CENTER FOR URBAN TRANSPORTATION RESEARCH

Measuring the Impact of Florida Scenic Highway Designation

Final Report

BDV25-977-61

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April 2020

Center for Urban Transportation Research
University of South Florida
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April 2020

Disclaimer

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the State of Florida Department of Transportation.

Metric Conversion

SYMBOL	WHEN YOU KNOW	MULTIPLY BY	TO FIND	SYMBOL
LENGTH				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
NOTE: volumes greater than 1000 L shall be shown in m^3				
MASS				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
TEMPERATURE (exact degrees)				
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C

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16. Abstract

This project details the design of two data collection instruments to assist the Florida Scenic Highway Program (FSHP) to evaluate and quantify the contribution of scenic highways to Florida's economy and quality of life of Floridians. To summarize and report on scenic byways trends, this study developed two user-friendly tools for use by the FSHP staff to maintain, sort, and analyze survey data collected from scenic highway tourists and nearby residents. These survey instruments and data analysis tools will assist FSHP staff in improving scenic highway visitor experience and identify and monitor quality of life impacts to local residents. Finally, this report presents an estimate of the economic impact of the entire Florida Scenic Highway Program.

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Executive Summary

The Florida Department of Transportation (FDOT) Florida Scenic Highways Program (FSHP) manages the state's 26 scenic highways, which are the site of cultural, historic, archeological, natural, recreational, and scenic resources. The federal grant program that funded Florida Scenic Highways projects in the past expired in 2012. Without a dedicated source of state, federal, or private funding, byway organizations face substantial challenges in preserving, maintaining, and enhancing scenic highways. Enhanced survey methods, coupled with user-friendly data analysis tools that are useful for identifying interesting relationships and trends related to the spending, travel behavior, and preferences of scenic highway tourists and local residents, would enable byway organizations to garner stakeholder support and seek out alternative sources of funding.

This project details the design of two data collection instruments to evaluate and quantify the contribution of scenic highways to Florida's economy and quality of life of Floridians. To summarize and report on scenic byways trends, this study developed two user-friendly tools for use by the FSHP staff to maintain, sort, and analyze survey data collected from scenic highway tourists and nearby residents. These survey instruments and data analysis tools will assist FSHP staff in improving scenic highway visitor experience and identify and monitor quality of life impacts to local residents. Finally, this report presents an estimate of the economic impact of the entire Florida Scenic Highway Program.

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Acronyms

AADT	Average Annual Daily Traffic
ACS	American Community Survey
API	Application Programming Interface
CBP	County Business Patterns
FDOT	Florida Department of Transportation
FSHP	Florida Scenic Highway Program
IMPLAN	Impact Analysis for Planning
I-O	Input-Output
IPA	Importance-Performance Analysis
ISTEA	Intermodal Surface Transportation Efficiency Act

1. Introduction

1.1. Background Statement

The Florida Department of Transportation (FDOT) Florida Scenic Highways Program (FSHP) manages the state's 26 scenic highways, which are the sites of cultural, historic, archeological, natural, recreational, and scenic resources [1]. The federal grant program that funded Florida Scenic Highways projects in the past expired in 2012. Without a dedicated source of state, federal, or private funding, byway organizations face substantial challenges in preserving, maintaining and enhancing scenic highways. Enhanced survey methods, coupled with user-friendly data analysis tools that are useful for identifying key relationships and trends related to the spending, travel behavior, and preferences of scenic highway tourists and local residents, would enable byway organizations to garner stakeholder support and seek out alternative sources of funding.

1.2. Project Objectives

The main objective of this project is to develop two data collection instruments that will assist the FDOT FSHP to evaluate and quantify the contribution of FSHP efforts to Florida's economy and quality of life of Floridians. To summarize and report on scenic byways trends, this study developed two user-friendly programs for use by the FSHP staff to maintain, sort, and analyze survey data collected from scenic highway tourists and nearby residents. These programs will allow preparing on-demand reports intended to improve visitor experience, establish quality of life impacts, and identify key relationships. Additionally, this study developed an estimate of the economic impact of the Florida Scenic Highway Program.

1.3. Project Activities

This research produced several deliverables that served to inform the analysis and findings of this report:

- **Deliverable No.1: Situational analysis of Florida's scenic byways.** A technical report summarizing a thorough assessment of the 26 scenic byways in Florida in order to collect relevant information relating to site-specific characteristics (e.g., start and end-points of the byway, the number of visitor centers, access and egress both to and from the scenic byway, and surrounding county, city, and town information).

- **Deliverable No. 2: Refined Florida Scenic Highway visitor survey.** A technical report detailing the efforts undertaken by the research team to refine and develop a customizable visitor survey for each scenic byway.
- **Deliverable No. 3: User-friendly visitor survey data analysis tool**. A user-friendly visitor survey data analysis tool that can be used by FSHP staff to easily maintain, sort, and analyze information obtained from the visitor surveys along with a user manual describing the use of the tool.
- **Deliverable No. 4: Florida Scenic Highway local quality of life survey.** A technical report detailing the efforts undertaken by the research team to develop a local quality of life aimed at residents along the scenic byways.
- **Deliverable No. 5: User-friendly local quality of life survey data analysis tool.** A user-friendly survey data analysis tool that can be used by FSHP staff to easily maintain, sort, and analyze information obtained from the local quality of life surveys along with a user manual detailing the use of the analysis tool.
- **Deliverable No. 6: Standard estimate of economic impacts.** A technical report providing a standard estimate of the economic impact associated with tourism spending at Florida scenic byways.

1.4. Organization of Report

Section 2 discusses the situational analysis of Florida's scenic byways, outlining the characteristics of each of the 26 scenic byways, and the extent of socio-demographic and economic data acquisition efforts. Section 3 describes the refined Florida scenic byway visitor survey, including its implementation. This section also discusses the survey data analysis tool developed for analyzing the data generated by the visitor survey. Section 4 presents the local quality of life survey and its implementation. This section also details the survey data analysis tool developed for analyzing the data generated by the resident survey. Section 5 summarizes the efforts undertaken to produce a standard estimate of economic impacts of the scenic byways. Section 6 details the conclusions of this study.

2. Situational Analysis of Florida's Scenic Byways

2.1. Background

In 1991, the Intermodal Surface Transportation Efficiency Act (ISTEA) went into effect as the pacesetter in initiating changes to transportation planning and policy in the post-Interstate Highway System era. With ISTEA, the National Scenic Byways Program (NSBP) was established with a vision of providing a distinctive collection of roads in America, together with their stories and treasured places [1-3]. In 1996, the State of Florida, through the Florida Department of Transportation (FDOT), passed legislation to establish an official program for scenic byways. In the following year, FDOT developed criteria and guidelines for the scenic highway program. In July 1996, FDOT, in accordance with section 335.093 of the Florida Statutes, established the Florida Scenic Highways Program (FSHP) with the vision of promoting economic development and conserving important resources while enhancing the quality of life in byway communities [2]. With over 1,500 miles in 32 counties, the FSHP consists of 26 state-designated scenic highways, of which five are designated as National Scenic Byways at the federal level and one, the Florida Keys Scenic Highway, is designated as an All-American Road [4].

A scenic highway is a public road that has been designated through an official declaration for its special qualities. Generally, for a road to be designated and recognized as a scenic highway in Florida, it should possess at least one of the six regionally significant intrinsic qualities (archeological, cultural, historic, natural, recreational, and scenic). Accordingly, the roads in Florida are designated as scenic highways with the purpose of enhancing these qualities, as well as influencing the preservation, maintenance, and protection of the highways. Designating a road as a scenic highway means that the road does not only pass through significant places, but it offers visitors exceptional travel experiences. The FSHP promotes scenic highways as tourism destinations to foster economic benefits to byway communities encompassing many rural areas. Participation in the scenic highways program may provide benefits such as resource preservation, enhancement, and protection to surrounding communities.

Visitors of scenic highways who seek authentic experiences spend on local restaurants, gas stations, bike shops, and other tourist-oriented businesses. This increase in tourism-related expenditures represents a direct economic benefit of scenic highway designation. There is a need to ascertain the economic impact and benefits of scenic highways in terms economic growth, job creation, and additions to the tax base at the local and state level.

Before a road is designated as a scenic highway, local grassroots organizations (known as byway organizations) must voluntarily seek such designation. Grassroots efforts heighten the awareness of a scenic highway's intrinsic qualities and enhance the overall travel experience. Byway organizations are characterized mostly as all-volunteer citizen groups or functioning as a program within another organization or agency. Currently, there is no dedicated source of state, federal, or private funding for byway organizations. Scenic highways are not revenue producing which means that no fees are collected from scenic highway travelers. Without a dedicated source of state, federal, or private funding, non-profit organizations face substantial challenges in preserving, maintaining and enhancing scenic highways. Most byway organizations, however, have little or no expertise in modeling such impacts and also have limited resources - staff and funds, required to undertake such a project [5].

There is a need for enhanced tourist expenditure and local quality of life surveys, along with user-friendly data analysis tools to enable byway organizations to garner stakeholder support and seek out alternative sources of funding.

2.2. Overview of the Florida Scenic Highways System

Figure 2-1 shows the location of the 26 designated scenic highways in Florida. More than half of the 26 highways are in close proximity to the Eastern coastline of the state. After the establishment of the FSHP, the 11-mile Pensacola Scenic Bluffs Highway became the first road to be designated as a scenic highway in 1998.

Table 2-1 and Table 2-2 provide context for the entire system and site-specific details. From Table 2-1, it can be seen that FDOT Districts 6, 7 and Florida Turnpike have the least number of designated scenic highways (one), while FDOT District 5 has the highest number of designations (8). Three scenic highways (A1A Scenic & Historic Coastal Byway; Florida Black Bear National Scenic Byway; and, Indian River Lagoon National Scenic Byway) span over two FDOT districts. The table also shows that 22 of the 26 (83%) scenic highways stretch over 10 miles in length. The three longest designated scenic highways in the state are (i) the Indian River Lagoon National Scenic Byway (233 miles); (ii) The Big Bend Scenic Byway (220 miles); and (iii) River of Lakes Heritage Corridor (156 miles). While some scenic highways are part of the urban thoroughfare (such as the Courtney Campbell Scenic Highway), a large majority of Florida scenic highways are located along the coastal areas of the state.

Figure 2-1 List of Designated Florida Scenic Highways

Source: Florida Scenic Highways Program

Results from Table 2-1 also reveal how most scenic highways designated in Florida are accessible from the major roadways in the state – i.e., I-75 and I-95. Other major roads such as the US 19, US 301, A1A, US 1 and US 41 form the major access points for the majority of the designated byways. Accessibility to the byways is an important measure to determine its overall

economic contribution and this study utilizes accessibility-related information of every specific byway to customize the visitor and residence surveys.

