in automobile to bike mode shifts between five percent to eight percent in the immediate service area. Impacts may be lower if conditions are not conducive to bicycling (few available bicycles in the system, insufficient network of dedicated bike routes, and/or climate conditions not conducive to bicycling). For the ROGG model, the lower end of the range was used (5%) due to the small network of dedicated bike routes in the ROGG Study Area.

Carshare

Shared vehicle programs are gaining wider and wider application across the country. Shared vehicles can be provided through a separate (typically private) car-sharing company or by the employer or property owner who owns, maintains, and manages the vehicle.

With three car sharing companies in Miami, the hard work of convincing companies to launch a program in a

new city has been done on the eastern side of the Study Area. Car2Go is the most flexible of the three existing operators since cars do not have to be returned to a particular parking spot, though they do have to be within the limits set by Car2Go. Having an eastern transit hub at SW 157th Ave. and U.S. 41, approximately two miles east of the Krome Ave. eastern terminus of the ROGG Study Area, within the reach of Car2Go members and marketing Car2Go as an easy way to get to the 'ROGG Ride' or other transit service would be a first step in using car share to offset any potential increase of private motorized vehicle trips along U.S. 41.

Potential Costs and Trip Reduction

Expanding car share costs staff time to meet with private car share companies, but typically does not require additional funding from jurisdictions. Each car share car has been shown to replace 15 cars in an area, resulting in a net reduction of 14 cars. In the ROGG corridor, this results in only a small reduction of the auto mode share of approximately 0.3%.*

Note: *Transportation Research Board (2005), Car-Sharing: Where and How it Succeeds, Transit Cooperative Research Program Report 108. http://onlinepubs.trb.org/Onlinepubs/tcrp/tcrp_rpt_108.pdf

Marketing and Information

Marketing alternative transportation should be part of the initial marketing campaign of the path. Campaigns should ensure that accessing the ROGG via alternative modes is emphasized, as well. Clear, easy-to-read literature and a navigable website(s) is essential to capturing riders who are not accustomed to using transit and may not be comfortable reading a map and schedule.

Marketing transit services and cycling opportunities, however, requires more than just graphics and literature. Typically efforts involve a coordinated marketing campaign across government agencies (departments of parks, transit, transportation and tourism) as well as the tourism sector, including cruise companies and tourism companies who provide ancillary tours and services. A unified marketing campaign with tour packages that include alternative transportation vouchers or service creates a one-stop-shopping experience for visitors looking to minimize the logistics of finding destinations and transportation to get there.

Grand Canyon Village Shuttle Bus Routes, Points of Interest, and Parking



Free Shuttle Buses
Free shuttle buses operate on three routes at Grand Canyon National Park: Hermit Trail, Village Route (Hermit, Kaibab, and Bright Angel), and Kaibab Trail. No tickets are required, and bus stops are clearly marked throughout the park by signs with the above symbols.

Hermits Rest Route
Buses provide transportation between the Village Route Transfer and Hermit Trail. Buses stop only at the Hermit Trail and Bright Angel Lodge. 75 Minutes Round Trip (without getting off bus)
May—Buses run:
• Every 30 minutes from 6:30 a.m. to 10:30 a.m.
• Every 15 minutes from 10:30 a.m. to sunset.
June, July, and August—Buses run:
• Every 30 minutes from 6:30 a.m. to sunset.
• Every 15 minutes from sunset to one hour after sunset.
September—Buses run:
• Every 30 minutes from 6:30 a.m. to sunset.
• Every 15 minutes from sunset to one hour after sunset.
Special Handicapped Vehicle Pick-up/Drop-off: Call the Backcountry Information Center for details.

Village Route
Buses provide transportation between Canyon View Information Plaza, Yavapai Observation Station, Kaibab Lodge, Bright Angel Lodge, and Hermit Trail. Buses stop only at the Village Route Transfer, Bright Angel Lodge, and Hermit Trail. 60 Minutes Round Trip (without getting off bus)
May—Buses run:
• Every 30 minutes from 6:30 a.m. to 10:30 a.m.
• Every 15 minutes from 10:30 a.m. to sunset.
June, July, and August—Buses run:
• Every 30 minutes from 6:30 a.m. to sunset.
• Every 15 minutes from sunset to one hour after sunset.
September—Buses run:
• Every 30 minutes from 6:30 a.m. to sunset.
• Every 15 minutes from sunset to one hour after sunset.

