Good Neighbor Trail

Final Report

Florida Shared-Use Nonmotorized (SUN) Trail Transportation Use Study

December 31, 2019

SUNTRAIL

FDOT

CONTENTS

FIGURES

TABLES

Glossary of Terms

Annual Average Daily Traffic (AADT*)*: The total volume of traffic passing a point or segment of a roadway or trail facility in both directions for one reporting year divided by the number of days in the reporting year.

Annual Average Daily Bicycle Traffic (AADBT): The total volume of bicycle traffic passing a point or segment of a roadway or trail facility in both directions for one reporting year divided by the number of days in the reporting year.

Annual Average Daily Non-Motorized Traffic (AADNT): The total volume of bicycle, pedestrian and other non-motorized traffic passing a point or segment of a roadway or trail facility in both directions for one year divided by the number of days in the reporting year.

Annual Average Daily Pedestrian Traffic (AADPT): The total volume of pedestrian traffic passing a point or segment of a roadway or trail facility in both directions for one year divided by the number of days in the reporting year.

Direct Effects: Changes in economic activity occurring as a direct consequence of decisions made by economic agents.

IMPLAN: IMPLAN® software is an economic modeling, input-output based, social account matrix software with the capability of estimating the economic impacts to a defined geography arising from expenditures in an industry or group of industries.

Indirect Effects: Changes in economic activity resulting from changes in sales from suppliers to directly affected businesses.

Induced Effects: Changes in economic activity resulting from spending by workers of directly and indirectly affected businesses.

Input-Output Model: A quantitative economic model that represents the interdependencies between different industries of an economy.

REMI: REMI® model is a dynamic forecasting tool that combines input-output econometric modeling with economic geography.

Executive Summary

The Florida Department of Transportation's (FDOT or Department) primary statutory responsibility is to coordinate the planning and development of a safe, viable, and balanced state transportation system serving all regions of the state, and to assure the compatibility of all components, including multimodal facilities. Furthering the state's commitment of improving mobility, the Florida Legislature passed measures in 2014 and 2015 to fund and develop multi-use trails. Specifically, The SUN Trail program was established in 2015, under Section 339.81, Florida Statutes (F.S.). Administered by FDOT, the SUN Trail program provides funding for closing gaps in the statewide system of paved non-motorized for bicyclists and pedestrians (SUN Trail network). This SUN Trail network is a refined version of the Florida Greenways and Trails System (FGTS) Plan's Land Trail Priority network; it includes high priority (strategic) trail corridors and connections.

FDOT identified a need to develop consistent and objective procedures to collect, evaluate, examine, analyze, report, and store information on multi-use trails including transportation trips, trail traffic, trail characteristics and percentages of trail travelers to determine how (paved) multi-use trails support place-to-place/destination-to-destination travel and how travelers utilize and access the SUN Trail network. This study explores five trails in Central Florida with urban and rural conditions. Specifically, the study analyzes trail usage and data collected from the Cady Way Trail, the Orlando Urban Trail (not on SUN Trail network), the West Orange Trail, the Good Neighbor Trail, and the Pinellas Trail. Several additional trails were identified as contributing to this study, these include: the Starkey Trail, the Lake Minneola Scenic Trail, the East Central Regional Rail Trail and the South Lake Trail. The methodology involves tabular and geospatial analyses to generate trail related measures listed in Table ES1.

Table ES1 | Trail Related Measures

Trail Related Measures	
Total number of visits	Gender ratio of trail users
Primary travel modes to trail	Age share of trail users
Primary travel modes on trail	Average amount spent on a typical trail visit on soft goods
Different activities on the trail	Average amount spent on a typical visit on hard goods
Frequency of trail usage	Average amount spent on accommodation if includes overnight stay
Popular days of trail usage	Health Benefit
Popular time of days for trail usage	Recreation Benefit
Duration of trail visit	Reduced Auto Use Benefit
Distance traveled in a trail visit	User Expenditures

The important findings of the data analyses are as follows:

- The primary mode on all five trails is bicycling, and the primary reason people use the trails is for exercise, health or recreational activities.
- The primary mode for people accessing the trails is by bicycle. This indicates that access to the trail support non-motorized transportation, which plays a pivotal role in attracting visitors. The only exception is Good Neighbor Trail, where people drive to use this facility, which may be because it is in a non-urban environment.
- The average frequency of usage of trail is close to three times per week. This indicates most trails in this study area have a high share of regular trail users.
- Most of the trail users prefer to use the trail before 10 a.m.
- The length and connectivity to other trails impacts the average duration and average trip length of the users. The trip duration ranges from 1.25-2.25 hours with an average trip length ranging from five-12 miles.
- A relatively higher share of males and aging population (50 and above) use all five trails.
- The West Orange Trail, and the Pinellas Trail have highest trail usage with approximately 300,000 trail visits per year. These trails have both urban characteristics and provide extensive connectivity to other trails outside of the study area. The Cady Way Trail and the Orlando Urban Trail see 77,560, and 30,660 annual visits, respectively. The Good Neighbor Trail, which of late experiences the least 22,510 visits annually, includes the newest segment in the study area, and is in a more rural setting.
- The trail users surveyed indicate that visitation is primarily during weekends.
- Usage varies per locations on studied trails. The Good Neighbor Trail experiences higher usage along the segment through the Withlacoochee State Forest, which directly connects to the 46-mile Withlacoochee State Trail. Similarly, the West Orange Trail experiences higher usage at trailheads and through downtown Winter Garden. The Pinellas Trail receives the highest trail counts near the City of Dunedin, which was designated as Florida's first official Trail Town (2018) under a program administered by the Office of Greenways and Trails (OGT), part of the Florida Department of Environmental Protection (FDEP). A Trail Town is a vibrant destination where people come together. It is a place where trail users can venture off a hiking, biking, equestrian or paddling trail to enjoy the amenities and unique heritage of the community, benefiting the town economically and socially.

Chapter 1. Introduction

The purpose of this study is to use industry best practices to develop a methodology framework to collect, evaluate, examine, analyze, report, and store information on multi-use trail transportation trips, trail traffic, trail characteristics and percentages of trail travelers to determine how (paved) multi-use trails support place-to-place/destination-to-destination travel and how travelers utilize and access the SUN Trail network. This study explored a pilot area in Central Florida that included trails in both urban and rural settings - included in the study area are the Cady Way Trail, the Orlando Urban Trail, the West Orange Trail, the Good Neighbor Trail, and the Pinellas Trail. The study considered alternate trails, which are Starkey Trail, Lake Minneola Scenic Trail, East Central Regional Rail Trail, and South Lake Trail.

The study defines concepts and datasets associated with trail transportation usage, establishes a scalable and repeatable methodology framework, and develops implementation guidelines to objectively quantify performance measures that can be used to evaluate trail-related performance measures.

This report includes subsequent sections:

- **Case Study Description:** Provides a summary of the five primary and the alternate trails. This is covered in Chapter 2.
- **Literature Review:** Provides a comprehensive review of existing studies on the trail use data programs, benefits and economic analysis; and reporting and visualization. This is covered in Chapter 3.
- **Data Gathering:** Provides a summary of data collected from stakeholder surveys/ interviews, and site-specific data collected from the trails. This is covered in Chapter 4.
- **Guidelines:** Provides the framework for trail data collection, analysis, and reporting. This is covered in Chapter 5.
- **Data Analysis:** Provides an explanation of the data inputs and outputs. This is covered in Chapter 6.

Finally, the document provides a summary of findings, and outlines recommendations in Chapter 7.

Chapter 2. Case Study Description

This chapter details five primary trails in Central Florida analyzed in this case study: the Cady Way Trail, the Orlando Urban Trail, the West Orange Trail, the Good Neighbor Trail, and the Pinellas Trail. Figure 1 illustrates the locations of these five trails as well as the alternate trails, which are the Starkey Trail, the Lake Minneola Scenic Trail, the East Central Regional Rail Trail, and the South Lake Trail.

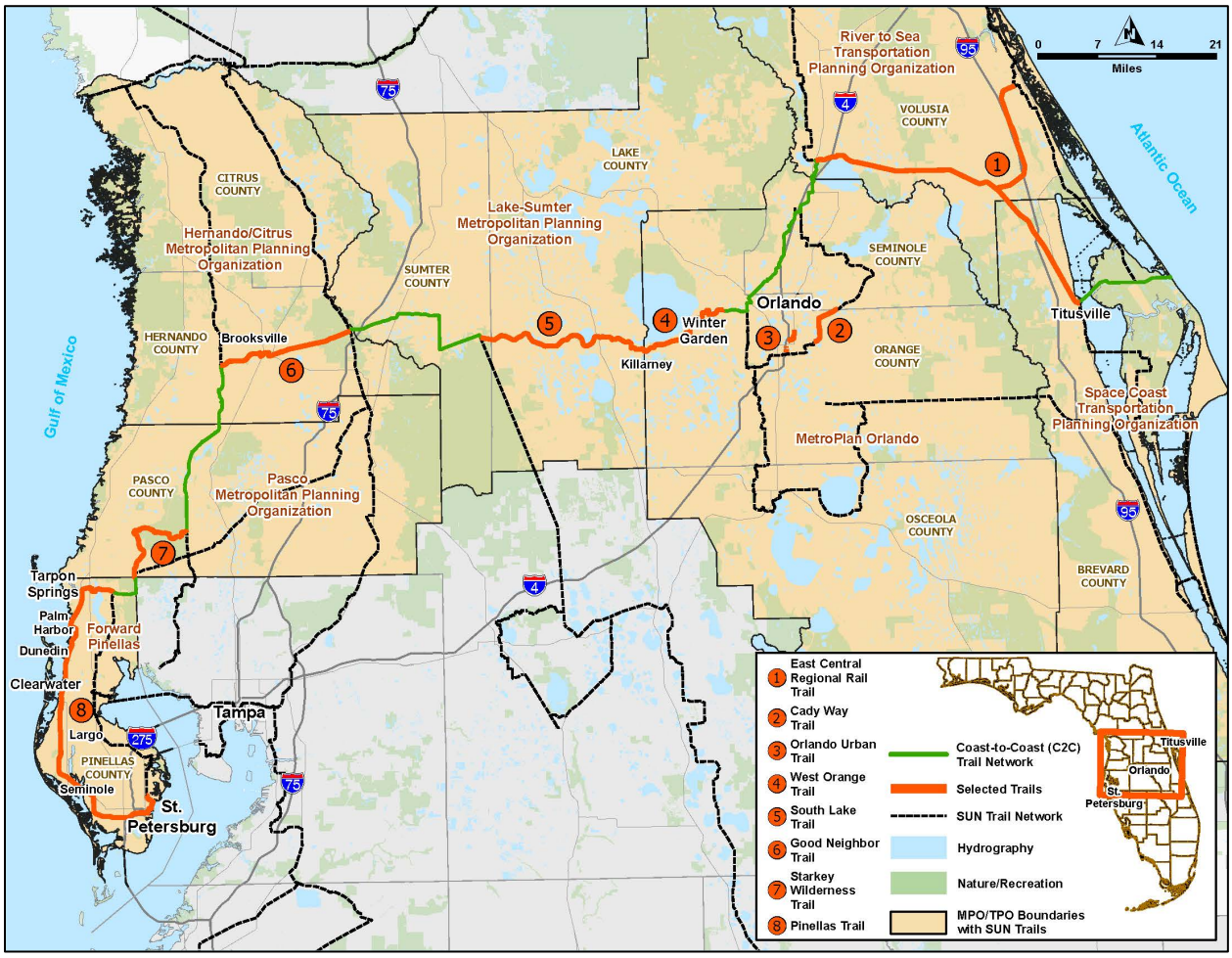


Figure 1 | Study Trail Locations

2.1. Cady Way Trail

The Cady Way Trail (Figure 2) is located northeast of downtown Orlando, and extends seven-and-a-half miles to connect the communities of Orlando from the Fashion Square Mall, north to Ward Memorial Park/Cady Way Park in Winter Park, and beyond to Hall Road at Aloma Avenue in Goldenrod, at the Orange/Seminole County line, and to the Cross Seminole Trail in Seminole County. Built along the former East Florida and Atlantic Railroads it is co-owned, managed and operated by the Orlando Department of Families, Parks and Recreation, and Orange County Parks and Recreation. Open to pedestrians, cyclists, and skaters during daylight hours since

1994, the trail connects residential areas, including the Baldwin Park neighborhood, to two schools, numerous restaurants and retail, commercial, and employment centers such as the Baldwin Park Town Center, and the Executive Center Drive. The trail wraps around Lake Gear, Lake Susannah, and Lake Baldwin, goes past the Winter Pines Golf Course, and the Cady Way Pool, alternating between ten- to 16-feet wide "single-width" pathway with painted centerline, and two paths separated by a median – with ten feet wide on one side and six feet wide on the other. The narrow "stations" or location reference numbers are marked in white on the trail, and are posted every 0.5 miles. There is a trail bridge over State Road (SR) 436.

Figure 2 | Cady Way Trail Map

2.2. Orlando Urban Trail

The Orlando Urban Trail is located near Downtown Orlando. Although it is considered the spine of Orlando's trail network, it is the only trail within the study area that is not part of the SUN Trail network. It was specifically identified for inclusion in this study because it provides north-south connectivity to and from an urban setting to the SUN Trail network, and it traverses areas where people utilize dockless bicycle sharing stations and other multi-modal facilities. The trail is approximately three miles long, and 12 feet wide, with 85% of the trail being an off-street path, with asphalt and concrete sections. The trail runs from Lake Highland through Loch Haven Park, to Mead Garden in Winter Park. Major trail highlights include connections to six lakes, Orlando Cultural Park, and the Gaston Edwards Trail. The city is in the process of extending the trail, south by third of a mile to the Central Business District to connect to the recently constructed Colonial (State Road 50) Overpass. Figure 3 shows the location and extent of this trail.

Figure 3 | Orlando Urban Trail Map

2.3. West Orange Trail

Connecting communities just northwest of downtown Orlando, the 20.8-mile long West Orange Trail (WOT) is owned and operated by Orange County. This paved trail extends from the Orange/Lake county line and passes through the towns of Killarney and Oakland, the city of Winter Garden, and through downtown Apopka with most of its length built along a historic railroad grade with a 14-foot-wide paved asphalt surface, open during daylight hours, for bicyclists, skaters and skateboarding, horseback riders, walkers and runners. This trail connects neighborhoods, schools, cafes and restaurants, and outfitters that provide bicycle rentals including one at the Killarney Station trailhead. Attractions along the WOT include the Winter Garden Heritage Museum, and butterfly garden at Lake Apopka. Portions of the WOT are located within the developing SUN Trail network, and are part of the developing regional Coast to Coast Trail (C2C). When complete, the C2C will connect nine counties from the Gulf of Mexico to the Atlantic Ocean, through communities in Central Florida from St. Petersburg to Titusville. The western end of the West Orange Trail connects to Lake County's existing C2C segment known as the South Lake-Lake Minneola Scenic Trail, the eastern end will provide a connection to the future C2C segment to Clarcona and Ocoee. Figure 4 illustrates the location and extent of the West Orange Trail.

Figure 4 | West Orange Trail Map

2.4. Good Neighbor Trail

Today the Good Neighbor Trail extends ten miles from historic Brooksville, a Florida Mainstreet Community, to the 46-mile long Withlacoochee State Trail (WST). Brooksville is the county seat of Hernando County. According to the 2010 United States Census, Brooksville's population totaled 7,719 – making it a more rural condition than other trails in the study area. The Russell Street Park (trailhead) includes the historic 1885 Train Depot and Countryman One-Room Schoolhouse Museums, a gazebo, picnic area, and restrooms. The six miles connecting east to the WST opened in November 2018, making this segment the newest trail section in the study area. The Good Neighbor Trail is within the developing C2C and the SUN Trail network. In the future, the western terminus will extend approximately seven miles, connecting to the Suncoast Trail and beyond. Figure 5 shows the location and extent of Good Neighbor Trail.

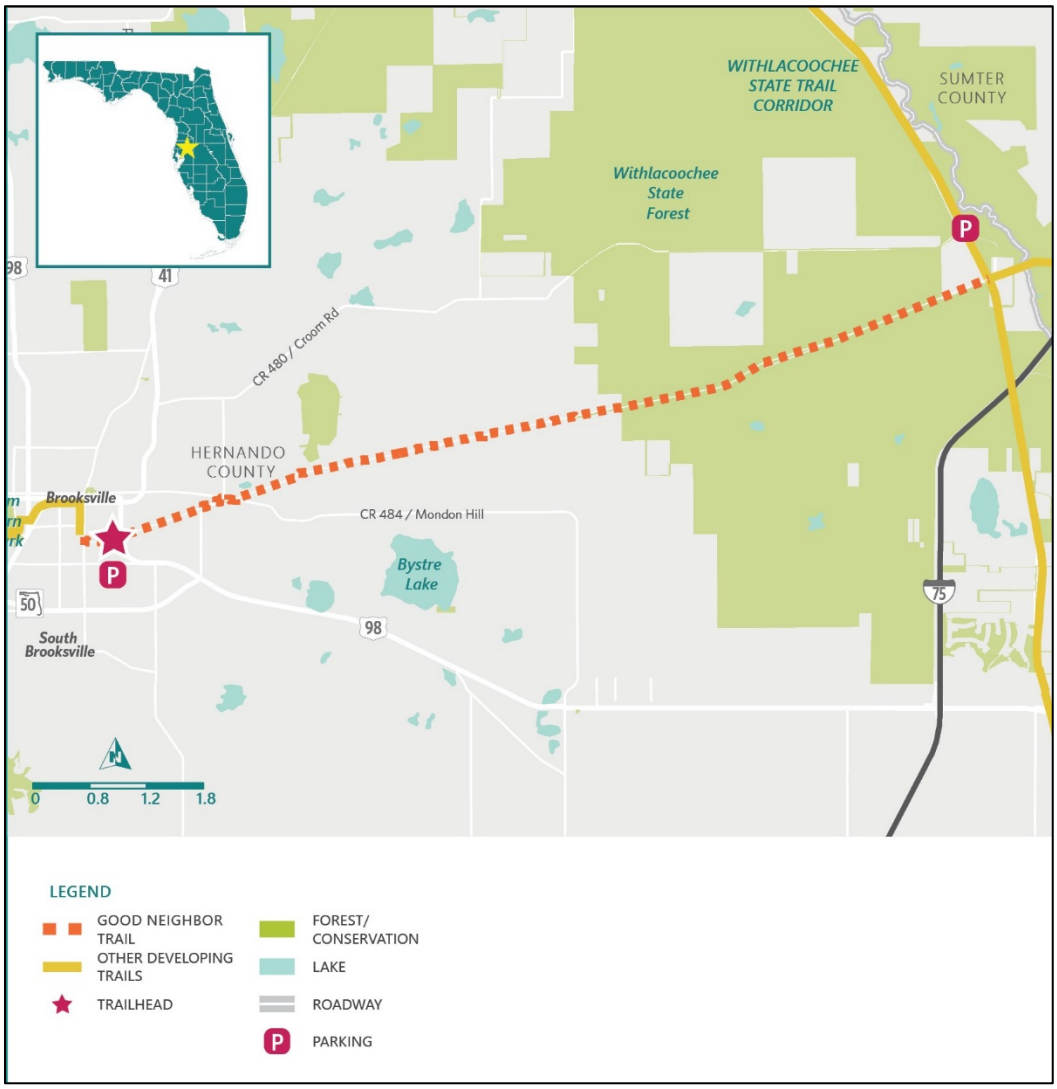


Figure 5 | Good Neighbor Trail Map

2.5. Pinellas Trail

The first five miles of the Pinellas Trail opened in 1990, with construction funded by Penny for Pinellas – a local sales tax for capital improvements on land purchased by the Florida Department of Transportation in 1983, making it one of Florida's oldest. In 2000, it was designated as a Millennium Trail by the White House. Today the trail, created along a portion of a railroad corridor, stretches nearly 54 miles from Tarpon Springs in the north to St. Petersburg in the south, passing through the towns of Tarpon Springs, Palm Harbor, Dunedin, Clearwater, Largo, Seminole, South Pasadena, Gulfport, and St. Petersburg. Anchoring the western side of the C2C, pedestrians, skaters and bicyclists use the Pinellas trail during daylight hours, with some trail patrons using it for their work commute instead of driving automobiles. Pinellas County Parks and Conservation Resources is responsible for the trail maintenance and operating costs. They receive assistance from the Friends of the Pinellas Trail, Inc. a non-profit

501.3c, and by Keep Pinellas Beautiful who provide the Pinellas Trail Adopt-A-Mile program, which is a cooperative partnership between the public/private sector and Pinellas County. Pinellas is one of Florida's most densely populated counties. Partners continue to close gaps in the Pinellas Trail, and eventually it will loop the entire County, and form a key component of the SUN Trail network. The trail while in and around large population centers traverses through parks, natural areas, and coastal communities. Other trail highlights include nine locations of unique art sculptures, and the Cross-Bayou Bridge over Boca Ciega Bay, and restaurants and businesses. Figure 6 shows the location and extent of Pinellas Trail.

Figure 6 | Pinellas Trail Map

Appendix J provides more information on the five primary trails in a concise infographic format.

Chapter 3. Literature Review

This chapter is intended to provide an overview of existing trail transportation studies reviewed for this report with the goal of identifying industry best practices related to trail traffic data collection, data maintenance and management, trail performance measures, trail trend analysis, factors impacting trail usage and reporting.

3.1. Approach

A review of related studies (more than 80) was conducted as part of this research. The information from the studies is summarized in the following sections of this chapter, and in Appendix A, a hyperlink for accessing the documents is also provided.

- Trail Use Data Programs;
- Benefits and Economic Analysis of Trails; and
- Reporting and Visualization.

The literature cited in this chapter is listed in the References Section at the end of the report.

3.2. Trail Use Data Programs

As part of the literature review, existing trail use data programs throughout the United States were reviewed. Collecting trail user counts and conducting trail user surveys are the primary activities of the trail use data programs. Most of the trail agencies recognize the need to collect trail use data in order to facilitate planning, budget development, grant applications, and marketing. Some of the state agencies have an annual trail use data collection program to conduct trail use counts and trail user surveys. Other trail agencies perform trail user counts and trail user surveys for a specific reason such as planning of a trail improvement project or estimation of the regional economic impacts of the trails. Although several trail data programs exist around the country, agencies are often faced with funding constraints for such activities.

Several agencies around the country have established trail use data programs in the last decade. The Parks and Trails Council of Minnesota started their annual trail user counting program in 2015.[1] The City of San Jose started their annual trail user count and survey program in 2007.[2] Miami Valley Regional Planning Commission (MVRPC), Ohio, started their continuous trail user count data collection program in 2009, and conducts trail user surveys every four years.[3] The City of Orlando began annual trail user counts data collection in 2015, which include both the Cady Way Trail and Orlando Urban Trail.[4] Forward Pinellas began collecting Pinellas Trail automated counter data in late 2016, and the 2017 report is the first full year of data. Forward Pinellas conducted Pinellas Trail user surveys in 1999, 2014 and 2019. The East Central Florida Regional Planning Council conducted a trail user survey in 2010 to specifically determine the economic impacts of Little Econ Greenway, West Orange and Cady Way trails on Orange County's local economy.[5] Florida trails are ideal locations to implement trail use data programs because of the suitable weather conditions for trail use throughout the year.

3.2.1. Non-Motorized Transportation Data Collection Methodology

The FDOT Office of Transportation Data and Analytics (TDA) began the development of a Non-Motorized Traffic Counting Program in May 2018 with a need to provide bicycle and pedestrian (Non-Motorized) volume and supporting statistics and information to new and existing data customers. The intent of developing the non-motorized data program is similar to motorized traffic volume data in that non-motorized data can be used for all the same types of analyses such as safety studies, planning and programming FDOT facilities, pavement and trail maintenance. The purpose of this program is to collect statistically valid bicycle and pedestrian (non-motorized) traffic volume data so that traffic volume statistics can be calculated and published annually. The Statewide Data Repository will serve as the data warehouse for all non-motorized data, both FDOT obtained and non-FDOT obtained. Any statewide agency currently involved in collecting non-motorized data is welcome to voluntarily submit their data to be included in the statewide data repository. In order for data to be submitted to FHWA, it must be formatted to the specific standards found in the FHWA Traffic Monitoring Guide.

Most of the existing trail use data programs utilize non-motorized transportation count data collection methodologies and standards. Non-motorized transportation data can be collected either by using manual methods or by utilizing automated counters. The purpose, level of effort, cost, schedule, accuracy of data and other considerations influence the selection of the appropriate methodology for a given project. Trail use data programs can include both manual and automatic trail user counting methods. Manual data collection methods are primarily used to collect non-motorized transportation data such as bicycles and pedestrians on roadways, intersections, and trail facilities. Manual counting methods can be used for collecting short-term trail user counts, and automatic counters can be used for both short-term and continuous count data collection.

The most widely accepted methodology for conducting manual bicycle and pedestrian counts was developed by the National Bicycle and Pedestrian Documentation (NBPD) project sponsored by the Institute of Transportation Engineers (ITE) Pedestrian and Bicycle Council in 2010.[6] NBPD recommends that agencies conduct manual counts in conjunction with automated counts to obtain information for estimating annual usage, benefits and economic impacts.

Manual counts provide valuable data demonstrating trail use and user characteristics. In the Bay Area Trails Collaborative (BATC) annual trail data program, manual counts were collected for a limited time period to capture more fine-grained data in addition to the automatic counts.[7]

Selection of representative and accessible manual counting locations, and recruitment and training of the volunteers to conduct manual field counts are critical in manual count programs.[7] In the 2015 Minnesota state trail user count program, count locations were selected near a city, trailhead, park, or major trail junction.[1] Volunteer recruitment to conduct field counts and volunteer training to ensure consistent data collection were conducted in preparation for manual count data collection. In the 2016 Capitol District Trail User Counts conducted by Parks and Trails New York (PTNY), manual observational counts were collected at all the automatic count locations.[8] Observational manual counts were used to supplement the automatic counts

because the automatic counters were unable to distinguish between mode (bicyclists, pedestrians, etc.) and trail user demographics. The observational counts were used as a way to verify the accuracy of the automatic counters. The 2017 Annual Count and Survey of San Jose trails also included manual trail user counts.[2]

Automatic counters play an important role in an extensive trail count program to capture the seasonal and special variability of the trail use. The Transportation Research Circular (Number E-C183) titled "*Monitoring Bicyclist and Pedestrian Travel and Behavior, Current Research and Practice*" published by Transportation Research Board (TRB) in March 2014 recommends that automatic continuous counts be collected at a few locations to capture the temporal variability and shorter period counts at many locations to capture the spatial variability.[9] Relevant traffic patterns across time correlate significantly within reasonable distance and hourly, daily, and monthly expansion factors can be created using the continuous counts.

The National Cooperative Highway Research Program (NCHRP) report 797, *Guidebook on Pedestrian and Bicycle Volume Data Collection* describes the methods and technologies for counting pedestrians and bicyclist, provides guidance on developing a non-motorized count program, suggests considerations for selecting appropriate counting methods and technologies, and provides examples of how organizations have used non-motorized count data to better fulfill their missions.[10]

The Federal Highway Administration (FHWA), *Traffic Monitoring Guide* provides the basic guidance intended to improve the state-of-the-practice in non-motorized traffic volume monitoring.[11] The FDOT sponsored *Non-Motorized Transportation Count Data Collection Study* recommends that Florida's future Statewide Non-Motorized Count Program should be comprised of a collection of continuous and short duration monitoring locations around the state. Non-motorized monitoring equipment at continuous monitoring locations would collect data in select areas to develop correction/adjustment factors and trends to extrapolate data from shorter duration sites.[12] The *FDOT 2018 Traffic Monitoring Handbook* includes a non-motorized traffic monitoring chapter to collect and maintain a statistically valid bicycle and pedestrian traffic volume data program so that statistics can be calculated and published annually to serve all FDOT data customers and partner agencies.[13] The FDOT Transportation Data and Analytics (TDA) began the development of a Non-Motorized Traffic Counting Program in May 2018.

Consequently, the *FDOT Statewide Non-Motorized Traffic Monitoring Program: Recommendations Report*, was developed including site section methodology and criteria for continuous and short-term traffic count data collection, and recommendation for sites that should be considered for continuous counting installations throughout the state of Florida. The recommended continuous count sites are distributed to represent the factor groups such as urban commute, urban mixed, urban recreational, rural recreational, university commute etc. Florida will use factor groups to calculate factors from continuous counts that can be applied to short-term counts for calculating annual traffic statistics. The report also recommends collecting two-hour manual counts as a validation count for where automated continuous and short-term counting equipment is installed.[33]

3.2.2. Non-Motorized Transportation Data Collection Technology

Various automatic counters are used in counting non-motorized traffic volumes such as pedestrians and bicyclists. There are different technologies used in the automatic counters. The accuracy and cost of the automatic counters varies and careful consideration should be given in identifying the counting technology at each count location. A matrix related to selecting the non-motorized counting technology is shown in Figure 7 below.[13]

1. What are you Counting?		Bicyclists Only	Pedestrians Only	Pedestrians & Bicyclists Combines	Pedestrians & Bicyclists Separately	Cost
2. What is the count duration?	Technology					
Continuous Count	Piezo/Inductance Loops	✓			✓	$$
How long determines complexity of installation	Magnetometer	●				$ - $$
	Pressure Sensor	●	●	●	●	$$
	Radar Sensor	●	●	●		$ - $$
	Seismic Sensor	●	●	●		$$
	Automated Camera	●	●	●	●	$$
	Infrared Sensor	●	✓	✓	✓	$ - $$
	Pneumatic Tubes	✓			✓	$ - $$
Short-term Count	Manual Counts	✓	✓	✓	✓	$$ - $$$

● Indicates that counting with this technology is possible

✓ Indicates a common or preferred practice

✓ Indicates a common practice, but technology must be combined with other technology to differentiate between the two modes

Source: FDOT Statewide Non-Motorized Traffic Monitoring Program Brochure

Figure 7 | Non-Motorized Data Collection Technology Matrix

Passive infrared counters are widely used by trail agencies to collect pedestrian and bicycle counts. A passive infrared counter detects the infrared radiation (i.e., heat) given off by pedestrians and bicyclists, and the system counts the number of heat-emitting objects that pass through. Passive infrared sensors are susceptible to false positives when windows, mirrors, or other reflective surfaces are positioned behind the pathway being counted. Occlusion (i.e., where one-person blocks another from the sensor's view when both pass the counter's sensor at the same time) was also found to occur with higher user volumes, resulting in undercounting of trail users.

Active infrared counters emit infrared radiation that is registered by the receiver, and the pedestrian and bicycle movements are counted when the beam between the transmitter and

receiver is broken by movement. Interference such as tree branches or flying butterflies blocking the active infrared beam are some of the limitations of active infrared counters.

Pneumatic tubes, piezoelectric strips and inductive loop counters are other technologies used to count non-motorized travel. Pneumatic tubes detect the pulses of air generated when a vehicle or bicycle rides over the tube. Piezoelectric strips emit electrical signals when deformed by bicycle wheels running over them. Inductive Loop Counter consists of wire "coiled" to form a loop that usually is a square, circle or rectangle that is installed into or under the surface of the roadway. It is sometimes difficult to cover the entire trail path using the inductive loops, which results in bypass errors. Bypass errors are caused by bicyclists riding around the loops. Larger undercounting of trail users will occur as a result of bypass errors.

By selecting suitable site locations to install automatic trail user counters, some of the limitations of the automatic counter technologies, as described above, can be overcome. The testing and evaluation of automated count technologies conducted by the *NCHRP Project 07-19 (Phase 2)*, also emphasizes that careful site selection plays an important role in the ultimate accuracy of the collected count data.[14] It is also critical to calibrate the counters at specific sites to obtain the most accurate and reliable results. Short-period manual counts at certain locations can be used to calibrate the automatic counts.

In order to count pedestrians and bicyclists separately, two technologies capable of counting pedestrians and bicyclists separately have to be paired together as recommended in the *FHWA Traffic Monitoring Guide.*[11] The infrared sensor by itself is not capable of differentiating between people walking or bicycling; however, when combined with the inductance loop detector, the bicyclist counts are automatically subtracted from the infrared sensor counts. The FDOT pilot study also recommended utilizing a combination of passive infrared and pneumatic tube equipment for non-motorized facility types.[12] These technologies have performed better in terms of accuracy when installed on trails and shared-use paths. Automated video monitoring is another method discussed in the FDOT pilot study. Automated video monitoring involves computer monitoring algorithms that identify pedestrians and bicyclists from digital video data. In addition, the *FDOT Non-Motorized Transportation Count Data Collection Study* identifies fiber optics, Bluetooth and Wi-Fi, and crowd-sourced data such as the Strava dataset as emerging technologies that may provide additional opportunities for improving the accuracy and reliability of the counts.[12]

3.2.3. Trail Use Survey

Trail use surveys are conducted to understand the trail user characteristics, trail users' perceptions of the trails, and trail economic impacts. The *Trail User Survey Workbook* developed by Rails-to-Trails Conservancy (RTC) provides useful guidelines on trail user surveys, related to general usage, demographics, and collection of trail user-related expenditures data.[15] The purpose of the survey workbook is to help analysts implement a trail user survey and determine the economic impact that the trail has on an area. Trail usage characteristics, demographics of trail users or visitors, trail users' perceptions of the trail, and spending related to trail activities are identified as the trail user survey goals in the workbook.

The methodologies identified as part of the document are Self-Selecting – Drop Box, Self-Selecting – Mail Back, Personal Intercepts, Direct Mail and Website-based.

A self-selecting survey, meaning trail users could pick up the survey forms at the trail's primary trailheads, method was used in the 2013 Erie to Pittsburgh trail survey.[16] An online survey (Self-Selecting), involving issuance of postcards to the trails users with the information and instructions to complete the online survey, was conducted in the 2017 annual survey of San Jose trails.[2]

A manual intercept survey was conducted as part of the North Carolina Department of Transportation (NCDOT) study conducted to evaluate the economic impacts of shared use paths in North Carolina.[17] In the NCDOT manual intercept survey, key features such as trail access points, nearby parking locations, space to place a survey table and for survey respondents to stand off the trail, access to water, food, and restrooms, and shade availability were considered in identifying the surveying locations.

In the Miami Valley, Ohio trail user manual intercept survey, trail users were invited to complete a trail user survey either on their smartphones or on paper.[3] Users were expected to complete the survey on their own and volunteers were not expected to ask the questions or fill in the responses for the survey respondents. For the users that preferred to use the smartphone survey, pre-printed cards with a "QR code" were provided to direct smartphones to the survey.

A manual intercept survey was also conducted using volunteers in the 2014 Pinellas Trail Users Survey.[18] Each Pinellas Trail survey site required staging of several tables and chairs, offered adequate parking options and restroom facilities, included enough area for advance signs, maps, printed safety materials, posters or banners, and offered water and promotional items for volunteers and survey respondents. Pinellas County conducted a similar survey in 2019.

Face-to-face (personal intercept) surveys were conducted as part of the Orange County trail survey for determining the economic impact of Little Econ Greenway, West Orange and Cady Way trails. Handout cards were available at trailheads and distributed through various groups directing trail users who opted out of the face-to-face survey the ability to respond online via Survey Monkey.[5] This "self-selecting" online survey link was also distributed to public and private stakeholders including users groups, trail-related businesses and area schools to place the survey link on their websites.

Survey questions included in the *Trail User Survey Workbook*[15] and other trail surveys are listed in Appendix C. Normally, 15 to 25 questions related to user demographics, trail use frequency, trail visit days, trail visit duration, trail visit purpose, trail use activity, trail conditions and trail user spending related to the trail visit are included in the trail user survey questionnaires.