Table 2-1 Location and Accessibility Characteristics of Florida's Scenic Highways

Florida Scenic Highways	Length (miles)	FDOT district	Major Access Roadways
Bradenton Beach Scenic Highway	3	1	I-75, US 41
Lemon Bay / Myakka Trail Scenic Highway	47		I-75, US 41
Palma Sola Scenic Highway	4		US 301, US 41
Tamiami Trail - Windows to the Gulf Coast Waters	70		I-75, US 41
The Ridge Scenic Highway	39		I-4, US 27, SR 60
J.C. Penney Memorial Scenic Highway	3	2	SR 16, US 17, US 301
Old Florida Heritage Highway	45		I-75, US 301, US 441
William Bartram Scenic & Historic Highway	17		I-95, I-295, US 17
A1A Ocean Islands Trail	39.7		I-95, I-295, I-10, A1A
Big Bend Scenic Byway	220	3	I-10, US 98
Pensacola Scenic Bluffs Highway	11		I-10, I-110, US-98, US 90
Scenic Highway 30A	24		US 98, US 331
Broward County A1A Scenic Highway	32	4	I-75, I-95, I-595, US 91
Indian River Lagoon - Treasure Coast Scenic Highway	42		I-95, A1A
Martin Grade Scenic Highway	12		I-95
Green Mountain Scenic Byway	45.2	5	I-4, US 441, Florida Turnpike
Heritage Crossroads: Miles of History	98		I-95, US 1, US 17
Ormond Scenic Loop & Trail	34		I-95, US 1, A1A
River of Lakes Heritage Corridor	156		I-4, I-95, US 17, US 1
Scenic Sumter Heritage Byway	62		I-75, US 301
Florida Keys Scenic Highway All-American Road	110	6	US 1, Florida Turnpike
Courtney Campbell Scenic Highway	10	7	I-275, US 19, SR 589, SR 60
A1A Scenic & Historic Coastal Byway	72	2 & 5	I-95, US 1
Florida Black Bear National Scenic Byway	120		I-95, I-75, I-4, US 301, US 17
Indian River Lagoon National Scenic Byway	233	4 & 5	I-95, A1A
Suncoast Scenic Parkway	42	Turnpike	I-275, I-75, US 98, US 19, SR 589

While Table 2-1 provides a broad overview of some locational and accessibility aspects to each of the 26 designated scenic byways, Table 2-2 lists the presence of activity centers around the scenic byways. The analysis discerns between three types of activity centers. The first category of activity centers consists of major cities (with population over 50,000) in the 50-mile radius of each scenic byway. A higher share of major cities in the 50-mile radius likely increases the probability of visitors to these byways. This may have a direct effect on their economic impact.

The next column lists the presence of other cities with population between 30,000 and 50,000 within a 30-mile radius from the scenic byway. The third category of activity centers involves the presence of any other minor city (with population between 10,000 and 30,000 residents).

Table 2-2 shows that scenic highways belonging to the Central and Southern Regions (as classified by FDOT FSHP) have a higher share of bigger cities in their vicinity. Additionally, the higher levels of population densities experienced along the Eastern coastline of Florida (in contrast to the Panhandle region, for instance) significantly increases accessibility to the scenic byways in the region. This, in turn, also has potential ramifications on their contribution to Florida's economy. Section 3 and Section 4 of this study take into consideration resident population and businesses activity surrounding each scenic byway to inform the development of the visitor expenditure and byway local quality of life survey instruments.

Table 2-2 Cities and CDPs in the Vicinity of Florida's Scenic Byways

Florida Scenic Highways	Major cities/CDPs (pop > 50,000) within 50 miles	Other cities/CDPs (pop 30k-50k) within 30 miles	Other minor cities/CDPs (pop 10k-30k) within 10 miles
PANHANDLE REGION			
Scenic Highway 30A		Panama City	Destin
Big Bend Scenic Byway	Tallahassee	Panama City	
Pensacola Scenic Bluffs Highway	Pensacola		
NORTHERN REGION			
A1A Scenic & Historic Coastal Byway	Jacksonville, Daytona Beach, Palm Coast	Ormond Beach	Jacksonville Beach, St. Augustine, Atlantic Beach, Palm Valley, Ponte Vedra Beach
Old Florida Heritage Highway	Gainesville, Ocala		
William Bartram Scenic & Historic Highway	Jacksonville		
J.C. Penney Memorial Scenic Highway	Jacksonville, Gainesville		

Table 2-2 Continued

Florida Scenic Highways	Major cities/CDPs (pop > 50,000) within 50 miles	Other cities/CDPs (pop 30k-50k) within 30 miles	Other minor cities/CDPs (pop 10k-30k) within 10 miles
Heritage Crossroads: Miles of History	Gainesville, Daytona Beach, Jacksonville, Palm Coast, Deltona, Sanford	DeLand, Ormond Beach	
A1A Ocean Islands Trail	Jacksonville		Jacksonville Beach, Atlantic Beach, Fernandina Beach
CENTRAL REGION			
Bradenton Beach Scenic Highway	St. Petersburg, Sarasota, Bradenton, Tampa, Brandon, Clearwater, Largo	Venice	Palmetto, South Bradenton, Bayshore Gardens
Courtney Campbell Scenic Highway	Tampa, Clearwater, St. Petersburg, Lakeland, Largo, Pinellas Park, Dunedin, Town 'n' Country, Palm Harbor, Brandon	Egypt-Lake Leto, Greater Carrollwood	Oldsmar, Westchase, Citrus Park, Safety Harbor
Florida Black Bear National Scenic Byway	Gainesville, Daytona Beach, Ocala, Deltona, Palm Coast, Orlando, Sanford	DeLand, Ormond Beach	Palatka
Green Mountain Scenic Byway	Orlando, Ocala, Deltona, Sanford	Ocoee, Apopka, Winter Garden, DeLand	Minneola
Indian River Lagoon National Scenic Byway	Palm Bay, Deltona, Daytona Beach, Sanford	DeLand, Ormond Beach	Melbourne, Titusville, Rockledge, Sebastian, West Melbourne, Cocoa, Satellite Beach, Cape Canaveral, Indian Harbor Beach
Ormond Scenic Loop & Trail	Orlando, Palm Coast, Daytona Beach, Port Orange,	Ormond Beach, DeLand	South Daytona, Holly Hill
Palma Sola Scenic Highway	St. Petersburg, Sarasota, Bradenton, Tampa, Brandon, Clearwater, Largo		Key Largo, Palmetto
River of Lakes Heritage Corridor	Orlando, Deltona, Daytona Beach, Port Orange, Sanford	Titusville, Oviedo, Winter Springs, Deland,	New Smyrna Beach, DeBary, Lake Mary, Orange City
Scenic Sumter Heritage Byway	Orlando, Ocala	Apopka, Winter Garden, Clermont	Groveland
Suncoast Scenic Parkway	Spring Hill		New Port Richey, Oldsmar
The Ridge Scenic Highway	Palm Bay, Lakeland, Kissimmee	Winter Haven, Dundee, St. Cloud	Haines City, Auburndale, Lake Wales

Table 2-2 Continued

Florida Scenic Highways	Major cities/CDPs (pop > 50,000) within 50 miles	Other cities/CDPs (pop 30k-50k) within 30 miles	Other minor cities/CDPs (pop 10k-30k) within 10 miles
SOUTHERN REGION			
Martin Grade Scenic Highway	Ford Lauderdale, Coral Springs, Port St. Lucie, Pembroke Pines, Pompano Beach, Hollywood, Miami Gardens, Davie, Boca Raton, Jupiter	Fort Pierce	
Indian River Lagoon - Treasure Coast Scenic Highway	Port St. Lucie, Coral Spring, Pompano Beach, Jupiter	Fort Pierce	Vero Beach, Stuart
Broward County A1A Scenic Highway	Miami, Fort Lauderdale, Hollywood, Pembroke Pines, Hialeah, Pompano Beach, West Palm Beach, Davie, Boca Raton, Miami Gardens, Deerfield Beach, Boynton Beach, Palm Beach Gardens, Jupiter, Coral Springs, Sunrise, Plantation	Parkland	Miami Beach, Delray Beach, North Miami, Margate, Coconut Creek, Hallandale Beach, Aventura, Dania Beach, Sunny Isles Beach, Opa-Locka, West Park, Lighthouse Point, North Bay Village
Florida Keys Scenic Highway All-American Road	Hollywood, Miami, Pembroke Pines, Miami Gardens, Davie, Homestead, Hialeah		Marathon, Key West, Key Largo
Lemon Bay / Myakka Trail Scenic Highway	Cape Coral, Fort Myers, North Port, Sarasota		Punta Gorda
Pensacola Scenic Bluffs Highway	Pensacola		
Tamiami Trail - Windows to The Gulf Coast Waters	Cape Coral, North Port, Sarasota, Bradenton		Venice, Punta Gorda, South Bradenton

2.3. Socio-demographic and Economic Data Acquisition

Economic data are necessary to inform the development of the visitor survey (Section 3) and to prepare the background data for the estimation of the economic impact estimate (Section 5). The acquisition of socio-demographic data is necessary to help define characteristics of residents living in proximity to the scenic byways and help define the sampling size for local quality of life survey (Section 4).

2.3.1 Socio-demographic Data

To obtain relevant data for each byway, FDOT Geographic Information Systems (GIS) files identifying the entire Scenic Highway network are used to generate a set of one-mile buffers around each byway [6]. The buffers define the geographic boundaries to extract data from various sources. Figure 2-2 shows an example of data acquisition for the William Bartram Scenic and Historic Highway. The one-mile buffer around the 17-mile long byway is used to identify 15 US Census Block groups for data extraction from the U.S. Census 2013-2017 American Community Survey (ACS) 5-year estimates [7]. Appendix A lists the ACS socio-demographic variables and Appendix B reports the County Business Patterns data.

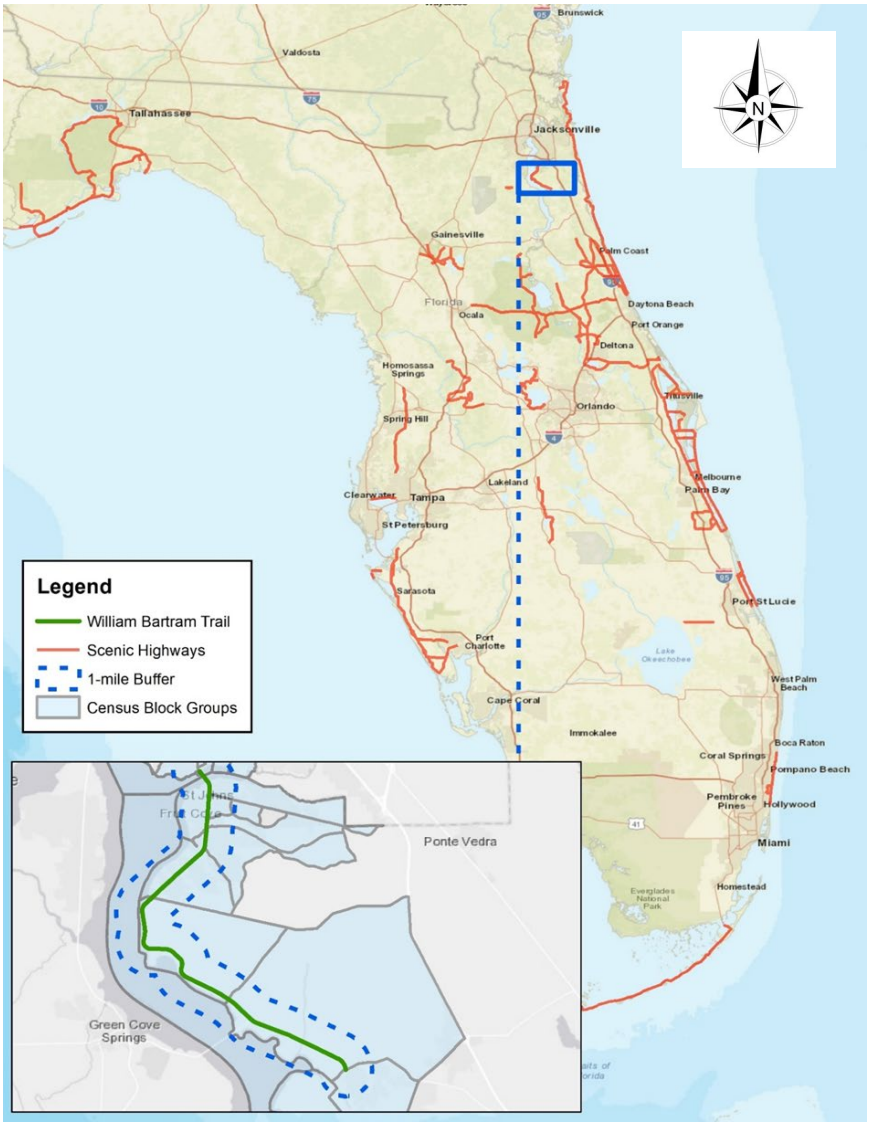


Figure 2-2 Scenic Highways Network – ACS Data Acquisition

For example, Table 2-3 reports selected statistics using ACS data from the 15 block groups identified by the one-mile buffer surrounding the byway corridor. The study area around the William Bartram Scenic Highway is characterized by a high percentage of high-income households (24.8% with income greater than $150,000) and is predominantly white (89.4%). To measure race diversity, this analysis will employ an index of ethnic heterogeneity that varies from zero (only one race in the neighborhood) to one (no race is prevalent), similar to Shannon's diversity index used in the ecological literature [8]. The entire dataset collected for the entire byways system consists of the ACS variables reported in Appendix A.