Kaibab Trail Route
Buses provide transportation between Canyon View Information Plaza, Yavapai Observation Station, Kaibab Lodge, Bright Angel Lodge, and Hermit Trail. Buses stop only at the Village Route Transfer, Bright Angel Lodge, and Hermit Trail. 30 Minutes Round Trip (without getting off bus)
May—Buses run:
• Every 30 minutes from 6:30 a.m. to 10:30 a.m.
• Every 15 minutes from 10:30 a.m. to sunset.
June, July, and August—Buses run:
• Every 30 minutes from 6:30 a.m. to sunset.
• Every 15 minutes from sunset to one hour after sunset.
September—Buses run:
• Every 30 minutes from 6:30 a.m. to sunset.
• Every 15 minutes from sunset to one hour after sunset.

Rules of the Road
Motorist Warning
Pedestrians have the right of way. Vehicles may stop for pedestrians in crosswalks. It is the Law.
Pedestrian Warning
Avoid walking on narrow park roads. Use trails that parallel most park roads. Always face traffic.
Bicyclist Warning
Bicycles are prohibited on all paved and unpaved park roads and the cave. Canyon Trail. They are prohibited on all other trails, including the Rim Trail. Bicycles must obey all traffic regulations. Always ride single file with the flow of traffic. Seat and fenders, wear bright colors and a helmet.
On the narrow Hermit Road bicyclists should pull to the right shoulder of the road and dismount when large vehicles are attempting to pass. Never hang on a shuttle bus while riding. Easily accessible shuttle bus stops are located in or near all parking areas.

Parking
P Parking is available in lots throughout Grand Canyon Village. Please avoid parking along the roadside except where signs or lines on the road indicate that it is permitted. Locations of the lots is indicated on the map above.
Lot A: Near Park Headquarters (administrative offices) and Mather of Arts. Large lot for the property bus available.
Lot B: Near the bus transfer in Market Plaza. This is the largest lot, but tends to fill early.
Lot C: This lot is near the intersection of Center and Village Loop Road. May have spaces when other lots are full.
Lot D: Unpaved lot along the railroad tracks in the middle of the Grand Canyon Village historic district.
Lot E: Near the Backcountry Information Center. The eastern portion of this lot has large, pull-through spaces for RVs and vehicles with trailers.

Accessibility
An accessible permit, allowing access to some areas closed to public traffic, is available at entrance gates, the Visitor Center at Canyon View Information Plaza, Yavapai Observation Station, Kaibab Lodge, Bright Angel Lodge, and Hermit Trail. Accessible shuttle buses are available in response to requests made the day prior. Call (928) 638-0591.
Visitors with accessibility considerations and their party members may use the shuttle that operates approximately every 15 minutes between Mather Point and Canyon View Information Plaza from 7:30 a.m. to 6:30 p.m. Shuttle service may be suspended during inclement weather.

Legend
Shuttle Bus Routes (Indicated in red, blue, or green)
Shuttle Bus Stops (Indicated in red, blue, or green)
Major Park Roads (All vehicles)
Secondary Roads (All vehicles)
Shuttle Buses Only (All vehicles)
P Parking
Picnic Tables
Paved Trails
Unpaved Trails
Direction of Shuttle Travel
Scale varies on this oblique view.

Grand Canyon Shuttle Map (Source: Mappery)

- 2. Gateway** – A gateway would also serve as a visual and experiential signal of a transition from one landscape (urban) to another (natural). A gateway can greatly add to the identity of a place and to the visitor experience.
- 3. Visitor Center/ Hub** – A visitor center or hub would serve information, education, and tourism functions, providing central marketing for all of the activities and destinations available in the area. The hub would also provide opportunities for retail tailored to cyclists, hikers, birders, and a range of other recreation needs.