3.2.4. Trail Use Data Management

Efficient data management systems are essential to store, analyze, and share data for planning and operation of trail facilities. The Transportation and Data Analytics Office (TDA) is the FDOT central clearinghouse and primary source for highway, traffic, and multimodal freight and

passenger data. FDOT gathers data directly through automated means and indirectly through District field personnel. TDA provides tools and training to record, process, analyze, evaluate, and report data. Asset and inventory data systems enable performance measurement to determine transportation service quantity, quality, accessibility, and utilization. The majority of data resides in the Roadway Characteristics Inventory (RCI) Enterprise Application, a computerized database, that was built to fulfill federal and state data reporting requirements and performs as a one stop shop for data and information on travel ways. RCI's importance is due to its storage of field- and office-collected data that are integrated into numerous FDOT database management systems through unique identification keys. Data that are stored in RCI include over 80 transportation system features, with underlying characteristics. A majority of these features and characteristics are coded with driven and recorded milepoint data provided by the field data collectors from eight FDOT districts. This method has been the accepted practice for over 30 years. Internal and external data stakeholders rely on the clearinghouse of roadway information and it is the single source for the creation of data products that FDOT provides to them. The RCI was expanded to inventory rail, bike, pedestrian, and trail data. As the SUN Trail program is less than five years old, and represents a system of trails being developed by partners for over 35 years FDOT has not had the ability to apply the same inventory methods uses for other modes of transportation.

Today, SUN Trail data presently stored in RCI under Feature 801 includes the location and the status (e.g. pending, active, inactive or deleted).[19] Although the Orlando Urban Trail and portions of the West Orange Trails are not within the SUN Trail network, and are not appropriate for inclusion under RCI-Feature 801, other segments included in this study are within the SUN Trail network. On behalf of FDOT, the Center for Urban Transportation Research University of South Florida completed a Multimodal Data Inventory Evaluation to improve FDOTs Roadway Classification Inventory on September 20, 2019. Objectives of this research were to determine a methodology of inventory of SUN Trail assets and identify an efficient data management design for hardware/software investment. The research investigated existing FDOT roadway and SUN Trail inventory methods and transportation data inventory methods of other state, regional, and local agencies. Findings included recommendations for SUN Trail features and characteristics data to be collected to support management of the life cycle of trail assets and performance measurement. Twelve identified data inventory methods were evaluated. Recommendations for inventory process and methods by responsible FDOT office were developed. The results of this research can be used as a basis to support future implementation of a trail characteristics inventory that may support stakeholder data needs.

The SUN Trail Linear Referencing System is maintained in GIS by the FDOT Systems Implementation Office; it is available through an interactive online GIS tool, or by downloading KMZ files or GIS shapefiles. FDOT District Five maintains an interactive GIS tool called TransPed.20. This tool houses regional pedestrian and bicyclist data in a centralized location for use throughout the planning and analysis of transportation projects. The tool includes traditional transportation data such as existing infrastructure, available routes, traffic counts and forecasts, crashes, as well as information about land use and socioeconomic characteristics pertinent to

travel by alternative modes. TransPed allows users to visualize travel patterns and demand for non-motorized modes of transportation with the ability to export or print data and maps. This is a good example of efficient data management and effective data usage.

The *New Hampshire Bicycle and Pedestrian Counting Master Plan* identifies how to centralize and access pedestrian and bicycle count data.[21] The New Hampshire master plan recommends a centralized bicycle and pedestrian count database. Manual and automatic count data should be entered and uploaded to the appropriate database for future processing, distribution, and use. Centralized storage of counts will facilitate the data to be used for comparison and analysis purposes at the local, regional, and statewide levels.

Modern automatic counters enable remote data downloading. This is advantageous because it provides real-time count data and enables agency staff to easily determine if a counter is continuing to operate and collect data, thereby significantly reducing the need for staff time in the field.

3.2.5. Trail Use Data Analysis

Trail user counts, trail user surveys, estimation of trail performance measures, and economic impacts of trail use are the most data analyses conducted by the national, state, local and non-profit trail entities.

Analysis of trail user counts includes validation of data from automatic trail counters, development of seasonal, monthly, weekly, and weekend trail use factors based on the annual continuous trail user counts, expansion and development of annual trail user estimates using the short-term counts, and annual trail use trend analysis. Manual trail user counts are used to validate the counts collected using the automatic counters. Factors related to hour of day (HOD), day of week (DOW), and month of year (MOY) are developed using the continuous counts. Monthly and weekly temporal factors estimated from the continuous counts are used to estimate the annual traffic using the short-term counts. The FDOT *Statewide Non-Motorized Traffic Monitoring Program: Recommendations Report* recommends estimating expansion factors by factor groups, by collecting automatic continuous counts at sites representing all the identified factor groups based on the shared use path land use and user characteristics.

The online Trail Traffic Calculator, developed by RTC, can be used to estimate the annual pedestrian and bicycle traffic occurring along trails using short duration manual count data.[22] By uploading short-term hourly traffic counts files to the RTC tool, annual estimates may can be obtained. Hourly counts are not required to be continuous. One can upload multiple counts for the same trail location from different times, days, and months in a single file. RTC recommends using two to four weeks of trail traffic counts as input data to reduce the estimation error.

Annual trail use counts are used to develop the trend in trail usage and seasonal variations. Annual and monthly trail usage by trail segments and mode (pedestrians, and bicyclists) are also estimated by using the trail counts. The FHWA *Traffic Monitoring Guide*[11] introduced three new terms, Annual Average Daily Bicycle Traffic (AADBT), Annual Average Daily Pedestrian

Traffic (AADPT) and Annual Average Daily Non-Motorized Traffic (AADNT), which are used in non-motorized travel estimation using the field-collected trail user counts. The statewide bicycle and pedestrian program survey, conducted as part of the FDOT *Non-Motorized Transportation Count Data Collection Study*, indicates that the greatest need for trail managers is knowing the total usage counts on Florida's trails.[12] This can help demonstrate the benefits of trails, including their economic impact and other benefits.

Performance measures are critical in evaluating any transportation facility. Transportation system operation, planning, and design are implemented based on the estimation of the existing and projected facility performance measures. Trail performance measures such as trail usage, trail user satisfaction, trail level of service (LOS), and trail use economic impacts are primary trail performance measures estimated from the trail use data program.

The FHWA publication "*Guidebook for Developing Pedestrian and Bicycle Performance Measures*" provides guidance to help communities develop performance measures that can fully integrate pedestrian and bicycle planning in their overall transportation performance management and planning processes.[23] Some of the performance measures included in the FHWA guidebook are listed below:

- Pedestrian and bicycle access to community destinations and jobs;
- Average pedestrian and bicyclists travel time to travel a specified distance;
- Average trip length for pedestrians and bicyclists in a given geographical area;
- Pedestrian and bicyclist related crashes;
- The average distance between designated pedestrian and bicycle crossing locations;
- The average delay associated with biking and walking at specific locations (e.g., signalized intersection);
- A measurement of the physical condition facilities, such as pavement condition or maintenance needs, along the trail;
- Miles of pedestrian and bicycle facilities in a specific geographic area; and
- Level of service of the pedestrian and bicycle facilities.

Level of Service (LOS) is a quality measure describing the operational status of a transportation facility. The LOS scoring system ranks a given "roadway's" ability to handle current traffic volume (usage). If a roadway's current traffic volume exceeds carrying capacity, traffic flow may be impeded and unsafe, and that roadway's LOS score will be low. Conversely, if a roadway's carrying capacity is greater than the roadway's current usage (thereby allowing traffic to flow freely and safely), then the LOS score for that roadway will be high. LOS scores are typically awarded on an ordinal "letter grade" scale of A through F, with A standing for the highest/best LOS score possible. In July 2006, FHWA released a report on how to calculate LOS for "shared use paths" (multi-use trails). The centerpiece of the report was a spreadsheet calculation tool that can determine the LOS for a given trail based on basic input data from the trail manager. FHWA-created LOS estimation method is documented in the FHWA report "*Shared-Use Path Level of Service Calculator, A User's Guide.*"[24] The FHWA method used one-way volume in an

hour, mode split percentages, trail width, and presence/absence of a centerline as the input variables to estimate the LOS. The FHWA report provides instructions on how to use the LOS methodology and the spreadsheet calculation tool. According to FHWA, a trail's carrying capacity (and thus LOS) is primarily a function of trail width and user type (e.g. cyclists, inline skaters, and pedestrians). Largely influenced by trail width, trail user conflicts typically occur during passing (opposite direction meetings and same direction over-takings). Length is not a factor in determining trail carrying capacity. Using the FHWA trail LOS calculation tool, a standard 12-foot wide paved multi-use trail with an hourly one-way trail user volume of 55-164 (passing a single, precise point on the trail) will receive an LOS score of B. User volume below 55 receives an LOS score of A, while user volume above 164 receives a C or lower. Carrying capacity in the SUN Trail network is defined as "the trail user volume which will allow a trail to retain a LOS score of B or better".

Trail user safety is the other important aspect to be considered in the trail performance measures. Passing slower users in the same direction and two-way traffic flow are two primary safety issues, particularly where there is a high volume of pathway/trail users.[25] It is stated in the FHWA publication "*Evaluation of Safety, Design, and Operation of Shared-Use Paths*" that centerline striping improves the safety of the pedestrian and bicycle traffic on the trails by reinforcing the idea that to pass a slower moving user, the bicyclist may need to use the travel lane of opposing trail users, and should pass only when the opposing lane is open.[26] Another safety issue is visibility of the pathway corridor and other users during nighttime travel. Shared use pathways running parallel and immediately adjacent to a roadway also present additional safety issues at driveway and intersection crossings because motorists do not expect bicyclists to travel in the opposite direction as roadway traffic.[25]

Pedestrian and bicycle traffic forecasting gained interest in recent years since the state and local agencies have started incorporating multimodal and complete street aspects in the transportation planning processes. Planning and design of transportation facilities are performed based on the future travel projections. Similarly, the pedestrian and bicycle facilities such as shared-use paths and trails should be planned based on the future non-motorized traffic projection. However, traditional travel demand forecasting models do not adequately capture pedestrian and bicycle trips. There are emerging forecasting approaches that are developed to perform pedestrian and bicycle travel projections. The Pedestrian and Bicycle Information Center (PBIC) white paper "*Bicycle and Pedestrian Forecasting Tools: State of the Practice*" summarizes the following forecasting tools as currently being considered for non-motorized travel projections.[27]

- Factor methods;
- Aggregate demand models;
- Bicycle share forecasting; and
- Activity and tour-based models.

Factor methods use existing bicycle and pedestrian count data relativities that are based on the relationship between pedestrian and bicycle activity levels and contextual factors such as

population and traffic volumes on the adjacent streets. Aggregate demand models are regression models including variables such as population density and land uses. Bicycle share forecasting applies GIS tools to the bicycle share stations to compile demographic data to identify the relationship with the pedestrian and bicycle activities. Activity and tour-based models determine travel choice based on an individual's daily activity pattern in the form of trip "tours."

The other useful trail data analysis is the benefits and economic impact analysis of trails. Benefits and economic impact analyses of trails are vital to evaluate the merits of trail projects. Justification for trail project funding is also established based on the economic impact analysis of the trails. Trail user counts and surveys provide required data to perform the economic impact analysis. The details of the benefits and economic analysis of trails are provided in the following section of this chapter.

3.3. Benefits and Economic Analysis of Trails

Many documents reviewed as part of this effort pertained to benefits and economic impacts of trails in Florida and elsewhere in the United States. Generally, some of the reviewed studies focused only on the benefits of trails, while others emphasized only economic impacts, and a few included both benefits and impacts. A diversity of approaches was evident in the related studies by different authors and agencies, and the key themes and takeaways for Florida are summarized in the subsections below.

3.3.1. Benefits

Various benefits related to trail usage are covered in the literature. Some of the benefit categories pertain to diversion from other modes, particularly roadways. Those transportation benefits capture travel time and other savings that accrue to trail users, such as commuters, that switch from auto to trail bicycling or walking, where applicable.[28] This benefit type can be calculated and presented as time (e.g., in annual hour terms) saved on travel to work by using a trail relative to commuting by car, oftentimes under congested conditions. Using appropriate values of time, these hours saved can be monetized into travel time saved by switching to trail commuting expressed in dollar terms.[17,28,29] For example, the total annual vehicle miles traveled reduced by diversion from auto to three trails in North Carolina was recently estimated to be over 21 million, with the value of travel congestion cost savings estimated to be $2.5 million.[17]

Treating trail usage as a form of exercise can also lead to health benefits that accrue to bicyclists, pedestrians, and skaters on the trails. The number of users and their time spent on exercise while on trails can be converted into monetary equivalents, typically by applying hourly dollar values to the trail activities to derive annual health benefits.[17,28,29] As an example, in the North Carolina study of three trails, an estimated number of annual hours of physical activity from walking and bicycling was close to 5.4 million.[17]

Another benefit of trail usage is recreation. This benefit can also be monetized by applying a dollar value to the time spent on recreational (e.g., excluding any commuting-related) activities on a trail. For instance, the hourly value of recreational time spent bicycling on trails was estimated to be around $10.[29]

Trails can also be beneficial from an ecological standpoint. This stems from the trees that grow, and improve air quality, etc., as part of the trails. Such benefits could be monetized by gathering data on tree coverage by species and size/diameter and application of certain dollar values to derive the related annual benefits in dollar terms. As an example, a recent study of a hike and bicycle trail in Central Austin, Texas estimated that there were over 7,600 trees with an average diameter of 11 inches surrounding the trail, and their ecological benefits value totaled close to $0.5 million.[28] This is an example of how the ecological benefits can be quantified.

There are also some other benefits of trails, such as changes in property values, business development, and quality of life, that are mentioned in the literature.[17,28,30] However, these can be "difficult to quantify as they are difficult to disentangle from overall regional characteristics and economic trends."[30]

The benefits derived from trails will depend on the magnitude of trail usage or visitation. The usage will, in turn, vary depending on various attributes, such as location, accessibility, perceived safety, cleanliness, upkeep, facilities offered, and other absolute and relative appeal of trails.

Based on the Economic Impact Assessment (EIA) by the FDEP, a total of 28,178,773 Florida residents and visitors used the state parks and trails system based on Fiscal Year 2017-2018 data. The estimated economic impact of Florida State Parks was over $2.3 Billion, generating jobs and stimulates local economies.[34]

3.3.2. Economic Impact

Economic impacts of trails pertain to expenditures by either trail users, or trail agencies, or both.

Expenditures by Users

The most common type of economic impact covered in the trail-related literature is that concerning the expenditures by trail users. These combine user counts and visits from trail count and survey data collection efforts with estimates of average spending per person by user type to derive the direct expenditure amounts.[5,15,17,22,30,31,32]

The RTC (2005)[15] provides guidance on how such direct spending can be derived. In this guidance documentation, the Conservancy outlines three categories of goods and services relevant to trails that can be captured in survey forms. These include: Soft Goods (e.g., water and other beverages, ice cream, snacks); Hard Goods (e.g., bicycles and related equipment, running shoes and clothing); and Overnight Accommodations (e.g., hotel/motel, bed and breakfast, or campground). The expenditures on hard goods, over the previous year, are also factored in conjunction with assumptions on average life-expectancy and depreciation of the purchased items. Examples of such methodology application are evident in the study by the Miami Valley Regional Planning Commission (2018),[3] and also a scan of trails in the East Coast states in the comparison of trail user expenditures (2009).[22] Whereas some studies report spending impacts by all users, two of the reviewed studies in Virginia[32,33] emphasized the

expenditures by non-local users as those represent new/incremental money injected in to the area economy.

While some studies conclude the economic impact estimations with only the total trail-related expenditures directly by trail users, others have added an additional layer of multiplier effects effects.[5,17,31,32,33] The multiplier effects comprise indirect (supplier-related), and induced (income re-spending) effects on top of the direct expenditures to derive total regional impacts. The multiplier effects are based on data from specialized data vendors such as IMPLAN or REMI.

Expenditures by Agencies
Another category of economic impacts that is used in some trail studies is that based on expenditures by trail developing and operating agencies. These expenditures pertain to initial investment – construction – or operations and maintenance (O&M), or both related to trails. These expenditures are run through economic input-output models (e.g., REMI or IMPLAN) to generate measures of total related economic impact of trails to an economy.[17,31]

3.4. Reporting and Visualization

Reporting and visualization styles were specifically noted while conducting the literature review. The styles depend on the purpose and the target audience.

3.4.1. Reporting

The City of Orlando publishes a *Bicycle & Pedestrian Annual Count Report.*[4] Bicycle and pedestrian counts are collected at 18 locations for a minimum of two weeks, including counts for the Cady Way Trail and the Orlando Urban Trail. The latest 2017 Annual Report provides a comprehensive summary of 13 trails within the city's jurisdiction, and each trail profile includes datasets showing trail utilization across hourly, daily, and weekly time periods. The City of Orlando began conducting trail counts in 2015 to collect user data and develop a better understanding of how pedestrian and bicycle networks are used in the city. These studies provide valuable information to the city so they can address gaps in bicycle-pedestrian networks and plan for future trail developments. The city hopes to continue to see an increase in bicycle-pedestrian network utilization as additional mobility opportunities become available.

In the *Economic Impact Analysis of Orange County Trails Report* by the East Central Florida Regional Planning Council (RPC), surveys of trail users were conducted in Orange County for the Cady Way Trail, Little Econ Greenway and West Orange Trail, and a REMI model was applied to estimate the related economic impacts to the county.[5] The surveys and analysis were conducted from 2010-2011 and summarize economic impacts during that time, specifically regarding Downtown Winter Garden. This study primarily focuses on data collection to understand the economic impacts of the trails, and the report also provides numerous tables, charts, and graphs which provide concise summaries of the responses to the survey questions. Funding assistance to the East Central Florida RPC was provided by the Office of Greenways and Trails, the Florida Greenways and Trails Foundation, the U.S. Forest Service, Orange County, and the City of Winter Garden.

Forward Pinellas periodically conducts the Pinellas Trail Users Survey study.[18] The study report provides a summary of information regarding Pinellas Trail use. The surveys inquired about trip mode used, trip purpose, distance traveled to/on the trail, frequency of use and some socioeconomic information. Surveys are conducted on two days and the report provided several charts and graphs which summarized survey responses for each question. Forward Pinellas first conducted the study in 1999 to better understand the trail's utilization. The most recent 2019 survey was designed to continue the collection of trail user data to support future federal and state funding opportunities, and to understand the demand for additional trail infrastructure and amenities.[18] The data collected in 2019 survey was used for analysis in this report. Similarly, Forward Pinellas publishes monthly count reports for the eight continuous sites on the trail.

3.4.2. Visualization

The reviewed studies displayed the data and analysis results in different formats. Some of the data analysis results shown in the studies include: trail characteristics and amenities, number of users, age, gender, general demographics, mode of use, and size of groups, health and other economic benefits. The following pages illustrate some outstanding infographics examples.

The Parks and Trails Council of Minnesota conducted a study in 2015[1] to provide an answer to the question: "How many people use Minnesota's state trails?" The council worked with volunteers across the state in 25 locations and collected a series of manual trail counts to achieve following goals:

- Provide an order-of-magnitude estimate of state trail use in Minnesota;
- Engage and mobilize local volunteers on the importance of trail counts;
- Highlight the need for future, expanded trail counts on Minnesota state trails; and
- Provide trail specific infographics.

Figure 8 illustrates a quick infographic for one of the Minnesota State Trail system trails.

BLUFFLANDS TRAIL SYSTEM

Located in the heart of Southeast Minnesota's river bluffs, the Blufflands State Trail System winds through river-carved limestone bluffs, rolling agricultural fields, traditional Amish communities, and historic milling towns. The trail system consists of the 42-mile Root River Trail, running from Fountain to Houston, and the 18-mile Harmony-Preston Trail. Field counts were conducted at the trailhead in Preston.

MAP OF COUNTING LOCATION

LOCATION: Trailhead in Preston
COUNTING DATES: Sept. 12, 13, 15, 16, and 17

TOTAL HOURS COUNTED: 10

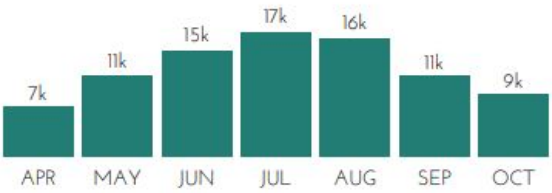
ESTIMATED
APRIL - OCTOBER TRAFFIC

2015 ≈ 52,000 « 86,000 » 121,000

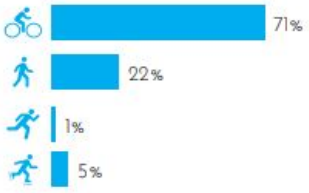
ESTIMATED
APR - OCT AVERAGE DAILY TRAFFIC

24 ≈ 242 « 403 » 565

ESTIMATED **MONTHLY TRAFFIC**



ESTIMATED **MODE SPLIT**



WEEKEND-TO-WEEKDAY RATIO:
SAT SUN 197%

PERCENT OF TRAIL USERS OVER 18:
78%

DOGS PER 100 PEOPLE:
2

Figure 8 | Sample Infographics: Blufflands Trail System

The Miami Valley Trails system in Ohio is the nation's largest paved trail network. Every four years since 2009, MVRPC has coordinated multiple trail-managing agencies across the Miami Valley to conduct a regional trail user survey[3] to fulfill objectives in the Comprehensive Local-Regional Bikeways Plan and the Miami Valley Bike Plan Update 2015. The study developed a fact sheet for all trails in the study area. Figures 9 and 10 illustrate examples of these fact sheets. Figure 11 illustrates an another infographic example from RTC.

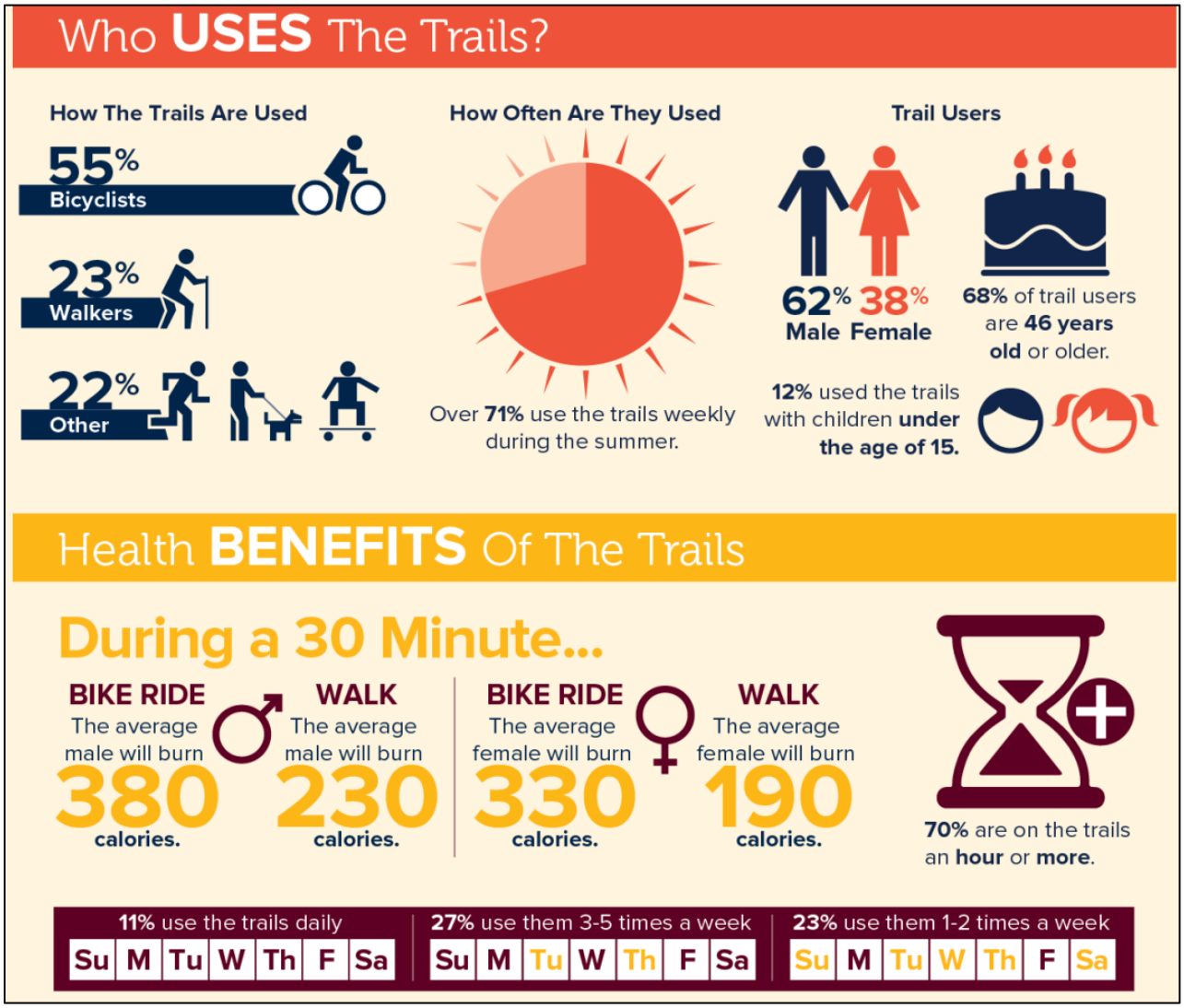


Figure 9 | Sample Infographics: Trail Users and Health Benefits, 2018

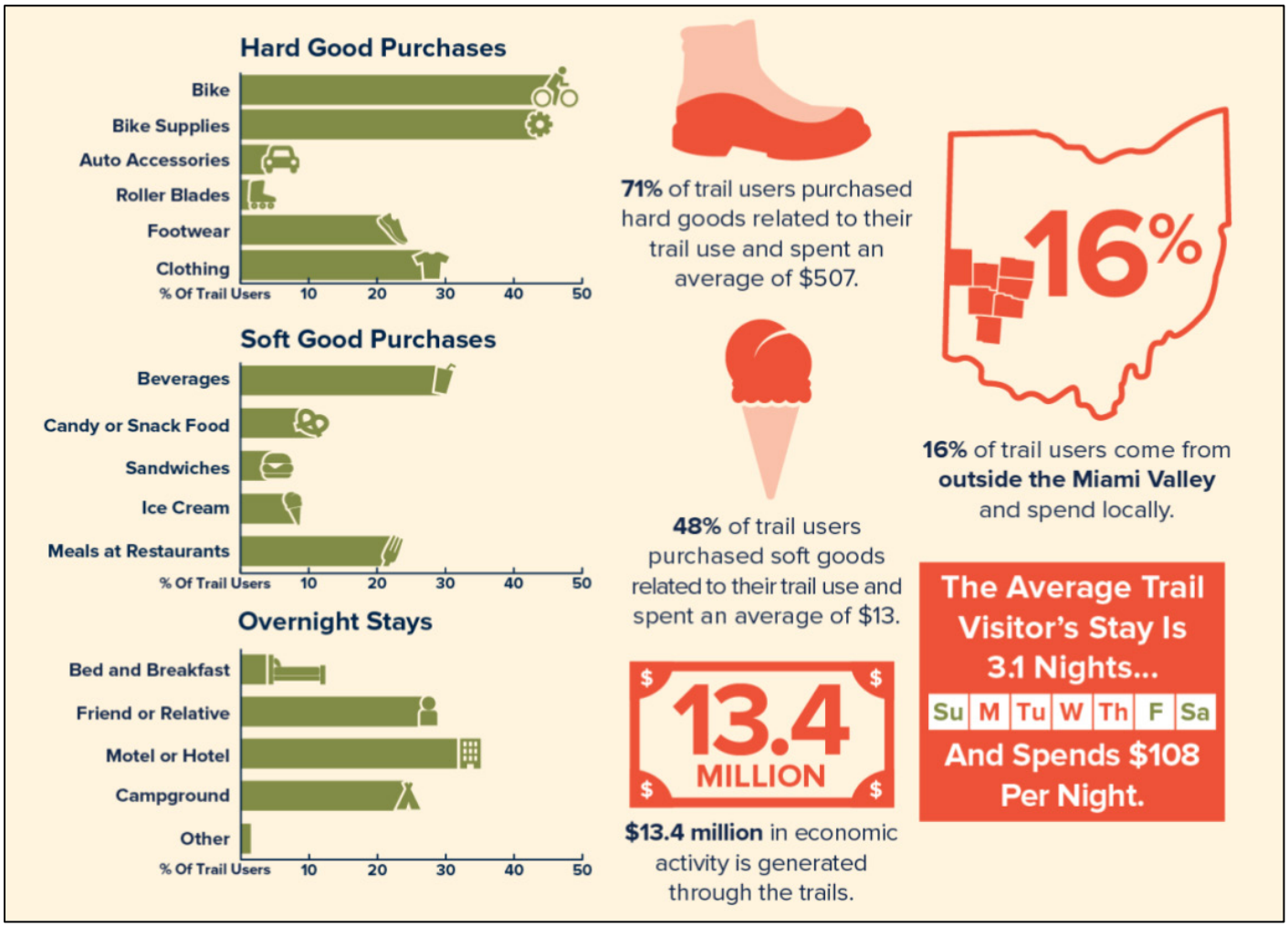


Figure 10 | Sample Infographics: Economic Impacts of Trails, 2018

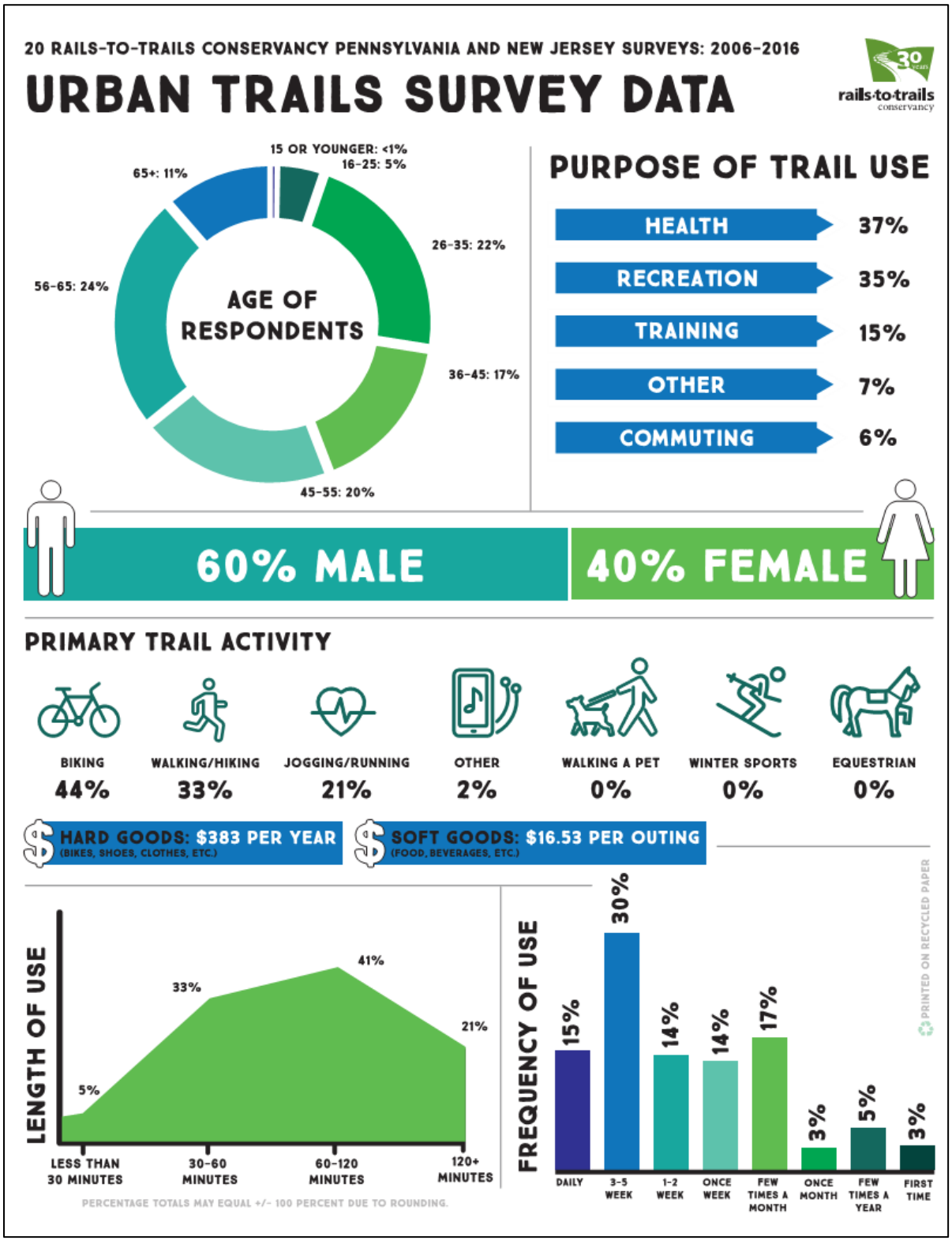


Figure 11 | Sample Infographics: Rails-to-Trails Conservancy – Survey Fact Sheet

This chapter summarizes three key trail-related aspects: trail use data programs, benefits and economic analysis of trails, and reporting and visualization. It is important to choose appropriate procedures and technologies for trail use data programs. The data programs depend on the sponsoring agency, funding, and the objectives of the data program. It is recommended that non-motorized count programs be comprised of a collection of continuous and short-duration monitoring locations. The manual counts are more suitable for collecting user characteristics, but the automated counters help to count the data for longer periods of time. Further, discussions with trail stakeholders can help facilitate a standardized framework for trail use program. Emerging technologies such as fiber optics, Bluetooth, Wi-Fi, and crowd-sourced data such as Strava may provide additional opportunities for improving the accuracy and reliability of the counts. Information on trail usage characteristics, demographics of trail users or visitors, trail users' perceptions of the trail and spending related to trail activities are gathered through user surveys. Self-Selecting – Drop Box, Self-Selecting – Mail Back, Personal Intercepts, Direct Mail and Website-based are some of the identified trail user survey data collection methodologies. Survey questions included in the Trail User Survey Workbook and other trail surveys are listed in Appendix C.

Some of the reviewed studies focused only on trail benefits, while others emphasized only economic impacts, and others included both benefits and impacts. A diversity of approaches was evident in the related studies by different authors and agencies. The key benefits quantified in studies include health benefits, recreational benefits, and ecological benefits. The most common type of economic impact covered in the trail-related literature is that pertaining to the expenditures by trail users.

The reviewed studies displayed the data and analysis results in varying formats. The reporting and visualization techniques depend on the purpose and the intended target audience. Some of the data analysis results shown in the studies include trail characteristics and amenities, number of users, age, gender, general demographics, mode of use, size of groups, health and other economic benefits.

Chapter 4. Data Gathering

This chapter details how the different datasets were gathered, collected, prepared, and processed for this study. To identify existing datasets available for this study, a comprehensive stakeholder engagement was conducted. This stakeholder engagement included a stakeholder kick-off meeting, online surveys, and follow-up interviews with the stakeholders. Based on the findings in the literature review in Chapter 3, and datasets identified through stakeholder engagement, it was determined that there was some missing information and data for some of the trails. To remedy this gap of information and data, additional data collection efforts were conducted as part of this study.

4.1. Stakeholder Survey and Follow-up Interviews

A stakeholder kick-off meeting was conducted to introduce the study goals and approach to everyone. This stakeholder kick-off meeting was followed up with a post meeting feedback survey and stakeholder interviews. Table 1 lists the agencies that were invited to be part of this study as a stakeholder. Appendix B provides the comprehensive list of stakeholders that were considered for this study. This section summarizes the approach and outcomes of the SUN Trail Stakeholder Post Meeting Feedback Survey, as well as follow-up interviews.

Table 1 | List of Stakeholders

Stakeholder Agencies	
Bike Florida, Inc. - Get In Touch!	Florida Bicycle Association
City of Brooksville	MetroPlan Orlando
City of Orlando	Orange County
City of Titusville	Pasco County
Florida Department of Environmental Protection	Pasco Metropolitan Planning Organization
Florida Department of Transportation	Pinellas County
East Central Florida Regional Planning Council	Rails-to-Trails Conservancy
Florida Bicycle Association	River to Sea Transportation Planning Organization
Forward Pinellas	Space Coast Transportation Planning Organization
Hernando/Citrus Metropolitan Planning Organization	Tampa Bay Area Regional Transit Authority
Lake County	Tampa Bay Regional Planning Council
Lake-Sumter Metropolitan Planning Organization	Volusia County

4.1.1. Stakeholder Survey Approach

The purpose of this survey was to gather information from the stakeholders about their existing approaches and resources to gather information on following major topics:

- Trail characteristics;
- Trail user counts;

- Trail user demographics and behavior;
- Other trail related datasets;
- Trail benefits and impacts;
- Trail data management;
- Trail data analysis; and
- Visualization and analytics tools.