Table 2-3 William Bartram Scenic Highway – Socio-demographic Data

		Percentile		
Variable	*Mean*	*25th*	*50th*	*75th*
Population and Race				
Total Population	4,275	1,521	2,425	7,173
Percent White	89.4%	83.9%	90.3%	94.0%
Percent Black	4.0%	0.6%	2.3%	8.3%
Percent Other	3.2%	0.7%	3.5%	4.5%
Percent Hispanic	5.6%	3.1%	5.3%	8.6%
Income				
Percent households less than $10,000	2.0%	1.6%	2.0%	2.6%
Percent households $11,000 to $29,000	6.5%	4.3%	6.4%	8.4%
Percent households $30,000 to $49,000	11.1%	6.5%	8.5%	16.5%
Percent households $50,000 to $59,000	4.8%	2.0%	4.4%	7.9%
Percent households $60,000 to $74,000	9.5%	6.8%	9.8%	12.6%
Percent households $75,000 to $99,000	18.3%	14.4%	16.9%	20.7%
Percent households $100,000 to $124,000	12.8%	10.4%	12.7%	14.7%
Percent households $125,000 to $149,000	10.3%	7.5%	11.9%	12.4%
Percent households $150,000 and above	24.8%	20.8%	25.2%	30.4%

Source: U.S. Census American Community Survey (ACS) 2013-2017 5-year average

In addition to the above information, data acquisition was also done on County Business Partners (CBP), as detailed in Appendix B, and businesses located within the one-mile buffer of all scenic byways by accessing the Google location application programming interface (API).

3. Refined Florida Scenic Highway Visitor Survey

3.1. Introduction

The existing FSHP byway visitor survey [9] was refined to produce a customized version that considers the intrinsic features of each scenic byway. The refined version of the FSHP byway visitor survey adopts a trickle-down approach to determine the impact of each scenic byway on Florida's economy. Existing documentation on earlier efforts to design similar surveys were reviewed by the research team before embarking on the current design [10-12].

This chapter provides an overview of the survey design process, including the key information elicited and the survey process flowchart.

3.2. Methodology

It was hypothesized that some share of visitors (whether local or out-of-state) are likely to be unaware of the presence of scenic byways at a given location. The visitor survey, when presented in the existing format, would therefore likely lead to survey respondent attrition. Capturing relevant information on site-specific characteristics can be useful to FSHP staff and byway organizations in terms of a cost-efficient resource allocation for promotional efforts. The refined version allows survey respondents to provide information regarding their visit to the areas along the scenic byway at the initial stage of the survey. After providing travel expenditure estimates incurred during the trip, respondents are asked about their awareness of the scenic byway designation.

Since the visitor survey will be made available as a web-based survey (with no assistance available for the survey respondent while taking the survey), it is important to create a simple way to direct each respondent to their respective scenic byway without depending on their memory to recollect the names or features of the respective byway. The survey follows a trickle-down approach that is better suited to extract more details relevant to each scenic byway. Therefore, the survey opens by asking respondents to pick one of the four Florida regions they most recently visited for leisure. To this end, the state map has been divided into four regions, consistent with the FSHP classification of the scenic byways across the state (Florida Panhandle, Northern Florida, Central Florida, and Southern Florida). Helpful hints are provided on the survey question to direct the respondents to select the correct region of their leisure travel.

Based on the selected region, the survey proceeds to the appropriate section where respondents are displayed map views showing their potential locations of travel. Each map view corresponds to the area along a particular scenic byway. The map view contains the major cities and towns around the area of each scenic byway, which would be helpful while the respondent recalls the site visit. Once the respondent chooses the relevant map, the survey then proceeds to the section pertaining to the specific scenic byway questions. Figure 3-1 shows the survey process along the various stages.

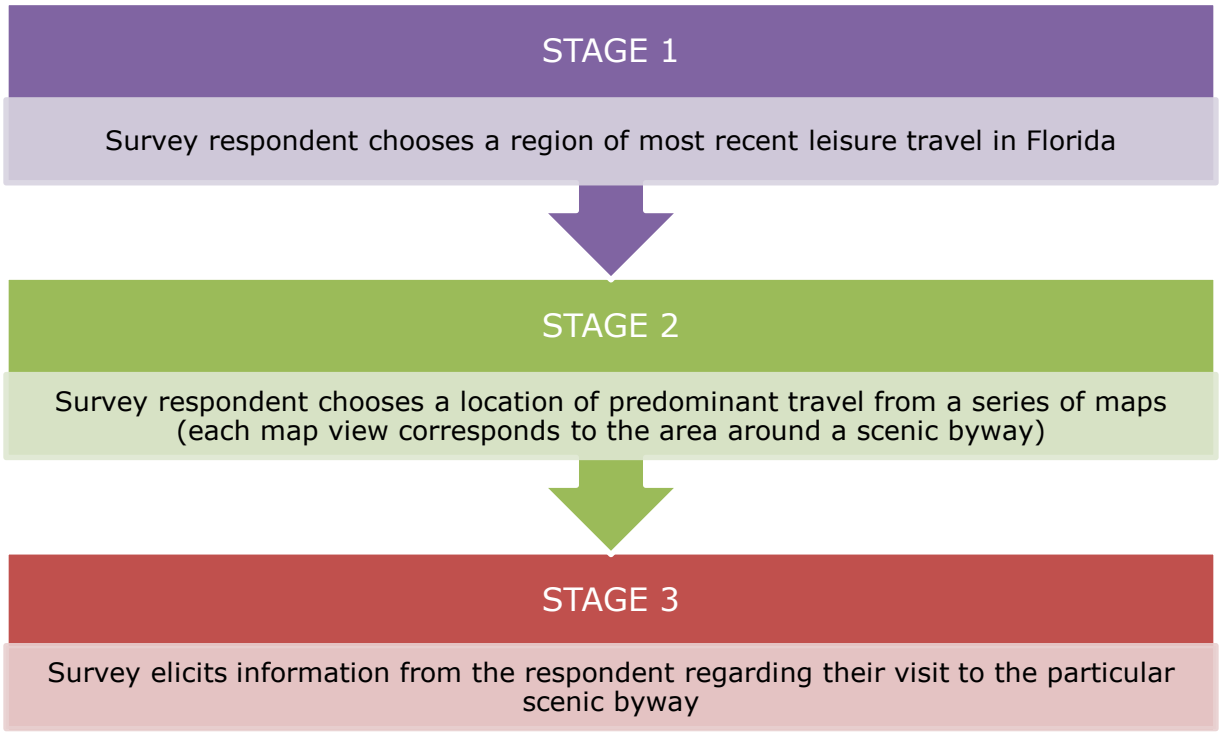


Figure 3-1 Refined Visitor Survey Process Flow Chart

Stage 3, which is customized based on Stage 1 and Stage 2 responses, allows customizing questions to a specific byway site. Investigating the relative attractiveness of the various points of interest along each scenic byway (based on a scale from 0-100) would provide numerous indicators to byway organizations regarding the performance of each of these locations. This would also provide an indication for any site-specific improvements and provide evidence for enhancements to specific locations, which may help byway organizations efficiently targeting promotional efforts.

It is also worth noting that respondents aware of the scenic byway designation (as revealed during the survey) are inquired regarding their motivations to visit scenic byways, as well as their level of satisfaction regarding scenic byway elements. The information collected in this

context provides information to scenic byway organizations regarding the effectiveness of current promotional efforts, as well as potential areas for improvement.

3.3. Example: Selection of Travel Area

Upon accepting to take the survey, the respondent is presented with a set of options to identify the area of travel in the State (Figure 3-2).

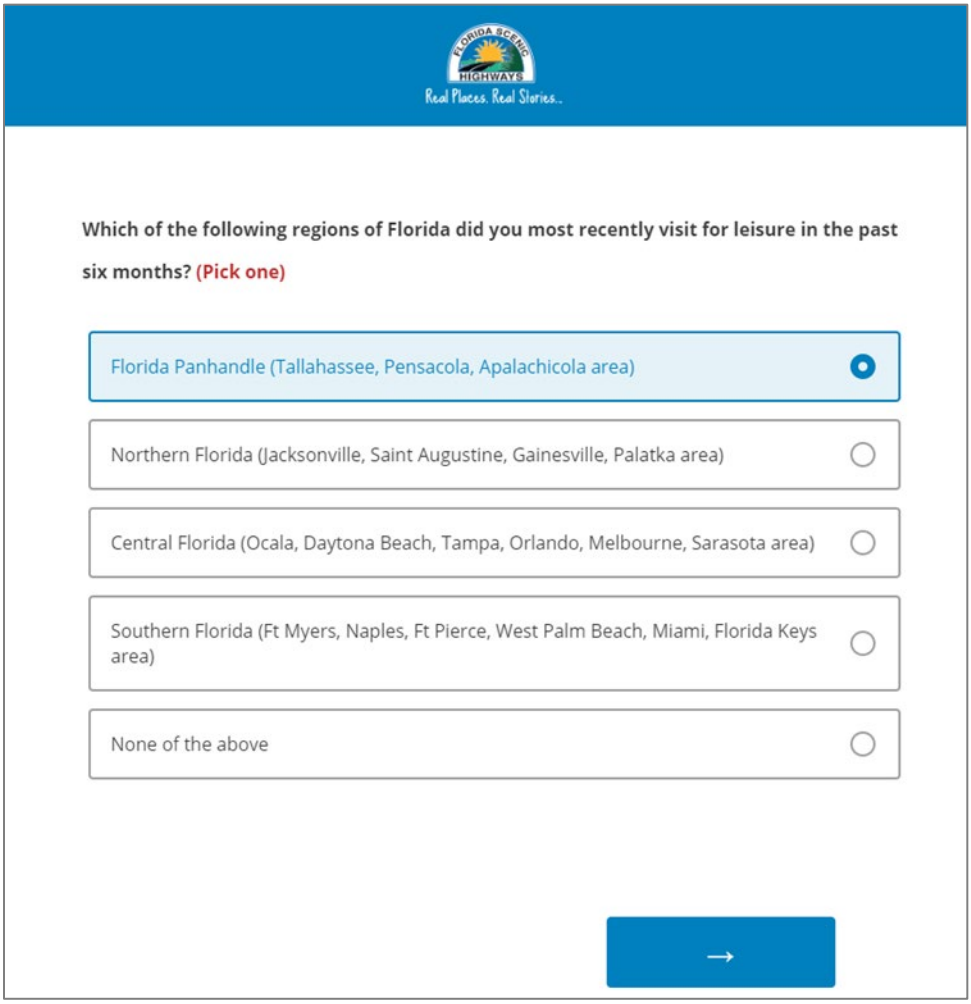


Figure 3-2 Selection of Major Area of Travel

Assume the Florida Panhandle is selected as the region of leisure travel, then the respondent is then presented three map views (map selection varies based on selected area), as shown in Figure 3-3. Each map view corresponds to the area along a particular scenic byway (there are three scenic byways in the Florida Panhandle region – the Big Bend, the Pensacola Scenic Bluffs, and the Scenic Highway 30A).