Potential Costs and Trip Reduction

Cost for site acquisition and construction of multimodal hubs range widely depending on the local real estate market, current material pricing, and a host of other factors. Some cities have constructed minimal facilities for less than \$5 million and more elaborate facilities can run into the tens of millions. A broad budgeting estimate for a multimodal hub is \$10 million to \$40 million. No research has been conducted that could help estimate the impact of a multimodal gateway on vehicle trips. This element was not included in the TRIA model, but is a key part of successful implementation of bike and transit facilities as well as parking management.

Summary Investment/ Policy Options

Development of the ROGG has the potential for gains in traffic due to popularity and success. There are, however, several strategies that can be implemented to counteract these potential gains and actually help reduce existing impacts. Many of the strategies go beyond just helping to reduce traffic on U.S. 41, many could provide ancillary environmental and economic benefits for the entire south Florida regions. These strategies include:

- Transit along U.S. 41,
- Parking Management,
- Bicycle Programs and Amenities,
- Bikeshare,
- Carshare,
- Marketing and Information,
- Multimodal Hubs and Gateways.

Potential Costs and Trip Reduction

Marketing campaigns can be small, only \$10,000 or \$20,000 for brochure printing, website development, or new materials development. A sophisticated and high-penetration campaign is likely to cost much more. Some regions have spent between \$50,000 and \$100,000 on alternative transportation campaigns for downtowns or even smaller, more targeted areas such as the ROGG Study Area.

A challenge facing existing research is pinpointing and isolating the beneficial effects of transit marketing campaigns. The range cited by recent research is between 3% and 11% transit ridership increase in the long-term, and up to 33% in the short-term. Marketing can reduce auto mode share by 1% in the short-term and 0.2% in the long-term.

Multimodal Hubs and Gateways

Visitors travel from the urban areas in Miami-Dade and Collier Counties into Big Cypress National Preserve and the Everglades National Park along only a few corridors. With a high concentration of hotels, the airport, and other

tourist destinations, the higher density at the Miami-Dade termini creates the potential for a unique gateway feature and multimodal facility to accommodate a range of potential park visitors and house many of the programs and policies discussed in these scenarios that would support the ROGG. The ideal location for this facility is near the intersection of SW 157th Ave. and U.S. 41.

On the Naples side, there is a lower concentration of tourism destinations as large as in Miami-Dade County and a lower density overall. One site for a multimodal hub is not as clear as on the eastern side, but locating a parcel to house a park and ride and serve as a hub for cyclists, transit riders, and other path users should be a next step. Establishing a point of access for visitors as they enter the parks and preserves would serve a number of functions:

- 1. Multimodal Hub** – The hub could be a major transit transfer stop for local services and ROGG Ride, or other branded park circulator. Visitors could drive and park at the hub and utilize the transit service to access the parks directly. Parking facilities could also accommodate car share. A bike station would be a central part of the hub, with a bikeshare station and other bicycle amenities such as a repair shop.

Alternative Transportation Summary

Alternative transportation conditions near to the ROGG Study Area are comprehensive. Currently two public transit providers provide service within biking distance of either terminus of the ROGG Study Area. Aside from the use of transit, other alternative transportation options are present including bikeshare and carshare providers. Several examples exist of successful bikeshare providers operating in natural environments and may serve as a model for future programs along ROGG. Parking facilities remain constrained through the Study Area due to the limitations, primarily environmental, of creating additional impervious parking lots at destinations adjacent to wetlands.

TRIA calculations for the ROGG determined that vehicle demand for accessing the path could be offset using existing transportation programs and services, a more extensive and strategically organized set of transportation management measures could actually reduce traffic along U.S. 41 and improve the overall travel experience for ROGG users and travelers along U.S. 41. This comprehensive approach could result in an overall reduction in vehicle trips of 39.5% from net levels. When additional trips generated by users of the ROGG are factored in, the overall results equal a 14.7% reduction in vehicle trips on U.S. 41.

Several strategies can be implemented to counteract potential gains contributed to the ROGG and actually help reduce existing impacts. Most strategies will go beyond just helping to reduce traffic on U.S. 41, many could provide ancillary environmental and economic benefits for the entire south Florida region. The next section will quantify some of these benefits for a full implementation scenario with the development of ROGG and alternative transportation strategies.