The survey began with a set of agency-related questions about the job profile of the respondents, their agency's geographical purview, and the trails under the jurisdiction of their agency or organization. The next set of questions were targeted to obtain information about availability of the datasets related to trail characteristics, trail user counts, trail user demographics and behavior, trail user benefits and impacts. The final set of questions was related to trail data management, trail data analysis and visualization and analytics tools used by the stakeholders. The complete survey consisted of 26 questions. The question types included rating questions (Likert scale), multiple choice, as well as open-ended questions.

The survey was designed and distributed using Survey Monkey©. It was distributed to more than 30 stakeholders. Appendix B provides the list of the stakeholders. Appendix D illustrates the survey instrument.

4.1.2. Stakeholder Interviews

The stakeholder interviews were conducted with every stakeholder agency. Appendix E was used as the stakeholder interview script. The findings of the survey and stakeholder interviews are summarized in next section.

4.1.3. Findings

Seventeen stakeholders responded to the online survey and shared valuable information about their trail use data collection programs and activities. The names of the trails under the jurisdiction of the responsive agencies or organizations are listed in Table 2.

The Florida Department of Environmental Protection (FDEP) manages 175 state parks and nine (paved) state trails. The Office of Greenways and Trials (OGT), a bureau within the FDEP Division of Recreation and Parks, is tasked with fulfilling Chapter 260, Florida Statutes, the Florida Greenways and Trails Act. To accomplish this, OGT has the responsibility of leading, planning and facilitating the development of an interconnected Florida Greenways and Trails System (FGTS) Plan. By working with public and private partners, OGT provides effective statewide leadership to establish, expand, and promote the FGTS. OGT served as FDEPs primary representative for this study.

The ten RPCs in Florida do not manage trails, rather they partner with government and the business community to enhance regional economic prosperity and improve the consistency and quality of programs to ensure they add value to state, regional and local initiatives. The scope of this study was modeled on – and the results build on - much of the previous work of the East Central Florida RPC. Since 2005, the East Central Florida RPC has used REMI PI+ modeling

software to estimate the economic impact of a variety of investments and activities. This REMI model has detailed demographic and economic data for all East Central Florida counties and the rest of Florida. Both the East Central Florida RPC and the Tampa Bay RPC provide assistance and input for developing segments of the C2C, the St. Johns River-to-Sea Loop (SJR2C), the SUN Trail network, and other trails.

Bike Florida, Inc., and Florida Bicycle Association do not manage trails, but have similar missions and receive revenues from Florida's Share the Road license plate sales. The mission of Bike Florida, which formed in 1994, is to help communities improve their economic health, bicycle infrastructure, and safety through bicycle tourism. Since 2011 they have tracked economic impacts of their annual bicycle tours, which is their primary fund raiser. Some of their tours, traversed trails in this study. The Florida Bicycle Association promotes education and advocacy programs, and encourages bicycling as a life-long activity. Safety education and awareness programs are directed to bicyclists, pedestrians, and motorists.

Based on the survey results 13 of the 17 agencies collect data on trail characteristics. Bike Florida, Inc., City of Brooksville, and Florida Bicycle Association responded that they do not collect data on trail characteristics. When surveyed, FDOT District Seven indicated it does not collect data on trail characteristics. However, the consultant discussed the response with FDOT and verified the agency does collect bicycle/pedestrian/trail characteristics. Additionally, on September 20, 2019 the Center for Urban Transportation Research University of South Florida completed a Multimodal Data Inventory Evaluation to Improve FDOTs Roadway Classification Inventory for FDOT. The aim of that research was to investigate acceptable inventory methods based on FDOT data accuracy requirements and available technology to create more efficient, scalable, and acceptable data inventory management standards. The objectives of this research were to determine a methodology of inventory of SUN Trail assets and identify an efficient data management design for hardware/software investment. The research investigated existing FDOT roadway and SUN Trail inventory methods and transportation data inventory methods of other state, regional, and local agencies. Findings included recommendations for SUN Trail features and characteristics data to be collected to support management of the life cycle of trail assets and performance measurement. Twelve identified data inventory methods were evaluated. Recommendations for inventory process and methods by responsible FDOT office were developed. The results of this research can be used as a basis to support future implementation of a trail characteristics inventory that may support stakeholder data needs.

The survey findings are further summarized and documented in the following four categories.

- Trail User Counts;
- Trail User Demographics and Survey;
- Trail Data Management; and
- Trail Data Analysis.

Table 2 | Summary of Survey Responses – Trails under the Survey Respondents' Jurisdiction

Agency	Trails under the Jurisdiction
City of Brooksville	C2C, Tom Varn Park Trail, Good Neighbor Trail*
City of Orlando	C2C, Bumby Path, Orlando Urban Trail*, Lake Underhill Path, Cady Way Trail*, Shingle Creek Trail, Gaston Edwards Park Trail, Orlando SE Trail
City of Titusville	C2C, SJR2C, East Coast Greenway (ECG), East Central Regional Rail Trail*
Country of Volusia County	C2C, SJR2C, ECG, Heart of Florida (HOFL), East Central Regional Rail Trail*, Spring to Spring Trail, SR 415
Forward Pinellas	C2C, Pinellas Trail*, Tri-County Trail
Hernando/Citrus Metropolitan Planning Organization	C2C, HOFL, Suncoast Parkway Trail, Good Neighbor Trail*, Withlacoochee State Trail
Lake County	C2C, South Lake Trail*, Wilson Lake Trail, Blackstill Lake Trail, Hancock Trail, Lake Apopka Loop Trail, Grassy Lake Trail, Trout Lake to Lake May Trail
Orange County	C2C, HOFL, West Orange Trail*, Cady Way Trail*, Little Econ Greenway, Avalon Trail, Lake Apopka Connector Trail, Clarcona / Ocoee Connector, Pine Hills Trail, Shingle Creek Trail, Innovation Way Trail
Pasco County	C2C, Suncoast Trail, Starkey Trail*
River to Sea Transportation Planning Organization	C2C, SJR2C, ECG, HOFL, East Central Regional Rail Trail*, Spring to Spring Trail, SR 415 Trail
Space Coast Transportation Planning Organization	C2C, SJR2C, ECG, East Central Regional Rail Trail*, Brevard Zoo Trail, North Merritt Island Pioneer Trail, A1A Urban Trail, South Brevard Al Tuttle Trail, St. Johns River Eco-Heritage Trail

*Trails Studied

4.2 Trail User Counts

From the survey responses, it is found that seven agencies collect pedestrian or bicycle counts along trails. The trail user counts data collection methodology, frequency of the counts, technology used to collect counts, and count data information obtained from the seven agencies are discussed in this section. Their survey responses related to trail user count data collection are summarized in Table 3.

Table 3 | Summary of Survey Responses – Trail User Counts

Agency	User Count Data	Count Frequency	Counting Method/ Counter Technology
City of Orlando	Bicycle and Pedestrian	Short-term	Pyro Box counters
City of Titusville	Bicycle	Short-term	Microwave or Ultrasonic counters
Florida Department of Environmental Protection	Bicycle and Pedestrian	Continuous	Tubes and Laser counters
Forward Pinellas	Bicycle and Pedestrian	Continuous	Passive infrared and Loop detectors
Lake County Office of Parks and Trails	Bicycle and Pedestrian	Continuous	Passive infrared
MetroPlan Orlando	Bicycle and Pedestrian	Short-term	Video camera and Passive infrared
Orange County Government	Bicycle and Pedestrian	Continuous	Passive infrared
Rails-to-Trails Conservancy	Bicycle and Pedestrian	Continuous	Not provided

The City of Titusville collects non-cyclical short-term trail bicycle counts at different locations over multiple periods of time using Microwave or Ultrasonic counters. The city has been collecting trail use data for the last three years and is currently working on using the datasets for estimating trail use trends and for obtaining grants. The Orange County Government collects continuous bicycle and pedestrian counts using passive infrared counters. It is stated in the survey response that the trail counts do not distinguish between bicycle and pedestrian counts. Forward Pinellas collects continuous counts distinguishing between bicycle and pedestrian counts using passive infrared counters and loop detectors. The City of Orlando collects trail user counts using Pyro Box counters.

The FDEP conducts continuous trail counts along trails managed by Florida State Parks using tube and laser counts. It was stated in their survey response that the counts did not distinguish between bicycle and pedestrian counts. The Lake County Office of Parks and Trails collects continuous counts using passive infrared counters. Lake County Office of Parks and Trails can also get Orange County's and SJRWMD's data for trails that connect to Lake County trails. Lake County Office of Parks and Trails uses the trail use count data to present the trail usage to the Board of County Commissioners (BCC) to obtain additional funding for counters, amenities, trail resurfacing, etc. MetroPlan Orlando collects bicycle and pedestrian short-term counts on an as-needed basis. MetroPlan Orlando acquired two Miovision cameras, and shares the data through its web portal. RTC noted their Go Counter mobile application can be used by planners and trail advocates to collect and analyze local counts on mobile devices.

4.3 Trail User Survey

Out of 17 respondents only two agencies conduct surveys (Forward Pinellas and the City of Titusville) to collect trail user demographics, etc. The trail user survey methodology, trail user demographics, and trail user behavior data information obtained from the two agencies that conduct trail user surveys are discussed in this section. Their survey responses related to trail user survey are summarized in Table 4. Forward Pinellas conducts field intercept surveys and postcard surveys to collect data on trail users' demographics and behavior. The City of Titusville Trail Welcome Center collects trail visitors' trip origin/residence information from the trail visitors. The River to Sea TPO conducts a general transportation user (not focused on trails) survey bi-annually, which includes several questions related to trails including level of satisfaction with existing trail facilities and how the agency should prioritize funding.

Table 4 | Summary of Survey Responses – Trail User Surveys

Agency	User Survey Data	User Survey Method	User Demographics Data	User Behavior Data
City of Titusville	Demographics	Personal intercept / Welcome Center staff interview	Residence location (zip code, country)	None
Forward Pinellas	Demographics and Behavior	In-person/Field Intercept and Postcards	Age, Gender, Residence location (zip code, country)	Trip purpose (commute, recreation, exercise), Trail activity (walk, bicycle), Frequency of trail visits, Trail usage duration

4.4 Trail Data Management

Information obtained from agencies indicating they collect data are discussed in this section; survey responses are summarized in Table 5. Overall, the cost for collecting data and sharing useful data are limitations.

Table 5 | Summary of Survey Responses – Trail Use Data Management

Agency	Trail Data Storage Method	Trail Data Needs Limitations and Challenges
City of Orlando	Excel spreadsheets and Online	Cost of counters and staff hours
City of Titusville	Location of counters	Prioritizing data collection
Florida Department of Environmental Protection	GIS database	Need access to more trail counts
Forward Pinellas	Spreadsheets	Vandalism and Equipment Maintenance
Lake County	Trail counters enter data into graphs, GIS database	Cost and making the data useful
MetroPlan Orlando	ArcGIS files (in-house server) and Miovision camera data will be cloud based	Not provided
Orange County	Digital spreadsheets, and GIS database	Vandalism and Equipment maintenance
Rails-to-Trails Conservancy	GIS database, and TrailLink (online)	Not provided

The Orange County Government saves trail data in digital spreadsheets and in a GIS database. The county indicated that vandalism and equipment upkeep are challenging. The City of Orlando's trail counts are stored in excel spreadsheets and are available on their website. The City identified that the cost of the counters, annual subscriptions, and staff hours to collect data and to create public interfaces for sharing the information are their limitations and challenges. The FDEP stores trail use information in GIS databases, visitation at State Parks and Trails are included in Land Management Uniform Accounting Council reports to the Governor and Cabinet. The Lake County Office of Parks and Trails has two trail counters, they enter data into graphs and GIS.

MetroPlan Orlando and Space Coast Transportation Planning Organization (TPO maintain the characteristics datasets for the trails in their respective counties in geospatial (GIS) format. The recorded trail characteristics include status of the trails (existing, programmed, prioritized, and planned), and the length, surface, and facility type of the trails. But, MetroPlan and Space Coast TPO do not have a trail user data collection program. They do collect pedestrian and bicycle counts occasionally, if there are project needs. The City of Brooksville do not maintain datasets at this time, due to limited resources. The City of Brooksville uses data from other sources and depends on collaborations with partners to acquire data for the trails in their jurisdiction.

The Hernando/Citrus MPO maps their trails but does not have other related datasets. They indicated that staff time and/ or costs for hiring consultants are challenges for developing and maintaining trail data. Volusia County mentioned that having associated entities (e.g. cities)

provide them with data, to be included in countywide GIS is both challenging and a limitation. The River to Sea TPO indicated that updating trail information, such as changes of status, is their challenge. This TPO obtained trail datasets from the East Central Florida Regional Planning Council to develop the River to Sea TPO's Bicycle and Pedestrian Plan. The East Central Florida Regional Planning Council stated that the limited availability of trail counts is a challenge for them; they work with others to collect regional trail characteristics every few years and provides on-going support. Pasco County does not collect trail counts or user data, citing other priorities. It is important to note, however, that the County refers to studies from other agencies if justification is needed for trail projects. Likewise, they are just completing construction of the Starkey Trail, a segment of the C2C.

4.5 Trail Use Data Analysis

The trail use data analysis information obtained from the agencies is discussed in this section. The agencies' survey responses related to trail use data analysis are summarized in Table 6. Trail user count analysis, trail user survey analysis, estimation of trail performance measures, and trail use economic impact analysis are the most common trail use data analyses conducted by local trail agencies. Agencies use available trail counts, user demographics and behavior, and economic data to perform trail use economic impact analysis. The East Central Florida Regional Planning Council indicated that local versus non-local visitors, and the purpose of the trip are also important information that should be collected to perform trail use analyses. The City of Titusville noted that that there is an increase in bed taxes after opening a trail. The City also mentioned it is important to collect bed taxes data to evaluate before and after trail project benefits and impacts.

Table 6 | Summary of Survey Responses – Trail Use Data Analysis

Agency	Trail Use Data Analysis Type	Trail Use Data Analysis Purpose
Bike Florida, Inc.	User benefits and impacts analysis, and Trail demand/ forecast models	Identification of long-term planning needs
City of Orlando	Trail use trend analysis, Trail performance measures	Identification of long-term planning needs, and to support trail safety
City of Titusville	Trail use trend analysis	To obtain grants
Florida Department of Environmental Protection-	Trail use trend analysis, Economic impact analysis	Identification of long-term planning needs
East Central Florida Regional Planning Council	Trail use trend analysis, Benefits and impacts analysis	User and trail segment profiles, and for the Economic impact analysis of Orange and Seminole County trails
Florida Bicycle Association	Trail use trend analysis, Benefits and/or impacts analysis, Trail performance measures	Not provided
Forward Pinellas	Trail use trend analysis, Benefits and/or impacts analysis, Trail performance measures, Trail demand/forecast models	Project prioritization, and the To identification ofy long-term planning needs
MetroPlan Orlando	Trail performance measures	Project prioritization, and the Identification of long-term planning needs
Orange County	Trail use trend analysis, Trail demand/forecast models	Identification of long-term planning needs, and Operational support
Rails-to-Trails Conservancy	Economic impact analysis	To develop tools

4.6 Summary of Gathered Data

The different datasets identified as necessary for this study are as follows:

Trail characteristics: The trail characteristics like width, length, amenities, trailheads, modes were gathered from FDOT SUN Trail resources, trail websites, and maintaining agencies.

Trail user counts: The trail user counts for the Cady Way Trail and West Orange Trail were acquired from Orange County. Orange County maintains nine continuous count stations on West Orange Trail, and two continuous count stations on Cady Way Trail. The City of Orlando collects short-term counts on one additional site on Cady Way Trail. But, for this study, only the counts from Orange County are considered as there is more confidence in statistics produced by continuous counts when compared to short-term counts. On the other hand, the City of

Orlando collects short-term counts on one site on Orlando Urban Trail in 2018. This is the best data available for the Orlando Urban Trail. These statistics are adjusted to compute the annual visit volumes. Forward Pinellas maintains eight continuous count stations on Pinellas Trail. Good Neighbor Trail does not have any count sites. Hence, it was deemed necessary to conduct short-term counts at four locations on Good Neighbor Trail. These short-term counts were conducted by the newly established FDOT Non-motorized count program. It is important to note that Hernando/Citrus County Metropolitan Planning Organization (MPO) has plans to install continuous count sites on Good Neighbor Trail in the near future. Table 7 summarizes specific details on the count stations.

Table 7 | Trail User Count Station Details

Trail Name	Counts Manager	Count Types	Users	Number of Sites
Cady Way Trail	Orange County	Continuous Counts	Pedestrians and Bicyclists	2
Orlando Urban Trail	City of Orlando	Short Term Counts	Pedestrians and Bicyclists	1
West Orange Trail	Orange County	Continuous Counts	Pedestrians and Bicyclists	9
Good Neighbor Trail	FDOT*	Short Term Counts	Bicyclists	4
Pinellas Trail	Forward Pinellas	Continuous Counts	Pedestrians and Bicyclists	8

*Part of this study.

Trail user demographics and behavior: Trail user surveys are needed to understand the trail user demographics and behavior. A personal intercept (field-based) trail user survey was conducted on the Good Neighbor Trail. For Orlando Urban Trail and Pinellas Trail, a personal intercept survey and web-based survey was conducted. For the remaining two trails (West Orange Trail, and Cady Way Trail), a web-based survey was conducted. Table 8 provides specific details on the surveys.

Table 8 | Trail User Survey Details

Trail Name	Survey Administrator	Personal Intercept Survey Date and Time	Number of Sites	Web-based Survey
Cady Way Trail	FDOT*	Not applicable	Not applicable	June 7-14, 2019
Orlando Urban Trail	FDOT*	May 11, 2019 (7:00 am to 7:00 pm)	2	June 7-14, 2019
West Orange Trail	FDOT*	Not applicable	Not applicable	June 7-14, 2019
Good Neighbor Trail	FDOT*	May 4, 2019 (7:00 am to 7:00 pm)	1	Not applicable
Pinellas Trail	Forward Pinellas	April 26-27, 2019 (7:00 am to 7:00 pm)	6	April 26-May 17, 2019

*Part of this study.

Trail benefits and impacts: The trail benefits and impacts were computed as part of this study utilizing the methodology explained in Chapter 5 as part of the guidelines framework. Different national studies were reviewed to identify relevant formula and input values.

Computing Environment: The analysis computing environment used two software programs for data processing and subsequent analyses. ArcGIS products were used to analyze geospatial information and spreadsheet tools were used were used for tabular analysis.

Chapter 5. Guidelines

This chapter is intended to describe comprehensive guidelines that can be used by the trail agencies, cities, counties, and other stakeholders for establishing or enhancing their trail traffic data collection processes, data maintenance and management techniques, trail performance measures, trail trend analysis, factors impacting trail usage and reporting. The guidelines developed in this task are an agglomeration of the literature review and lessons learned from trail data collection, field user survey, and associated analyses for the five trails selected for this study with trails in urban and rural settings.

The guidelines developed in this chapter are summarized in the following sections:

- Trail Use Data Collection
- Economic Analysis

5.1. Trail Use Data Collection Guidelines

5.1.1. Introduction

The FDOT 2018 Traffic Monitoring Handbook (TMH) includes a non-motorized traffic monitoring chapter related to collecting and maintaining a statistically valid bicycle and pedestrian traffic volume data program. The methodology described in the TMH is focused on all the non-motorized data collection activities performed on state roadways and intersections. The guidelines developed by Non-Motorized Traffic Monitoring Program will be used for any future trail counts data collection efforts. As per the FDOT website, the statewide short-term count program is preparing for its first round of statewide deployments in coordination with local agencies. Continuous count program remains in the research phase while working towards its first round of continuous count installations. The following section provides a brief description of the different trail count programs identified in literature review.

Factors affecting trail use data collection program are as follows:

- Purpose of data collection;
- Level of effort;
- Cost, and available budget;
- Schedule of data collection;
- Accuracy of data; and
- Other considerations.

These factors influence the selection of the trail use data collection methodology for a trail system. Trail use data program includes short-term counts, continuous counts, and trail user survey. Continuous counts capture the temporal variability, and shorter period counts capture the spatial variability along a given trail. Based on the needs of the trails, purpose of the trail use data collection, and available resources, including budget, trail use data collection program can be established.

A trail use data collection program can be categorized as short-term counts program, continuous counts program and trail user surveys.

5.1.2. Short-Term Trail Use Counts

Short-term trail use counts can be collected either by using manual methods or by utilizing automated counters. As per literature review, the recommended duration for short-term counts is two weeks at a given location.

5.1.3. Continuous Trail Use Counts and Data Collection Technology

Automatic counters play an important role in the continuous trail count program. Continuous non-motorized traffic monitoring counters at trail locations can be used to collect continuous pedestrian and bicycle count data. Continuous count stations can provide trail use daily counts over 24 hours, 365 days of the year. Continuous trail use data can be used to develop correction/adjustment factors and trends to extrapolate data from shorter duration counts. It is critical to determine the appropriate number of continuous count locations and the specific sites to install the continuous counters in a trail use data collection program.

Various automatic counters are used in counting non-motorized traffic volumes such as pedestrians and bicyclists. The accuracy and cost of the automatic counters varies, and careful consideration should be given in identifying the counting technology at each count location. A matrix related to selecting the non-motorized counting technology is shown in Figure 7 above.

5.1.4. Trail Use Survey

Self-Selecting – Drop Box, Self-Selecting – Mail Back, Personal Intercepts, Direct Mail, and Website-based are the trail user survey data collection methodologies.

A sample survey questionnaire is included in the Appendix C. It is recommended to include 15 to 25 questions related to user demographics, trail use frequency, trail visit days, trail visit duration, trail visit purpose, trail use activity, trail conditions, and trail user spending related to the trail visit in the trail user questionnaire. The trail use survey implemented for this report is included in Appendix F.

5.1.5. Trail Use Data Management

An efficient trail use data management system is essential to store, analyze, and share the trail use data for trail planning, operation, and design purposes. A centralized bicycle and pedestrian trail count database is recommended. Manual and automatic count data should be entered and uploaded to the appropriate database for future processing, distribution, and use. Centralized storage of counts will facilitate the data to be used for comparison and analysis purposes at the local, regional, and statewide levels.

Modern automatic counters enable remote data downloading. This is advantageous because it provides real-time count data, and enables agency staff to easily determine if a counter is continuing to operate and collect data, thereby significantly reducing the need for staff time in the field.

5.2. Economic Analysis Guidance

5.2.1. Introduction

An expansion of SUN Trail in Florida can be expected to yield a number of various economic benefits and impacts. These benefits may include health, recreation, and ecological ones. Economic impacts may capture those associated with expenditures by trail users, and those related to constructing and operating trails.

The purpose of this section is to provide guidance on economic evaluation of benefits and impacts related to trails on the SUN Trail network in Florida. Such guidance may assist trail stakeholder agencies in Florida in further recognizing and informing the public about trails-related benefits and impacts to their communities, and larger decision making with respect to trail investments. The guidance is largely based on methodologies, practices, and sources found in related literature as applied to trails. The guidance is not meant to be prescriptive, but rather offer multiple options for the choice of benefit and impact categories that may or may not apply to a trail, and/or be practical given data availability and other resources at the trail governing agency's disposal.

5.2.2. Benefits Guidance

Various benefits related to trail usage are covered in the literature. The more common ones, and potentially applicable to SUN Trail stakeholders are described in this section.

Estimations of trail benefits generally rely heavily on inputs pertaining to the volumes of trail users, and are presented in annual terms. To that effect, counts of users, and their characteristics constitute important inputs into economic analyses of trails.

5.2.3. Recreational Use Benefits

Health Benefits

Treating trail usage as a form of exercise can lead to health benefits that accrue to bicyclists or pedestrians regularly using the trail. The number of users and their time spent on exercise while on trails can be converted into monetary equivalents, typically by applying hourly dollar values to the trail activities to derive annual health benefits. NCHRP 552 lends some guidance on this benefit type. The NCHRP researchers, based on a number of studies, determined that an annual per capita health cost savings from physical activity are estimated at about $153.1.[1] This annual per capita value can then be multiplied by the total number of regular trail users to derive the annual trail benefit, as in the Equation below.

$$\textbf{Annual Health Benefit} = \textbf{Number of Trail Users} \times \textbf{H}$$

where, H = value of health savings from physical activity per capita per year.

Suggested value; H = $153.1 (in 2017$)

[1] Based on the original NCHRP 2006 value of $128 (p. 39) inflated from 2006$ to 2017$ using the GDP Price Deflator as per the U.S. DOT Discretionary Grant Programs Guidance. All dollar values are expressed in 2017 constant dollars, unless stated otherwise.

Recreation Benefits

Another benefit of trail usage is recreation. This benefit can also be monetized by applying a dollar value to the time spent on recreational (e.g., excluding any commuting-related) activities on a trail (NCHRP 552, 2006). The value of time to any applicable commuters would be accounted for separately under mobility/reduced auto use benefits, as described in a subsequent subsection below. Based on the NCHRP research, the daily value (assuming a typical day of about one hour of trail activity) of recreational trail time is around $12.[2] The daily value needs to be applied to an estimated number of regular trail users engaged in recreational activities while on the trail. While the NCHRP document uses the number of new cyclists (less new commuters), one could also apply this calculation to all recreational users of a trail. The derivation also requires an annualization of the benefit, for instance assuming 365 days a year. The overall formula for recreation benefit derivation is shown in the Equation below.

$$\textbf{Annual Recreation Benefit} = (\textbf{Number of Trail Users} - \textbf{Number of Commuters}) \times \mathbf{D} \times \mathbf{365}$$

where, D = value of recreational time per user per day.

Suggested value; $\mathrm{D} = \$12$ (in 2017$)

Reduced Auto Use Benefits

Another potential benefit of trails pertains to diversion from other modes, particularly auto. Such benefits to society are generated by the number of commuters that replace auto travel by switching to a non-motorized on trails. The benefits include reduced congestion to remaining drivers, reduced air pollution to the larger society, and user cost savings. The magnitude of these benefit components will vary by location type (e.g., urban, suburban, or small town/rural) and associated congestion, and time of day (peak vs. off-peak). To derive the reduced auto use benefit, the total unitary (per mile) saving is multiplied by the number of (new) commuters, the average round trip length, and annualization factors, as in the Equation below.

$$\textbf{Reduced Auto Use Benefit} = \textbf{Number of Commuters} \times \mathbf{L} \times \mathbf{S} \times \mathbf{50} \times \mathbf{5}$$

where, L = average round trip length per user per day; and S = savings per mile

Suggested value; $\mathrm{S} = \$0.16$ (in urban areas) *or* $S = \$0.10$ ($in\ suburban\ areas$) *or* $S = \$0.01$ ($in\ small\ towns\ or\ rural\ areas$) $-$ *all in* 2017$

Alternatively, depending on data availability, any estimated number of saved hours by trail users for commuting purposes could also be monetized. This benefit type can be calculated and presented as time (e.g., annual hours) saved on travel to work/school by using a trail relative to commuting by car. Using a unitary value of time (per hour), such annualized hours saved can be monetized into travel time saved by switching to trail commuting expressed in dollar terms, as exemplified in the Equation below.

[2] Based on the original NCHRP 2006 value of $10 (p. 39) inflated from 2006$ to 2017$ using the GDP Price Deflator as per the U.S. DOT Discretionary Grant Programs Guidance.

$$\textbf{Commuting Time Benefit} = \textbf{Number of Daily Hours Saved in Commuting} \times \textbf{VOT} \times \textbf{S} \times \textbf{50} \times \textbf{5}$$

where, VOT = average value of time per hour

Suggested value; VOT = $14.8 (in 2017$)

Ecological Benefits

The ecological benefits can be measured as a function of the tree coverage associated with a trail. This stems from the trees that are planted/grow, and improve air quality, etc.. Related data, which is a count of trees by species and their current average diameter, need to be inventoried and aggregated along the trail by the local trail stakeholder(s). The monetization can be conducted by utilizing a calculator such as the USDA Forest Service's National Tree Benefit Calculator.[3] Given a specification of tree coverage at a trail location (by zip code), and their diameter, the calculator can estimate annual ecological benefits arising from the trees associated with the trail.

Safety Benefits

Safety benefits of trails can be challenging to estimate. According to NCHRP 552, "Increased cyclist safety is an often assumed, poorly understood, and highly controversial benefit of bicycle facilities." (2006, p. 33). However, under certain circumstances, safety benefits may be estimated. Generally, safety benefits are measured as changes in trail user accidents by severity, and monetized using cost estimates in dollars per fatality, injury, and vehicle damage. Safety improvements are measured using the projected change in the number and severity of annualized accidents anticipated to occur with a trail in place (or with trail improvements) relative to a No-Build (without a trail, or without specific safety-driving improvements) scenario.

If the number of pertinent avoided accidents involving trail users is available, then a monetization of safety benefits can be conducted using the unit values of reduced fatalities, injuries, and property damage, as exemplified in the Equation below. The unit values may be drawn from the latest U.S. DOT[4] guidance using either the KABCO or the MAIS scale of injuries severity. It should also be noted that there is a difference between accidents and the number of individual fatalities and injuries involved. Therefore, the number of avoided accidents needs to be converted to specific number of avoided fatalities, injuries (by severity), and any damaged vehicles, if applicable. Such a conversion may be done by applying averages per accident.

$$\begin{aligned}\textbf{Safety Benefit} &= (\textbf{Number of Annual Fatalities Avoided} \times \textbf{F}) \\ &+ (\textbf{Number of Annual Injuries Avoided} \times \boldsymbol{l_{sev}}) \\ &+ (\textbf{Number of Damaged Vehicles Avoided}) \times \textbf{V}\end{aligned}$$

[3] National Tree Benefit Calculator, http://treebenefits.com/calculator/

[4] U.S. DOT, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, December 2018.

where, F = statistical value of life or fatality cost; l_{sev} = value per injury (by severity); and V = property damage per vehicle

Suggested value; F = \$9,600,00; l_{sev} varies by severity; and V = \$4,300 (all in 2017\$)

Trail practitioners can derive any one or all the above-described benefits, depending on the fitting input data availability, other resources, and purpose of the benefits analysis pertaining to a trail of interest/under management.

5.3. Economic Impact Analysis Guidance

Trails can have a measurable impact on economies in which they are located. This subsection describes two main categories of impacts that may be of interest to trail administrators.

5.3.1. Trail User Expenditures

This impact category can capture the direct dollar expenditures by the trail users in a recent year. It can be derived based on the number of annual trail visitations (based on trail usage/ counts), and average amounts of money spent by the users (as per relevant survey data specific to a trail under analysis). The user spending may entail categories such as: 1) Hard goods – goods that are subject to multiple use and depreciate over time (e.g., bicycles and other equipment/accessories, footwear, and clothing); 2) Soft goods – consumable per visit (e.g., water/beverages, and snacks) associated with trail usage; and 3) Overnight accommodations – related to stays at hotels/motels/campgrounds. The next three equations indicate the variables needed to estimate each of the three trail user expenditure categories, as per the RTC methodology.[5]

$$\textbf{Trail Annual Spending on Hard Goods} = ((\boldsymbol{Number\ of\ Annual\ User\ Visits}) / (\boldsymbol{Average\ Annual\ Number\ of\ User\ Visits}) \times \boldsymbol{HGExp/AL} \times \boldsymbol{HGP})$$

where, HGExp = average amount spent on hard goods per trail users; HGP = percentage of trail users that purchased hard goods related to the trail; and AL = average life expectancy of hard good purchases

Suggested value; AL = 6 (where majority of trail users are bicyclists)

$$\textbf{Trail Annual Spending on Soft Goods} = (\textbf{Number of Annual User Visits} \times \textbf{SGExp} \times \textbf{SGP})$$

where, SGExp = average amount spent on soft goods;

SGP = percentage of trail users that purchased soft good related to the trail

$$\textbf{Trail Annual Spending on OverNight Accomodations} = (\textbf{Number of Annual Unique Trail Users} \times \textbf{OAExp} \times \textbf{OAP} \times \textbf{N})$$

where, OAExp = average nightly amount spent on overnight accomodations per trail user;

[5] Rails-to-Trails Conservancy. Trail User Survey Workbook, 2005.

OAP = percentage of trail users that spent on overnight accomodations related to the trail; and

N = average number of nights per stay

Total direct annual user expenditures related to a trail can be approximated by an aggregation of the three estimates associated with hard goods, soft goods, and overnight accommodations. The average amount spent on hard goods, soft goods and overnight accommodations are calculated from the outcomes of the trail user survey responses.

Capital, and Operations and Maintenance Expenditures

Another type of impact category that can be derived pertains to direct expenditures related to operations and maintenance (O&M), and capital expenditures related to the area trails. Total or annual amounts of such expenditures corresponding to the trail development and O&M could be assembled and reported as direct expenditures. The input data on these costs may be tracked by trail-governing/administrative agencies.

Multiplier Effects

For both categories of direct expenditures, economic impact models can be applied to translate such direct expenditures to direct impacts on an area economy (e.g., relevant county or statewide) in terms of metrics such as employment/jobs, earnings, and economic value added/Gross Regional Product. Moreover, the direct impacts can also be combined with the multiplier (indirect and induced) effects. Indirect effects are changes in economic activity resulting from changes in purchases by local firms that are the suppliers to the directly affected businesses (e.g., bicycle manufacturing); and Induced effects pertain to changes in economic activity resulting from labor income re-spent by workers of directly and indirectly affected businesses on household goods and services purchased from local businesses. The Total Impact is the sum of the direct, indirect, and induced impacts.

Economic impact models are deployed to expand on direct impacts into total impacts. Two of such models that are commonly used for such analyses are REMI, and IMPLAN.

REMI

Region Economic Models, Inc. (REMI) has developed models that answer various questions about the effect of investments or policy initiatives on the economy of local (and larger) regions. Each calibrated area (or region) in the models has economic, demographic and policy variables so that various policies that affect an economy of interest can be tested. The models also include projections of numerous economic variables for a region. The models are based on past and current research and development, which has been peer reviewed and published in academic journals. REMI has been used by hundreds of governmental agencies, universities, and others. The REMI model is a dynamic forecasting and policy analysis system that includes key input-output econometric estimates integrating inter-industry transactions, long-run equilibrium features, and new economic geography.

IMPLAN

IMPLAN® is an economic modeling, input-output based, social account matrix software with the capability of estimating the economic impacts to a defined geography ensuing from expenditures in an industry or group of industries (or, commodity, or group of commodities). A social account matrix reflects the economic interrelationships between the various industries, households, and governments in an economy and reflects such interdependency through impact multipliers. Impact multipliers are internally developed within IMPLAN®, derived from the local purchase percentages, production functions, and socioeconomic data for the defined economy, for each of the economic impact measures and are geographically-specific. IMPLAN® is a static “snapshot” model, with the economic impacts estimated only for a specific time period, so it is incapable of estimating economic impacts beyond the duration of the (construction and operations) expenditure intervals. An underlying assumption of the model is that the economic impacts will occur only in the period in which the expenditures occur and would not carry over into subsequent years, which could occur in certain instances.

A deployment of either model will depend on the availability of resources (budget, and time) for this impact modeling effort. Generally, the IMPLAN® model may be less expensive, but it is also less robust. The cost will largely depend on the number of regions, and industry detail incorporated into a model. Regional analyses are typically done at a county level (with one or multiple/combination of counties), and could also include statewide analysis units depending on the analysis purpose. It should be noted that any local agencies may not have the requisite skillset to properly estimate economic impacts with these models. In such cases, they may be advised to seek modeling support from external parties, which could include RPCs. Both the East Central and Tampa Bay RPCs have subscribed and modeled various impacts with REMI, or procure specialized consulting services.

Many benefits and economic impacts are associated with trails, and can be derived and reported. Some categories may not apply to all trails in Florida, and that the guidance provides options to practitioners to choose from depending on the trail-specific circumstances.

Chapter 6. Data Analysis

This chapter focuses on describing the results in tabular, visual, and spatial formats. Appendix J provides trail profiles, which include the results in a visual/infographic format. Appendix G and Appendix H provide all statistics for trail counts and trail user surveys in tabular format.

6.1. Cady Way Trail

Figure 12 shows that the Cady Way Trail has seen a tremendous growth from 2016 to 2017 with highest annual traffic (bicycles and pedestrians) in 2017 followed by a decrease in traffic volumes in 2018. The web-based trail user survey results indicate trail user behaviors below.