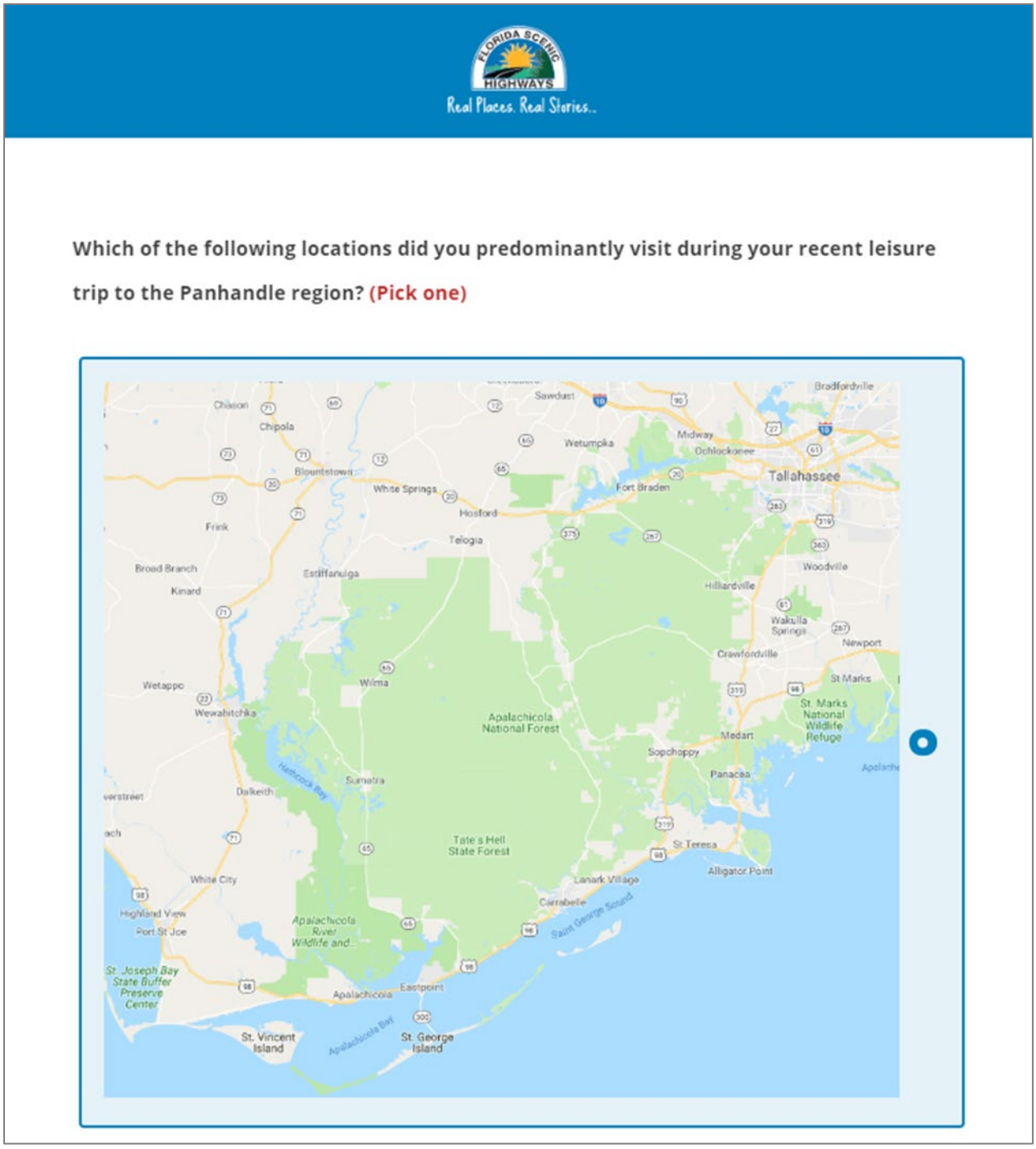


Figure 3-3 Selection of Location of Travel

Once the respondent chooses the relevant map view (let us assume they chose the map view corresponding to the Tallahassee region, i.e., the Big Bend Scenic Byway), the survey then proceeds to collect information pertaining to that particular trip along the Big Bend Scenic Byway. Key information solicited in this stage includes:

1. Trip purpose
2. Length of stay
3. Type of accommodation
4. Information regarding the travel party: number of adults, presence of children
5. Relative attractiveness of points of interest (based on site selection and available points of interest) along each scenic byway
    a. Trip expenditures
    b. Satisfaction with trip(s) to the area
    c. Visitor feedback based on experience
6. Awareness of the scenic byway designation
    a. Motivational factors for visiting the scenic byway
    b. Level of satisfaction with the elements of the scenic byway
7. Resources used to plan the trip
8. Socio-demographics: home zip code, gender, age group, household income

At the completion of the above steps, the survey proceeds to a conclusion.

3.4. Survey Implementation

The draft final survey is available as a web-based instrument readily implementable on the FSHP website. The survey was delivered to FDOT FSHP staff as a task deliverable. The FSHP staff recommended some modifications which were undertaken by the project team and then the final version was submitted to the FDOT Research Center for the final approval. The FDOT Research Center approved this product and the current version is available at: https://usf.az1.qualtrics.com/jfe/form/SV_1Gn7Znm55gJSt25

3.5. Byway Visitor Survey Tool

Based on the feedback received from the FSHP and byway organizations, the research team also developed a byway visitor survey data analysis tool, a spreadsheet application that analyzes data generated by the online visitor survey. This tool and user manual were delivered to FDOT FSHP staff as a task deliverable.

The visitor survey tool enables the user to summarize results at different levels of aggregation, ranging from summary tables for the entire Florida Byway system to summary information at a regional level (i.e., Panhandle, Northern, Central, and Southern regions), and down to any of the 26 byways.

The Byway Tool is based on a set of macros written in Visual Basic language within the Microsoft Excel® software platform and is available as an Excel macro-enabled file. By double-clicking on the file, Microsoft Excel starts and displays a customized toolbar appearing on the farther right of the Excel ribbon toolbar called "Byway Tool, "showing a customized spreadsheet tab called "Analysis." This tab contains four steps defining four drop down lists, which allow selecting the desired level of aggregation and for the analysis: 1) Select Region; 2) Select Byway; 3) Select Survey Block; and 4) Run Analysis By (Figure 3-4).

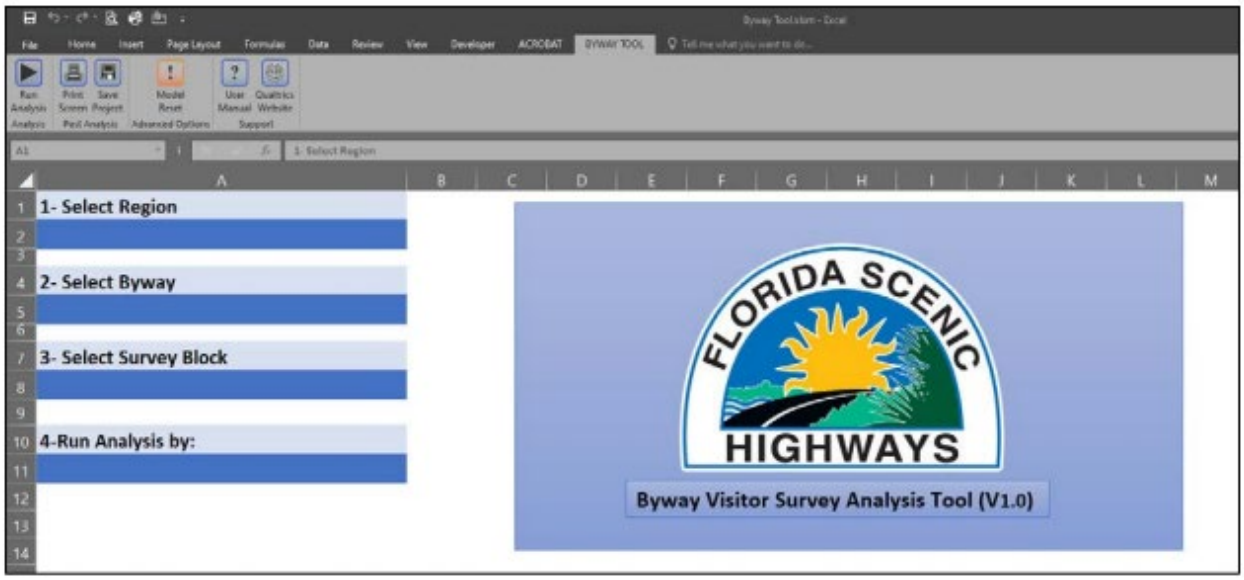


Figure 3-4 Landing Page of the Scenic Byway Visitor Survey Tool

The "Select Region" and "Select Byway" dropdown lists on the survey tool allow for analyses at various levels of geographic aggregation – ranging from system-level analyses of all byways, to analyzing a specific region, and to the analysis of a specific byway. Figure 3-5 describes the various levels of aggregation available in the survey tool.

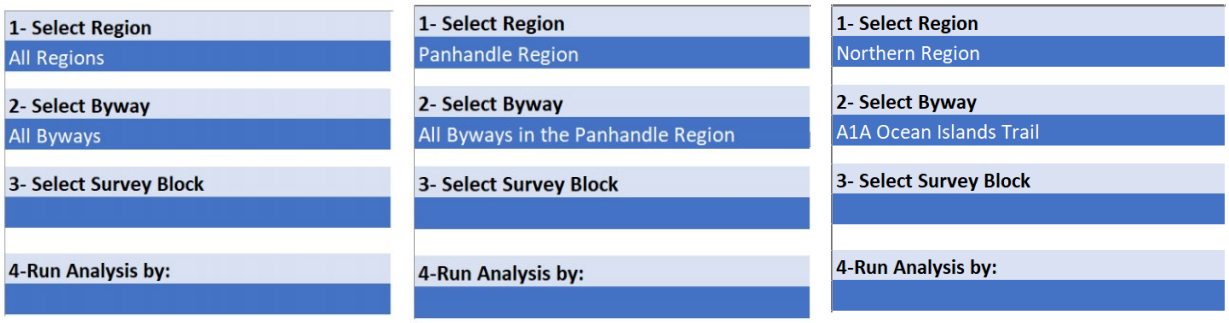


Figure 3-5 Geographic Aggregation Levels-Byway Visitor Survey Analysis Tool

3.5.1 Selecting the Level of Data Aggregation

The Byway Tool allows analyzing the visitor survey by providing: 1) a summary of response rates; 2) specific results for each of the main categories of data, specifically:

- Trip Information – This includes trip purpose, mode of travel, nights spent in the area, type of accommodation, and travel party characteristics.
- Expenditures – This includes average dollar amount spent by the visitors on several expense item categories.
- Demographics – This includes age, gender, household income, and residential location of the survey respondent.
- Site Attractiveness – This includes survey respondent's assigned scores on several sites along each scenic byway. The survey respondent designates a score (between 0 and 100) to the sites that they visited and the unselected sites receive a "N/A" by default. The output shows an average rating for each site based on the responses received.
- Byway Specifics – The data collected under Byway Specifics includes byway-specific information on respondents' level of awareness; how they learned about the scenic byway; the factors that motivated them to visit the byway; and, the resources they utilized in planning their trip, as well as their feedback on any enhancements the scenic byway would require.
- Visitor Feedback – The data collected under Visitor Feedback includes information on respondent's level of satisfaction with the areas visit along the scenic byway, as well as their likelihood to return for a visit to this area and recommend their friends and family to visit the scenic byway.

3.5.2 Example – Site Attractiveness of the Big Bend Scenic Byway

The following example is based on a synthetic sample generated consisting of 975 survey responses randomly assigned to the Big Bend Scenic Highway in the Panhandle Region.

3.5.2.1 Summary of Responses

The first step is to obtain a summary of the responses. To obtain this information the analyst first selects the appropriate geographic region in Step 1 and Step 2 detailed in Figure 3-5 and proceeds to select "Demographic Profile" in Step 3 (Figure 3-6). The tool runs and the results provide details about the income distribution, split between in-state and out-of-state travel (Figure 3-7)

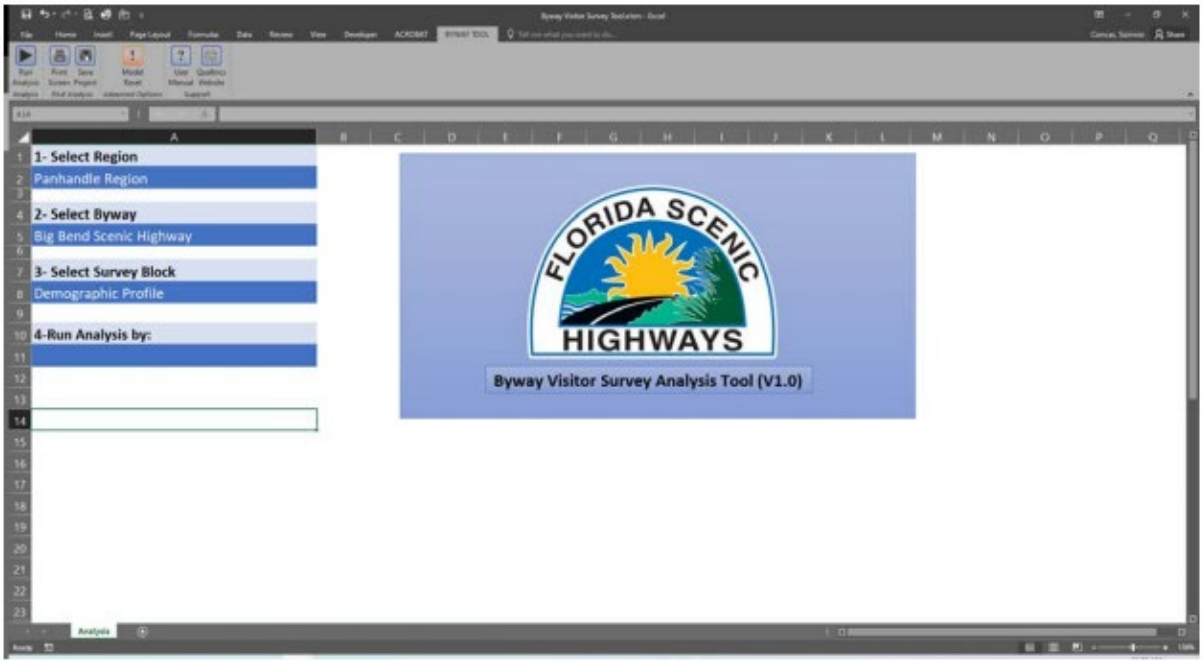


Figure 3-6 Analysis of Survey Responses – Big Bend Scenic Highway Example

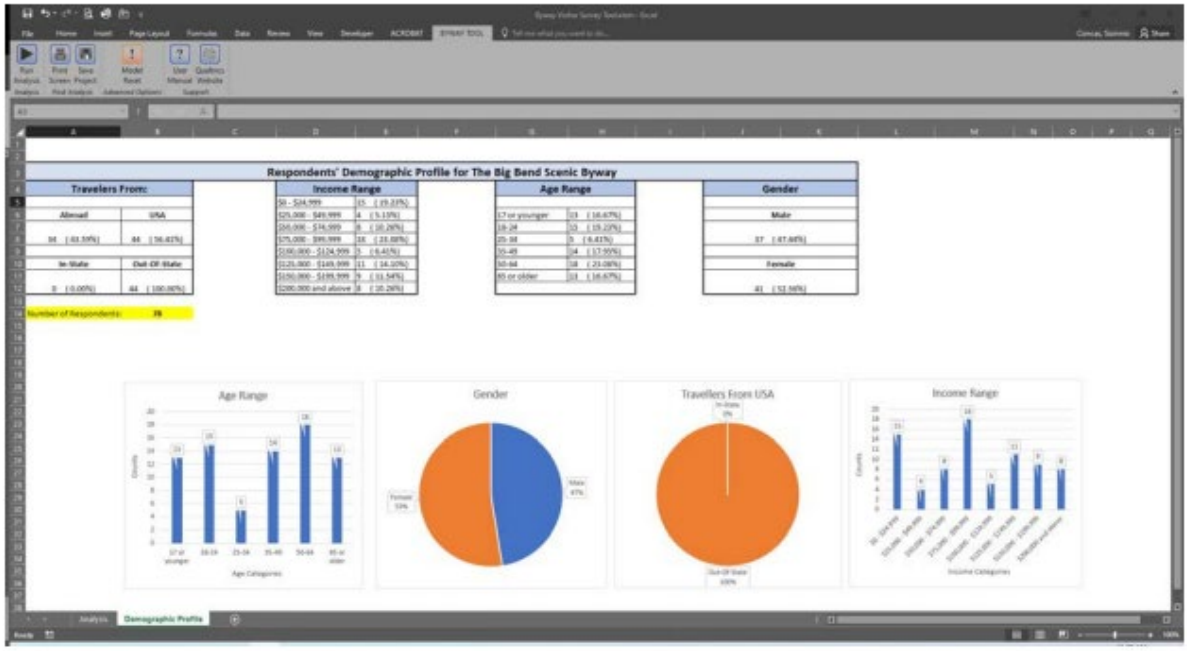


Figure 3-7 Summary of Responses – Big Bend Scenic Highway Example

3.5.2.2 Site Attractiveness

After obtaining the summary of responses, in Step 3 the analyst can select "Site Attractiveness" and in Step 4 proceeds to select "General." Proceed to click on the "Run Analysis" button (Figure 3-8). A new tab named "Site Attractiveness (General)" displays the results (Figure 3-9).

Figure 3-8 Site Attractiveness Analysis – Big Bend Scenic Highway Example

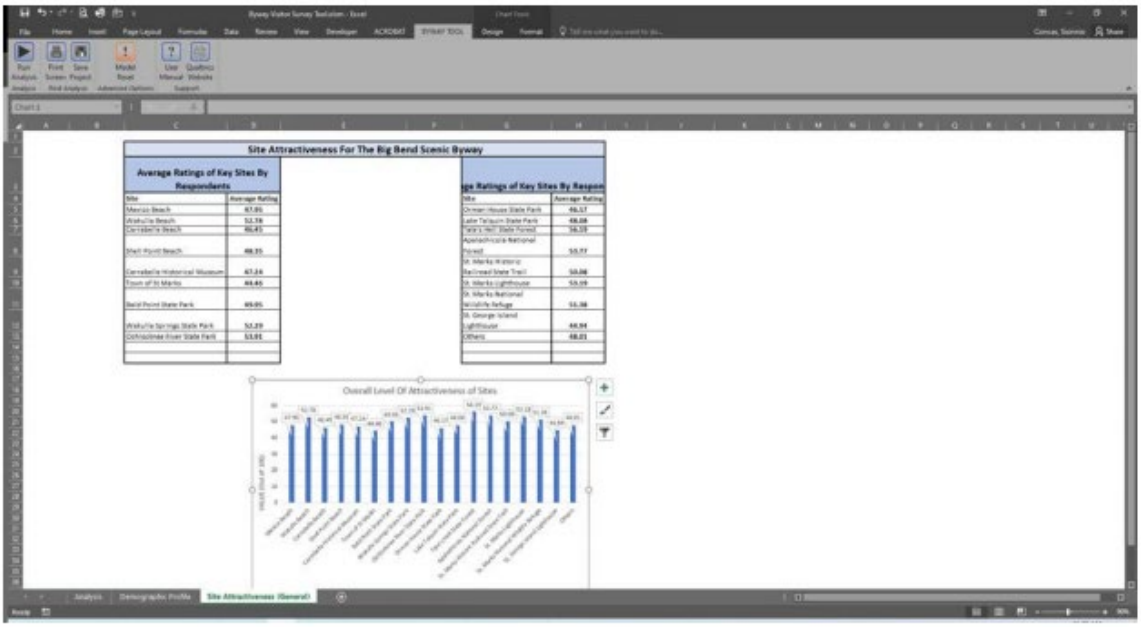


Figure 3-9 Site Attractiveness Results – Big Bend Scenic Highway Example

3.5.2.3 Site Attractiveness by Gender

To compare site attractiveness by gender it is sufficient to select "Gender" in Step 4 and click on the "Run Analysis" button (Figure 3-10). A new tab named "Site Attractiveness (Gender)" summarizes the results (Figure 3-11)