More than 80% of respondents indicated that they travel to Cady Way Trail on a bicycle, which resonates well with the primary mode on the trail which is also bicycling. This indicates that the access to the trail supports non-motorized transportation, which plays a pivotal role in attracting trail users. Majority of respondents indicated that they use the trail for exercise, health or recreational activity (90%). A small share of respondents use the trail for commuting, which is expected. 47% of respondents indicated that they use the trail more than three times in a week. This does indicate that trail has a high share of regular users. As expected, Saturday (87%) and Sunday (81%) are the most popular days for trail users. The trail users prefer to be on the trail in the mornings before 10 AM (49%). Surprisingly, 23% indicated that they are on the trail in the afternoon from 2 pm to 6 pm. Cady Way Trail users are on the trail for an average duration of 1.59 hours, and an average trip distance of 10 miles. Approximately 60% of trail user respondents were male with 43% of the trail users in the age category of 50 and above.

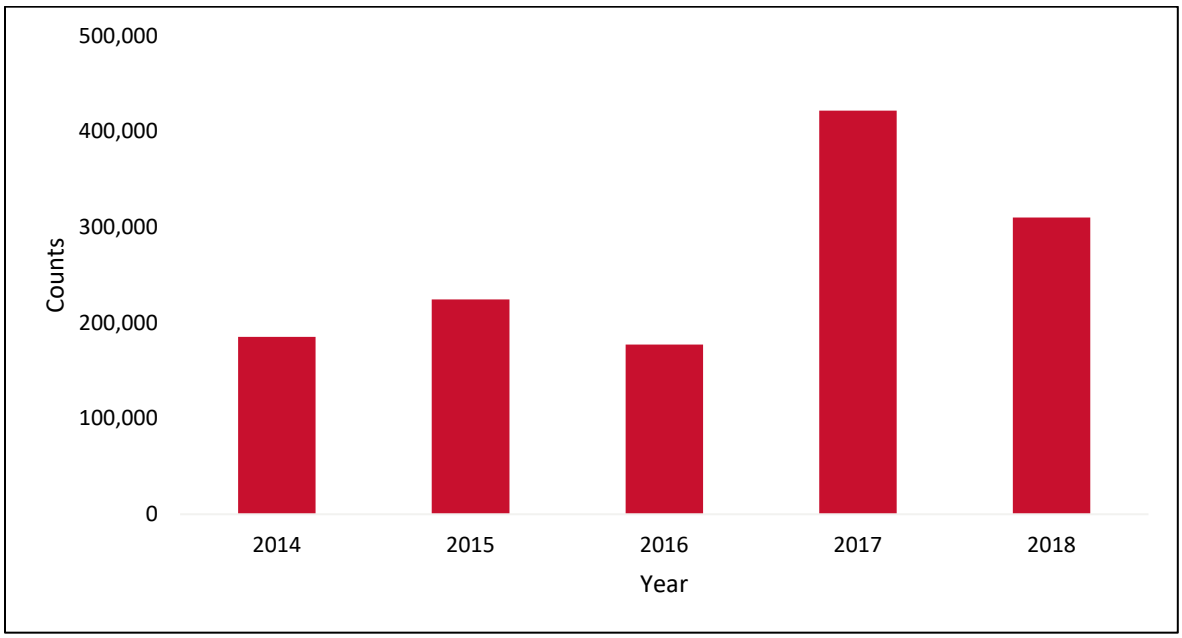


Figure 12 | Annual Volume of Bi-Directional Counts on two Cady Way Trail Sites

6.2. Orlando Urban Trail

City of Orlando conducts one short-term count on Orlando Urban Trail, which is bidirectional, and includes pedestrians and bicyclists. However, these counts cannot distinguish between pedestrians and bicyclists or directionality. The short-term counts are extrapolated to compute annual statistics. The annual statistics are estimated to be consistently around 60,000 from 2015-2018. The personal intercept and web-based survey results conducted on this trail indicate trail user behaviors below.

More than 50% of user respondents indicated that they bicycle or walk to Orlando Urban Trail, which resonates well with the primary modes on the trail which are bicycling (55%) and walking or running (45%). This indicates that the access to the trail supports non-motorized transportation which plays a pivotal role in attracting trail users. Most respondents indicated that they use the trail for exercise, health or recreational activity (87%). A small share of respondents use the trail for commuting. Thirty-nine percent (39%) of respondents indicated that they use the trail more than three times in a week. This does indicate that trail has a high share of regular users. As expected Saturday (93%) and Sunday (72%) are the most popular days for trail users. The trail users prefer to be on the trail in the mornings before 10 AM (52%). Orlando Urban Trail users are on the trail for an average duration of 1.26 hours, and an average trip distance of 5.88 miles. Approximately 70% of trail user respondents were male, with 46% of the trail users in the age category of 50 and above.

6.3. West Orange Trail

The West Orange Trail has nine continuous counters. The count locations are at Killarney-W, Killarney-E, Oakland Park, Tildenville Road Outpost, Division, Chapin Station, Pipe Bridge, and West Road, West of AVO, North of Keene Road and Apopka Station.

Figure 13 below provides monthly volume of bi-directional counts on selected West Orange Trail count sites. The count sites indicate that Tildenville Outpost, Killarney E and Apopka Station have the highest counts with the Tildenville Outpost near the Winter Garden and is flanked by multiple schools and churches. It is important to note that Winter Garden Station has the bicycle rental services which is a good location as it is one of the most popular sites on the trail. The other popular location is the Killarney E which houses the bicycle rental location and is the trailhead. Apopka station is the third most popular location and is the trail end. The trail counts indicate clear seasonality across the months. August is the most popular month, while the months from January to April are the off-peak months with the heavy trail traffic from May to December. The web-based trail user survey results indicate trail user behaviors below.

More than 80% respondents indicated that they travel to West Orange Trail on a bicycle, which resonates well with the primary mode on the trail which is bicycling too. This indicates that the access to the trail supports non-motorized transportation, which plays a pivotal role in attracting trail users. Many respondents indicated that they use the trail for exercise, health or recreational activity (90%). A small share of respondents use the trail for commuting. Forty-two percent (42%) of respondents indicated that they use the trail more than three times in a week. This

does indicate that trail has a high share of regular users. As expected Saturday (83%) and Sunday (87%) are the most popular days for trail users. The trail users prefer to be on the trail in the mornings before 10 AM (48%). West Orange Trail users are on the trail for an average duration of 1.81 hours, and an average trip distance of 11.5 miles. Approximately 60% of trail user respondents were male, with 46% of the trail users in age category of 50 and above.

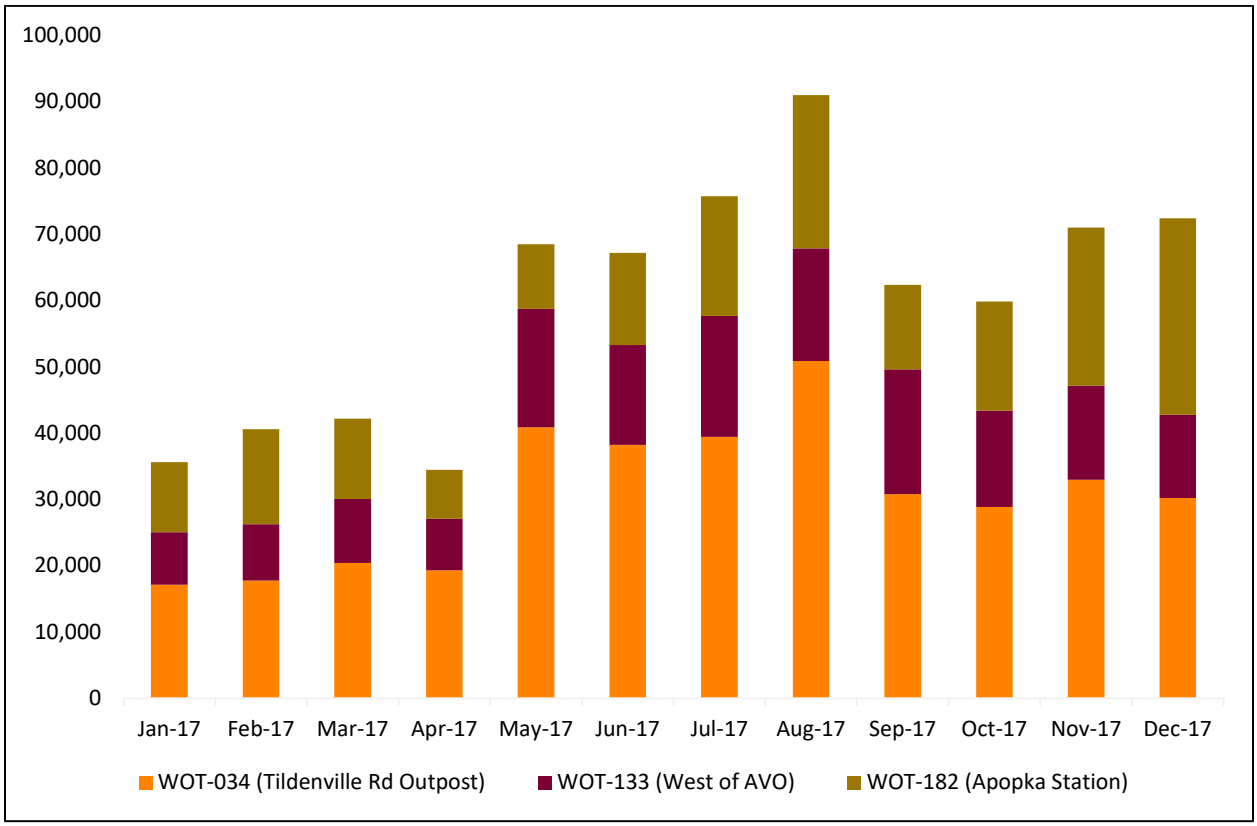


Figure 13 | Monthly Volume of Bi-Directional Counts on Major West Orange Trail Count Sites

6.4. Good Neighbor Trail

FDOT conducted four short-term counts on the Good Neighbor Trail, which are bidirectional and include bicyclists only. The short-term counts were conducted for two weeks. Figure 14 indicates that weekend bicycle counts are considerably higher when compared to weekday bicycle counts. The other important highlight of these counts was that the two count sites (Site #8 and Site #11) in a forested area (Withlacoochee State Forest) have higher trail counts when compared to the trailhead (Site#1) and the older trail section (Site #4), which is a more populous area. This clearly highlights that the Good Neighbor trail connection to Withlacoochee Trail on east has impacted the trail usage positively. The annual statistics were estimated by extrapolating the two-week counts, resulting in an annual estimate of more than 35,000 bicyclists in 2019.

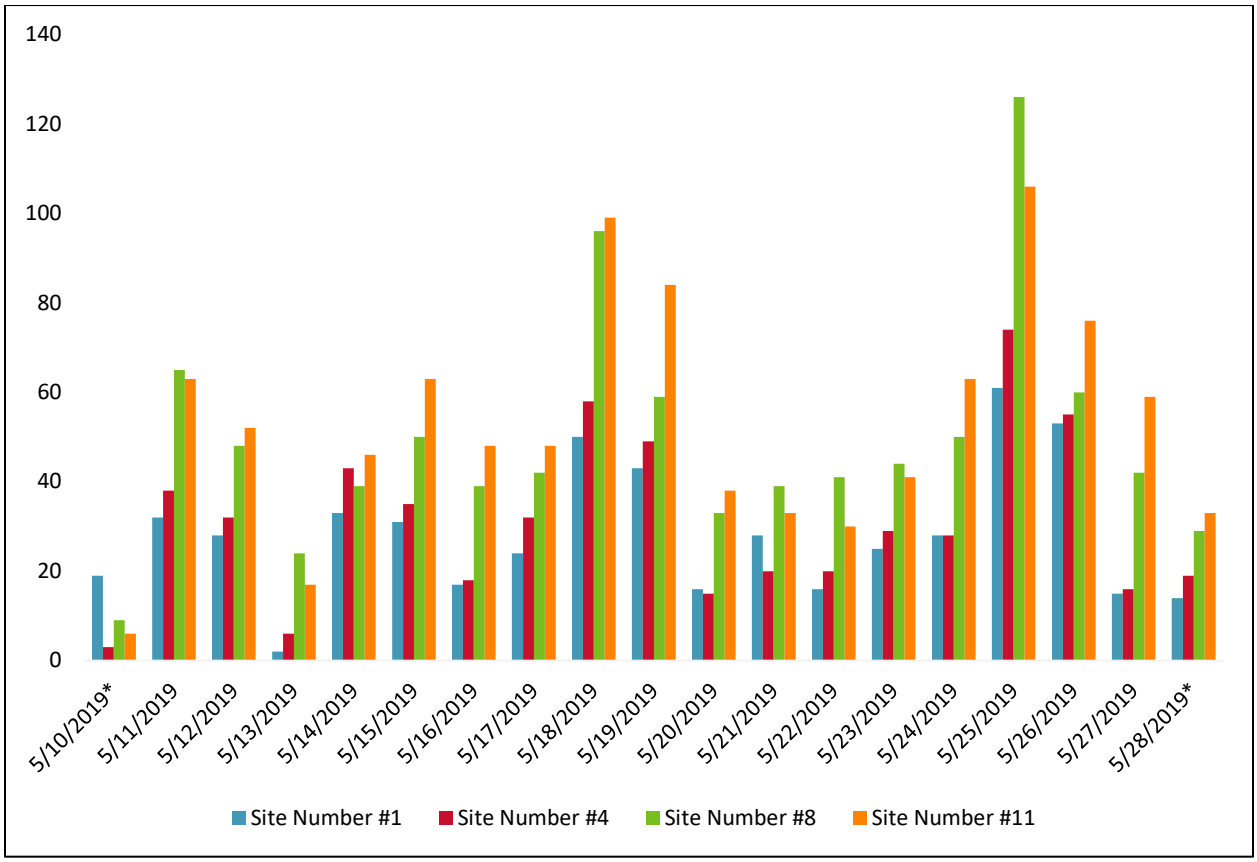


Figure 14 | Daily Volume of Bi-Directional Counts on Good Neighbor Trail Count Sites

*Collected data is not for the whole day.

The personal intercept (Figure 15) survey results indicate the trail user behaviors below.

More than 53% of respondents indicated that they use their cars to arrive at the Good Neighbor Trail. However, the primary mode on the trail is bicycling (76%). The majority of respondents indicated that they use the trail for exercise, health or recreational activity (87%). A small share of respondents uses the trail for commuting. Twenty-one percent (21%) of respondents indicated that they use the trail more than three times in a week. This indicates that the trail does not see frequent visits as it is more a recreational trail. As expected Saturday (95%) is the most popular day for trail users. The trail users prefer to be on the trail in the mornings before 10 AM (71%). Good Neighbor Trail users are on the trail for an average duration of 2 hours, and an average trip distance of 12 miles. Approximately 68% of trail user respondents were male, with 70% of the trail users in the age category of 50 and above.

Figure 15 | Trail User Survey on Good Neighbor Trail

6.5. Pinellas Trail

The Pinellas Trail has eight continuous counters at the following locations – East Lake Tarpon, Palm Harbor, Dunedin, Clearwater, Walsingham, Seminole, Bay Pines and St. Petersburg.

Table 9 | Trail User Counts on Pinellas Trail

Site Location	2017 Annual Counts	2017 Bicycle Share (%)	2018 Annual Counts	2018 Bicycle Share (%)
East Lake Tarpon	48,670	92	56,093	97
Wall Spring	271,175	79	No counts	
Palm Harbor	No counts		179,388	84
Dunedin	319,308	86	259,804	81
Clearwater	155,760	76	181,988	64
Walsingham	161,221	81	59,554	81
Seminole	193,519	79	201,657	64
Bay Pines	160,099	52	158,738	73
St. Petersburg	148,631	79	125,892	62

Table 9 indicates that, the annual counts at the Dunedin site are the highest with the Seminole and Clearwater sites showing strong numbers, too. It is important to highlight that Dunedin is the

first designated trail town in Florida. It has long been a mecca for non-motorized paved trail users. This anecdotal evidence supports the high counts at the Dunedin site. The personal intercept (Figure 16) and web-based survey results indicate trail user behaviors, which are summarized below.

More than 56% of respondents indicated that they bicycle to Pinellas Trail, which resonates well with the primary modes on the trail which is bicycling (65%). The count data from Table 9 further emphasizes that bicycling is the primary mode on the trail. This indicates that the access to the trail supports non-motorized transportation which plays a pivotal role in attracting trail users. Many respondents indicated that they use the trail for exercise, health or recreational activity (88%). The hourly count report for Pinellas Trail indicates that the peak period of the trail usage is between 6:00 am and 11:00 am. A small share of respondents uses the trail for commuting. Sixty-one percent (61%) of respondents indicated that they use the trail more than three times in a week. This does indicate that trail has a high share of regular users. Pinellas Trail users are on the trail for an average duration of 2.25 hours, and trip distance of 9.52 miles. Approximately 54% of trail user respondents were male, with 72% of the trail users in the age category of 50 and above.

Figure 16 | Trail User Survey on Pinellas Trail

Table 10 presents the different measures computed for the five trails. Appendix G and Appendix H provide comprehensive details.

Table 10 | Trail User Measures Details

Measures	Cady Way Trail	Orlando Urban Trail	West Orange Trail	Good Neighbor Trail	Pinellas Trail
Total number of visits	77,560	30,660	360,389	17,179 (bicycle only)	293,677
Total number of responses (personal intercept survey and/or web-based survey)	76	258	57	38	1,512
Top two primary travel modes to trail	Bicycle and Car	Bicycle and Pedestrian	Bicycle and Car	Car and Bicycle	Bicycle and Pedestrian
Top primary travel mode on trail	Bicycle	Bicycle	Bicycle	Bicycle	Bicycle
Average frequency of trail usage (Number of days per week)	2.68	2.54	2.56	2.88	3.37
Popular days of trail usage	Saturday and Sunday	Saturday and Sunday	Saturday and Sunday	Saturday	Saturday and Sunday
Popular time of days for trail usage	Morning (before 10 am)	Morning (before 10 am)	Morning (before 10 am)	Morning (before 10 am)	Morning (before 11 am)
Duration of trail visit (hours)	1.59	1.26	1.81	2	2.25
Distance traveled in a trail visit (miles)	10	5.88	11.54	12	9.5
Gender ratio of trail users (Male/Female)	1.48	1.16	1.43	2.08	1.14
Major age group of trail users	50 and above	50 and above	50 and above	50 and above	50 and above
Average amount ($) spent on a typical trail visit on soft goods	25.2	16.8	31.4	6.9	13.4
Average amount ($) spent on a typical visit on hard goods	314.5	255.5	299.4	583.4	347.0
Average amount ($) spent on accommodation if includes overnight stay	-	1,787.5*	50	3,000*	312.5
Health Benefit ($)	$88,500	$36,900	$431,700	$24,000	$266,500
Recreation Benefit ($)	$866,700	$319,800	$4,084,100	$233,800	$3,491,900
Reduced Auto Use Benefit ($)	$8,900	$3,600	$44,400	-	$30,400
User Expenditures ($)	$1,255,900	$284,400	$8,445,33300	$100,700	$1,887,400

* Indicates results skewed by a small number of respondents.

Chapter 7. Conclusions and Recommendations

7.1. Conclusions

This study defined concepts and datasets associated with trail transportation usage, establishes a scalable and repeatable methodology framework, and developed implementation guidelines to objectively quantify performance measures that can be used to evaluate trail-related performance measures. The framework is consistent, data-driven, repeatable, scalable, and ready for the implementation for all other SUN Trails in the State of Florida. The five case studies (Cady Way Trail, West Orange Trail, Orlando Urban Trail, Pinellas Trail, and Good Neighbor Trail) serve as an example of how a SUN Trail Transportation use study can be applied to other Florida trails.

The important findings of the data analyses are as follows:

- The primary mode on all five trails is bicycling, and the primary reason people use the trails is for exercise, health or recreational activities.
- The primary mode for people accessing the trails is by bicycle. This indicates that access to the trail supports non-motorized transportation, which plays a pivotal role in attracting visitors. The only exception is the Good Neighbor Trail, where people drive to use this facility, which may be because it is in a non-urban environment.
- A high number of trail users visit the trail more than three times per week. This indicates most trails in this study area have a high share of regular trail users.
- Most of the trail users prefer to use the trail before 10 a.m.
- The length and connectivity to other trails impacts the average duration and average trip length of the users. The trip duration ranges from 1.25-2.25 hours with an average trip length ranging from 5-12 miles.
- A relatively higher share of males and aging population (50 and above) use all five trails.
- The West Orange Trail and the Pinellas Trail have highest trail usage with approximately 300,000 trail visits per year. These trails have both urban characteristics, and provide extensive connectivity to others trails outside of the study area. The Cady Way Trail and Orlando Urban Trail see 77,560, and 30,660 annual visits, respectively. The Good Neighbor Trail experiences the least visits (17,179 bicyclists annually), it includes the newest segment in the study area and is in a more rural setting.
- The trail users surveyed indicate that visitation is primarily during weekends.
- Usage varies per locations of studied trails. The Good Neighbor Trail experiences higher usage along the segment through the Withlacoochee State Forest, which directly connects to the 46-mile Withlacoochee State Trail. Similarly, the West Orange Trail experiences higher usage at trailheads and through downtown Winter Garden. The Pinellas Trail receives the highest trail counts near the City of Dunedin, which was designated as Florida's first official trail town (2018) under an OGT program.

The study has also developed following important deliverables and materials, which can be applied by any other agency or organization:

- **Guidelines Framework:** The guidelines developed in this study are an agglomeration of the literature review and lessons learned from trail data collection, field user survey and associated analyses for the five trails selected for this study. The guidelines are summarized for trail use data collection, economic analysis, and other analyses. Appendix J (Study Brochure) provide the guideline details of this framework.

- **Stakeholder Engagement Materials:** This study developed a list of stakeholders that provided guidance and important data elements for this study. The stakeholder kick-off meeting was followed by a comprehensive stakeholder survey (Appendix D) and stakeholder interviews (Appendix E) to gather datasets and information for the different trail. The outcomes of the stakeholder engagement are explained in Chapter 4. The focus was to obtain information on following data elements:

  - Trail user counts;
  - Trail user demographics and behaviors;
  - Trail data management; and
  - Trail use data analysis.

- **Trail User Survey Instrument:** A personal intercept survey was conducted on the Good Neighbor Trail, and the Orlando Urban Trail. Similarly, a web-based survey was conducted on the Orlando Urban Trail, the Cady Way Trail, and the West Orange Trail. Forward Pinellas conducted personal intercept and web-based survey on the Pinellas Trail. The survey instruments and volunteer survey training packets are provided in Appendix F and Appendix J, respectively.

- **Private Business Survey:** Appendix I provides an example of a private business survey instrument. This study identified that a substantial outreach effort is needed to get significant responses from private businesses to understand the trail impacts.

- **Training Packet:** Appendix J provides a training packet, which can be used by any agency to conduct a personal intercept or web-based survey to understand the trail user characteristics and their behaviors.

- **Trail Profiles:** A two-page trail profile (Appendix J) is developed for each of the five trails as part of this study. These profiles are meant to serve as a useful reference infographics document, which can be implemented by any other agency or organization.

- **Study Brochure:** The study brochure (Appendix J) summarizes the complete study for understanding of any external stakeholders for future needs.

7.2. Recommendations

Recommendations identified as part of this study are follows:

- Develop a comprehensive benefits and economic analysis tool for trails. Industry standard economic input-output modeling products such as REMI or/and IMPLAN could be incorporated into this tool for economic impact analyses. This will be a major undertaking for the state as well as any other agency.
- Assist FDOT Non-motorized transportation count program in identifying count locations on SUN Trails.
- The trail counts should be assigned to the trail segments for meaningful interpretation. It is expected that this process is developed in FDOT's Non-motorized count program.

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Appendix A: Literature Review/Resources Matrix

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
1	2012 National survey of bicyclist and pedestrian attitudes and behavior, volume 2: Findings report. (Report No. DOT HS 811 841 B), Schroeder, P. & Wilbur, M. (2013, October).	USDOT NHTSA	National	• The survey was conducted to collect data about respondents who engaged in bicycling and/or walking outdoors. • The survey collected information regarding the availability of bicycle-pedestrian facilities, perceptions about walking/biking, and knowledge about bicycle-pedestrian laws. • This survey compared results with the 2002 administration.	• The survey was conducted through telephone calls with 16- to 39-year-olds. • 7,509 surveys were conducted with people in the U.S.	N/A
2*	2015 State Trail User Count (2016)	Parks and Trails, Council of Minnesota	Minnesota	• The general approach to this study was to: 1. select representative and accessible counting locations, 2. recruit volunteers to conduct field counts at each location, and 3. extrapolate the field count data to estimate non-winter traffic at each location.	• A series of manual trail counts at 25 locations to start building a body of knowledge on the nature and volume of use on Minnesota's state trails.	• Manual counting locations, representative and accessible, 37 segments, volunteer safety and accessibility, locations were near a city, trailhead, park, or major trail junction. • Volunteer recruitment to conduct field counts at each location, volunteer training to ensure consistent data collection, project overview webinar with instructions on when and how to conduct the field counts and a series of practice examples. • Six hours of counts on weekdays and four hours on weekends, peak hours. • Every person crossing the count location “screen line” was counted regardless of the direction, out-and-back users could be counted twice but replicates how automated counters work. • Counts were taken by age (adult or youth) and activity (bicyclist, walker, jogger, skater, equestrian or other) in 15-minute intervals. • Extrapolation of the field count data to estimate traffic at each location using extrapolation factors obtained from automated permanent counters from other Minneapolis trails.
3	2040 Long Range Transportation Plan, Technical Report 6: Bicycle and Pedestrian Plan (2016)	MetroPlan Orlando	Orlando, Florida	• The 2040 Long Range Transportation Plan (LRTP) includes an update to the Bicycle and Pedestrian Plan. • This document includes analyses for prioritizing bicycle and pedestrian projects in Orlando.	• Demand data will dictate how certain bicycle-pedestrian facilities are prioritized in the future. • Areas for improvements along bicycle-pedestrian facilities were determined based on existing conditions, socioeconomic data, and connectivity to transit.	N/A

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
4	Active Performance Measures (2015)	Fehr & Peers	N/A	• This document provides a number of recommended measures for analyzing bicycle-pedestrian facilities. • The recommended measures are based on the following topics: health & safety, multimodal, equity, education, access, infrastructure, economic development, and place-making.	• A number of case studies are provided for each of the recommended measures.	N/A
5	America's Rails-with-Trails, A Resource for Planners, Agencies and Advocates on Trails Along Active Railroad Corridors (2013)	Rails-to-Trails Conservancy	National	• This report analyzes 88 rails-with-trails to provide information regarding corridor width, railroad type, train frequency, train speed, rail-with-trail attitudes from agencies, setbacks, separations, crossings, liabilities, management and maintenance. • This report also provides a number of rail-with-trail case studies which provides the status, description, and design information for each facility. • The resources used in this report are publicly available online and include individual survey and interview responses, Recreational Use Statutes (RUS), legal agreements, rail-with-trail feasibility studies, image libraries, and a rail-with-trail list.	• Some national statistics are provided in this report, such as Rail-with-Trail Locations, Rail Deaths per 100 Million Miles of Train Travel, Railroad Classifications, Railroad Corridor Ownership, and data regarding the 88 rails-with-trails (previously mentioned). • Survey and interviews regarding the 88 rails-with-trails were used to gather information.	• This report provides information about legal and design issues related to rails-with-trails.
6*	An Economic Impact Analysis of the Coast to Coast Trail (2017) (DRAFT)	Tampa Bay Regional Planning Council (RPC) and East Central Florida RPC	Central Florida (nine counties Coast to Coast)	• Past surveys were combined with user counts, and construction spending to estimate, using the REMI model, economic impact of the C2C trail by county.	• Trail count data from the nine counties were collected from the nine counties. The number of trail users in the nine counties in 2015 (at 1.4M) is lower than the number of trail users just in Orange County in 2010.	• Users spending values were based on the 2011 Orange County trails study.

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
7*	Analysis of 2017 Trail Usage Patterns along the Great Allegheny Passage - (LT_Trail Data) (2018)	Allegheny Trail Alliance	Cumberland, Maryland to Pittsburg, Pennsylvania	• The estimates trail use patterns along the Great Allegheny Passage (GAP), it is based on two primary data sources. These numbers are based on direct TrafX counts, but also filled in data for days in which no counts are reported or in which the counts do not seem to be reasonable. These are then adjusted using a factor obtained by comparing with the manual count locations at the same site. Then use these adjusted TrafX counts to derive high-, middle-, and low-range estimates of total trail use along the GAP.	• TrafX counters and Synchronized Manual Counters.	• The recommendations are as follows: 1. Make every reasonable effort to gather the data in a consistent manner from year to year. To keep the count locations the same from year to year and continuing to conduct the synchronized counts at the same locations. 2. Collect as much data as possible. 3. That at least two of the synchronized counts be conducted on a weekend day (Saturday and/or Sunday).
8*	Bicycle & Pedestrian Annual Count Report (2017)	City of Orlando	Orlando, Florida	• Bicycle and pedestrian counters were rotated throughout Orlando's trail network. Counts were collected at each location for a minimum of two weeks.	• This study provides bicycle and pedestrian counts for trails in the Orlando area, including Cady Way Trail and the Orlando Urban Trail.	• The counters collect data for two weeks which may not be an accurate representation of the trail throughout the year.
9	Bicycle & Pedestrian Count Program Annual Report (2016)	City of Orlando	Orlando, Florida	• Bicycle and pedestrian counters were rotated throughout Orlando's trail network. Counts were collected at each location for a minimum of two weeks.	• This study provides bicycle and pedestrian counts for trails in the Orlando area, including Cady Way Trail and the Orlando Urban Trail.	• The counters collect data for two weeks which data may not be an accurate representation of the trail throughout the year.
10	Bicycle & Pedestrian, Count Program (2014)	FDOT District 5 (D5)	D5	• The data was collected at fourteen intersections for NBPDP and nine intersections in D5. The data for D5 was collected by filming each intersection for each 72-hour and 48-hour period. Two cameras were used at two opposing corners of each intersection in order to capture all pedestrian movements within the vicinity of the intersection. The videos were then counted off site and used for data verification. The data was then represented graphically for each intersection and the peak hour was identified for weekday and weekend.	• The data was collected during a two hour period on September 11, 2014 (5 to 7 PM) and September 13, 2014 (12 to 2 PM) as specified by the NBPDP. • The data for D5 was collected during a 72-hour (weekday) and 48-hour (weekend) period in September 2014.	• The purpose of this project is to expand the locations of bicycle and pedestrian traffic counts to include strategic locations throughout the FDOT D5 area.

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
11	Bicycle & Pedestrian, Count Program (2015)	FDOT District 5 (D5)	D5	• The data was collected at 15 intersections in D5. The data for D5 was collected by filming each intersection for each 72-hour and 48-hour period. Video recording for used at each intersection in order to capture all pedestrian movements within the vicinity of the intersection. The data was then represented graphically for each intersection and the peak hour was identified for weekday and weekend. The report also included a comparison of 2014 and 2015 daily/peak volumes.	• From September 15-20, 2015, weekday and weekend bicycle and pedestrian traffic data was collected using manual video counting at 14 intersection locations and one segment location within FDOT D5.	N/A
12	Bicycle and Pedestrian Count Programs: Summary of Practice and Key Resources (2018)	Pedestrian and Bicycle Information Center (PBIC)	National	• This document provides a summary of current practices for agencies who are starting or maintaining bicycle-pedestrian count programs.	• This document provides information on collecting counts, data management, data sharing, quality checking, etc.	N/A
13	Bicycling & Walking in the United States, Benchmarking Report (2016)	Alliance for Biking & Walking	National	• This project is a compilation of data regarding bicycling and walking trends in the United States. • This 2016 report is the 5th edition of the report which has been updated every few years since 2007. • The purpose of the report is to promote data collection and availability, establish standards to measure progress, and to strengthen partnerships to better improve bicycle-pedestrian facilities.	• Data was collected through publicly available sources and city/state surveys. • Various statistics and infographics are provided for the country and states.	N/A
14	Bicycling/Moving America Forward (2008)	The Bikes Belong Coalition	National	• This document provides a series of short summaries and infographics regarding the health benefits of bicycling.	• Data was collected from a variety of sources, including public sources and data from previously conducted surveys.	• This study was completed in 2008 and therefore some of the statistics may be out-of-date.
15*	Cady Way and Orlando Urban Bike and Pedestrian Trails (and Downtown Transportation Plan)	City of Orlando	Orlando, Florida	• This website by the City of Orlando provides general information about the five trails within the City of Orlando: Cady Way, Lake Underhill, Orlando Southeast, Orlando Urban, and Shingle Creek.	• Information includes general trail characteristics, amenities, and attractions along the trails.	N/A

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16*	Capital District Trail User Counts (2016)	Parks & Trails New York for the Capitol District Transportation Committee	Capital Region multi-use trails	• NBPDP Background Data Sheet and Standard Screen line Count Form can be used. • Six trails, 22 count locations close to trailheads that had trail parking nearby. • Electronic counts were undertaken in three-week (seven-day) periods in September. • Observational counts were conducted for one day during each week. • Passive infrared counters were installed to monitor traffic continuously for seven days. • Passive infrared counter must be installed 36 inches off the trail surface and can detect activity from up to 13 feet away. • Electronic counters were installed where the observed count was conducted. • At 10 locations bi-directional counters that could measure direction of user travel were installed.	• Trail User Counts.	N/A
17	Case Studies in Delivering Safe, Comfortable, and Connected Pedestrian and Bicycle Networks (2015)	U.S. Department of Transportation Federal Highway Administration	National	• This report primarily summarizes project examples under the following categories: Planning and Prioritization, Shared Use Paths, Corridor Improvements, Bridges, On-Road Facilities, and Intersection and Crossing Improvements.	• Sources used for this report are cited at the end of the document and includes sources from USDOT, Dutch Centre for Research and Contract Standardization in Civil and Traffic Engineering (CROW), FHWA, Walk Score, NCHRP, the Mineta Transportation Institute, and other literary works. • The USDOT National Travel Survey was used in the development of the report.	N/A
18	Case Studies in Delivering Safe, Comfortable, and Connected Pedestrian and Bicycle Networks, Volume II (2016)	U.S. Department of Transportation Federal Highway Administration	National	• This report primarily summarizes project examples under the following categories: Planning and Prioritization, Shared Use Paths, Corridor Improvements, Bridges, On-Road Facilities, Intersection and Crossing Improvements, and Comprehensive Projects and Programs.	• The resources used to develop this report are not referenced.	N/A

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19*	Clear Creek Trail Study (2007)	Bloomington, Indiana, Parks & Recreation Department	Clear Creek Trail	• Trail user counts using active infrared trail counters, installed near the entrances, recorded by date and time. • Observational manual counts by date and time were used to develop model to adjust the infrared counts (adjustment factor 15%, 1.15). • Face to face survey interviews, every 3rd trail user entering was selected to eliminate selection bias, 32 multiple choice and open-ended questions.	• Trail User Counts. • Trail User Survey.	• Counts do not represent the number of users, only the number of times that the beam was broken. • Battery failure, inconsistent data recording and interference such as people or ants blocking the active infrared beam are some of the limitations.
20	Coast to Coast Trail Atlas (2016)	The Florida Department of Economic Opportunity	Coast to Coast Trail, Florida	• This source provides a series of maps showing the Coast to Coast (C2C) Trail and amenities/attractions along the trail.	• The maps show neighboring trails, studies, trailheads, transportation, ATMs, hospitals, emergency sites, campgrounds, museums, wildlife areas, parks, food vendors, and wetlands/lakes.	N/A
21	Coast to Coast Trail Implementation and Marketing Toolkit (2017)	Coast to Coast Trail Florida	Coast to Coast Trail, Florida	• This report provides overviews of the C2C leadership team, the C2C website, key stakeholders that are involved in the trail's development, recommended actions for the future planning, design and construction of the trail segments, and economic development and tourism.	• Public references were used to develop this report, including the following websites: Crime Prevention through Environmental Design, Forward Pinellas - Pinellas Trail Security Task Force (PTSTF), Florida Greenways and Trails, Florida Department of Transportation, and the City of Winter Garden Comprehensive Plan 2010-2020.	• This report supplements examples in the Urban-Rural Overlay Report.
22*	Coast to Coast Trail Urban-Rural Overlay Study (2016)	Coast to Coast Trail Florida	Coast to Coast Trail, Florida	• An Assets and Opportunity Inventory was identifies the amenities along the C2C. • Public stakeholder workshops were held to gather information for the analyses of the proposed segments. • Webinars were conducted to provide guidance to the Tampa Bay and East Central Florida RPCs regarding procedures for conducting opportunity inventories. • Public information was gathered to create design guidelines.	• Some public resources listed in the document include information from the Florida Association of Native Nurseries and floridasnature.com. • The stakeholder workshops provided brainstorming sessions where suggestions were made to improve trail design.	• The proposed design guidelines may be relevant to trail profiles, such as proposed wayfinding signage and trail amenity guidelines (e.g. restrooms, drinking fountains, bicycle parking, etc.). • The trail habitat maps provided may be useful for trail profiles. • This report focuses on concepts that can be used to unify design guidelines throughout the trail, but may be helpful in developing trail profiles.
23	Coding Non-motorized station location information in the 2016 Traffic Monitoring Guide format (2016)	USDOT FHWA	N/A	• This guide provides information on the Traffic Monitoring Guide (TMG) format and how to format counts for multimodal users. • The TMG non-motorized format is required for any data submitted to the Traffic Monitoring Analysis System (TMAS).	• This guide provides examples of various counting scenarios and how those counts should be formatted to the TMG standard.	N/A