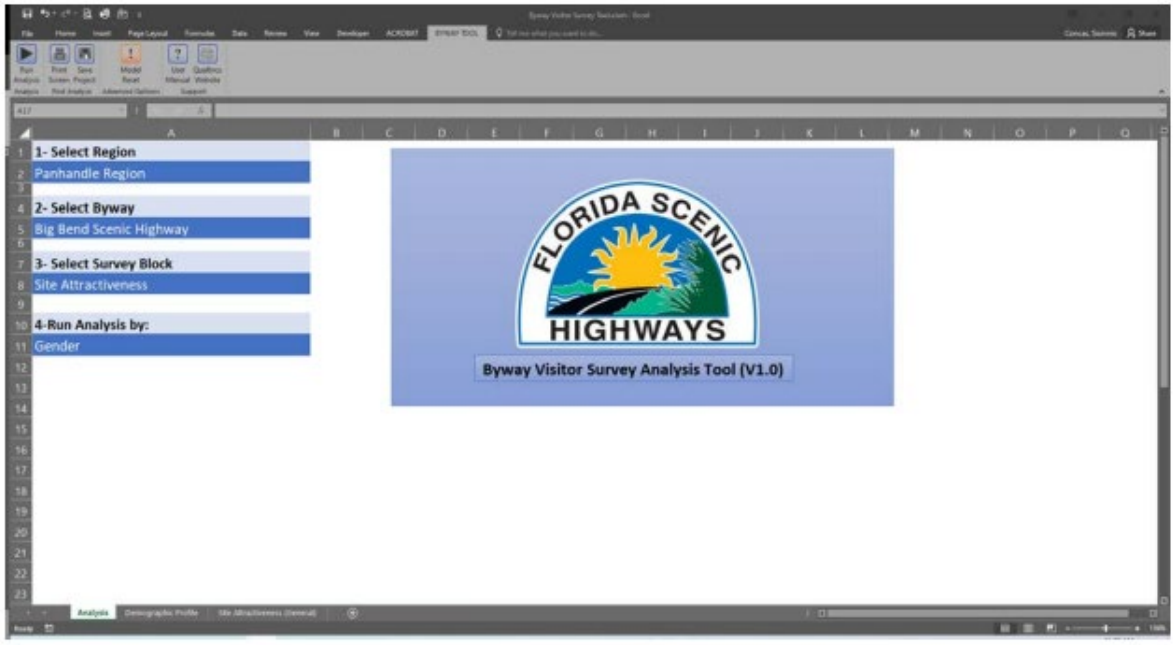


Figure 3-10 Site Attractiveness Analysis by Gender – Big Bend Scenic Highway

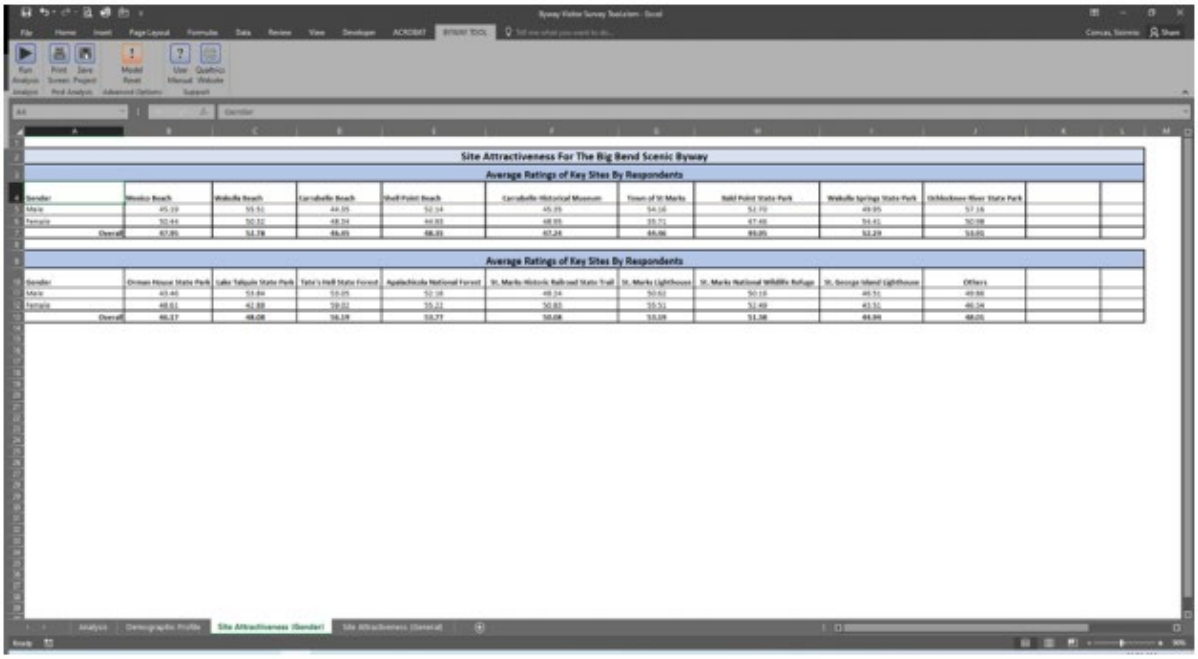


Figure 3-11 Site Attractiveness Results by Gender – Big Bend Scenic Highway

4. Florida Scenic Highway Local Quality of Life Survey

4.1. Introduction

The FSHP local quality of life survey seeks to understand the impacts of various attributes on the byway residential communities' improved quality of life. The survey questionnaire built upon the instrument developed to assess the impact on quality of life and the economy of the Lake County Scenic Byway [11].

Respondents living around the scenic highways (as determined by their residential zip code) are the target demographic for this survey. The FSHP local quality of survey begins with a qualifier question enquiring respondents' current residential zip code location. Once the eligibility of the respondent is determined, the survey proceeds to the questions of interest. The survey is divided into two sections:

- Section 1 elicits information on respondents' sociodemographic characteristics
  - Respondents' gender, age group, and household income are of primary interest in this section.
  - The survey goes into detail on residential location (length of stay at the present zip code location) as it is an important variable in order to understand the attributes that affect residents' quality of life.
  - The survey then proceeds to obtain respondent information on their employment – status, zip code, and industry. This information is useful to attribute specific impacts of industries on each location along the scenic byway. The NAICS county business codes are used for this purpose.
- Section 2 asks information on the impact of the scenic byways towards local quality of life
  - This section starts by determining respondent awareness on their local scenic byway. The determination of the local scenic byway is made based on the respondents' stated residential zip code.
  - Only respondents who are aware of the scenic highways during the time of the survey are asked to state the impacts on local quality of life. This is done to ensure quality data collection and avoid erroneous estimates of the impacts.
  - Once the respondent's awareness about the local scenic byway is determined, the survey proceeds to elicit more input on the scenic highway and the local economy. Impact of tourism and the contribution of the scenic highways to tourism are major

aspects to consider during such analyses and a determination of either impact is made in this survey.

- Finally, the survey proceeds to ask a set of questions conducive to an Importance-Performance Analysis (IPA). Analyses of this type have been conducted in many fields to simultaneously understand the importance of selected attributes to the respondent and to better understand the performance of the scenic highways under these selected attributes.

Once the respondents provide their responses to the IPA, the survey concludes.

4.2. Importance-Performance Analysis

Importance-Performance Analysis (IPA) is a quantitative approach for measuring and evaluating people's opinions and feelings about certain characteristics of an issue [13]. IPA has been used to evaluate the various attributes of destinations or recreational facilities [14], urban transportation [15], tourism [16], marketing [17], and logistics[18] to simultaneously understand the importance of selected attributes and to determine their performance in the eyes of clients or customers.

IPA results are in the form of a matrix that is created by plotting the stated attributes' *Importance* values against the reported *Performance* values on a two-dimensional graph having four quadrants, as shown in Figure 4-1 [13]. *Importance* and *Performance* are measured using as values the means of the two measures on a Likert scale. Each of the four quadrants provides recommendations how to manage and prioritize resources: resources that need to be prioritized are located in the "Concentrate here" quadrant (high importance and low performance); resources with required continuing work are located in the "Keep up the good work" quadrant (high importance and high performance); resources or efforts that need to be reallocated are identified within the "Low priority" (low importance and low performance) and the "Possible overkill" (low importance and high performance) quadrants [13, 19].

High

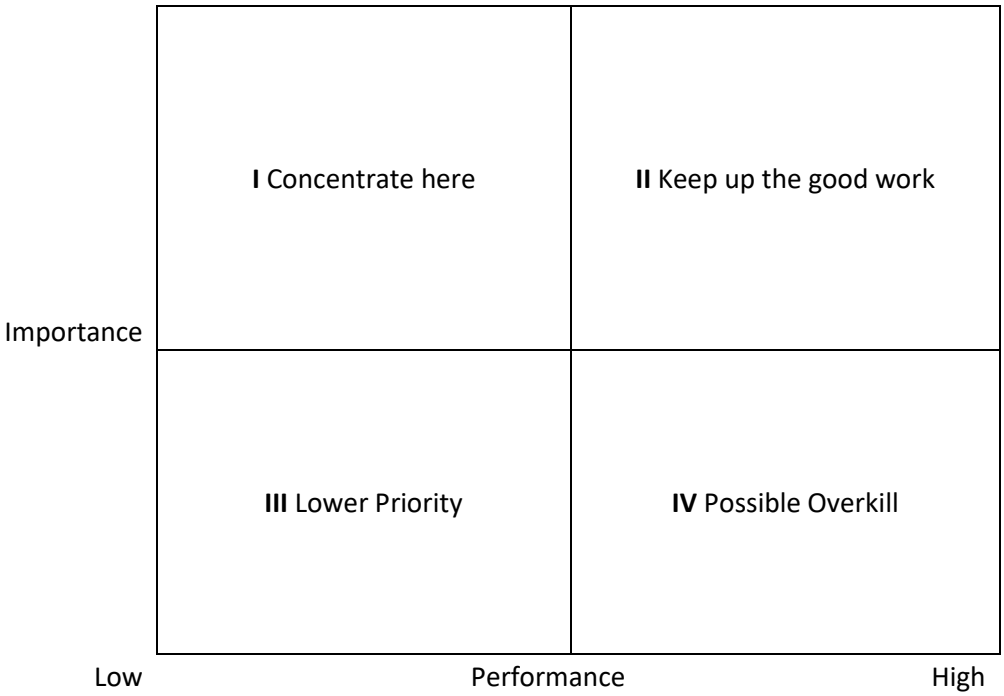


Figure 4-1 Importance-Performance Analysis Matrix

Source: Martilla and James [13]

In the resident survey, respondents are asked to rate the importance of 14 attributes that ascribe quality of life around the scenic byway to them. Once respondents evaluate the importance of these attributes (i.e., *Importance*), they are then asked to determine how the scenic byways perform in enhancing or decreasing these attributes (i.e., *Performance*).

4.3. Survey Implementation

The draft final survey is available as a web-based instrument, readily implementable on the FSHP website. The survey was delivered to FDOT FSHP staff as a task deliverable. The FSHP staff recommended some modifications, which were undertaken by the project team and then the final version was submitted to the FDOT Research Center for the final approval. The FDOT Research Center approved the survey and the current version is available at https://usf.az1.qualtrics.com/jfe/form/SV_dcflNVYEtNH9rwx

4.4. Byway Local Quality of Life Survey Tool

Based on the feedback received from the FSHP and byway organizations, the research team also developed a byway local quality of life survey data analysis tool, a spreadsheet application that analyzes data generated by the local quality of life survey. The tool enables the user to summarize results at different levels of aggregation, ranging from summary tables for the entire

Florida Byway system to summary information at a regional level (i.e., Panhandle, Northern, Central, and Southern regions), and down to any of the 26 byways.

The tool is based on a set of macros written in Visual Basic language within the Microsoft Excel® software platform and is available as an Excel macro-enabled file. By double-clicking on the file, Microsoft Excel starts and displays a customized toolbar appearing on the farther right of the Excel ribbon toolbar called “Byway Resident Survey Tool, “showing a customized spreadsheet tab called “Analysis.” Upon launching the Byway Tool, a customized spreadsheet tab called “Analysis” appears as the landing page. This tab contains four steps defining five dropdown lists, which allow selecting the desired level of aggregation and for the analysis: 1) Select Region; 2) Select Byway; 3) Select Survey Block; 4) Split Analysis Into; and 5) Run Analysis By (Figure 4-2).

Figure 4-2 Landing Page of the Scenic Byway Resident Survey

The “Select Region” and “Select Byway” dropdown lists on the survey tool allow conducting analysis at various levels of geographic aggregation – ranging from a system-level analysis of all byways, to analyzing of a specific region, and to the analysis of a specific byway, similar to the Visitor Survey tool (Figure 3-5).

4.4.1 Selecting the Level of Data Aggregation

The Byway Tool allows analyzing the resident survey by providing: 1) a summary of response rates; 2) specific results for each of the main categories of data, specifically:

- Demographics – This includes age, gender, and household income of the survey respondent
- Length of stay at zip code – This includes the number of months a respondent lived in their residential zip code in the past year, as well as the duration of stay at this zip code
- Employment Characteristics – This includes survey respondents' current employment status, and their industry of current employment (if applicable).
- Impact of Byway on local economy – The data collected under this category includes information on how respondents learned about the scenic byway, the extent to which the byway contributes to the local area tourism, and the importance of tourism to the local economy.
- Importance-Performance Analysis – The data collected under this category includes respondents' opinions on the importance of various quality-of-life attributes to them, and how the byway affects these quality-of-life attributes, in their opinion. This serves as the basis for the Importance-Performance Analysis that has been developed as part of the resident survey tool.

4.4.2 Example – Importance Performance Analysis of the Big Bend Scenic Highway

The following example is based on a synthetic sample consisting of 81 survey responses of residents along the Big Bend Scenic Highway in the Panhandle Region.

4.4.2.1 Importance-Performance Analysis

The quality of life resident survey asks respondents to rate the importance of 14 attributes that ascribe quality of life around the scenic byway to them. Once they evaluate the importance of these attributes, respondents identify how the scenic byways perform in enhancing or decreasing these attributes.

The Byway Tool allows conducting IPA as detailed in Section 4.2.To conduct the analysis the analyst must select "Importance Performance analysis" in Step 3 (Figure 4-2). Next, in Step 4 the analyst chooses the desired level aggregation. This allows analyzing responses for those respondents that are aware of the presence of the byway (option "Respondents aware of Byway") or analyzing the survey response using the combined sample (option "Both"). In this example, the analyst selected "Respondents aware of Byway" (Figure 4-3). To run the analysis without splitting the result by sociodemographic cohorts, the user selects the "General" option in Step 5. Clicking on the "Run Analysis" button runs the model (Figure 4-4). A new sheet named "Importance-Performance (General)" displays the results (Figure 4-5)

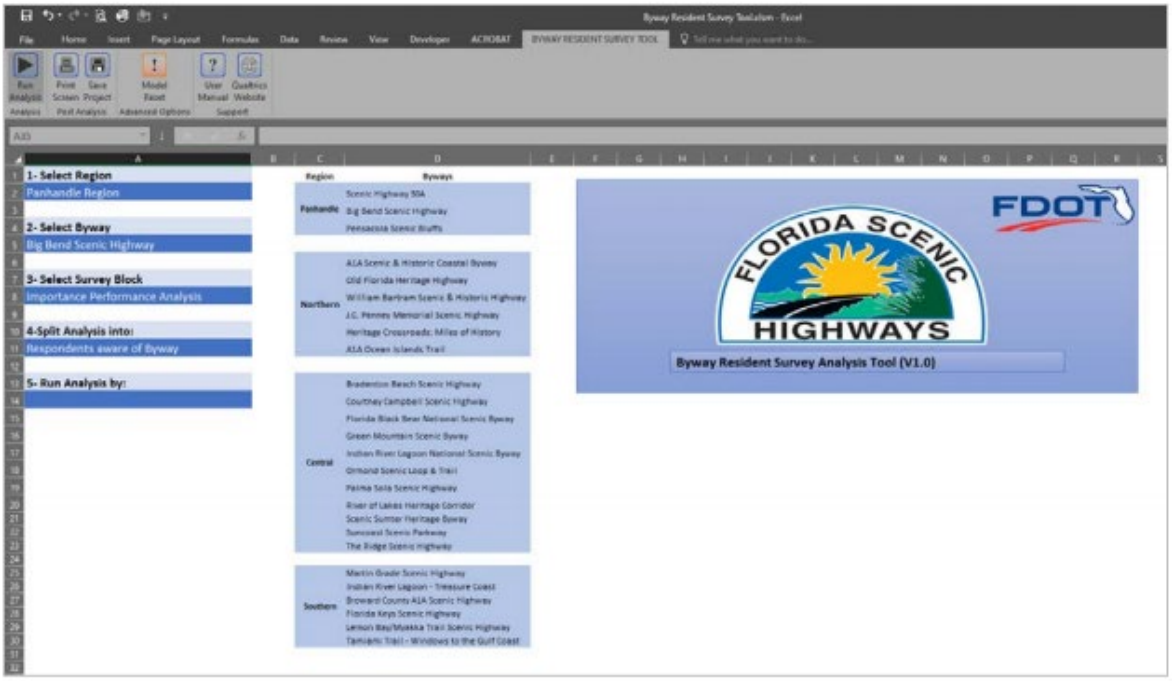


Figure 4-3 Importance Performance Analysis – Big Bend Scenic Highway Example

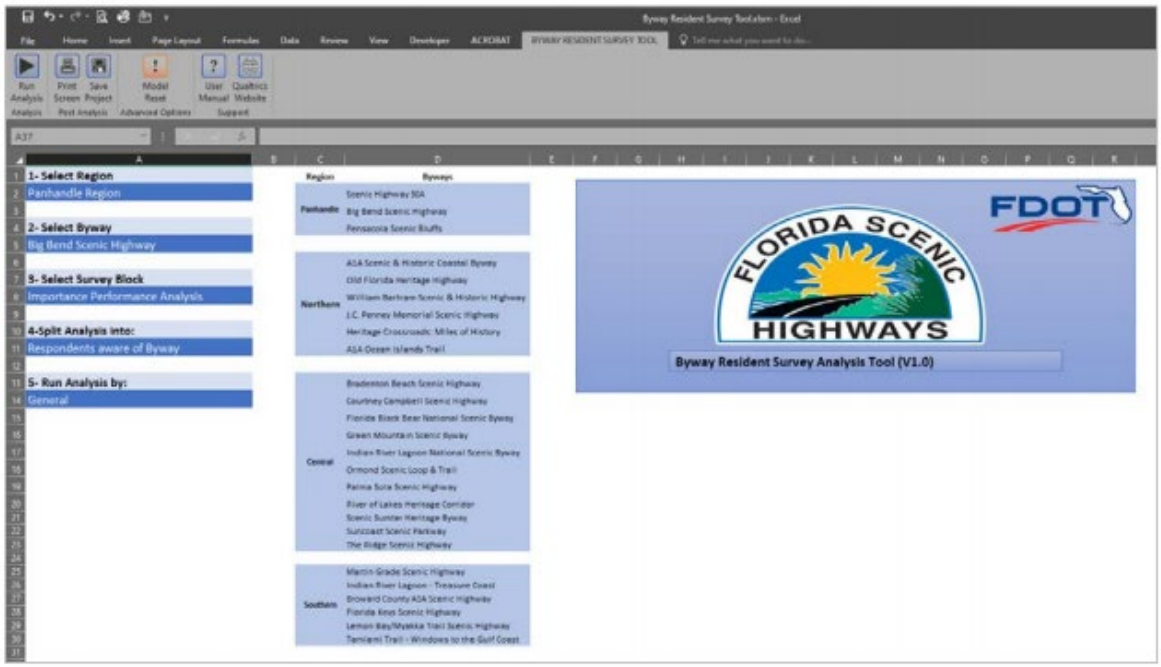


Figure 4-4 Importance Performance Analysis – Big Bend Scenic Highway Example

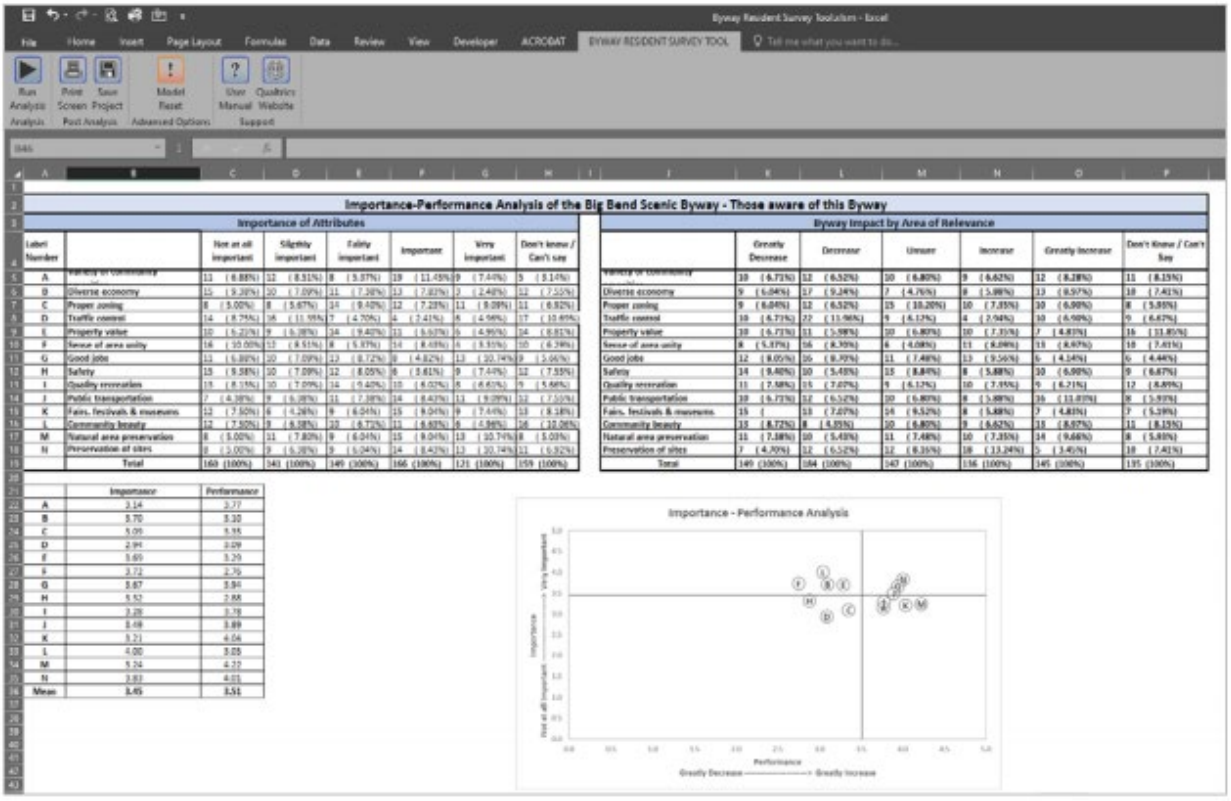


Figure 4-5 Importance Performance Results – Big Bend Scenic Highway Example

The results from the Importance Performance Analysis indicate respondents' emphasis on quality of life attributes along the scenic byway and the performance of the scenic byway in enhancing these attributes. Figure 4-6 zooms into the Importance Performance matrix, which provides indications to the byway organizations and FSHP staff on the efforts required for enhancing or maintaining resident quality of life along the scenic byway.

In this illustrative example, respondents felt that community beauty (label L in Figure 4-6) and sense of area unity (label F in Figure 4-6) attributes were very important to them (as evidenced by the high importance scores). At the same time, respondents indicated that the Big Bend scenic byway does not sufficiently contribute to the relevance of these attributes (as evidenced by the lower levels of the performance scores). Byway organizations could use this feedback to concentrate more on efforts geared at enhancing the contribution of the Big Bend scenic byway and conducting process improvements to enhance the relevance of these factors around the scenic byway. On the other hand, IPA also reveals how focusing on a variety of community amenities should be a lower priority to focus on, such as proper zoning (label C in Figure 4-6) and traffic control (label D in Figure 4-6).