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24	Conflicts on Multiple-Use Trails: Synthesis of the Literature and State of the Practice	The FHWA and The National Recreational Trails Advisory Committee	National	• This report is intended to summarize information regarding trail-user conflicts on multiple-use trails. • Part I of this report provides a synthesis of literature regarding multiple-use trails, and Part II identifies gaps in knowledge and provides recommendations for future research that could help bridge those gaps.	• Sources used to develop this report are referenced throughout the document, but not compiled into a single list.	• This report references studies completed in the 1980s and 1990s, and therefore is probably too outdated.
25*	Counting Program Master Plan, April 2015	New Hampshire Bicycle and Pedestrian Transportation Advisory Committee (BPTAC)	New Hampshire	• The following elements are essential for the successful development of a bicycle and pedestrian counting program: 1. Identify and recommend equipment and techniques that are both functional and affordable. 2. Identify equipment and techniques that can count accurately and with an appropriate level of detail when needed (distinguish between bicycles and pedestrians, times of day, etc.). 3. Establish data standards and formats that ensure the data collected is compatible and allows the information collected to be useable for multiple purposes. 4. Allow flexibility for the entity doing the counting. 5. Maximize the potential for future growth of the program in sophistication and in number of counts. • The recommended manual count strategy is largely based on recommendations from the National Bicycle and Pedestrian Documentation Project (NBPDP). • The BPTAC counting subcommittee identified Eco-Counter equipment to be best suited for present and future counting needs in New Hampshire based on its research of available equipment.	NA	NA

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26*	Economic and Health Benefits of Bicycling in NW Arkansas (2018)	Walton Family Foundation	Northwest Arkansas	• Monetization of health/mortality benefits using the WHO HEAT model and trails usage by bicyclists. • Collection of bicycling-related expenditures data.	• Trail usage. • Trail users' behavior. • Data on residents spending on bicycles, equipment, and events.	• Inappropriately mixed/added benefits and impact/spending amounts together. Limited to bicycling (no walking) only. The HEAT model is designed for European geographies. • The amounts are the summation of the impacts from spending and health benefits that's inappropriate in this study. Economic impacts and benefits should be reported separately, and as an aggregate into one dollar figure.
27*	Economic Impact Analysis of Orange County Trails (2011)	East Florida Regional Planning Council	Orange County (three trails)	• Surveys were conducted with users along three different trails in Orange County, and the REMI model was applied to estimate the related economic impacts to the County.	• Consumer spending related to trails, and usage of trails in Orange County including users' characteristics.	• Summary descriptions of the Cady Way and West Orange trails are included in the report. • The primary focus is on the economic impact of user spending based on a survey conducted about eight years ago.
28*	Erie to Pittsburgh Trail (Between Titusville and Parker, Pa.) 2013 User Survey and Economic Impact Analysis (2014)	Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation	Erie to Pittsburg Trail (EPT), Pennsylvania	• Passive infrared counters were placed at 12 locations along the 66 miles of trail. These counters collect data on the number of trail users passing the counter by detecting each user's "heat signature." • This survey was designed specifically to monitor trail-user characteristics and economic impact. • Economic Impact Analysis based on: - Annual Hard Goods Purchase (bicycles, bicycle equipment, running/walking shoes, etc.). - Soft Goods Purchase (water, soda, snacks, ice cream, lunches, etc.). - Lodging Expenses (motel/hotel). • This study utilized a survey methodology previously tested on Pennsylvania trails and documented in RTC's Trail User Survey Workbook. • RTC's Trail User Survey Workbook template as a starting point, the survey form was refined with input from the staff and volunteers of the Council on Greenways and Trails, Oil Region Alliance and Allegheny Valley Trails Association. The sample was self-selecting, meaning trail users could pick up survey forms that were available at each of the trail's primary trailheads.	• An analysis of the data accumulated from infrared counters located along the Trails and paper surveys received from users indicates an estimated 158,507 annual user visits to the combined Trails. • In order to develop an annual user estimate, the data collected from mid-May through October was extrapolated to a 12-month estimate using a User Visit Model developed by RTC. • Trail user survey. - Visitor home zip code, trail visit frequency, age, visited with children, gender, primary trail activity, trail use day, time spend on the trail, main use of the trail, source to get the trail info, money spend to buy items (bicycle, clothing etc.) to visit trails, money spend as part of the trail visit (meals, beverages etc.), trail visit accommodation (overnight stay) information (place, number of days, accommodation expenses), trail maintenance, trail security, trail cleanliness, trail access points, name of the trail visited.	• 55% for exercise, 43% for recreation, 1.4% for transportation.

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29	Evaluating the Economic Impact of Shared Use Paths in North Carolina (2018)	ITRE, Alta, NCDOT	North Carolina	• Monetization different benefits (health, congestion relief, safety, and air pollution) of switching modes to trail usage by applying travel demand data and various factors and models. • Applied of the IMPLAN model and survey and other data to estimate economic impacts from trail user expenditures, operations and maintenance (O&M) and capital spending, and property values.	• Trail usage. • Trail users' characteristics. • Data on trail users' spending. • Capital and O&M costs. • Transportation data on congestion.	• Large effort with diverse methodologies, data sources, and models. • Resource consuming.
30	Evaluating the Use of Crowdsourcing as a Data Collection Method for Bicycle Performance Measures and Identification of Facility Improvement Needs (2015)	USDOT FHWA	Oregon	• This study developed a smartphone application called ORcycle to collect data about cyclists. • The app collects data through GPS technology and by prompting the user with questionnaires.	• The app has collected data on a number of characteristics, such as the specific routes the cyclist uses, route choice, comfort level, route stressors, demographic information, etc.	N/A
31	Federal Trail Data Standards (2010)	Standards Development Group Federal Geographic Data Committee	N/A	• Universal trail data standards will enable national, regional, state, and trail-level managers and the public to use mutually understood terminology for recording, retrieving and applying spatial and tabular information. • The Federal Trail Data Standards (FTDS) identify a common set of standardized terminology that can be consistently applied to a core set of trails information.	N/A	• The Federal Geographic Data Committee (FGDC) is composed of representatives from the Departments of Agriculture, Commerce, Defense, Energy, Housing and Urban Development, the Interior, State, and Transportation; the Environmental Protection Agency; the Federal Emergency Management Agency; the Library of Congress; the National Aeronautics and Space Administration; the National Archives and Records Administration; and the Tennessee Valley Authority.
32	FHWA Bicycle-Pedestrian Count, Technology Pilot Project, Summary Report, December 2016, Report No. DOT-VNTSCFHWA-17-02 (2016)	USDOT FHWA	10 MPOs from across the United States	• This report provides a summary of the FHWA's one-year Bicycle-Pedestrian Count Technology Pilot Project. • The FHWA selected 10 MPOs from across the country to participate in the project, and this report summarizes how each MPO identified count locations, selected/installed count technology, and collected/used count data.	• Automatic counters were used for periods ranging from one week to six months. • Some MPOs validated automatic count data by conducting manual counts. • The report also provides information regarding pros and cons for each type of counter.	N/A

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33*	Gitchi-Gami State Trail 2015 & 2016 Usage Studies (2015)	Arrowhead Regional Development Commission (ARDC) Regional Planning Division	North Shore of Lake Superior	• Seven automatic active infrared trail counters were used for 23 sites, setup height 40 inches (optimal height for counting bicyclists), TrailMaster TM 1550 model range 150 feet, aimed away from road, avoid tree branch wave. • Control sites were placed at two locations which were monitored throughout the summer, chosen based on their abilities to host seasonal counters (and not fall or be tampered with) as well as their ability to represent respective county segments (by being located centrally and/or in proximity to amenities that represent the Gitchi-Gami State Trail segments, broken down by county). • The other sample sites were monitored for 10 consecutive days using five trail counters by rotating the trail counters. • Counts were adjusted by multiplying by 1.292, a multiplier based on previous trail count studies that corrects for occlusion (when more than one trail user passes the counter simultaneously and is counted as one user). • Seasonal factors (for the specific dates) obtained from the control site permanent counts were used to estimate the total summer counts for the sample sites.	• Trail User Counts.	• Year 2016 Gitchi-Gami State Trail Usage Study, included the addition of An Eco Pyro Box counter (control site) which works by use of a passive infrared scanner, the Pyro Box counts people passing within the range by detecting their body temperature, did not require a receiving unit meaning that there were no misalignment issues when gathering counts. Additionally, the Eco Pyro counter has the ability to transmit data automatically to a cloud based server where data analysis can be performed online. • Creating validation methods to ensure acceptable counter performance is necessary, Example: abnormally high counts because of child running back and forth (Active or Passive infrared counters), butterfly flying (Active infrared counters), etc. • Infrared TrailMaster counters do not differentiate between bicyclists, walkers, runners, etc., to obtain on the type of usage a device differentiating user types or a person taking notes manually (or collecting and reviewing trail video), inability to count two or more trail users who pass the counter simultaneously (occlusion).
34*	Good Neighbor Trail	The City of Brooksville	The City of Brooksville	• This website provides general information about the City of Brooksville's Good Neighbor Trail. A Google map location of the trail is also provided.	• Data includes general information about the trail, such as the length, trailhead location, and description.	N/A
35	Guidebook for developing pedestrian and bicycle performance measures (2016)	USDOT FHWA	N/A	• This document provides information for how bicycle-pedestrian investments, activity, and impacts can be measured and how these factors are related to communities' planning processes. • Examples of communities using these measurements in their plans are also included in the report.	• The report identifies resources that can be used to facilitate bicycle-pedestrian planning in communities. • The report also provides information about datasets that are needed for various performance measures.	N/A

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36*	Guidebook on Pedestrian and Bicycle Volume Data Collection, 2014 and errata 2016, Report 797 (2014)	Transportation Research Board (TRB) of National Academies, National Cooperative Highway Research Program	N/A	• This document describes methods and technologies that can be used for counting pedestrians and bicyclists, and also provides information on automated technology implementation. • Guidance is also provided for developing a data collection program, selecting counting technologies, and information on how to use the data collected.	• This document provides a wide range of examples and case studies for methods that can be used to collect bicycle-pedestrian data and examples of how to utilize the data.	N/A
37	Increasing Ridership of Santa Fe Trails (2013)	Santa Fe Trails	Santa Fe, New Mexico	• This study evaluated methods that could increase bus ridership for Santa Fe Trails. • Surveys were distributed to bus riders and non-riders to determine improvements to the system. • Improved signage and a smartphone application were also added/developed to provide riders with more transit information.	• 36 surveys were collected from the public. • 273 surveys were collected from bus riders. • Data from the Santa Fe Trails were used to generate the Google transit feed files for the trip planning application.	N/A
38	Indiana Trails Use Study (Summary Report)		Indiana	• This study is a comprehensive review of six trails in Indiana. • 240 different variables were analyzed in four different surveys and traffic counts that were completed between June and November 2000.	• Trail counts were recorded by infrared counters and downloaded in the field and later transferred to computers. • Count results are summarized in the report.	• This study consists of seven volumes: one for each of the six trails analyzed, plus the summary report. • The link provided is to an updated version of the study.
39	Innovation in Bicycle and Pedestrian Counts (2016)	Alta Planning + Design	N/A	• Different technologies in data collection.	N/A	• New technologies are emerging that aim to change the way active transportation data is collected, making it less expensive and easier to collect, resulting in more reliable data. This report provides a review of these technologies and their applications.
40	Mapping ridership using crowd sourced cycling data., 2016	Jestico, B., et al	Victoria, British Columbia	• This study used data provided by Strava.com to quantify how crowd sourced data from a fitness app represented bicycle ridership by comparing the data to manual counts. • The study team used GIS and a Generalized Linear Model to understand the relationship between the data.	• Data was collected through the Strava fitness app and collecting manual counts. • Counts ranged from 15 to 534 cyclists per hour. • Count stations consisted of various intersections; these included major roadways, residential streets, and paved multi-use trails.	N/A

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41	Methodology for Linking Greenways and Trails with Public Transportation in Florida, Final Report (2016)	FDOT and the National Center for Transit Research (NCTR)	Hillsborough County and Pinellas County	N/A	• Local government comprehensive plan, the transit development plan, and community master plans. The Metropolitan Planning Organizations (MPO) for both Hillsborough and Pinellas Counties were the primary data sources for the investigation. • Newsletters of MPO committees, such as Livable Roadways and the Bicycle and Pedestrian Advisory Committees (BPAC), and BPAC meeting minutes.	• One of the goals of MetroPlan Orlando's bicycle and pedestrian Plan was to prioritize bicycle and pedestrian projects that will shift travelers away from single occupant vehicle travel. • MetroPlan Orlando used a prioritization matrix that identifies criteria of importance to the community and assigned weights to the criteria.

42*	Methods and Technologies for Pedestrian and Bicycle Volume Data Collection (2016)	AASHTO, in cooperation with the FHWA, and was conducted in the NCHRP, which is administered by the TRB	N/A	• The research described in this NCHRP Phase II report evaluated five additional automated count devices, representing four different detection technologies that is not evaluated in the NCHRP Report 797: Guidebook on Pedestrian and Bicycle Volume Data Collection. • The research evaluated automated non-motorized count technologies in different settings, including ranges of temperature, varying weather conditions, mixed traffic conditions, mixed travel directions, and facility types (e.g., roadways, multi-use paths), to determine their accuracy and reliability. • It is clear from the testing that careful site selection plays an important role in the ultimate accuracy of the collected count data. • It is also critical to calibrate the counters at specific sites to obtain the most accurate and reliable results. • Passive infrared counter detects the infrared radiation (i.e., heat) given off by pedestrians and bicyclists, and the system counts the number of heat-emitting objects that pass through: 1. Primary sensor technology used at present in the United States. 2. Relatively easy to install. 3. Background conditions that can accumulate heat in the sun may trigger false detections. 4. Passive infrared sensors are susceptible to false positives when windows, mirrors, or other reflective surfaces are positioned behind the pathway being counted. 5. Occlusion (i.e., where one person blocks another from the sensor's view when both pass the counter's sensor at the same time) was found to occur with higher user volumes, resulting in undercounting. 6. The testing found a weighted average undercounting rate of 9.5% and a total deviation of 22.5%.	• Inductive Loop Counter consists of wire "coiled" to form a loop that usually is a square, circle or rectangle that is installed into or under the surface of the roadway: 1. A weighted average over counting of 4.8% and an average total deviation from the actual counts of 10.5% were found. 2. Larger undercounting will occur at sites where the bicycle travel way is wider than the detection zone, as a result of bypass errors. • It is recommended that practitioners calibrate and conduct their own ground truth count tests for the automated technologies they deploy at a given site or set of sites. • Recommends that practitioners develop correction factors on a site-specific basis. • Combination counters use multiple. technologies to generate separate estimates of pedestrian and bicycle volumes. • Passive infrared detection to get aggregate counts and inductive loops to get separate bicycle counts.	• Active infrared counter emit infrared radiation which is received by the receiver and the pedestrian and bicycle movements are counted when the beam between the transmitter and receiver is broken by movement. 1. It is moderately easy to install, but special attention should be given to align the transmitter and the receiver. 2. Interference such as people or flying butterflies blocking the active infrared beam are some of the limitations. 3. Counts do not represent the number of users, only the number of times that the beam was broken. 4. The device was found to have a weighted undercount rate of 7.6% with a total deviation from actual counts of 7.3%. • Radar devices operate by emitting electromagnetic pulses and deducing information about the surroundings based on the reflected pulses. • Pneumatic tubes detect the pulses of air generated when a vehicle or bicycle rides over the tube. 1. The tubes are relatively easy to install but ongoing, routine checks of the site are recommended to make sure the tubes have not become dislodged. 2. The net weighted average accuracy of bicycle-specific pneumatic tubes showed an undercount by an average of 19.8% with an average total deviation from actual counts of 22.2%. • Piezoelectric strips emit electrical signals when deformed by bicycle wheels running over them.

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43*	Miami Valley Trail User Survey Report (2017)	Miami Valley Regional Planning Commission, Ohio	Miami Valley, Ohio	• Collection of trail users-related expenditures data on soft and hard goods, and overnight stays along with other user data to derive direct spending-related economic impact estimates. • The report provides summaries of the methodology and lessons learned for each question administered within the survey.	• Trail usage. • Data on users spending on hard and soft goods, and overnight spending related to trail usage.	• References the Rails-to-Trails Conservancy trail user survey and "economic impact" methodology. • Accounts only for direct spending by trail users to estimate related "economic impact". • 1,170 surveys were collected from 8,868 people who were counted on the trails.
44	Modeling the Impacts of Bicycle Facilities on Work and Recreational Bike Trips in Los Angeles County, California (2014)	Los Angeles County, Metropolitan Transportation Authority (LACMTA)	Los Angeles County, California	• In this study, two models were developed to predict the increase of bicycle trips and miles traveled as a result from investments in bicycle facilities in Los Angeles County. • Other variables included in the models were demographics, land use, and infrastructure.	• The first model was a regression model that used census data from the American Community Survey to predict commutes by mode. • The model involved two disaggregate models that used data from the National Household Travel Survey to predict frequency of bicycle trips.	N/A
45	Modes Less Traveled-Bicycling and Walking to Work in the United States: 2008–2012, (May 2014)	U.S. Census Bureau	National	• This report summarizes census data in relation to non-motorized traveling characteristics. • Summaries are provided which explore commuting trends, walking/biking comparisons across different regions, commutes by residence type, trends by income level, and many other characteristics at a national level.	• Census data by various years.	N/A
46*	Monitoring Bicyclist and Pedestrian Travel and Behavior Current Research and Practice (2014)	Transportation Research Circular, Transportation Research Board	N/A	• Identification of a selection of recent advancements in bicycle and pedestrian data monitoring pertaining to both traffic volumes and behavioral data. • Capturing temporal variability-continuous counts, few count locations; often the relevant patterns across time correlate significantly, hourly, daily, and monthly expansion factors can be created. • Capturing spatial variability-many locations with shorter count periods.	N/A	N/A

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47	Multiuse trail intersection safety analysis: A crowd sourced data perspective (2017)	Geographical Sciences and Urban Planning, School of Spatial Analysis Research Center (SPARC)	Capital Regional District, British Columbia, Canada	• This study identified unsafe design characteristics between multi-use trails and roads. • The team found that a higher proportion of collisions and incidents occurred at multi-use trail-road intersections when compared to road-road intersections.	• The team used collision and near miss incident data from BikeMaps.org and conducted site observations at 32 intersections. • A negative binomial regression was used to model the relationship between the number of incidents and infrastructure characteristics.	N/A
48*	National Bicycle & Pedestrian Documentation Project (NBPD) (2010)	Institute of Transportation Engineers Pedestrian and Bicycle Council	N/A	• NBPD recommends conducting pedestrian and bicyclists' counts during the designated national count week, the second week in September. Agencies are asked to select a Tuesday, Wednesday or Thursday, and a Saturday following or preceding the count week. Recommended times are from 5 to 7 PM on weekdays (to correspond with peak travel times) and noon to 2 PM. on Saturdays to target recreational users. • NBPD recommends that agencies conduct manual counts in conjunction with automated counts to obtain information for estimating annual usage, benefits and economic impacts.	NA	• Manual counts track bicycle and pedestrian travel in a very limited time frame and do not account for various factors that impact trail use patterns. • The bicycle and pedestrian count data collection instructions provided in this report is generic and not specific for the trail user counts data collection.
49	Naturalistic Bicycling Behavior Pilot Study (2017)	FDOT and the Center for Urban Transportation Research (CUTR)	Tampa Bay Area	• Developed a Data Acquisition system. Collected estimated 2000-participant-hour naturalistic bicycling behavior data. • Developed a process for using the collected data to conduct analysis.	• Video from forward- and rear-facing cameras. • Distance data from four sensors, one for each side of bicycle. • GPS (global positioning system) data for location and route every one second. • Accelerometer data on three axes. • Gyroscope data on three axes (pitch, roll, and yaw). • Light level for environment conditions. • Origin, destination, trip length, and trip reason; input from participant.	• Portable low-energy embedded system comprising several components.

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
50*	Non-Motorized Transportation Count Data Collection Study (2017)	FDOT	Florida	• The objective of this Non-Motorized Transportation Count Data Collection Study is to develop a recommended practice for the Department to establish a statewide pedestrian and bicycle count program. • In this study, as part of the stakeholder outreach, a Statewide Bicycle and Pedestrian Program Survey was conducted. • The greatest need for trail managers is knowing the total usage counts on Florida's trails. This can help demonstrate the benefits of trails, including their economic impact and health benefits. • Many trail count devices have been removed by trail managers because of high vandalism rates; therefore, consider counters that are embedded into pavement or are resistant to vandalism. • Miami-Dade Transportation Planning Organization (TPO) utilized piezoelectric strips installed on the M-Path, which is a multi-use trail that is roughly 10 miles and travels underneath the MetroRail in Miami. • Pinellas County Parks and Conservation Resources Department installed five infrared devices throughout the Pinellas Trail, which is a 47-mile long trail within Pinellas County. These devices count all users that pass through the infrared beams, but do not distinguish between different users. Three of them are permanently installed in the north, central and southern portions of the trail with two of them being portable to allow for the department to count as necessary. The data they collect is being used to justify further funding for trail expansions and assist with maintenance needs for the trail.	• While the passive infrared could count both types of users, it is not able to distinguish between them. • Florida's future Statewide Non-Motorized Count Program should be comprised of a collection of continuous and short duration monitoring locations around the state. • FDOT should conduct short term counts for at least one weekday and one weekend day per location. • Two hour intervals are common for manual counts and times vary with automated counts. • Non-motorized monitoring equipment at continuous monitoring locations would collect data in select areas to develop correction/adjustment factors and trends to extrapolate data from shorter duration sites. • Fiber Optics, Bluetooth and Wi-Fi, and Crowd-Sourced Data such as Strava dataset are identified as emerging technologies that may provide additional opportunities for improving the accuracy and reliability of the counts.	• To properly recommend a methodology for monitoring non-motorized traffic in Florida, a series of pilot studies were conducted to examine and compare non-motorized monitoring technologies in different conditions. • Based on the Pilot study, it is recommended that FDOT utilize automated or manual video imaging equipment for most of the context land use zones or facility types and passive infrared/pneumatic tube equipment for bicycle-specific facilities. The devices automatically transmit the data back to the department so they can review it, eliminating the need for staff to travel into the field to retrieve the data. • Recommended to utilize a combination of passive infrared and pneumatic tube equipment for non-motorized specific facility types. These technologies performed better overall in terms of accuracy when installed on trails and shared-use paths. • If a combination of technologies cannot be used, then video recording or manual counts must be used as they can differentiate between users. • The Palm Beach MPO employed this methodology at some of its sites when counting bicyclists and pedestrians as part of the FHWA Bicycle-Pedestrian Count Technology Pilot Project. They installed the pneumatic tube devices along the bicycle lane when possible and then installed the passive infrared devices on a vertical element (street sign, telephone poll, etc.) so they could collect data on different non-motorized users.

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
51	North Carolina Non-Motorized Volume Data Program (NCNMVDP) (2017)	NCDOT	North Carolina	• Phase I of the NCNMVDP involved 12 locations where continuous count stations (CCSs) were installed to monitor bicycle and pedestrian traffic; these stations went live in late 2014. • Additional count stations were added to Phase I of this study in 2015 and 2016. • Phase II consisted of installing nine CCSs in late 2016. • As of January 2017, there are a total of 25 count stations across North Carolina.	• Summaries, graphs, and charts of the data gathered from the 25 count stations are included in the report.	N/A
52*	Orange County Multimodal Corridor Plan Phase 1, (2014)	Orange County	Orange County	• The goal for this plan is to create a 2040 transportation network for Orange County that correlates with the MetroPlan Orlando 2040 Long Range Transportation Plan. • This plan primarily focuses on the county's current and future multimodal system needs in regards to transportation, land use, and capital planning.	• The Safety Theme within this plan was developed based on crash data. • Data collection methods are planned to be expanded on through the integration of emerging technologies. • The county will continue monitoring available data sources through other projects occurring within the county.	N/A
53*	Pinellas County (Guide to the Pinellas Trail)	Pinellas County	Pinellas County	• This website provides general information about the Pinellas Trail. The site also provides links to media sources, audio tours, maps, trail rules, and other related information.	• The website includes general information about the trail, such as amenities, activities, and attractions.	N/A
54*	Pinellas Trail Users Survey (2014)	Pinellas County Metropolitan Planning Organization	Pinellas County	• Surveys were conducted to collect data regarding the Pinellas Trail use. • Surveys include inquiries regarding trip mode, purpose, and distance to/on trail, frequency of use, residency, age, and gender.	• This study summarizes trail use surveys for the Pinellas Trail; data can be used for the HDR study.	• Surveys were conducted on two days and may not accurately represent trail usage.
55	Reliability and Validity of the Transport and Physical Activity Questionnaire (TPAQ) for Assessing Physical Activity Behavior (2014)	Adams, E.J., et al	N/A	• This study analyzes the reliability of physical activity measures in the transport and physical activity questionnaire (TPAQ). • This study was initiated because there is currently no validated survey instrument that provides a comprehensive assessment of both physical activity and travel behaviors.	• Accelerometers were programmed to record data at 10-second epochs.	N/A

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
56	Reliability Testing of the PABS (Pedestrian and Bicycling Survey) Method. Journal of Physical Activity and Health, Vol. 9, No. 5, (2012)	Transportation Research Board (TRB)	N/A	• This paper presents a new method for collecting generalizable data: the sampling method developed in the Pedestrian and Bicycling Survey (PABS) project. PABS offers a rigorous, yet inexpensive, simple, and well-documented method to conduct surveys.	• The PABS mail-out–mail-back survey and probabilistic (generalizable) sampling approach can be performed in-house within municipal agencies.	N/A
57*	Seamless Travel: Measuring Bicycle and Pedestrian Activity in San Diego County and its Relationship to Land Use, Transportation, Safety and Facility Type (2010)	Caltrans	San Diego County, California	• This study evaluates bicycle-pedestrian data sources and collection methods, conducts bicycle-pedestrian surveys and counts, analyzes bicycle-pedestrian activity levels to quantify factors contributing to bicycle-pedestrian facility usage and demand, and provides recommendations for improving mobility linkages.	• Bicycle and pedestrian counts are conducted through manual or automated counters depending on the duration of the analysis. • This study utilized automated 24-hour counters at five locations throughout San Diego County (from August 2007 to July 2008).	• There were some limitations in using the Seamless bicycle and pedestrian models, which could be improved by using a gravity model.
58	Self-Reported Facilitators and Barriers to Trail Use Along an Urban Community Trail (2013)	University of Rochester (Thesis Paper)	The Genesee Riverway Trail, Rochester, New York	• Data from a trail survey conducted in 2012 by the Environmental Health Sciences Center was used in the report which analyzed the correlation between physical activity and well-being in the community. • Another survey was conducted with community members to analyze the frequency of trail use.	• Quantitative and qualitative analyses were used in the surveys to understand the determinants which facilitated or discouraged trail use. • Over 40 references were used in the development of this report and are all cited at the end of the document.	• This study analyzes facilitators and barriers relating to the use of the Genesee Riverway Trail. • Both surveys are included in the report. • The smaller sample size used in the survey may have skewed the results more in comparison with previous surveys conducted along the trail.
59	Shared-Use Path Level of Service Calculator (2006)	USDOT FHWA	N/A	• This study created a level of service (LOS) estimation for shared-use paths. • The method required four inputs: one-way user volume in an hour, mode split percentages, trail width, and presence/absence of a centerline.	• This study provides instructions on how to use the LOS methodology and the spreadsheet calculation tool. • This study also provides fictional case studies to exemplify the use of the tool.	• LOS is calculated by using four inputs: one-way user volume within the designated hour, mode split percentages, trail width, and the presence or absence of a centerline.

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
60	St. Johns County Rails with Trails (2009)	St. Johns County, Florida	The St. Johns County Rail with Trail Corridor	• The proposed trail alignment was developed with input from local agencies and an advisory committee. • The report includes a corridor description, Florida East Coast background information, environmental summary, rail-with-trail design guidelines, railroad maintenance description, and design standards.	• Two references are cited: Lessons Learned Literature Review, Current Practices, Conclusions and Rails-with-Trails: Design, Management, and Characteristics of 61 Trails along Active Rail Lines. • Other sources reviewed include the following: the Natural Resource Conservation Commission (NRCS), Soil Survey of St. Johns County, Florida, USGS Quadrangle (topographic) maps, Digital Ortho Quarter Quadrant Color Infrared Satellite Imagery, color aerial photography, FWC website and Eagle Nest Locator, and U.S. Fish and Wildlife Service's website.	• The purpose of this study was to analyze the preliminary design considerations, environmental impacts, and costs to understand if the project is feasible.
61	Strategic Agenda for Pedestrian and Bicycle Transportation, Report No. FHWA-HEP-16-086 (2016)	USDOT FHWA	National	• This report is intended to inform FHWA's pedestrian and bicycle activities during the next three to five years. • The framework for these activities are based around a number of goals and action items that will help guide future investments, policies, and partnerships related to bicycle-pedestrian networks.	• Goals determined in this report include networks, safety, equity, and trips. • Each goal includes actions that are related to capacity building, policy, data, and research.	N/A

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
62*	Strategies for Monitoring Multiuse Trail Networks: Implications for Practice (2016)	University of Minnesota	N/A	• This case study compares strategies developed by 10 organizations for monitoring traffic on multi-use trails, including local, multi-county, statewide and multi-state trail networks. • Infrared monitors are reliable and produce consistent counts of mixed-mode traffic (i.e., undifferentiated bicyclists and pedestrians), but typically undercount because of the problem of occlusion. • Higher rates of 96 occlusion may be associated with higher traffic volumes or the configuration of facilities, so site-specific 97 validation of counts is important. • The Parks and Trails Council of Minnesota, completed a series of manual counts to provide order-of-magnitude estimates of trail use, mobilize local volunteers, and highlight the need for expanded counting. The monitoring strategy involved dividing the trails into 15 to 25 mile segments, recruiting volunteers, and counting for a minimum of 10 hours on each segment, including peak-hours on weekdays and weekends. The Council chose locations purposefully based on three factors: expected patterns of use, accessibility, and volunteer safety. Most locations were near a city, trailhead, park, or junction. All factors used to extrapolate counts were obtained from analyses of year-round trail traffic on other multi-use trails in Minnesota.	• Arrowhead Regional Development Commission (ARDC).monitored traffic on every mile of the Gitchi-Gami Trail (GGT) along Lake Superior. The monitoring followed the FHWA procedures and included two reference or control sites and 21 short-duration monitoring locations approximately one to two miles apart. Short-duration counts were taken for a minimum of 10 days. All monitoring was done with active infrared monitors, and all counts were adjusted for occlusion. Short-duration counts were extrapolated using a “day-of-summer” approach based on the day-of-year approach. • Rails-to-Trails Conservancy, Inc. Midwest Office commenced monitoring in the fall of 2015; 1,056 miles of existing trails in 32 counties in four states (Maryland, Ohio, Pennsylvania, and West Virginia). To identify monitoring locations, GIS was used to create points at one-mile intervals along the entire network. One-half mile buffers were created around each point, and geospatial data were assembled within the buffers. Each buffer was classified into one of five distinct groups that capture major variations in contextual characteristics: urban, suburban, low intensity development / rural, forest, and parks. Six locations from each of the five classes for a total of thirty monitoring locations all 30 passive infrared monitors will be at these locations for a minimum of one year.	• The Greenways Division of Indy Parks and Recreation established a monitoring network on five trails that included 30 active infrared monitors, nearly one per mile for 33 miles of trails. • Minneapolis Park and Recreation Board (MPRB) monitored the city’s 80-mile shared-use network following procedures in the TMG. The monitoring network included six permanent, reference sites and 80 short-duration sites on trail segments that averaged about one mile in length. All reference sites were established prior to the monitoring campaign because of interest in traffic flows at particular locations. Short-duration monitoring segments were established based on access points, intersections, and other 196 aspects of the built environment. Counts were collected with active infrared sensors. The short-duration counts were taken for at least seven days between, adjusted for occlusion. Short duration counts for each segment were extrapolated to annual average daily trail traffic (AADTT) using the day-of-year factoring method. • Three Rivers Park District (TRPD) maintains 16 regional trails totaling 133 miles and manually counts trail visitors at access points following protocols established by the Metropolitan Council. The TRPD also has maintained seven permanent passive infrared monitors to obtain more detailed traffic data. • Mid-Ohio Regional Planning Commission (MORPC) have monitored trail traffic for several years using both passive and active infrared monitors by following TMG guidelines.
63	Strava data	FDOT	Florida	• This website provides statewide crash data for all years.	• Data is provided as zip files.	N/A
64*	SUN Trail GIS	FDOT	Florida	• This website provides SUN Trail Mapping information.	• The website provides a PDF, shapefiles, ArcGIS Online, and KMZ files of the SUN Trail statewide network. • The dataset provides existing, planned, and conceptual corridors within the SUN Trail network.	N/A

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
65	The Effects of Weather on Urban Trail Use: A National Study, 2016	University of Minnesota	Various locations across the United States	• This study monitored trail traffic at 45-50 locations in 12-13 cities in seven climatic regions for approximately one year. • The team analyzed the data and developed models to understand how different climates affected trail usage.	• The results showed that the models differed by region. • Weather affected bicyclists and pedestrians differently.	• Only able to find PowerPoint, not the report. • Link may need to be copied and pasted into a web browser in order to work.
66	The FDOT Source Book (2017)	FDOT Forecasting and Trends Office	Florida	• The research describes methods to calculate Pedestrian and Bicycle LOS based on AADT, Maximum Speed, Median Type, Area Type, and Bicycle-Pedestrian data.		• This study discusses forecasting and trail performance measures.
67	The influence of sampling interval on the accuracy of trail impact assessment (1999)	U.S. National Park Service, Great Smoky Mountain National Park	Great Smoky Mountain National Park	• This study analyzes the problems related to designing trail impact assessment and monitoring (IA&M) surveys, specifically in relation to the choice of sampling intervals.	• The results showed that systemic point sampling provided reasonably accurate results.	N/A
68*	The Minnesota Bicycle and Pedestrian Counting Initiative: Implementation Study (2015)	The University of Minnesota	Minneapolis, Minnesota	• The purpose of this study was monitor non-motorized traffic by installing automated sensors and portable sensors. • Afterwards, the team developed models to extrapolate the counts and integrate them into the MnDOT traffic monitoring databases.	• The project findings were used to create the state's first guidance document for collecting bicycle and pedestrian data, called the "DRAFT Bicycle and Pedestrian Data Collection Manual." • Bicycle-pedestrian counts are provided in table format within the document.	N/A
69	The Missing Link Bicycle Infrastructure Networks and Ridership in 74 US Cities (2014)	University of Minnesota Department of Civil Engineering	74 mid-to large size cities in the United States	• Linear regression models revealed that connectivity and directness are important factors in predicting bicycle commuting after controlling for demographic variables and the size of the city. • The connectivity and density factors are positive and significant.		N/A
70*	The Trail: Economic Impact Analysis (2016)	The Trail Foundation, Austin, Texas	Central Austin, Texas	• Monetization of various benefits (ecological, health, transportation/commuting, and corporate office lease rates) using trail usage, tree coverage and other factors including. the Tree Benefits Calculator. • Application of the county-level IMPLAN model to estimate economic impacts from O&M and capital spending.	• Trail usage. • Trail users' demographics. • Data on expenditures related to trail O&M and capital improvements.	• Some qualitative benefits are also briefly described. • Specific to a highly used urban trail in Austin County.

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
71*	The Virginia Creeper Trail: An Analysis of Net Economic Benefits and Economic Impacts of Trips (2004)	University of Georgia - Thesis	Southwest Virginia	• Collection of trail usage and users trail-related expenditures data from a survey. • Application of IMPLAN multipliers to derive total expenditures-based impacts.	• Trail usage. • Trail users' demographics. • Data on trail users' expenditures on goods and services.	• Cautions against confusing economic benefits and impacts. • Emphasized impacts related only to non-local expenditures (new money brought to the study region). • Somewhat dated, and highly theoretical.
72*	Traffic Monitoring Guide (2016)	USDOT FHWA	National	• This document provides the most up-to-date information to state highway agencies and policies that are used in traffic monitoring programs.	• This document is intended to help states improve their data collection processes through the use of new technologies (e.g. automated counters for non-motorized corridors).	• There are multiple sections within this document that highlight non-motorized traffic monitoring technology and counting equipment.
73	Trail Asset Management Plan (2011)	City of Billings, Montana and Yellowstone County, Montana	City of Billings, Montana and Yellowstone County, Montana	• The literature review was developed by reviewing existing and proposed trail maintenance plans, utilizing recommendations from advocacy groups, and researching published articles. • The Fairfax County Authority uses GIS-based maintenance maps in conjunction with their trail inventory and maintenance management system for visually communicating trail networks and for planning purposes.	• Research was conducted by reviewing published reports regarding trail maintenance.	• This report provides a summary of trail maintenance planning, maintenance requirements, and the agencies involved in trail maintenance.
74*	Trail Count 2017 Annual Count & Survey of San Jose Trails (2017)	City of San Jose	San Jose Trails	• Volunteers were used in the trail data collection: - Count Sheet - The Trail Count sheet permitted volunteers to count trail users at 30-minute increments. The sheet provided space to count pedestrians, bicyclists and skaters, as well as their direction of travel. A 12-hour count was conducted. - Survey "Postcard" - The postcard asked users to complete the on-line survey. Twenty questions included common demographic questions per past surveys, and questions mode of travel, reason for use, ranking of priorities and ranking of concerns. The survey included multiple-choice questions and opportunities for comments. Trail users were encouraged to take the survey via postcards found at count stations and through social media.	• Trail user counts • Trail user online survey: - Age, gender, home place, visited trail name, visited alone or with others, trail activity, primary reason for using the trail, what motivates to use the trails, trail visit frequency, money spend as part of the trail visit (meals etc.), annual expenditure to visit trails (shoes, bicycle related etc.), impression about the trails, any weather issues limiting the trail use, rating the trail characteristics (trail surface, length, views, entry features, signage, maintenance, staff etc.), trail needs, source to gather trail info.	• The day's count data was used to estimate the annual trips occurring along the trails, calculated with the Rails-to-Trails Conservancy's Trail Traffic Calculator. The calculator considers climate, time of year, and other factors to project a likely annual figure. http://www.railstotrails.org/our-work/research-and-information/trail-modeling-and-assessmentplatform/trail-traffic-calculator/ • 57% for exercise, 22% for recreation, 19% for transportation/commuting.

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
75	Trail Modeling and Assessment Platform (T-Map)	Rails-to-Trails Conservancy	National	• This website provides information about the T-MAP and how the RTC is using it to lead a nationwide effort to improve the way which trail networks are developed. • Years one and two will be used to collect data and create the modeling and assessment tools. • T-MAP will be deployed in year three with RTC's partners.	• T-MAP will be collecting data on trail use and trail users in 12 urban areas across the United States.	N/A
76*	Trail User Survey Workbook (2005)	Rails-to-Trails Conservancy	N/A	• Provides guidelines on trail user surveys related to general usage, and collection of trail users-related expenditures data on soft and hard goods, and overnight stays along with other user data to derive direct spending-related economic impact estimates. • The purpose of this manual is to help you implement a trail user survey and determine the economic impact that your trail has on your community. • Survey Goals: - Trail usage characteristics – what trail visitors do, when and why they do it. - Demographics of trail users or visitors – age, gender, residence, etc. - Trail users' perceptions of the trail – maintenance, security, cleanliness. - Spending related to trail activities – bicycle or equipment purchase, food, water, etc. • Survey Data Collection Methodology: - Self Selecting - Drop Box (holder for survey forms & survey collection box). - Self Selecting - Mail Back (holder for survey forms & post office box). - Personal Intercepts (intercepting trail users & asking them to complete the survey). - Direct Mail, Web site based, E-mail.	• Provides guidelines on who, how, and when to survey. • Sample forms are included in the "Trail User Survey Workbook".	• Useful guidelines on trail surveys. • Economic Impact Analysis - The economic impact of a trail is an important tool in helping to establish and maintain support for your trail. • Economic impact analyses include: - The amount of money users spend. - The number of annual trail visitations. - The costs associated with the trail. • Trail User Spending: - Hard Goods. - Soft Goods. - Overnight Accommodations. • Accounts only for direct spending by trail users to estimate related "economic impact". • Item #77 below provides a summary of the spending estimations based on the RTC 2005 Workbook.
77*	Trail User Surveys and Economic Impact: A Comparison of Trail User Expenditures (2009)	Rails-to-Trails Conservancy	Pennsylvania and some NE states	• A scan of 14 surveys from PA and other NE states focused on rail trails users' spending on non-durable goods, such as food.	• Trail usage. • Trail users' demographics. • Trail users' (average) spending on non-durable goods.	• Provides estimates of total annual spending on soft goods on select rail trails in PA and NE states. • Focused on estimates of soft spending on a limited number of trails in the NE US in 2009.

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
78	Estimated Economic Impact of Proposed Trail Enhancements to Pocahontas State Park		Chesterfied County, Virginia	• Application of IMPLAN multipliers to derive total expenditures-based impacts • Applied (with some adjustments) trail usage and users trail-related expenditures data from another (Virginia Creeper Trail, 2004)	• Re-used previous study data on trail usage, and on trail users' expenditures on goods and services.	N/A
79*	TrailLink	Rails-to-Trails Conservancy	National	• This website provides information about trails across the United States.	• Information provided includes trail length, end points, trail surfaces, trail category, trail activities, access, attractions, and other general information about the trail.	N/A
80*	TRAILS COUNT! Creating a Regional Program to Measure Trail Use in the Bay Area (2016)	Bay Area Trails Collaborative (BATC), founded by Rails-to-Trails Conservancy and the East Bay Regional Park District	San Francisco Bay Area Trails	• Automated count technologies: - Passive infrared counters count bicyclists and pedestrians through a sensor that detects the body temperature of users within the range of the sensor. - Ground sensors offer another technology option for counting trail users, but they can only detect bicycles, not pedestrians. - Piezoelectric strips detect bicyclists using two metal strips that are embedded in the pavement across a trail or roadway. • Manual counters: - Manual trail counts are collected by individuals at a particular location by recording the number of trail users that pass by that point. • Complementing Count Data: - Surveys (mail-back or drop box survey, intercept survey, online survey). - Crowdsourcing (mobile application data). - Shared Data Among Agencies and the Public – BATC partners have indicated their interest in having an easily accessible source of bicycle and pedestrian counts from a variety of locations across the region to help understand broader usage patterns and the potential value of future projects. Web-based data sharing has been successfully implemented in other regions. A key consideration for the Bay Area will be to determine how to compile data collected by local agencies that may use different counting technologies and methods.	• Bay Area Agencies Trail Data Collection Agencies used the following counter types: - Passive infrared with pneumatic tubes - Passive infrared with inductive loops - Passive infrared only - Shared Counters Among Agencies – Several staff at Bay Area agencies expressed an interest in collecting trail-count data but have been unable to do so due to lack of funding. The Sonoma County Transportation Authority and Solano County Transportation Authority have implemented a strategy to increase the local capacity to conduct this work, purchasing counters to conduct bicycle and pedestrian counts but also making them available for loan to local jurisdictions in their area. To help ensure that high-quality data is collected, local agency staff has been trained to install the counters and upload the data they have collected.	• Bay Area-wide bicycle/pedestrian/trail count program: - Automated and Manual Counts – As the range of data collection practices indicates, there is no “one size fits all” approach to collecting trail-use data. The key to determining the most appropriate strategy is for each agency to articulate its objectives and identify available resources. • Several of the agencies surveyed and others from outside the Bay Area have demonstrated that there is considerable value in deploying two or more strategies to complement each other. For example, automated counter data, manual counts and surveys could all be conducted on the same trail segments. This would provide a richer picture of trail use, as each approach is better suited to collecting a particular type of data. Data collected through manual counts can also reveal patterns that can be extrapolated to help develop a picture of user characteristics for similar trails. • Multiple Types of Automated Count Equipment – While some agencies have relied exclusively on one model of counter, others have developed programs utilizing both mobile and permanent counter stations. While permanent count stations may be the clear choice for collecting data at key locations in the trail network, including mobile counters as part of a count program allows for data collection at more sites, creating additional flexibility and helping maximize the efficient use of limited resources. The permanent count stations can also help develop customized adjustment factors for short-duration trail counts, accounting for daily, weekly, monthly and seasonal variations to develop annual trail-use projections.

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
81*	TransPed, An Interactive Pedestrian and Bicycle Planning Tool (June 2016)	East Central Florida Regional Planning Council (ECFRPC)	Florida	• The TransPed online tool is a GIS-based tool that provides spatial information regarding bicycle and pedestrian facilities. • The online tool also provides analytical tools that can be used with the map data.	• Layers included in the map includes schools, bicycle-pedestrian counts, bicycle-pedestrian crashes, JUICE bicycle share, pedestrian facilities and gaps, bicycle facilities, US bicycle network, existing and future bicycle-pedestrian demand, LOS, Strava data, trails, transit systems, adopted five-year work program, environmental data, underserved populations, land use, population, and employment data.	N/A
82*	Using big data to understand trail use: three Strava tools (2016)	TRAFx Research	Global	• Strava is a software service used by people who bicycle, run, walk, etc. to track themselves using GPS-enabled devices. • Provides aggregated, "de-personalized" Strava user data for a particular area, including activity type, travel direction, user volume, gender, age, speed, duration, and routing. • Strava users varies from trail to trail (1-12%). Therefore, it is necessary to use trail traffic counters at a sufficient number of locations, to validate the Strava data. • Volumetric counters in combination with Strava data and survey data create potential to provide more complete data over a wider area. • It is unlikely that any one source of trail data will replace all others.	• Strava has not disclosed how many people use the Strava app, but in 2014 Strava claimed that over three million user tracks are uploaded each week, worldwide; In 2016 this reached over five million user tracks. • Strava data validation is required. • Trail counters are necessary for validation and 'truthing' purposes. Example: Validation done by Griffin and Jiao (2014) in Austin, Texas.	• Strava Metro might be used: - To estimate counts (i.e.., volume of use) on trails (or locations) without trail counters. This would be appropriate for trails that have similar characteristics and attract similar users. - To gain insights into use type (e.g., bicycle vs. non-bicycle). - To infer direction and speed of travel. - To better understand the spatial distribution, flow and route selection of trail users (i.e.., where do people ride, run, walk, etc.), using Strava users as a proxy for overall trail users. - To determine how many hours (i.e.., duration) some trail users use trails daily, weekly, monthly, etc.
83*	Web GIS Application to Update and Maintain Recreational Trails Database (2005)	University of Florida (UF) GeoPlan Center	Florida	• Originally funded by the FDEP, Office of Greenways and Trails, the UF GeoPlan Center developed an interactive website to collect existing trail data. • Web application utilizes ArcIMS and ArcSDE to display GIS data layers for the data collection.	• GIS from trail managers	• Limitation may be from trail managers (local, county, federal, and state agencies) not submitting GIS data for their trails
84*	West Orange Trail	Orange County	Orange County (three trails)	• This website provides general information about the West Orange Trail. • Several links are provided for detailed directions to the trail, safety guidelines, and a trail map.	• Information includes hours of operation, trail location, points of interest along the trail, and trail activities.	N/A
85	Economic Impact Assessment – Florida State Park System	Florida Department of Environmental Protection	Florida	• Memorandum provides economic information for Florida State Parks and State Trails.	• The Division of Recreation and Parks has generated the annual Economic Impact Assessment since 1994. • The data is collected through the use of models and software.	N/A

No	Title	Sponsoring Agency or Organization	Geographic Area	Methodology Highlights	Data Collected	Other Comments
86	Economic Impact of Outdoor Recreation Activities in Florida	Florida Department of Environmental Protection	Florida	• This study provides information about the economic impact of outdoor recreation. • The appendix includes the methodology and survey results.	• 7,000 surveys were conducted across Florida and the U.S. and 45 states were represented.	N/A

Appendix B: List of Stakeholders

Organization	Last Name	First Name	Job Title	County	Address	City	State	ZIP	Email Address	Primary Telephone
Bike Florida, Inc. - Get In Touch!	Hancock	Joy	Executive Director	Statewide	611 S. Fort Harrison, Suite 155	Clearwater	FL	33756-	joy@bikeflorida.org	(352) 224-8601
City of Brooksville	Geiger	Bill	Community Development Director	Hernando	201 Howell Avenue	Brooksville	FL	34601-	bgeiger@cityofbrooksville.us	(352) 540-3810
City of Orlando, Transportation Planning Division	Sikonia, AICP	Ian	Senior Planner / Bicycle and Pedestrian Coordinator	Orange	400 S. Orange Avenue, PO Box 4990	Orlando	FL	32801-	ian.sikonia@cityoforlando.net	(407) 246-3325
City of Titusville, Public Works Department	Cook	Kevin	Director	Brevard	445 S. Washington Avenue	Titusville	FL	32796-	Kevin.Cook@Titusville.com	(321) 567-3846
Department of Transportation	Garcia	Heather	District Five, Planning and Corridor Development Manager (PLEMO)	Regional	719 S. Woodland Blvd.	DeLand	FL	32720-	heather.garcia@dot.state.fl.us	(386) 943-5077
Department of Transportation	Henry	Alex	District Seven, Bicycle and Pedestrian Coordinator	Regional	11201 N. Malcolm McKinley Drive	Tampa	FL	33612	alex.henry@dot.state.fl.us	(813) 975-6405
East Central Florida Regional Planning Council	McCue, AICP	Tara	Director, Planning and Community Development	Regional	455 N. Garland Ave., 4th Floor	Orlando	FL	32801-	tara@ecfrpc.org	(407) 245-0300
Department of Environmental Protection	Alderson	Doug	Assistant Chief, Office of Greenways and Trails	Statewide	3900 Commonwealth Blvd., MS 795	Tallahassee	FL	32399	doug.alderson@floridadep.gov	(850) 245-2061
Department of Environmental Protection	Bernier	Katie	Regional Coordinator, Office of Greenways and Trails	South	3900 Commonwealth Blvd., MS 795	Tallahassee	FL	32399	katherine.bernier@FloridaDEP.gov	(850) 245-2078
Department of Environmental Protection	Browne	Samantha	Chief, Office of Greenways and Trails	Statewide	3900 Commonwealth Blvd., MS 795	Tallahassee	FL	32399	samantha.browne@floridadep.gov	(850) 245-2076
Department of Environmental Protection	Moore	Britney	Regional Coordinator, Office of Greenways and Trails	North	3900 Commonwealth Blvd., MS 795	Tallahassee	FL	32399	britney.moore@floridadep.gov	(850) 245-3069

Organization	Last Name	First Name	Job Title	County	Address	City	State	ZIP	Email Address	Primary Telephone
Department of Environmental Protection	Morgan	Donald	Regional Coordinator, Office of Greenways and Trails	Central	3900 Commonwealth Blvd., MS 795	Tallahassee	FL	32399	donald.morgan@floridadep.gov	(850) 245-3126
Florida Bicycle Association	Huff	Patricia	President	Statewide	P.O. Box 617	Everglades City	FL	34139	snookcity@gmail.com	(239) 695-2397
Florida Bicycle Association	Afonso	Becky	Executive Director	Statewide	250 Strathmore Avenue	Oldsmar	FL	34677	becky@floridabicycle.org	(813) 748-1513
Forward Pinellas	Chatman	Rodney	Manager, Planning Division	Pinellas	310 Court Street	Clearwater	FL	33756	rschatman@forwardpinellas.org	(727) 464-8250
Forward Pinellas	Miller	Susan	Bicycle Pedestrian Planner	Pinellas	310 Court Street	Clearwater	FL	33756	smiller@forwardpinellas.org	(727) 464-8250
Hernando/Citrus Metropolitan Planning Organization	Diez	Steven	Executive Director	Hernando	1661 Blaise Drive	Brooksville	FL	34601-	stevend@hernandocounty.us	(352) 754-4057
Lake County Office of Parks & Trails	Bonilla	Robert	Parks and Trails Division Manager	Lake	Post Office Box 7800	Tavares	FL	32778-	rbonilla@lakecountyfl.gov	(352) 742-0992
Lake County Office of Parks & Trails	Quigley	Gallus	Recreation Coordinator - Trails	Lake	2401 Woodlea Road	Tavares	FL	32778	gquigley@lakecountyfl.gov	(352) 742-3866
Lake-Sumter Metropolitan Planning Organization	Woods	Mike	Interim Executive Director	Lake/Sumter	1616 South 14th Street	Leesburg	FL	34748-	mwoods@lakesumtermpo.com	(352) 315-0170
MetroPlan Orlando	Whittington	Virginia	Director of Regional Partnerships	Orange, Seminole, Osceola	250 South Orange Avenue, Suite 200	Orlando	FL	32801-	vlwhittington@metroplanorlando.com	(407) 481-5672
MetroPlan Orlando	Wilson	Mighk	Transportation Planner	Orange	250 S. Orange Avenue Suite 200	Orlando	FL	32801-	mwilson@metroplanorlando.com	(407) 481-5672
Orange County Parks and Recreation	Kimmer, APR, CPRC	Mandy J.	Public Relations Information Officer	Orange	4801 W. Colonial Drive	Orlando	FL	32308-	amanda.kimmer@ocfl.net	(407) 836-6257
Orange County Parks and Recreation	Moffett	Cedric	Planner III	Orange	4801 W. Colonial Drive	Orlando	FL	32308-	cedric.moffett@ocfl.net	(407) 826-6200
Orange County Parks and Recreation	Stockdill	Tammy	Site Supervisor 1, West Orange Trail	Orange	501 Crown Point Cross Road	Winter Garden	FL	34787-	tammy.stockdill@ocfl.net	(407) 654-1108
Orange County Planning Department	Ramos	Regina	Planning Manager	Orange	4801 W. Colonial Drive	Orlando	FL	32308-	regina.ramos@ocfl.net	(407) 836-6200
Pasco County	Beneck	Sam	Project Manager	Pasco	5418 Sunset Road	New Port Richey	FL	34652-	sbeneck@pascocountyfl.net	(727) 753-8194
Pasco County	Poon	William	Engineer III	Pasco	8731 Citizens Drive	New Port Richey	FL	34652-	wpoon@pascocountyfl.net	(727) 847-2411

Organization	Last Name	First Name	Job Title	County	Address	City	State	ZIP	Email Address	Primary Telephone
Pasco Metropolitan Planning Organization	Kevlin	Ross	Active Transportation Planner	Pasco	8731 Citizens Drive, Suite 320	New Port Richey	FL	34654-	rkevlin@pascocountyfl.net	(727) 847-8140
Pinellas County Public Works	Rice, PE	Joan M.	Traffic Engineering Multi-Modal Safety	Pinellas	22211 US Hwy 19 N. Bldg.1	Clearwater	FL	33765-	jrice@pinellascounty.org	(727) 464-8610
Rails-to-Trails Conservancy	Bryan	Ken	Florida Director	Statewide	PO Box 15227	Tallahassee	FL	32317-	ken@railstotrails.org	(850) 264-3067
River to Sea Transportation Planning Organization	Harris	Stephan C.	Transportation Planner - Project Manager	Volusia	2570 W. International Speedway Boulevard, Suite 100	Daytona Beach	FL	32114-	sharris@r2ctpo.org	(386) 226-0422
Space Coast Transportation Planning Organization	Kraum	Sarah	Multi Modal Program Specialist	Brevard	2725 Judge Fran Jamieson Way, Building B,	Melbourne	FL	32940-	sarah.kraum@brevardfl.gov	(321) 690-6890
Tampa Bay Area Regional Transit Authority	Matoni	Anthony V.	Senior Planner & Project Coordinator	Regional	4350 West Cypress Street, Suite 700	Tampa	FL	33607-	anthony.matonti@tbarta.com	(813) 282-8200
Tampa Bay Regional Planning Council	Flynn	Marshall	Director of Information System & GIS	Regional	4000 Gateway Centre Blvd., Suite 100	Pinellas Park	FL	33782	marsh@tbrpc.org	(727) 570-5151
Tampa Bay Regional Planning Council	Vitale, AICP	Sarah	Senior Planner	Regional	4000 Gateway Centre Blvd., Suite 100	Pinellas Park	FL	33782	sarah@tbrpc.org	(727) 570-5151
Volusia County Parks, Recreation and Culture	Baylie	Tim	Director	Volusia	202 North Florida Avenue	Deland	FL	32720-	tbaylie@volusia.org	(386) 736-5953
Volusia County Parks, Recreation and Culture	Bergeron	Terri	Administrative Coordinator - Parks, Rec & Culture	Volusia	202 North Florida Avenue	DeLand	FL	32720-	tbergeron@volusia.org	(386) 736-5953

Appendix C: Trail User Survey - Sample Questions

Trail User Survey Workbook (Metropolitan Trails)

(Modified survey questions are included in the workbook for Suburban Trails and Rural Trails)

1. What is your zip code?
2. How often, on average, do you use the trail?
3. Please identify your age group?
4. Were any children under the age of 15 with you on your trail experience today?
5. What is your gender?
6. What is your primary activity on the trail?
7. Generally, when do you use the trail?
8. How much time do you generally spend on the trail each visit?
9. Would you consider your use of the trail to be for Recreation? Health and Exercise? Commuting? Fitness Training? Other?
10. If you use the trail to commute, what is the total round trip mileage?
11. How did you find out about the trail?
12. Has your use of the trail influenced your purchase of Bike? Bike supplies? Auto accessories? Rollerblades? Footwear? Clothing? Nothing?
13. Approximately how much did you spend on the items above in the past year?
14. In conjunction with your most recent trip to the trail, did you purchase any of the following? Beverages? Candy/Snack foods? Sandwiches? Ice cream? Meals at a restaurant along the trail?
15. Approximately how much did you spend, per person, on the items above on your most recent visit?
16. Did your visit to the trail involve an overnight stay in one of the following types of accommodations? Motel/Hotel? Bed and Breakfast? Friend or Relatives Home? Campground?
17. How many nights did you stay in conjunction with your visit to this trail?
18. Approximately how much did you spend on overnight accommodations per night?
19. In your opinion, the maintenance of the trail is (circle one) Excellent Good Fair Poor
20. In your opinion, the safety and security along the trail is (circle one) Excellent Good Fair Poor
21. In your opinion, the cleanliness of the trail is (circle one) Excellent Good Fair Poor
22. Would you be willing to pay an annual usage fee to help maintain the trail?
23. What portion of the trail do you use most often?
24. Which trail access point do you generally use when you visit the trail?

Annual Survey of San Jose Trails

1. What is your age? Under 18, 18-24, 25-34, 35-44, 45-54, 55-64, 65 or older
2. What is your gender? Male, Female

3. Where do you call home? San Jose, South Bay, Bay Area
4. Which San Jose trail did you last visit?
5. Did you visit the trail by yourself?
6. On your recent visit to a San Jose trail, what did you do along the trail? Bicycling, Walking, Jogging/Running, Other
7. What was your primary reason for using the trail today? Health, Recreation, Commuting, Other
8. What motivates you to use San Jose trails? Fun, Exercise, Environment, Save money, Efficient use time
9. How often do you visit San Jose Trails? Several times per week, At least once a week, Several times a month, At least once a months, Infrequently, This is my first visit
10. How much did you spend on snacks or meals as part of your trail visit? Nothing, $1-5, $6-10, $11-20, $21-40, $41-80, $81-100, more than $100
11. How much do you spend annually to enjoy San Jose Trails (shoes, clothing, fitness tools, bike-related expenses? Nothing, $1-5, $6-10, $11-20, $21-40, $41-80, $81-100, more than $100
12. What is your impression of San José Trails from this and prior visits? Rank 1 to 10
13. Did winter storms, with related flooding and debris, limit your use of San José Trails?
14. Rate the following about San José Trails? Rank 1 to 10
    - Quality of the trail surface, Length of trail, Natural views, Trail entry features, Other trail users, Signage, Maintenance and upkeep, Park Rangers or other staff
15. What needs focus along San Jose Trails? Rank 1 to 10
    - Closing trail gaps, Build new trails, Maintenance, Management and enforcement, Promotion, Bigger Projects, Enhancements, Equity
16. Where do you seek information on San Jose Trails?
17. What's your favorite source for local trail, hiking and biking news?
18. What would make San Jose the county's best trail and walking city?

Miami Valley, Ohio Trail User Survey

1. Where are you taking the survey today? Name of the County
2. Please tell us where are you from (home)? Name of the County
3. How did you learn of the Miami Valley Trails?
4. How did you get to the trail today? Walk, Bike, Automobile, Transit Bus
5. Where did you access the trail today?
6. How many people are in your group out on the trails today?
7. How often, on average, do you use the trail? Daily, 3-5 times per week, Once a week, A couple of times a month, Once a month, A few times per year, First time
8. When do you use the trail? Weekdays, Weekends, Both
9. How much time do you generally spend on the trail each visit? Less than 30 minutes, 30 minutes to one hour, one to two hours, more than two hours
10. What is/are your primary activity/activities on the trail? Walking, Biking, Jogging/Running, Rollerblading, Horseback riding, Skiing, Other.
11. If you use the trails for bicycling, do you also bike on streets and roads?

12. Would you consider use of the trails to be for? Recreation, Health and Exercise, Commuting, Fitness Training, Tourism
13. Are you a member of a club/association that uses the trails?
14. In your opinion, the maintenance of the trail is? Excellent, Good, Fair, Poor
15. In your opinion, your safety and security along the trail is? Excellent, Good, Fair, Poor
16. In your opinion, the cleanliness of the trail is? Excellent, Good, Fair, Poor
17. Has your use of the trail influenced your purchase of? Bike, Bike supplies, Auto accessories, Rollerblades, Footwear, Clothing, Nothing
18. On your most recent trip to the trail did you purchase any of the following? Beverages, Snacks, Sandwiches, Ice cream, Meals at a restaurant along the trail, Admission to museum/attraction, None of these
19. Did your trail visit include an overnight stay in one of these accommodations? Hotel/Motel, Bed and breakfast, Friend or Relative's home, Campground, No overnight stay
20. What is your zip code?
21. Please identify your age group? 15 and under, 16-25, 26-35, 36-45, 46-55, 56-65, 66 or older
22. Were the children under the age of 15 with you on your trail experience today?
23. What is your gender? Male, Female
24. What is your household income? Less than 10,000, $10,000-15,000, $15,000-25,000, $25,000-35,000, $35,000-50,000, $50,000-75,000, $75,000-100,000, $100,000-150,000, $150,000-200,000, $200,000 or more
25. Please identify your race? White, Black or African American, American Indian / Alaska Native, Asian, Native Hawaiian/other Pacific Islander, Other

Orange County Trail System Online Survey

1. What County you reside in?
2. Enter the zip code of your residence?
3. How did you hear about the Orange County Trails?
4. What is your age group? 15 and under, 16-25, 26-35, 36-45, 46-55, 56-65, 66 and over
5. How many times per year do you visit trails in Orange County? 0, 1-5, 6-10, More than 10, Other
6. What was the last Orange County trail you visited? West Orange Trail, Cady way Trail, Little Econ Trail, Have never visited, Other
7. How do you typically travel from your home to the trail? Vehicle, Bicycle, Transit, Walk, Other
8. What is the primary reason for using Orange County Trails? Recreational activity, Health and/or fitness, Transportation
9. On average, how much time do you spend on the trail per visit? 0-2 hours, 3-6 hours, More than one day, Everyday
10. What time of year do you typically visit the trails? Spring, Summer, Fall, Winter, I visit regardless of season

11. What days of the week do you typically visit rails? Monday-Thursday, Friday, Saturday, Sunday
12. In conjunction with your trail visits, did you stay overnight in? Campground, Motel/Hotel, Friend or relative's home, NA
13. On average, please list any expenditures you typically make on a trail visit? Restaurant, Food and beverage (retail), Transportation, Books, guides, maps, Rental fees for bikes, skates, and pull-along carriages, Other
14. What activities do you typically participate in during your trail visits? Walking, Running, Bicycling, Skating, Nature watching, Picnic, Special event, Other
15. Would you more likely to purchase goods and/or services from local stores/vendors during your trail visit if you had coupons for these services?
16. Would you like to see additional trail events?
17. How do you rate your overall Orange County Trail experience?
18. How did you hear about this survey?

Pinellas Trail Users Survey

1. How did you get to the trail? Walk/Run, Bike/Skate, Car, Other
2. How far did you travel to get to the trail? 2 miles or less, 2-10 miles, 10 miles or more
3. Why do you usually use the trail? Work, School, Shopping, Exercise, Socialize, Recreation, Restaurants, Park/Beach
4. What other uses? Work, School, Shopping, Exercise, Socialize, Recreation, Restaurants, Park/Beach
5. On the trail, do you usually…? Walk, Bicycle, Jog/Run, Skate
6. How many days per week do you usually travel on the trail? one day or less, two days, three-five days, five-seven days
7. How far (one way) do you usually travel on the trail? 2-miles or less, 2-10 miles, 10-miles or more
8. Would you use more trails countywide? Yes, No
9. Do you feel safe using the trail? Yes, No
10. What do you like and dislike about the trail?
11. Are you a year-round resident? Or a tourist/seasonal resident?
12. What is your age group? 18 yrs or younger, 19-34 yrs, 35-49 yrs, 50-64 yrs, Over 64 yrs
13. What is your gender? Male, Female

Appendix D: Stakeholder Survey Instrument

Introduction

Project Description

The Florida Department of Transportation is conducting this survey as part of an ongoing project titled, “Florida Shared Use NonMotorized (SUN) Trail Transportation Use Study”. The project will identify industry best practices to develop, standardize and implement methodology to collect, evaluate, examine, analyze, report and store information for multi-use trail transportation trips, trail counts, trail characteristics and trail users to determine how (paved) multi-use trails support place-to-place/destination-to-destination travel and how trail users utilize the SUN Trail network. This study will explore a pilot study area in Central Florida that includes trails in urban and rural settings. The trails included are Cady Way Trail, West Orange Trail, Orlando Urban Trail, Pinellas Trail and Good Neighbor Trail. As appropriate, other multi-use trails in Central Florida, such as the Starkey Trail, Lake Minneola Scenic Trail, the East Central Regional Rail Trail, the South Lake Trail, or others identified by the project manager, may also be considered as contributing to the value of this transportation study.

Survey Description

The purpose of this survey is to gather information about the following major topics:

- Agency information;
- Trail characteristics;
- Trail user counts;
- Trail user demographics and behavior;
- Other trail related datasets;
- Trail benefits and impacts;
- Trail data management;
- Trail data analysis; and
- Visualization and analytics tools.

This survey will take approximately 15 minutes to complete. Please note that questions/fields marked with an asterisk (*) indicate that answers are required. Please complete the survey by February 14, 2019. Upon completion of this survey, you will be asked if you would like to participate in a follow-up interview. If you have any questions or concerns, please contact the principal investigators:

Robin Birdsong
SUN Trail Program Manager
Florida Department of Transportation
Robin.Birdsong@dot.state.fl.us
(850) 414-4922

Your feedback is important. Thank you in advance for participating in our survey.

Agency Information

1. Please list the name of your agency or organization.

Click here to enter text.

2. What is your agency's geographical purview (Check all that apply)?

☐Nationwide or Multiple states

☐Single state (Florida)

☐Regional

☐County

☐Multiple trails

☐Other (please specify)

Click here to enter text.

3. If applicable, please list the trails under the jurisdiction of your agency or organization.

Click here to enter text.

4. Please provide your information below.

Name Click here to enter text.

Job Title Click here to enter text.

Email Address Click here to enter text.

Phone Number Click here to enter text.

Trail Characteristics

Trail characteristics include trail length, pavement characteristics, amenities, parking conditions, accessibility and connectivity to paved roads, lodging facilities and others.

5. Does your agency collect any data on trail characteristics?

☐Yes

☐No

If yes, then go to 6. If no, then go to next section (go to 7).

6. Can you provide this data and any associated documentation?

☐Yes

☐No

If yes, please provide documentation links below. Send related data and other associated documentation to Robin.Birdsong@dot.state.fl.us

Click here to enter text.

Trail User Counts

7. Does your agency collect bicycle or pedestrian counts for trails?

☐ Yes, both bicycle and pedestrian[1] counts

☐ Yes, bicycle counts only

☐ Yes, pedestrian counts only

☐ No

If yes, then go to 8. If no, then go to next section (go to 12).

[1]Pedestrians includes walkers and runners.

8. Does your methodology distinguish between bicycle and pedestrian counts?

☐ Yes

☐ No

9. How frequently are the counts collected by your agency? (Check all that apply).

☐ Cyclical (same location (s) over multiple periods of time)

☐ Non-cyclical (different location (s) over multiple periods of time)

☐ One-time count / Short-term Count

☐ Continuous count

☐ Other (please specify)

Click here to enter text.

10. Please check the technologies used by your agency to collect counts (Check all that apply).

☐Manual counts

☐Tube counts

☐Video camera

☐Passive infrared

☐Active infrared

☐Bluetooth detectors

☐Loop detectors

☐Microwave or ultrasonic

☐Other (please specify)

Click here to enter text.

11. Can you provide the related data and any associated documentation?

☐ Yes

☐ No

If yes, please provide documentation links below. Send related data and other associated documentation to Robin.Birdsong@dot.state.fl.us

Click here to enter text.

Trail User Demographics and Behavior

12. Does your agency collect any data on trail users' demographics and behavior?

☐Yes, both user demographics and behavior

☐Yes, user demographics only

☐Yes, user behavior only

☐No

If yes, then go to 13. If no, then go to next section (go to 17).

13. Please check the methods used by your agency to collect this data (Check all that apply).

☐Online self-reported surveys

☐Field intercept surveys

☐Postcard surveys

☐Telephone surveys

☐Drop box surveys

☐Other (please specify)

Click here to enter text.

14. Please check the trail user demographics collected by your agency (Check all that apply).

☐Age

☐Gender

☐Race

☐Residence Location (Example: county, zip code, local)

☐Other (please specify)

Click here to enter text.

15. Please check the trail user behavior data collected by your agency (Check all that apply).

☐Trip purpose (Example: commute, recreation, health)

☐Trail activities (Example: walk, jog, hike, bicycle ride, horseback ride)

☐Frequency of visits by time of day, day of week, season

☐Trail usage by average duration and length of visits

☐Trail user group size (average and/or distribution)

☐Trail user expenditures (Example: trail user fees, related purchases of goods and services, related overnight stay expenditures)

☐Mode used to arrive and depart from the trail (Example: bike to trail, drive to trail)

☐Other (please specify)

Click here to enter text.

16. Can you provide the related data and any associated documentation?

☐Yes

☐No

If yes, please provide documentation links below. Send related data and other associated documentation to Robin.Birdsong@dot.state.fl.us

Click here to enter text.

Trail Benefits and Impacts

Trail benefits include health and recreation or other activities of trail users, as well as any ecological or economic benefits. Economic impacts typically capture impacts pertaining to trail-related expenditures by trail users or agencies responsible for building and/or operations of trails.

17. Does your agency collect any related data or otherwise measure economic benefits and impacts?

☐Yes, both user benefits and impacts

☐Yes, benefits only

☐Yes, economic impacts only

☐No

If yes, then go to 18. If no, then go to next section (go to 19).

18. Can you provide the related data and any associated documentation?

☐Yes

☐No

If yes, please provide documentation links below. Send related data and other associated documentation to Robin.Birdsong@dot.state.fl.us

Click here to enter text.

Other Trail Related Datasets

19. Did we miss any important trail-related datasets?

☐Yes

☐No

If yes, please list the missing datasets and provide more information below.

Click here to enter text.

Trail Data Management

20. How do you store the different trail related datasets? Are these datasets referenced to geospatial information (Example: trail network)? Do you have any standardized methods and processes to manage the datasets? Please provide more details. If possible, please share the links to these documents.

Click here to enter text.

21. What are the limitations and challenges you encounter to meet your trail data needs? Please illustrate with examples (if any). (Example: data storage, acquisition cost, analytical skills or other).

Click here to enter text.

Trail Data Analysis

22. How do you use the trail datasets? (Check all that apply).

☐User and trail segment profiles

☐Trends of trail usage

☐Benefits and/or impacts

☐Trail performance measures

☐Statistical trail demand / forecast models

☐Project prioritization

☐Long term planning needs

☐Other (please specify)

Click here to enter text.

23. Do you purchase any proprietary datasets or acquire datasets from other organizations/agencies?

☐Yes

☐No

If yes, please list these datasets and briefly explain the reasons for acquiring these datasets.

Click here to enter text.

Visualization and Analytics Tools

24. Can you share a list of white papers, infographics, source books, reports, designs, web portals or other initiatives you have completed and are relevant to trail use? Please provide online links to the resources if available or send the attachments to the principal investigators.

Click here to enter text.

Follow-Up Phone Interview

Thank you for taking our survey! We really appreciate your feedback. For additional questions, we will conduct a follow-up phone interview with you.

Appendix E: Stakeholder Interview Script

Good Morning/Afternoon/Evening.

Thank you for your response to the survey, this interview is a follow up to the information provided in the survey. Today, we have Makarand Gawade and Arjun Chauhan. Can you hear us clearly? Let us get around the call and introduce ourselves (if more than one).

On behalf of the project team, I would like to welcome you and sincerely thank you for agreeing to participate in today's interview. The goal of this study is to examine, analyze trail usage, and report data for different trails. Before we get started, I hope you have already received the list of questions and agenda before this meeting. Please let us know. We can send the materials to you right away. With this in mind...

QUESTIONS

- **Let's start by talking about the survey. What is your general impression of the survey? What did you like and dislike? Please feel free to elaborate on any of the specific aspects!**

Length of the survey, problems with sending emails to FDOT, open ended question issues

- **Do you have a count program? If yes,**
  - How often do you collect data? What is your objective of collecting counts?
  - Do you collect continuous counts for the entire year?
  - How are the counts validated?
  - How are the count sites selected?
  - How are annual users estimated? What is the methodology?
  - Any thoughts on the current technology you use? Limitations if any?

Information from survey for internal references:

Stakeholders	Count Program
City of Titusville	Bicycle counts only
Orange County Government	Bicycle and pedestrian counts.
City of Orlando	No. However, we have some count information from them (confirm)
East Central Florida Regional Planning Council	No
FDOT-D7	No
Forward Pinellas	Bicycle and pedestrian counts.
Department of Environmental Protection, Office of Greenways and Trails	Bicycle and pedestrian counts.

Stakeholders	Count Program
Bike Florida, Inc.	No
Everglades City Trail Town Committee (Member) Friends of the River of Grass Greenway (President) Florida Bicycle Association (President)	No
River to Sea TPO	No
County of Volusia	No
Hernando/Citrus MPO	No
Lake County Office of Parks & Trails	Bicycle and pedestrian counts.
City of Brooksville	No
MetroPlan Orlando	Bicycle and pedestrian counts.
Space Coast Transportation Planning Organization	No
Florida Bike Association	No

- **Do you conduct a user behavior survey?**
  - How often do you conduct the behavior survey? What is the objective of collecting user survey?
  - Do you collect the usage data by activity (e.g., biking, walking, running, etc.)?
  - Do you collect the data by activity primary purpose (e.g., recreation, health, commute, etc.)?
  - If not, can you elaborate on how you gather user behavior information? Do you need this kind of information?
  - How do you administer the survey?
  - Any limitations or concerns in administering the survey?
  - Do you think a different method could be used to conduct the survey for higher engagement?

Information from survey for internal references:

Stakeholders	User Survey
City of Titusville	Yes. User behavior
Orange County Government	No
City of Orlando	No
East Central Florida Regional Planning Council	No
FDOT-D7	No
Forward Pinellas	User Behavior and Demographics
Department of Environmental Protection, Office of Greenways and Trails	No
Bike Florida, Inc.	No
Everglades City Trail Town Committee (Member) Friends of the River of Grass Greenway (President) Florida Bicycle Association (President)	No
River to Sea TPO	No

Stakeholders	User Survey
County of Volusia	No
Hernando/Citrus MPO	No
Lake County Office of Parks & Trails	No
City of Brooksville	No
MetroPlan Orlando	No
Space Coast Transportation Planning Organization	Yes
Florida Bicycle Association	Yes

- **Do you perform any Economic Analysis of the trails? (Benefits or impacts of trail users to the community/businesses around area)**
    a. If yes, what kind of analysis (e.g., economic benefits, or economic impacts) do you conduct?
    b. If you don't do it, do you use other sources?
    c. Do you use any specific models or have customized any models?
    d. Can you share the models and supporting documentation with us?
    e. How often do you update the economic analysis?
    f. What are the primary inputs you use/need?
    g. Any limitations or concerns pertaining to economic analysis?

Stakeholders	User Survey
Florida Bicycle Association	No
Space Coast Transportation Planning Organization	No
MetroPlan Orlando	No
City of Brooksville	No
Lake County Office of Parks & Trails	No
Hernando/Citrus MPO	No
County of Volusia	No
River to Sea TPO	No
Everglades City Trail Town Committee (Member) Friends of the River of Grass Greenway (President) Florida Bicycle Association (President)	No
Bike Florida, Inc.	Yes
Department of Environmental Protection, Office of Greenways and Trails	Yes
Orange County Government	Yes
Forward Pinellas	No
FDOT-D7	No
East Central Florida Regional Planning Council	Yes
City of Orlando	No
City of Titusville	No

- **How do you report the data, statistics and any analyses?**
    a. Infographics, Standard reports or tools?
    b. Can you share these materials with us?

Additional specific questions to stakeholders

- **One of our tasks, is to conduct field user surveys and interviews with other stakeholders like private businesses, trail managers, bicycle share programs, etc.? Do you conduct such surveys and studies regularly?**
  Can you help us in connecting us with these stakeholders?
  Any specific questions you would like to ask in the field user survey?
  If we end up doing a field survey, can you assist us in providing volunteers for field user surveys?
  We plan to design field user surveys in next few weeks? We would like you to review them and provide your inputs and feedback to us.

Thank you so much for all your helpful feedback! Do you have any additional comments or any more suggestions for how the examination, analysis of trail usage, and reporting of data could be further improved?

Appendix F: Trail User Survey Instrument

Project Description (Script for Volunteers if needed)

The Florida Department of Transportation is conducting this survey as part of an ongoing project titled, “Florida Shared Use NonMotorized (SUN) Trail Transportation Use Study”. The project will identify industry best practices to standardize methodologies to evaluate multi-use trails on and that connect it to the statewide SUN Trail network. This survey is for the users of the Orlando Urban Trail.

Survey Description

The purpose of this trail user survey is to gather information about the following major topics:

- Trail user information;
- Trail user demographics;
- Trail user behavior;
- Trail use economic impact activities;
- Trail user satisfaction; and
- Trail needs

This survey will take approximately five minutes to complete. If you have any questions or concerns, please contact the principal investigators:

Robin Birdsong

SUN Trail Program Manager

Florida Department of Transportation

Robin.Birdsong@dot.state.fl.us

(850) 414-4922

Your feedback is important. Thank you in advance for participating in our survey.

RESPONSES (CHECK ALL THAT APPLY)

1. **Zip code of your residence(s): _____**

2. **Typical travel mode to get to the trail:**
   - ○ Walk
   - ○ Bicycle
   - ○ Car
   - ○ Transit
   - ○ Other_____

3. **Typical primary activity on the trail:**
   - ○ Walking/Hiking
   - ○ Running/Jogging
   - ○ Bicycling
   - ○ Skating
   - ○ Other_____

4. **Primary reason for using trail:**
   - ○ Exercise/Health
   - ○ Recreational Activity
   - ○ Going to Work
   - ○ Going to School
   - ○ Going to Restaurant
   - ○ Going to Shopping
   - ○ Site Seeing
   - ○ Other_____

5. **Average trail usage frequency:**
   - ○ Daily
   - ○ 2 days per week
   - ○ 3-4 days per week
   - ○ 5-7 days per week
   - ○ Few times per month
   - ○ Few times per year
   - ○ Other_____

6. **Typical day(s) of the week you use the trail:**
   - ○ Monday
   - ○ Tuesday
   - ○ Wednesday
   - ○ Thursday
   - ○ Friday
   - ○ Saturday
   - ○ Sunday

7. **Time of day you use the trail most often:**
   - ○ Morning (before 10 AM)
   - ○ Midday (10 AM - 2 PM)
   - ○ Afternoon (2 PM - 6PM)
   - ○ Evening (after 6 PM)

8. **Average time spent on the trail each visit:**
   - ○ Less than 30 minutes
   - ○ 30 minutes to 1 hour
   - ○ 1 to 2 hours
   - ○ 2 to 4 hours
   - ○ 4 to 8 hours
   - ○ More than 8 hours

9. **Average distance traveled on the trail each visit:**
   - ○ 0-2 miles
   - ○ 2-10 miles
   - ○ 10-20 miles
   - ○ More than 20 miles

10. **Combined amount ($) spent on a typical trail visit on beverages, snacks and meals: _____**

11. **Combined amount ($) spent annually to visit the trail (purchasing shoes, clothing, bicycle-related expenses, and other trail-exercise equipment):**
    _____

12. **Money ($) spent on accommodations (hotel/motel/campground) annually to enjoy this trail (if it includes overnight stay): _____**

13. **Combined amount ($) spent on a typical trail visit on grocery shopping:**
    _____

14. **Trail needs/issues (Examples: safety, security, amenities, cleanliness, maintenance): _____**

15. **Age: _____**

16. **Gender: _____**

17. **Group Size: ___**

18. **How did you find out about the trail?**
    - ○ Word of mouth
    - ○ Roadside signage
    - ○ Driving past
    - ○ Newspaper
    - ○ Parks department
    - ○ Bicycle shop
    - ○ Convention and Visitors Bureau
    - ○ Internet web site
    - ○ Other_____

Appendix G: Trail Counts Statistics

Cady Way Trail

- The counts are bidirectional, includes pedestrians and bicyclists, but cannot distinguish between pedestrians and bicyclists or directionality.
- These are continuous counts (Orange County counts) and short-term counts (City of Orlando counts)
- Assumptions: Directionality can be calculated by dividing numbers by two.

Table H-1 | Trail Count Statistics – Cady Way Trail

Mode	Annual Count for two sites	Annual count-for one site
2014	185,339	
2015	224,641	122,275
2016	177,468	111,325
2017	422,061	152,205
2018	310,238	

West Orange Trail

- The counts are bidirectional, includes pedestrians and bicyclists, but cannot distinguish between pedestrians and bicyclists or directionality.
- These are continuous counts.
- Assumptions: Directionality can be calculated by dividing numbers by two.
- Source of data is Orange County
- WOT 160 and WOT 182 counters are on non-SUN Trail sections of West Orange Trail

Table H-2 | Trail Count Statistics – West Orange Trail

Site Location	WOT-001 (Killarney W)	WOT-004 (Killarney E)	WOT-034 (Tildenville Rd Outpost)	WOT-072 (Chapin Station)	WOT - 082 (Pipe Bridge)	WOT-097 (West Road)	WOT-133 (West of AVO)	WOT-160 (North of Keene Rd.)	WOT-182 (Apopka Station)
Jan-17	7,933	9,357	17,136	8,623	8,071	7,372	7,920	1,639	10,561
Feb-17	8,678	8,069	17,755	11,156	8,912	7,432	8,518	1,893	14,331
Mar-17	8,940	7,700	20,404	11,700	9,421	7,622	9,675	1,922	12,079
Apr-17	8,792	7,787	19,326	11,160	10,262	9,132	7,766	1,831	7,381
May-17	19,108	30,465	40,881	22,383	11,037	25,065	17,836	4,155	9,748
Jun-17	23,486	27,558	38,224	18,749	7,780	22,154	15,071	3,754	13,887

Site Location	WOT-001 (Killarney W)	WOT-004 (Killarney E)	WOT-034 (Tildenville Rd Outpost)	WOT-072 (Chapin Station)	WOT - 082 (Pipe Bridge)	WOT-097 (West Road)	WOT-133 (West of AVO)	WOT-160 (North of Keene Rd.)	WOT-182 (Apopka Station)
Jul-17	19,461	32,369	39,420	20,098	8,948	23,444	18,226	4,736	18,064
Aug-17	22,142	31,758	50,867	20,400	8,860	18,256	16,995	5,266	23,110
Sep-17	18,244	28,157	30,769	18,249	6,438	17,013	18,826	4,682	12,769
Oct-17	21,496	31,894	28,837	21,846	9,021	30,895	14,526	324	16,460
Nov-17	17,858	34,835	32,956	18,204	9,136	32,078	14,205	411	23,846
Dec-17	17,197	33,027	30,219	17,197	7,735	32,417	12,522	297	29,662

Orlando Urban Trail

- The counts are bidirectional, includes pedestrians and bicyclists, but cannot distinguish between pedestrians and bicyclists or directionality.
- These are short term counts (City of Orlando counts)
- Assumptions: Directionality can be calculated by dividing numbers by two.

Table H-3 | Trail Count Statistics – Orlando Urban Trail

Year	2014	2015	2016	2017	2018
Annual count-one City of Orlando site	-	64,240	62,586	61,320	-

Pinellas Trail

- The counts are bidirectional, includes pedestrians and bicyclists, and can distinguish between pedestrians and bicyclists, but cannot distinguish directionality.
- These are continuous counts.
- Source of data is Forward Pinellas

Table H-4 | Trail Count Statistics – Pinellas Trail

Year	2017		2018	
Site Location	Annual Counts	Bicycle Share (%)	Annual Counts	Bicycle Share (%)
East Lake Tarpon	48,670	92	56,093	97
Wall Spring	271,175	79	No counts	
Palm Harbor	No counts		179,388	84
Dunedin	319,308	86	259,804	81
Clearwater	155,760	76	181,988	64
Walsingham	161,221	81	59,554	81

Year	2017		2018	
Site Location	Annual Counts	Bicycle Share (%)	Annual Counts	Bicycle Share (%)
Seminole	193,519	79	201,657	64
Bay Pines	160,099	52	158,738	73
St. Petersburg	148,631	79	125,892	62

Good Neighbor Trail

- The counts are bidirectional, includes bicyclists, but cannot distinguish directionality.
- These are short term counts (FDOT counts)
- Assumptions: Directionality can be calculated by dividing numbers by two.

Table H-5 | Trail Count Statistics – Good Neighbor Trail

Date	Site Number			
	#1	#4	#8	#11
5/10/2019*	19	3	9	6
5/11/2019	32	38	65	63
5/12/2019	28	32	48	52
5/13/2019	2	6	24	17
5/14/2019	33	43	39	46
5/15/2019	31	35	50	63
5/16/2019	17	18	39	48
5/17/2019	24	32	42	48
5/18/2019	**50**	**58**	**96**	**99**
5/19/2019	**43**	**49**	**59**	**84**
5/20/2019	16	15	33	38
5/21/2019	28	20	39	33
5/22/2019	16	20	41	30
5/23/2019	25	29	44	41
5/24/2019	28	28	50	63
5/25/2019	**61**	**74**	**126**	**106**
5/26/2019	**53**	**55**	**60**	**76**
5/27/2019	15	16	42	59
5/28/2019*	14	19	29	33

* Data was not completed for the whole day. Hence, ignored.

Appendix H: Trail Survey Statistics

Table I-1 | Trail Mode to Trail

Mode	Cady Way Trail	Orlando Urban Trail	West Orange Trail	Good Neighbor Trail	Pinellas Trail
Walk	30.26%	51.55%	26.32%	5.26%	25.18%
Bicycle	82.89%	55.43%	82.46%	42.11%	55.68%
Car	44.74%	25.97%	66.67%	52.63%	17.34%
Transit	5.26%	1.55%	1.75%	0.00%	-
Other	-	-	-	-	1.79%

Table I-2 | Travel Mode on Trail

Mode	Cady Way Trail	Orlando Urban Trail	West Orange Trail	Good Neighbor Trail	Pinellas Trail
Bicycle	86.84%	55.04%	84.21%	76.32%	65.98%
Pedestrian	13.15%	43.8%	15.79%	23.68%	32.36%
Skate	0.00%	1.16%	0.00%	0.00%	0.93%

Table I-3 | Activity on Trail

Activity on Trail	Cady Way Trail	Orlando Urban Trail	West Orange Trail	Good Neighbor Trail	Pinellas Trail
Exercise/Health/Recreational Activity	93.43%	86.82%	94.74%	86.84%	87.95%
Going to Church	0.00%	0.39%	0.00%	0.00%	Not option
Going to Restaurant	1.32%	3.88%	1.75%	0.00%	1.93%
Going to School	0.00%	0.00%	0.00%	10.53%	1.26%
Going to Shopping	1.32%	2.33%	0.00%	2.63%	0.93%
Going to Work	3.95%	6.59%	3.51%	0.00%	4.73%
Other	-	-	-	-	3.19%

Table I-4 | Trail Usage Frequency

Trail Usage Frequency	Cady Way Trail	Orlando Urban Trail	West Orange Trail	Good Neighbor Trail	Pinellas Trail
No response	1.32%	0.78%	1.75%	0.00%	-
1-2 times per week	1.32%	0.39%	1.75%	0.00%	21.31%
2 days per week	18.42%	15.12%	24.56%	7.89%	18.23%
3-4 days per week	27.63%	15.89%	31.58%	21.05%	33.24%
5-7 days per week	11.84%	12.02%	8.77%	0.00%	27.21%
Daily	6.58%	9.69%	3.51%	26.32%	
Few times per month	23.68%	28.29%	22.81%	26.32%	
Few times per year	9.21%	17.05%	5.26%	18.42%	
Twice per day	0.00%	0.78%	0.00%	0.00%	

Table I-5 | Days of Week

Days of Week	Cady Way Trail	Orlando Urban Trail	West Orange Trail	Good Neighbor Trail
Monday	36.84%	32.95%	38.60%	34.21%
Tuesday	47.37%	39.15%	50.88%	57.89%
Wednesday	56.58%	44.57%	57.89%	44.74%
Thursday	50.00%	40.31%	50.88%	52.63%
Friday	50.00%	41.47%	43.86%	42.11%
Saturday	86.84%	92.25%	82.46%	94.74%
Sunday	80.26%	72.09%	85.96%	55.26%

*Pinellas Trail Survey did not include this question as this information is available from their count program

Table I-6 | Time of day

Time of day	Cady Way Trail	Orlando Urban Trail	West Orange Trail	Good Neighbor Trail
Morning (before 10 AM)	48.68%	51.55%	47.37%	71.05%
Midday (10 AM – 2 PM)	15.79%	32.17%	15.79%	28.95%
Afternoon (2 PM - 6 PM)	22.37%	33.72%	19.30%	26.32%
Evening (after 6 PM)	13.16%	28.29%	15.79%	28.95%

*Pinellas Trail Survey did not include this question as this information is available from their count program

Table I-7 | Duration of trip (hr.)

Trip Duration	Cady Way Trail	Orlando Urban Trail	West Orange Trail	Good Neighbor Trail	Pinellas Trail
1 to 2 hours	46.05%	37.21%	47.37%	50.00%	39.11%
2 to 4 hours	19.74%	11.24%	28.07%	39.47%	29.76%
30 minutes to 1 hour	25.00%	33.33%	15.79%	5.26%	19.04%
4 to 8 hours	1.32%	0.39%	1.75%	0.00%	6.60%
Less than 30 minutes	7.89%	17.83%	7.02%	5.26%	2.83%
More than 8 hours	-	-	-	-	2.66%
Average Duration	**1.59**	**1.26**	**1.81**	**2.00**	2.25

Table I-8 | Trip Distance (miles) - two-way

Trip Duration	Cady Way Trail	Orlando Urban Trail	West Orange Trail	Good Neighbor Trail	Pinellas Trail*
0-2 miles	13.16%	31.78%	8.77%	7.89%	17.57%
10-20 miles	21.05%	10.85%	22.81%	34.21%	-
2-10 miles	46.05%	53.88%	40.35%	34.21%	48.90%
More than 20 miles	19.74%	3.49%	28.07%	23.68%	-
10 miles or more					33.53%
Average Distance	**10.00**	**5.88**	**11.54**	**12.00**	**4.76**

*Pinellas Trail Survey asked this question for a one-way trip distance

Table I-9 | Gender Split

Gender Split	Cady Way Trail	Orlando Urban Trail	West Orange Trail	Good Neighbor Trail	Pinellas Trail
Female	40.28%	46.40%	41.07%	32.43%	46.63%
Male	59.72%	53.60%	58.93%	67.57%	53.37%

Table I-10 | Age Mix

Age Mix	Cady Way Trail	Orlando Urban Trail	West Orange Trail	Good Neighbor Trail	Pinellas Trail
18 or under	2.50%	3.70%	2.70%	8.70%	3.45%
19 - 34	20.00%	25.93%	18.92%	4.35%	8.96%
35 - 49	35.00%	27.78%	32.43%	17.39%	16.12%
50 - 64	32.50%	24.07%	32.43%	34.78%	40.61%
65 or older	10.00%	18.52%	13.51%	34.78%	30.86%

Table I-11 | Combined amount ($) spent on a typical trail visit on soft goods:

Trail Name	Weighted Average Expenditure ($)	Percent of respondent who provided a non-zero cost ($) for this question
Cady Way Trail	25.16	63.16%
Orlando Urban Trail	16.81	53.88%
West Orange Trail	31.40	73.68%
Good Neighbor Trail	6.89	57.89%
Pinellas Trail	13.36	46.76%

Table I-12 | Combined amount ($) spent annually to visit this trail on hard goods

Trail Name	Weighted Average Expenditure ($)	Percent of respondent who provided a non-zero cost ($) for this question
Cady Way Trail	314.45	77.63%
Orlando Urban Trail	255.47	65.12%
West Orange Trail	299.39	75.44%
Good Neighbor Trail	583.42	71.05%
Pinellas Trail	346.92	49.21%

Table I-13 | Money ($) spent on accommodations (hotel/motel/campground)

Trail Name	Average Expenditure ($)	Percent of respondents
Orlando Urban Trail	1,787.5*	1.55%
West Orange Trail	50	1.75%
Good Neighbor Trail	3,000*	5.26%
Pinellas Trail	312.5	0.53%

* Indicates results skewed by a small number of respondents.

Appendix I: Private Business Survey

Project Description

The Florida Department of Transportation is conducting this survey as part of an ongoing project titled, “Florida Shared Use NonMotorized (SUN) Trail Transportation Use Study”. The project will identify industry best practices to standardize methodologies to evaluate multi-use trails on and that connect to the statewide SUN Trail network. This survey is for businesses along each of the five trails identified as a part of the project namely, Orlando Urban Trail, West Orange Trail, Cady Way Trail, Pinellas Trail and Good Neighbor Trail.

The purpose of this business survey is to gather information about the following major topics:

- Characteristics of businesses near trails;
- Impact of trail usage on businesses; and
- Economic characteristics of businesses near trails

This survey will take approximately 10 minutes to complete. If you have any questions or concerns, please contact the principal investigators:

Robin Birdsong

SUN Trail Program Manager

Florida Department of Transportation

Robin.Birdsong@dot.state.fl.us

(850) 414-4922

Your feedback is important. Thank you in advance for participating in our survey.

Please remember that any business information you share will be treated as strictly confidential and will be reported as aggregated numbers only.

QUESTIONS/RESPONSES

1. **Do you know if your business is close to a trail?**
   - Yes
   - No
   - Not applicable/Don't know

2. **If you answered yes to the above question, how informed/familiar/or even supportive are you with the trail?**
   - Very informed
   - Moderately informed
   - Minimally informed,
   - Not informed/Unfamiliar
   - Not applicable/Don't know

3. **Zip code of your business: _____**

4. **Please check the CLOSEST trail to your business from the following:**
   - Cady Way Trail
   - Good Neighbor Trail
   - Orlando Urban Trail
   - Pinellas Trail
   - West Orange Trail

5. **What is the proximity of your business to the CLOSEST trail?**
   - Adjacent to the trail
   - Less than ¼ mile from the trail
   - ¼ – ½ mile from the trail
   - ½ – 1 mile from the trail
   - 1 – 3 miles from the trail
   - 3 – 5 miles from the trail
   - More than 5 miles from the trail

6. **What is primary classification of your business?**
   - Bicycle repairs/sales or rentals
   - Convenience/grocery store
   - Hotel/motel/accommodations
   - Outdoor recreational/outfitter
   - Pharmacy/drug store
   - Restaurant/tavern/café/ice cream shop
   - Retail/gift/specialty store

- Campground
- Light industrial/manufacturing
- Transportation/shuttling
- Other (please specify) _____

7. **How long have you been in business (operating in close proximity to trail)?**
_____years _____months

8. **What months of the year do you consider to be your peak months (Check all that apply)?**
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

9. **What are your peak business hours (Check all that apply)?**
- 7:00 am – 12:00 pm
- 12:00 pm – 5:00 pm
- 5:00 pm – 9:00 pm
- After 9:00 pm
- Steady throughout the day
- Other (please specify) _____

10. **What days of the week is your business open (Check all that apply)?**
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

11. **Did the trail have an impact on choosing the location of your business?**
- Yes
- No
- Not applicable/Don't know

12. **What impact has the location of the trail system had on your business in the past year?**
- Increased sales/revenue significantly
- Increased sales/revenue somewhat
- Had no impact
- Decreased sales/revenue somewhat
- Decreased sales/revenue significantly
- Not applicable/Don't know

13. **Has the trail had any impact on your decision to do the following with respect to your operations?**
    - Expand your operations in the past year
    - Make plans to expand your operations
    - Maintain existing operations
    - Downsize your operations in the past year
    - Make plans to downsize your operations
    - None

14. **What percentage of your annual sales would you estimate to be attributed to the trail?**
    - 2017: _____
    - 2018: _____

15. **How many employees does the business near the trail have?**
    - Full time: _____
    - Part Time: _____

16. **Please describe the general outlook of your employees towards the trail (Examples: employees commute or use the trail before/after work hours/during lunch breaks):**

    _____
    _____
    _____

17. **Time of day your employees use the trail most often:**
    - Morning (before 10 AM)
    - Midday (10 AM - 2 PM)
    - Afternoon (2 PM - 6PM)
    - Evening (after 6 PM)

18. **Does the business promote the trail usage for wellness of the employees?**
    - Yes
    - No
    - Not applicable/Don't know

19. **Please explain any other actions that you have taken to attract and/or cater to trail users.**

    _____
    _____

20. **Trail needs/issues specific to your business (Examples: safety, security, amenities, cleanliness, maintenance, bicycle racks):**

    _____

Appendix J: Trail Profiles and Study Brochures

This appendix includes following materials:

Trail Profiles:

The profiles are a two-page fact sheets for the five trails, and include the following details:

- Trail description;
- Trail characteristics and location details;
- Trail usage;
- Trail usage behavior;
- Trail user demographics;
- Economic benefits and impacts; and
- Trail map.

Study Brochures:

The brochure is a four-page infographic document summarizing the study tasks in a concise manner. It includes the following details:

- Study summary;
- Study methodology steps;
- Transportation use measures;
- Guidelines framework;
- Data Gathered as part of the study;
- Data Collection effort as part of the study;
- Trail User Survey Template used as part of the study; and
- Instructions provided to volunteers for trail user survey.

CADY WAY TRAIL

COUNTY: Orange

CITIES/NEIGHBORHOODS:
Goldenrod, Azalea Park,
Winter Park, Orlando

LENGTH: 7.2 mi

The Cady Way Trail is northeast of downtown Orlando and extends seven-and-a-half miles to connect the communities of Orlando from the Fashion Square Mall, north to Ward Memorial Park/Cady Way Park in Winter Park, and beyond to Hall Road at Aloma Avenue in Goldenrod, at the Orange/Seminole County line, and to the Cross Seminole Trail in Seminole County. Built along the former East Florida and Atlantic Railroads it is co-owned, managed, and operated by the Orlando Department of Families, Parks and Recreation, and Orange County Parks and Recreation. Open to pedestrians, cyclists, and skaters during daylight hours since 1994, the trail connects residential areas, including the Baldwin Park neighborhood, to two schools, numerous restaurants and retail, commercial, and employment centers such as the Baldwin Park Town Center, and the Executive Center Drive. The trail wraps around Lake Gear, Lake Susannah, and Lake Baldwin, goes past the Winter Pines Golf Course, and the Cady Way Pool. Alternating between 10- to 16-feet wide "single-width" pathway with painted centerline, and two paths separated by a median – with 10 feet wide on one side and 6 feet wide on the other. The narrow "stations" or location reference numbers are marked in white on the trail and are posted every 0.5 miles. There is a trail bridge over State Road (SR) 436.

TRAIL CHARACTERISTICS

HOURS OF OPERATION[2]
SUNRISE TO SUNSET

TRAIL WIDTH[3]
10-16 FT.

TRAIL SURFACE[1]
ASPHALT

*EXPERIENCE RATING[4]

Excellent	**69%**
Very Good	**21%**
Good	**8%**
Fair	**2%**

FDOT

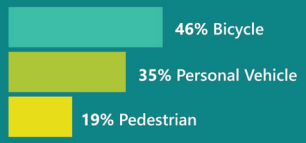
CADY WAY TRAIL

HOW IS THE TRAIL USED?

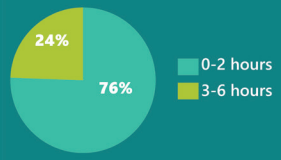
NUMBER OF VISITS (IN 2018)[6]

77,560

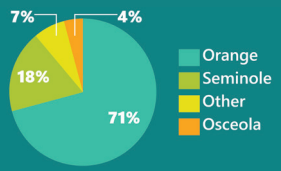
TRAIL ACCESS[4]



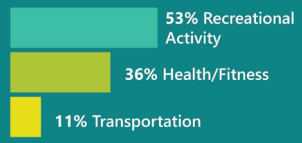
TIME SPENT ON TRAIL PER VISIT[4]



COUNTY OF RESIDENCE[4]



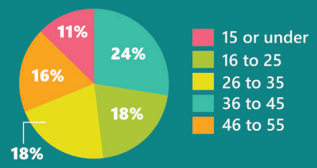
REASON FOR TRAIL USE[4,7]



SATURDAY
MOST VISITED TRAIL DAY[4,7]

80%
OF USERS VISITED IN GROUPS OF TWO OR LARGER[4]

AGE OF VISITOR[4]



59%
OF TRAIL VISITORS VISITED MORE THAN TEN TIMES IN A YEAR[4]

USER ACTIVITIES ON TRAIL[4,7]

87% - BICYCLING
13% - PEDESTRIAN

ECONOMIC BENEFITS & IMPACTS[6,7]

$88K
HEALTH BENEFITS

$867K
RECREATIONAL BENEFITS

$9K
REDUCED AUTO USE BENEFITS

$1.3M
USER EXPENDITURES

[1] TrailLink: https://www.traillink.com/trail/cady-way-trail/
[2] Florida Geographic Data Library, 2019
[3] Bike Orlando, 2019
[4] East Central Florida Regional Planning Council, 2011
[5] Orange County Parks & Recreation, 2019
[6] Bicycle counts were collected by Orange County
[7] Based on Field data collection survey conducted by FDOT in 2019.
[6,7] Based on recent year user volumes and surveys. Annual estimates.

ORANGE COUNTY PARKS AND RECREATION
4801 West Colonial Drive
Orlando, FL 32808
Email: parks@ocfl.net
Phone: (407)-836-6200

ORLANDO URBAN TRAIL

COUNTY: Orange

CITIES/NEIGHBORHOODS: Orlando

LENGTH: 2.6 mi

The Orlando Urban Trail is located near Downtown Orlando. Although it is considered the spine of Orlando's trail network, it is the only trail within the study area that is not part of the SUN Trail network. It was specifically identified for inclusion in this study because it provides north-south connectivity to and from an urban setting to the SUN Trail network, and it traverses areas where people utilize dockless bike sharing stations and other multi-modal facilities. The trail is approximately three miles long and 12 feet wide, with 85% of the trail on an off-street path with asphalt and concrete sections. The trail runs from Lake Highland through Loch Haven Park, to Mead Garden in Winter Park. Major trail highlights include connections to six lakes, Orlando Cultural Park, and the Gaston Edwards Trail. The city is in the process of extending the trail south by a third of a mile to the Central Business District to connect to the recently constructed Colonial (State Road 50) Overpass.

TRAIL CHARACTERISTICS

HOURS OF OPERATION[2]
SUNRISE TO SUNSET

TRAIL WIDTH[3]
12 FT.

TRAIL SURFACE[1]
ASPHALT, CONCRETE

AMENITIES[1]
PARKING **RESTROOMS**

FDOT

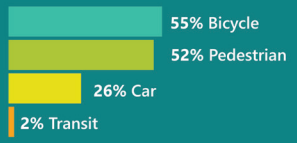
ORLANDO URBAN TRAIL

HOW IS THE TRAIL USED?

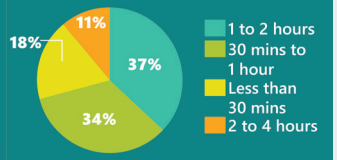
NUMBER OF VISITS (IN 2018)[4]

30,660

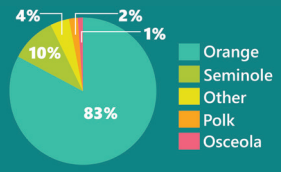
TRAIL ACCESS[5]



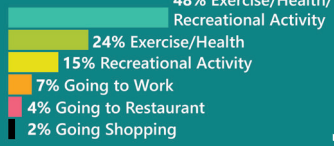
TIME SPENT ON TRAIL PER VISIT[5]



COUNTY OF RESIDENCE[5]



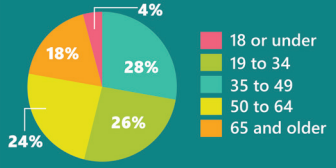
REASON FOR TRAIL USE[5]



SATURDAY[5]
MOST VISITED TRAIL DAY[5]

32% OF TRAIL VISITORS TRAVELED 2 MILES OR LESS[5]

AGE OF VISITOR[5]



28% OF TRAIL VISITORS VISITED A FEW TIMES PER MONTH[5]

95% OF TRAIL VISITORS WERE YEAR-ROUND RESIDENTS[5]

USER ACTIVITIES ON TRAIL[5]

55% - BICYCLING
44% - PEDESTRIAN
1% - SKATING

ECONOMIC BENEFITS & IMPACTS[4,5]

$37K HEALTH BENEFITS

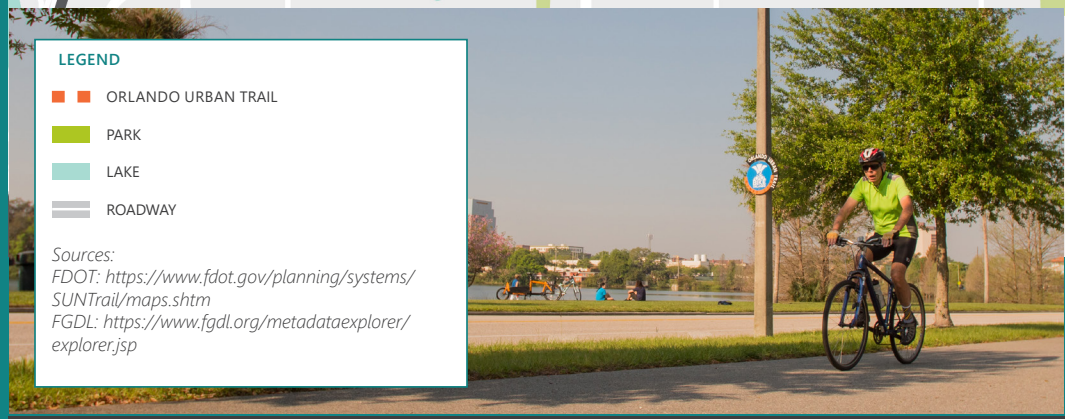
$320K RECREATIONAL BENEFITS

$4K REDUCED AUTO USE BENEFITS

$284K USER EXPENDITURES

[1]TraillLink: https://www.traillink.com/trail/orlando-urban-trail/
[2]City of Orlando: http://www.cityoforlando.net/transportation-planning/orlando-trails/
[3]Bike Florida: https://www.bikeflorida.net/west_orange_trail.htm
[4]Bicycle counts were collected by City of Orlando
[5]Based on Field data collection survey conducted by FDOT in 2019.
[4,5]Based on recent year user volumes and surveys. Annual estimates.

Sources:
FDOT: https://www.fdot.gov/planning/systems/SUNTrail/maps.shtm
FGDL: https://www.fgdl.org/metadataexplorer/explorer.jsp



CITY OF ORLANDO
400 South Orange Avenue
Orlando, FL 32801
Phone: (407)-246-2121

WEST ORANGE TRAIL

COUNTY: Orange

CITIES/NEIGHBORHOODS:
Apopka, Winter Garden, Oakland, Killarney

LENGTH: 20.8 mi

Connecting communities just northwest of downtown Orlando, the 22-mile long West Orange Trail (WOT) is owned and operated by Orange County. This paved trail extends from the Orange/ Lake County line and passes through the towns of Killarney and Oakland, the city of Winter Garden, and through downtown Apopka with most of its length built along a historic railroad grade with a 14-foot-wide paved asphalt surface, open during daylight hours, for bicyclists, skaters and skateboarding, horseback riders, walkers, and runners. This trail connects neighborhoods, schools, cafes and restaurants, and outfitters that provide bicycle rentals including one at the Killarney Station trailhead. Attractions along the WOT include the Winter Garden Heritage Museum, and the butterfly garden at Lake Apopka.

Portions of the WOT are located within the developing SUN Trail network and are part of the developing regional Coast to Coast Trail (C2C). When complete, the C2C will connect nine counties from the Gulf of Mexico to the Atlantic Ocean, through communities in Central Florida from St. Petersburg to Titusville. The western end of the West Orange Trail connects to Lake County's existing C2C segment known as the South Lake-Lake Minneola Scenic Trail, the eastern end will provide a connection to the future C2C segment to Clarcona and Ocoee.

TRAIL CHARACTERISTICS

HOURS OF OPERATION[2]
SUNRISE TO SUNSET

TRAIL WIDTH[4]
14 FT.

TRAIL SURFACE[1]
ASPHALT, CONCRETE, DIRT, WOODCHIPS

*EXPERIENCE RATING[5]

Excellent	Very Good	Good	Fair
73%	23%	4%	1%

FDOT

WEST ORANGE TRAIL

HOW IS THE TRAIL USED?

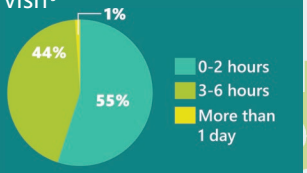
NUMBER OF VISITS (IN 2017)[7]

360,389

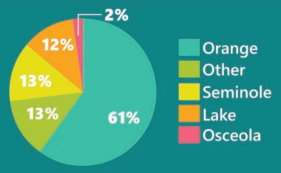
TRAIL ACCESS[5]

- 64% Personal Vehicle
- 20% Bicycle
- 11% Pedestrian
- 3% Transit (LYNX, carpool)
- 2% Other

TIME SPENT ON TRAIL PER VISIT[5]



COUNTY OF RESIDENCE[5]



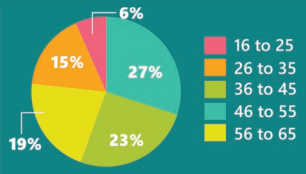
REASON FOR TRAIL USE[5,8]

- 53% Recreational Activity
- 42% Health/Fitness
- 6% Transportation

SATURDAY
MOST VISITED TRAIL DAY[5,8]

67%
OF USERS VISITED IN GROUPS OF TWO OR LARGER[5]

AGE OF VISITOR (TOP FOUR)[5]



65%
OF TRAIL VISITORS VISITED MORE THAN TEN TIMES IN A YEAR[5]

9%
OF TRAIL VISITORS SPEND THE NIGHT[5]

USER ACTIVITIES ON TRAIL[5,8]

84% - BICYCLING
16% - PEDESTRIAN

ECONOMIC BENEFITS & IMPACTS[7,8]

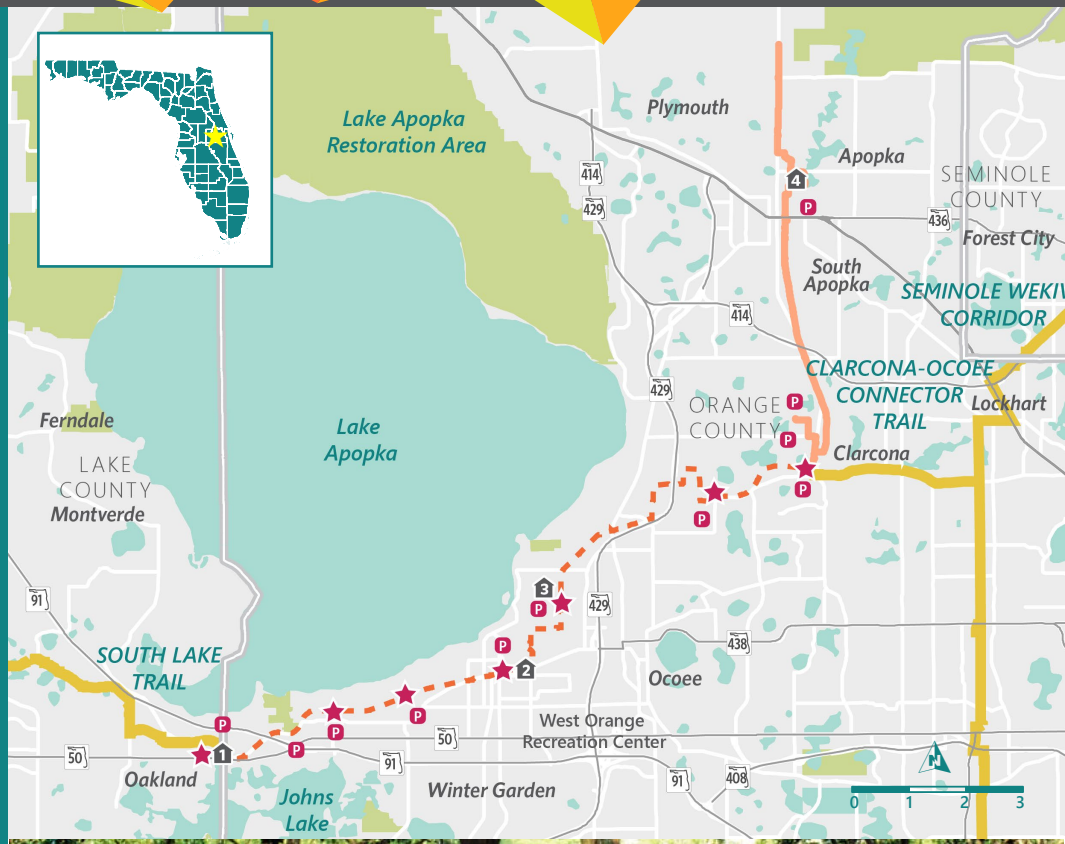
$432K
HEALTH BENEFITS

$4.1M
RECREATIONAL BENEFITS

$44K
REDUCED AUTO USE BENEFITS

$8.4M
USER EXPENDITURES

[1] TrailLink: https://www.traillink.com/trail/west-orange-trail/
[2] Florida Geographic Data Library, 2019
[3] Florida Department of Environmental Protection
[4] Bike Florida, 2019
[5] East Central Florida Regional Planning Council, 2011
[6] FDOT
[7] Bicycle counts were collected by Orange County
[8] Based on Field data collection survey conducted by FDOT in 2019.
[7,8] Based on recent year user volumes and surveys. Annual estimates.



LEGEND

- WEST ORANGE TRAIL (SUN Trail)
- WEST ORANGE TRAIL (Remaining)
- OTHER DEVELOPING TRAILS
- TRAILHEAD
- PARK
- LAKE
- ROADWAY
- PARKING
- 1 KILLARNEY STATION
- 2 WINTER GARDEN STATION
- 3 CHAPIN STATION
- 4 APOPKA STATION

Sources:
FDOT: https://www.fdot.gov/planning/systems/SUNTrail/maps.shtm
FGDL: https://www.fgdl.org/metadataexplorer/explorer.jsp

ORANGE COUNTY PARKS AND RECREATION
4801 West Colonial Drive
Orlando, FL 32808
Email: parks@ocfl.net
Phone: (407)-836-6200

GOOD NEIGHBOR TRAIL

COUNTY: Hernando

CITIES/NEIGHBORHOODS:
Brooksville, Powell, Brookridge

LENGTH: 10.3 mi

Today the Good Neighbor Trail extends 10 miles from historic Brooksville, a Florida Mainstreet Community, to the 46-mile long Withlacoochee State Trail (WST). Brooksville is the county seat of Hernando County. According to the 2010 United States Census,Brooksville's population totaled 7,719 – making it a more rural condition than other trails in the study area. The Russell Street Park (trailhead) includes the historic 1885 Train Depot and Countryman One-Room Schoolhouse Museums, a gazebo, picnic area, and restrooms. The six miles connecting east to the WST opened in November 2018, making this segment the newest trail section in the study area. The Good Neighbor Trail is within the developing C2C and the SUN Trail network. In the future, the western terminus will extend approximately seven miles, connecting to the Suncoast Trail and beyond.

TRAIL CHARACTERISTICS

HOURS OF OPERATION[2]
SUNRISE TO SUNSET

TRAIL WIDTH[3]
12 FT.

TRAIL SURFACE[1]
ASPHALT

AMENITIES[1]
PARKING **RESTROOMS**

FDOT

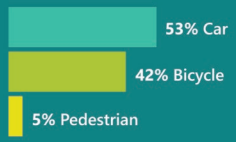
GOOD NEIGHBOR TRAIL

HOW IS THE TRAIL USED?

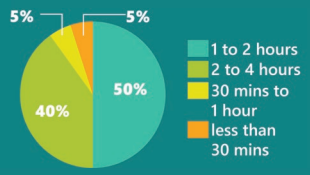
NUMBER OF VISITS (IN 2019)[4]

22,510

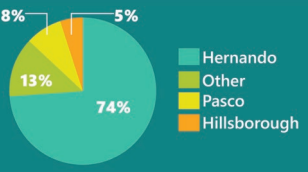
TRAIL ACCESS[5]



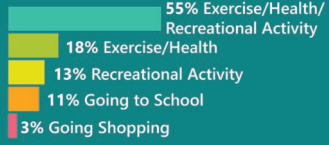
TIME SPENT ON TRAIL PER VISIT[5]



COUNTY OF RESIDENCE[5]



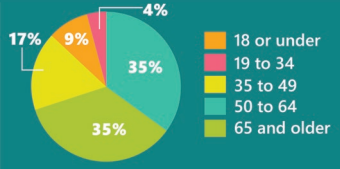
REASON FOR TRAIL USE[5]



SATURDAY[5]
MOST VISITED TRAIL DAY[5]

58% OF TRAIL VISITORS TRAVELED MORE THAN 10 MILES[5]

AGE OF VISITOR[5]



55% OF TRAIL VISITORS VISITED MULTIPLE TIMES A WEEK[5]

82% OF TRAIL VISITORS WERE YEAR-ROUND RESIDENTS[5]

USER ACTIVITIES ON TRAIL[5]

76% - BICYCLING
24% - PEDESTRIAN

ECONOMIC BENEFITS & IMPACTS[4,5]

$24K
HEALTH BENEFITS

$234K
RECREATIONAL BENEFITS

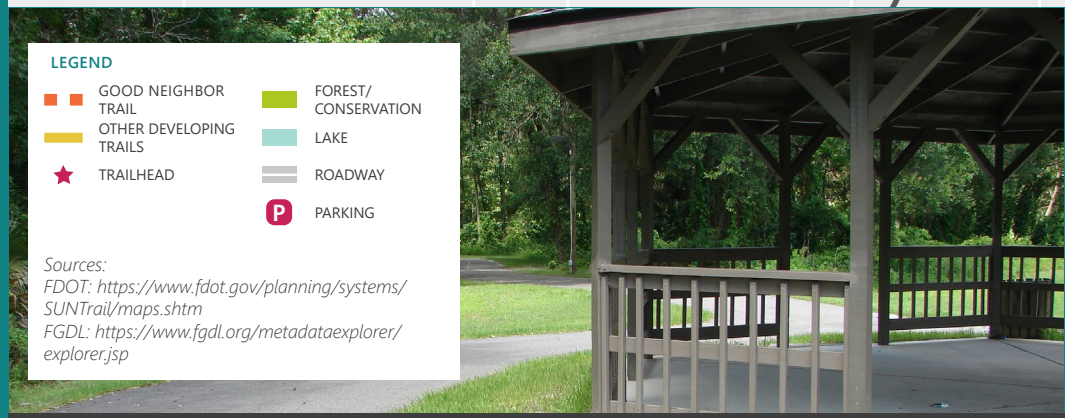
$101K
USER EXPENDITURES

[1] TrailLink: https://www.traillink.com/trail/good-neighbor-trail/
[2] Florida's Adventure Coast: https://floridasadventurecoast.com/brooksvilles-good-neighbor-trail/
[3] Hernando/Citrus MPO: https://www.hernandocounty.us/Home/ShowDocument?id=5333
[4] Bicycle counts were collected by FDOT
[5] Based on Field data collection survey conducted by FDOT in 2019.
[4,5] Based on recent year user volumes and surveys. Annual estimates.

LEGEND

- GOOD NEIGHBOR TRAIL
- OTHER DEVELOPING TRAILS
- TRAILHEAD
- FOREST/ CONSERVATION
- LAKE
- ROADWAY
- PARKING

Sources:
FDOT: https://www.fdot.gov/planning/systems/SUNTrail/maps.shtm
FGDL: https://www.fgdl.org/metadataexplorer/explorer.jsp



CITY OF BROOKSVILLE
201 Howell Avenue
Brooksville, FL 34601
Email: cob-info@cityofbrooksville.us
Phone: (352)-540-3810

PINELLAS TRAIL

COUNTY: Pinellas

CITIES/NEIGHBORHOODS:
St. Petersburg, Gulfport, South Pasadena, Tarpon Springs, Palm Harbor, Dunedin, Bay Pines, Crystal Beach, Clearwater, Seminole

LENGTH: 54 mi

The first five miles of the Pinellas Trail opened in 1990, with construction funded by Penny for Pinellas – a local sales tax for capital improvements, on land purchased by the Florida Department of Transportation in 1983, making it one of Florida's oldest. In 2000 it was designated as a Millennium Trail by the White House. Today the trail, created along a portion of a railroad corridor, stretches nearly 54 miles from Tarpon Springs in the north to St. Petersburg in the south, passing through the towns of Tarpon Springs, Palm Harbor, Dunedin, Clearwater, Largo, Seminole, South Pasadena, Gulfport, and St. Petersburg. Anchoring the western side of the C2C, pedestrians, skaters, and bicyclists use the Pinellas trail during daylight hours, with some trail patrons using it for their work commute instead of driving automobiles. Pinellas County Parks and Conservation Resources is responsible for the trail maintenance and operating costs. Pinellas is one of Florida's most densely populated counties. Partners continue to close gaps in the Pinellas Trail and eventually it will loop the entire county, and form a key component of the SUN Trail network. The trail while in and around large population centers traverses through parks, natural areas, and coastal communities. Other trail highlights include nine locations of unique art sculptures, the Cross-Bayou Bridge over Boca Ciega Bay, and restaurants and businesses.

TRAIL CHARACTERISTICS

HOURS OF OPERATION[2]
SUNRISE TO SUNSET

TRAIL WIDTH[3]
15 FT.

TRAIL SURFACE[1]
ASPHALT

AMENITIES[1]
PARKING **RESTROOMS**

PINELLAS TRAIL

HOW IS THE TRAIL USED?

NUMBER OF VISITS (IN 2018)[4]

293,677

TRAIL ACCESS[5]

- 56% Bicycle
- 25% Pedestrian
- 17% Car
- 2% Other

TIME SPENT ON TRAIL PER VISIT[5]

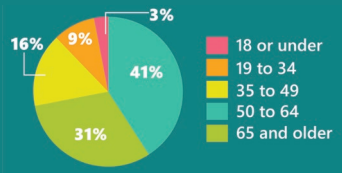
- 39% 1 to 2 hours
- 30% 2 to 4 hours
- 19% 30 mins to 1 hour
- 7% 4 to 8 hours
- 3% Less than 30 mins
- 2% More than 8 hours

REASON FOR TRAIL USE[5]

- 59% Exercise
- 29% Recreation
- 12% Other

49% OF TRAIL VISITORS TRAVELED 2 TO 10 MILES[5]

AGE OF VISITOR[5]



60% OF TRAIL VISITORS VISITED 3-7 DAYS PER WEEK[5]

80% OF TRAIL VISITORS WERE YEAR-ROUND RESIDENTS[5]

USER ACTIVITIES ON TRAIL[5]

66% - BICYCLING
34% - PEDESTRIAN
1% - OTHER

ECONOMIC BENEFITS & IMPACTS[4,5]

$267K HEALTH BENEFITS

$3.5M RECREATIONAL BENEFITS

$30K REDUCED AUTO USE BENEFITS

$1.8M USER EXPENDITURES

[1] TrailLink: https://www.traillink.com/trail/fred-marquis-pinellas-trail/
[2] Florida Department of Environmental Protection: https://floridadep.gov/parks/ogt
[3] Bike Florida: https://www.bikeflorida.net/pinellas_trail.htm
[4] Count data was provided by Forward Pinellas.
[5] "Survey" refers to the survey conducted by Forward Pinellas.
[4,5] Based on recent year user volumes and surveys. Annual estimates.

PINELLAS COUNTY
Parks & Conservation Resources
12520 Ulmerton Road
Largo, FL 33774
Phone: (727)-582-2100

SHARED-USE NONMOTORIZED (SUN) TRAIL TRANSPORTATION USE STUDY

Cady Way Trail

Orlando Urban Trail

West Orange Trail

Good Neighbor Trail

Pinellas Trail

The Florida Department of Transportation's (FDOT or Department) primary statutory responsibility is to coordinate the planning and development of a safe, viable, and balanced state transportation system serving all regions of the state, and to assure the compatibility of all components, including multimodal facilities. Furthering the state's commitment of improving mobility, the Florida Legislature passed measures in 2014 and 2015 to fund and develop multi-use trails. Specifically, The SUN Trail program was established in 2015, under Section 339.81, Florida Statutes (F.S.). Administered by FDOT, the SUN Trail program provides funding for closing gaps in the statewide system of paved non-motorized for bicyclists and pedestrians (SUN Trail network). This SUN Trail network is a refined version of the Florida Greenways and Trails System (FGTS) Plan's Land Trail Priority network; it includes high priority (strategic) trail corridors and connections.

SUN TRAIL TRANSPORTATION USE STUDY

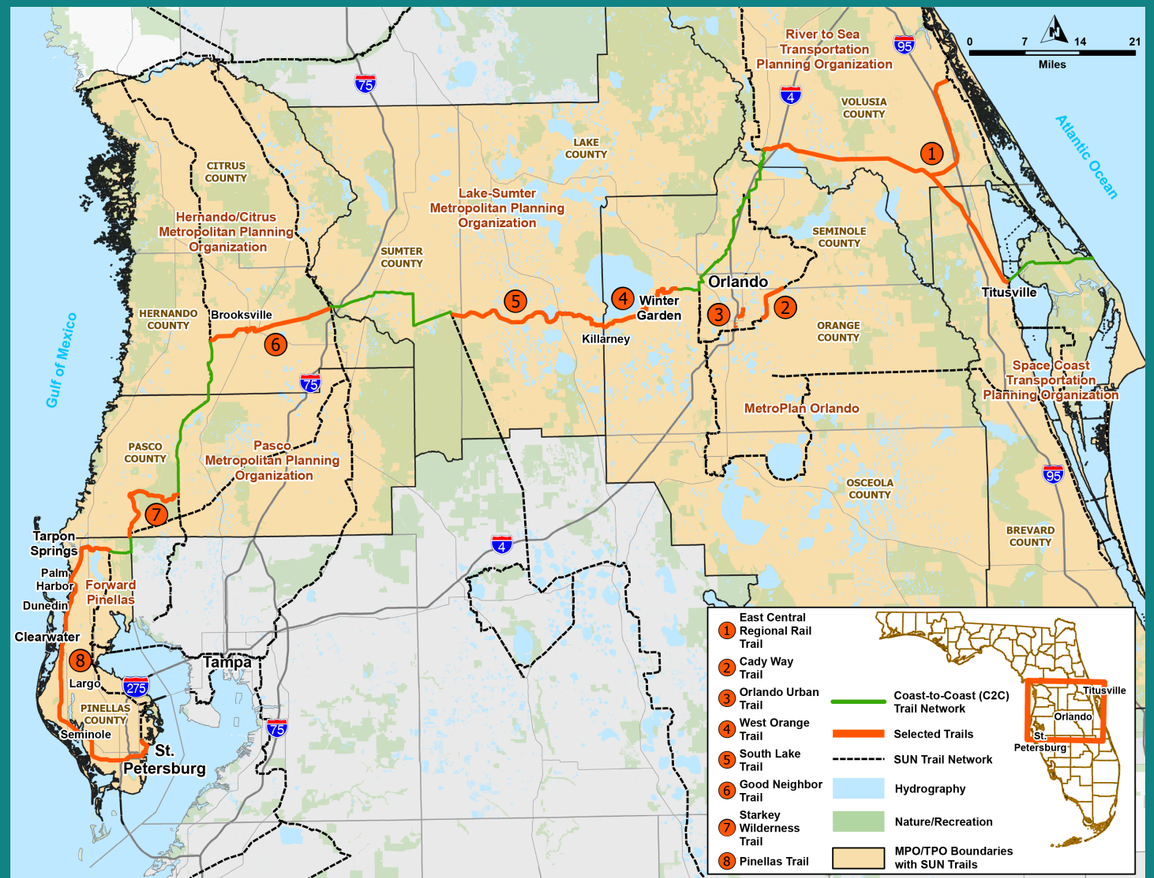
PROJECT SUMMARY

FDOT identified a need to develop consistent and objective procedures to collect, evaluate, examine, analyze, report, and store information on multi-use trails including transportation trips, trail traffic, trail characteristics and percentages of trail travelers to determine how (paved) multi-use trails support place-to-place/destination-to-destination travel and how travelers utilize and access the SUN Trail network. This study explores five trails in Central Florida with urban and rural conditions. Specifically, the study analyzes trail usage and data collected from the Cady Way Trail, the Orlando Urban Trail (not on SUN Trail network), the West Orange Trail, the Good Neighbor Trail, and the Pinellas Trail.

Several additional trails were identified as contributing to this study, these include: the Starkey Trail, the Lake Minneola Scenic Trail, the East Central Regional Rail Trail and the South Lake Trail.

The study defines concepts and datasets associated with trail transportation usage, establishes a scalable and repeatable methodology framework, and develops implementation guidelines to objectively quantify performance measures that can be used to evaluate trail-related performance measures.

Study Trail Locations



METHODOLOGY STEPS

1 Literature Review

- Trail Use Data Programs
- Benefits and Economic Analysis of Trails
- Reporting and Visualization

2 Data and Information Gathering

- Stakeholder Surveys and Interviews
- Gather available data from stakeholders
- Conduct trail user survey and trail user counts
- Leverage other available datasets as needed

Data and Information Gathering Included the Following:

- Trail characteristics;
- Trail user counts;
- Trail user demographics and behavior;
- Other trail related datasets;
- Trail benefits and impacts;
- Trail data analysis; and
- Visualization and analytics tools.

3 Transportation Use Measures

TOTAL NUMBER OF VISITS	GENDER RATIO OF TRAIL USERS
PRIMARY TRAVEL MODES TO TRAIL	AGE SHARE OF TRAIL USERS
PRIMARY TRAVEL MODES ON TRAIL	AVERAGE AMOUNT SPENT ON A TYPICAL TRAIL VISIT ON SOFT GOODS
DIFFERENT ACTIVITIES ON THE TRAIL	AVERAGE AMOUNT SPENT ON A TYPICAL VISIT ON HARD GOODS
FREQUENCY OF TRAIL USAGE	AVERAGE AMOUNT SPENT ON ACCOMMODATION IF INCLUDES OVERNIGHT STAY
POPULAR DAYS OF TRAIL USAGE	HEALTH BENEFITS
POPULAR TIME OF DAYS FOR TRAIL USAGE	RECREATION BENEFIT
DURATION OF TRAIL VISIT	REDUCED AUTO USE BENEFIT
DISTANCE TRAVELED IN A TRAIL VISIT	USER EXPENDITURES

SUN TRAIL TRANSPORTATION USE STUDY

GUIDELINES FRAMEWORK

Comprehensive guidelines help establishing or enhancing trail traffic data collection processes, data maintenance and management techniques, trail performance measures, trail trend analysis, factors impacting trail usage and reporting, which can be used by the following:

- Trail agencies
- Cities and Counties
- Other stakeholders

The guidelines below include information on following two major topics:

- Trail Use Data Collection
- Trail User Survey

There are few additional tips on the next page.

Trail Use Data Collection

1. What are you Counting?		Bicyclists Only	Pedestrians Only	Pedestrians & Bicyclists Combined	Pedestrians & Bicyclists Separately	Cost
2. What is the Count Duration?	**Technology**					
Continuous Count	Piezo/ Inductance Loops	⊕	-	-	✓	$$
	Magnetom-eter	✓	-	-	-	$-$$
	Pressure Sensor	✓	✓	✓	✓	$$
	Radar Sensor	✓	✓	✓	-	$-$$
	Seismic Sensor	✓	✓	✓	-	$$
	Automated Camera	✓	✓	✓	✓	$$
	Infrared Sensor	✓	⊕	⊕	✓	$-$$
	Pneumatic Tubes	⊕	-	-	✓	$-$$
Short-term Count	Manual Counts	⊕	⊕	⊕	⊕	$$-$$$

How long determines complexity of installation.

Trail User Survey

	Online Survey	Dropbox Survey	Personal Intercept Survey (with online survey option)
Market Penetration	**Low**	**Medium**	**High**
Cost	**$**	**$$**	**$$$***
Duration	**Unconstrained**	**Unconstrained**	**Unconstrained**

*Cost will be lower if volunteers are available.

- ✓ Indicates that counting with this technology is possible
- ⊕ Indicates a common or preferred practice
- ✓ Indicates a common practice, but technology must be combined with other technology to differentiate between the two modes

DATA GATHERING

Stakeholder Engagement:
A stakeholder kick-off meeting was conducted to introduce the study goals and approach to everyone. This stakeholder kick-off meeting was followed up with a post meeting feedback survey and stakeholder interviews. The table below lists the agencies that were invited to be part of this study.

Stakeholder Agencies

Bike Florida, Inc. - Get In Touch!	Florida Bicycle Association
City of Brooksville	MetroPlan Orlando
City of Orlando	Orange County
City of Titusville	Pasco County
Florida Department of Environmental Protection	Pasco Metropolitan Planning Organization
Florida Department of Transportation	Pinellas County
East Central Florida Regional Planning Council	Rails-to-Trails Conservancy
Florida Bicycle Association	River to Sea Transportation Planning Organization
Forward Pinellas	Space Coast Transportation Planning Organization
Hernando/Citrus Metropolitan Planning Organization	Tampa Bay Area Regional Transit Authority
Lake County	Tampa Bay Regional Planning Council
Lake-Sumter Metropolitan Planning Organization	Volusia County

Stakeholder survey and interviews were conducted to gather information from the stakeholders about their existing approaches and resources to gather information on trail characteristics, trail user counts, trail user demographics and behavior, other trail related datasets, trail benefits and impacts, trail data management, trail data analysis, and visualization and analytics tools.

Summary of Survey Responses – Trail Use Counts and Trail User Surveys

Agency	User Count Data	Count Frequency	User Survey Data	User Survey Method
City of Orlando	Bicyclists + Pedestrians	Short-term counts	-	-
City of Titusville	Bicyclists	Short-term counts	User Demographics	Personal intercept/ Welcome Center staff interview
Florida Department of Environmental Protection	Bicyclists + Pedestrians	Continuous counts	-	-
Forward Pinellas	Bicyclists + Pedestrians	Continuous counts	User Demographics and User Behavior	In-Person/Field Intercept and Postcards
Lake County Office of Parks and Trails	Bicyclists + Pedestrians	Continuous counts	-	-
MetroPlan Orlando	Bicyclists + Pedestrians	Short-term counts	-	-
Orange County Government	Bicyclists + Pedestrians	Continuous counts	-	-
Rails-to-Trails Conservancy	Bicyclists + Pedestrians	Continuous counts	-	-

SUN TRAIL TRANSPORTATION USE STUDY

DATA COLLECTION EFFORT

The trail user counts for all trails (Exception: Good Neighbor Trail) were acquired from different stakeholders. These counts are adjusted to compute the annual visit volumes. Good Neighbor Trail does not have any count sites. Hence, it was deemed necessary to conduct short-term counts on Good Neighbor Trail. These short-term counts were conducted by the newly established Florida Department of Transportation (FDOT) Non-motorized count program. The table below summarizes specific details on the count sites.

Trail Use Data Collection

Trail Name	Counts Manager	Count Types	Users	Number of Sites
Cady Way Trail	Orange County	Continuous Counts		2
Orlando Urban Trail	City of Orlando	Short Term Counts		1
West Orange Trail	Orange County	Continuous Counts		9
Good Neighbor Trail	Florida Department of Transportation	Short Term Counts		4
Pinellas Trail	Forward Pinellas	Continuous counts		8

Trail user surveys are needed to understand the trail user demographics and behavior. A personal intercept (field-based) trail user survey was conducted on the Good Neighbor Trail. For Orlando Urban Trail and Pinellas Trail, a personal intercept survey and web-based survey was conducted. For the remaining two trails (West Orange Trail and Cady Way Trail), a web-based survey was conducted. The table below provides specific details on the surveys.

Trail User Survey

Trail Name	Survey Administrator	Personal Intercept Survey Date and Time	Number of Sites	Web-based Survey
Cady Way Trail	Florida Department of Transportation	Not applicable	Not applicable	June 7-14, 2019
Orlando Urban Trail	Florida Department of Transportation	May 11, 2019 (7:00 am to 7:00 pm)	2	June 7-14, 2019
West Orange Trail	Florida Department of Transportation	Not applicable	Not applicable	June 7-14, 2019
Good Neighbor Trail	Florida Department of Transportation	May 4, 2019 (7:00 am to 7:00 pm)	1	Not applicable
Pinellas Trail	Forward Pinellas	April 26-27, 2019 (7:00 am to 7:00 pm)	6	April 26-May 17, 2019

Additional Tips:

- Conduct a reconnaissance survey and do background research to select sites for field user survey and trail count locations.
- Include local stakeholders to get better understanding of the sites.
- For additional pedestrian and bicyclist counts information, contact non-motorized counts program managed by FDOT Transportation Data and Analytics Office.
- Use trail profiles developed under this project as reference materials for different analyses.
- For comprehensive economic impact and benefit analysis, Region Economic Models, Inc. (REMI) modeling services are available with Regional Planning Councils for a nominal price.

TEMPLATE FOR TRAIL USER SURVEY

NO.	QUESTION	RESPONSES (CIRCLE ALL THAT APPLY)								
1	**Zip code of your residence(s):**									
2	**Typical travel mode to get to the trail:**	*Walk*	*Bicycle*	*Car*	*Transit*	*Other*				
3	**Typical primary activity on the trail:**	*Walking/ Hiking*	*Running/ Jogging*	*Bicycling*	*Skating*	*Other*				
4	**Primary reason for using trail:**	*Exercise/ Health*	*Recreational Activity*	*Going to Work*	*Going to School*	*Going to Restaurant*	*Going to Shopping*	*Site Seeing*	*Other*	
5	**Average trail usage frequency:**	*Daily*	*2 days per week*	*3-4 days per week*	*5-7 days per week*	*Few times per month*	*Few times per year*	*Other*		
6	**Typical day(s) of the week you use the trail:**	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*	*Sunday*		
7	**Time of day you use the trail most often:**	*Morning (before 10 AM)*	*Midday (10 AM-2 PM)*	*Afternoon (2 PM-6PM)*	*Evening (after 6 PM)*					
8	**Average time spent on the trail each visit:**	*Less than 30 minutes*	*30 minutes to 1 hour*	*1 to 2 hours*	*2 to 4 hours*	*4 to 8 hours*	*More than 8 hours*			
9	**Average distance traveled on the trail each visit:**	*0-2 miles*	*2-10 miles*	*10-20 miles*	*More than 20 miles*					
10	**Combined amount ($) spent on a typical trail visit on beverages, snacks and meals:**									
11	**Combined amount ($) spent annually to visit the trail (purchasing shoes, clothing, bicycle-related expenses, and other trail-exercise equipment):**									
12	**Money ($) spent on accommodations (hotel/motel/campground) annually to enjoy this trail (if it includes overnight stay):**									
13	**Combined amount ($) spent on a typical trail visit on grocery shopping:**									
14	**Trail needs/issues (Examples: safety, security, amenities, cleanliness, maintenance):**									
15	**Age:**									
16	**Gender:**									
17	**Group Size:**									
18	**How did you find out about the trail?**	*Word of mouth*	*Roadside signage*	*Driving past*	*Newspaper*	*Parks Department*	*Bicycle shop*	*Convention and Visitors Bureau*	*Internet web site*	*Other*

INSTRUCTIONS FOR TRAIL USER SURVEY VOLUNTEERS

Materials to be provided:

- Surveys
- Safety vests
- Assorted pens
- Clipboards
- Survey signs
- Online survey cards
- Water, table / chairs at each location
- Promotional items
- Trash bags

Instructions:

1. Meet the supervisor or staff at your scheduled shift time (preferably 15 minutes before your shift time).
2. Put survey signs in advance before and after location on trail.
3. Ask if trail user would like to help us by completing the survey (any age is okay).
4. If the trail user refuses, please be polite and ask other trail users.
5. If the trail users are a group, they can fill one survey for the whole group and add group size number (Question 17).
6. Use the script provided in the survey document to explain the purpose of the survey if asked by the trail user.
7. Ask if trail user wants you to read the questions or wants to fill the survey themselves.
8. Provide clarifications to the trail user about any questions. Avoid providing your own opinions about the trail and trail usage. If the user refuses to respond to a specific question, please clarify it with them.
9. After they complete the survey, offer one promotional item per person.
10. If trail user would prefer, offer an online survey card.
11. At the end of your shift, put all completed surveys in an envelope marked your shift time.
12. Please return clipboards, completed surveys and other materials and give them to staff/supervisor at that location.
13. Pick up any trash at the end of day.

Safety First:

1. Wear safety vest for whole duration of your shift.
2. Drink sufficient water/electrolytes.
3. Wear sunscreen if necessary.
4. Please do not loiter on the trail, for safety.
5. If you are driving to the location:
   - Obey all traffic laws.
   - Park outside of travelway.
   - Lock vehicle.
6. If you encounter bad weather:
   - Do not perform field work during heavy rain, lightning, tornado, or hurricane conditions.
   - Notify staff/supervisor that weather prohibits work.
   - Data can be collected in light rain only if surveys can be protected from getting any moisture on it.
   - Photos should be taken only in rain-free conditions.

For any concerns or more information call the staff/supervisor.

SUN Trail website: http://floridasuntrail.com/
Final Deliverables: https://www.fdot.gov/planning/systems/SUNTrail/guidance.shtm
Statewide Non-Motorized Traffic Monitoring Program: https://www.fdot.gov/statistics/trafficdata/florida-non-motorized-traffic-monitoring

Florida Department of Transportation
Systems Implementation Office
605 Suwannee Street, MS 19, Tallahassee, FL 32399
(850) 414-4922
http://floridasuntrail.com

FDOT

SUNTRAIL

Cady Way Trail

Contact Information:

Florida Department of Transportation
Systems Implementation Office

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http://FloridaSunTrail.com/