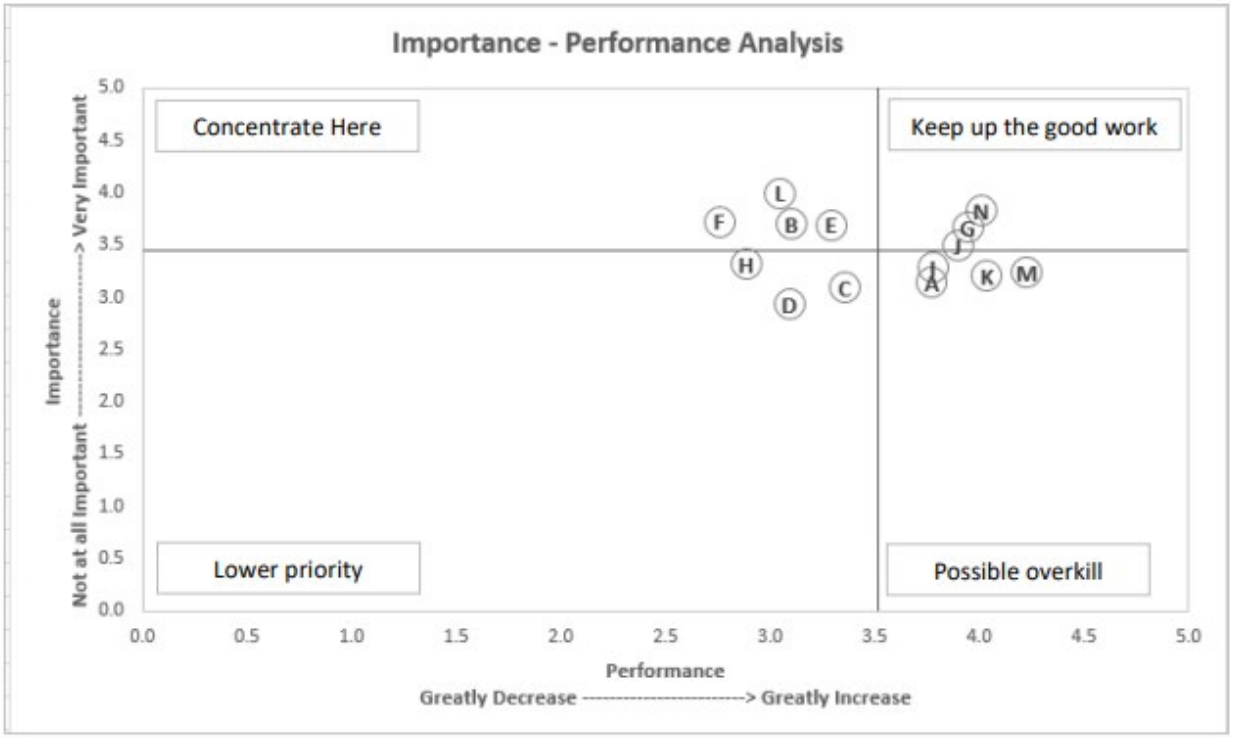


Figure 4-6 Importance Performance Matrix – Big Bend Scenic Highway Example

5. Standard Estimate of Economic Impacts

This section presents the economic impact analysis of visitor spending patterns that are attributable to scenic byway designation.

5.1. Past Economic Studies Focusing on Scenic Highways

There exist examples of economic impact studies focusing on the role of scenic highways in contributing to economic growth. Petraglia and Weisbrod [20] conducted a comprehensive literature review of impact studies related to scenic byway designation. The study found a variety of methods used to collect data and assess the economic contribution because of a byway designation. The studies that provided quantitative estimates in terms of jobs supported and added growth to local and regional output (i.e., sales) relied on input data from visitor surveys and economic input output models. These studies used traffic measurement estimates to relate changes in traffic growth to changes in visitor expenditures. The assumption is that highway designation increases awareness of the facility and its amenities and in turn induces additional tourist visits and local spending.

In a recent study estimating the economic impact of Florida's Sumter Heritage Byway, Hodges and Court provide a detailed review of previous studies, focusing on efforts that rely on the use of surveys of byway travelers to estimate direct spending on local businesses [10]. To estimate the economic impact of the Scenic Sumter Heritage Byway on the entire economy of Sumter County, Hodges and Court first analyzed historic traffic volumes along the scenic byway. They observed that the Sumter Scenic Byway experienced a 13.0 percent growth (as measured in AADT) since its designation in 2012. The authors multiplied the 2017 AADT estimates by the average spending per day by nonresident visitors, the share of survey respondents who identified themselves as outside of Sumter County (i.e., nonresident), the share who reported sightseeing or exploring historic sites as primary trip purpose, and the share of nonresident respondents who were aware of the byway. Finally, they multiplied these weighted expenditures by 365 to obtain an annual estimate and fed it into an input output model to evaluate the economic impact of the byway. The authors employed the Impact Analysis for Planning (IMPLAN) input-output software to estimate the economic impacts [21].

Variants of AADT and economic activity approaches have been used to estimate the impact of changes in arterial or highway traffic changes brought about by construction closures or by bypass investments. For example, Hodges & Court developed a methodology to estimate the impact of reduced AADT from roadway construction closures on business sales and employment levels. In a separate study, Concas evaluated the impact of reduced regional and

local traffic from the construction of a limited access roadway on local business sales and employment [22].

5.2. Methodology

To estimate the contribution of scenic byways on economic development, this study adopts a framework that links byway tourist expenditures from the Byway Visitor survey developed in Task 2 of this research effort to the portion of traffic that can be ascribed to scenic byway designation. This approach builds on methods adopted by Weisbrod and Petraglia [20] and Hodges and Court [10] by scaling tourist expenditure estimates from the visitor survey to an entire byway system using annual average daily traffic estimates (AADT).

The goal is to leverage the data that will be collected on byways visitors using the Visitor Survey instrument (See Section 3 of this report) to obtain economic impact estimates of the entire byway network in Florida and for each of the 26 scenic byways.

Figure 5-1 summarizes the approach. First, key byway visitor survey data are entered to define expenditure patterns and visitor profile. As FHSP staff deploys the visitor survey, the data can be fed into Step one. In Step 2, the visitor expenditures information and visitor profile information (i.e., average length of stay and travel party size) are used to obtain a per-person daily expenditure estimate. In Step 3, the daily per-person multiplied by 365 days and scaled to an estimated portion of the byway traffic current traffic levels ascribed to the byway designation. This estimate corresponds to the direct expenditure impact of the scenic byway. In Step 4, input output multipliers are used to translate the direct visitor expenditure impacts into economic impact estimates.

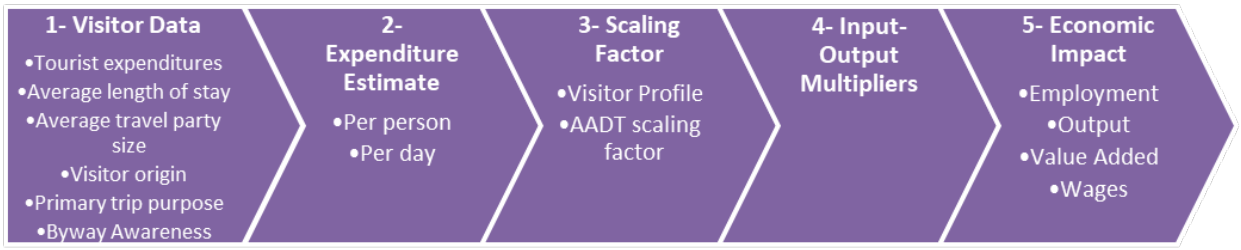


Figure 5-1 Economic Impact Method

5.2.1 Visitor Expenditure Estimates

The research team culled publicly available Florida tourism expenditure estimates from online sources and published reports [22-24]. Table 5-1 reports daily per person estimates by expenditure type.

Table 5-1 Visitor Expenditure Estimates-Florida

Expenditure Type	Daily - per person ($)
Food and Drinks	
Restaurants & Bars	42
Groceries	7
Expenditures on Transportation	
Gasoline and Oil	7
Taxi or Car Rental	4
Expenditures on Lodging	
Hotels, Motels, Cabins, etc.	116
Campground Fees	2
Other Expenses	
Tour, Exhibit, or Park Fees	14
Recreational Equipment Rental	7
Retail Shopping (clothing, gifts, souvenirs, etc.)	9
Other Goods Purchases	7
Total	**215**

Source: CUTR Estimates

The byway visitor survey instrument focuses on understanding travel patterns and the extent of awareness of a given byway visited during a trip. This information is necessary to better estimate the contribution to the local economy of the scenic byways.

In the absence of information from the byway visitor survey, this study assumes that the share of nonresident tourists is equivalent to the statewide estimates provided by the state's official tourism agency Visit Florida [23]. Accordingly, in 2018 Florida welcomed 126.1 million tourists, 14.3 million (11.3%) of which were international visitors. When estimating the impact of a single scenic byway, the share of non-resident tourists is equal to the sum of nonlocal and international visitors.

The share of tourists traveling for sightseeing purposes along the scenic byways is assumed to correspond to 14.3 percent of the respondents, or equivalent to the estimates obtained by the visitor survey for the Scenic Sumter Heritage Byway by Hodges and Court [10].

Table 5-2 Scenic Byway Visitors Profile

Average Length of Stay (days)	4
Average Travel Party Size	2.7
Visitors Origin	***Share (%)***
USA Out-of-State	47.0%
International	11.3%
Primary Trip Purpose	***Share (%)***
Sightseeing / Drive Through	14.3%
Byway Awareness	***Share (%)***
Very Much Aware	17.0%
Somewhat Aware	20.0%

Source: CUTR Estimates and Assumptions

The values of Table 5-1 and Table 5-2 can be used as proxy estimates while the visitor survey instrument developed in Task 2 of this research is being deployed. Once data become available, the above estimates can be revised to produce more accurate economic impact estimates.

5.3. AADT Scaling Factor

To scale the visitor expenditures estimate to the entire byway system, the next step is to multiply the annualized tourist expenditures by the share of traffic on the scenic byways that is attributable to the designation.

To obtain a more accurate estimate of the contribution of the scenic byways to increased growth in travel, this study defined an econometric model that relates the growth in AADT to the scenic byway designation event for each of the 26 byways. The FDOT provides historical traffic and geographic information system (GIS) roadway data that can be readily used for this purpose. These data were used to run the econometric model as detailed in Appendix C of this report. The model estimates that, on average, traffic volumes (i.e., AADT) on scenic byways increased by about 6.8 percent in the years following the designation. This estimate is used as the scaling factor in the visitor expenditure aggregation.

5.4. Economic Impact Estimates

Combining the scenic byway visitor expenditure data and scenic byway visitor profile with the share of AADT attributable to scenic byway designation provides the necessary input to

estimate the combined impact of all 26 byways on the state's economy. Table 5-3 reports the estimates, showing that the direct impact of these expenditures in 2019 is about 63.1 million.

Table 5-3 Direct Visitor Expenditure Impacts-All Florida Byways

Expenditures on Food and Drink	**Daily - per person ($)**	***Total Annual ($)***
Restaurants & Bars	42	12,328,369
Groceries	7	2,054,728
Expenditures on Transportation		
Gasoline and Oil	7	2,054,728
Taxi or Car Rental	4	1,174,130
Expenditures on Lodging		
Hotels, Motels, Cabins, etc.	116	34,049,781
Campground Fees	2	587,065
Other Expenses		
Tour, Exhibit, or Park Fees	14	4,109,456
Recreational Equipment Rental	7	2,054,728
Retail Shopping (clothing, gifts, souvenirs, etc.)	9	2,641,793
Other Goods Purchases	7	2,054,728
Total	***215***	***63,109,508***

The data of Table 5-3 are entered into the input-output model to estimate the economic impact of visitor expenditures. This study makes use of the IMPLAN model to generate I-O tables and multipliers. IMPLAN and the associated datasets are supported by the IMPLAN Group LLC [21].

Table 5-4 summarizes direct, indirect, induced, and total impacts in terms of employment, output, value added, and wages. Total impacts on output are about $113.1 million and represent the total production of goods and services in Florida because of scenic byway visitor expenditures. Total industry output measures the value of the production of goods and services by businesses in the local economy. Generally, total industry output is equivalent to total business sales plus what businesses place into (or remove from) inventory.

The total impact on value (or gross state product) added of $63.1 million represents a measure of gross profits and is a measure of wealth produced by the designation status. Scenic byway driven visitor expenditure help support about 1,070 jobs in the State.

Table 5-4 Total Impacts by Type

Impact Type	*Employment*	*Output ($, million)*	*Value Added ($, million)*	*Wages and Salaries ($, million)*
Direct	709	59.5	37.5	21.3
Indirect	146	22.8	12.8	6.7
Induced	216	30.9	13.5	6.7
Total	***1,071***	***113.1***	***63.9***	***34.6***

Figure 5-2 shows a breakdown of jobs impact by major industry sectors. The impact on jobs depends on the relative composition of the visitor expenditures. About 44 percent of the jobs are in the lodging industry, and 40 percent are in the food and accommodation services sectors, followed by retail services.

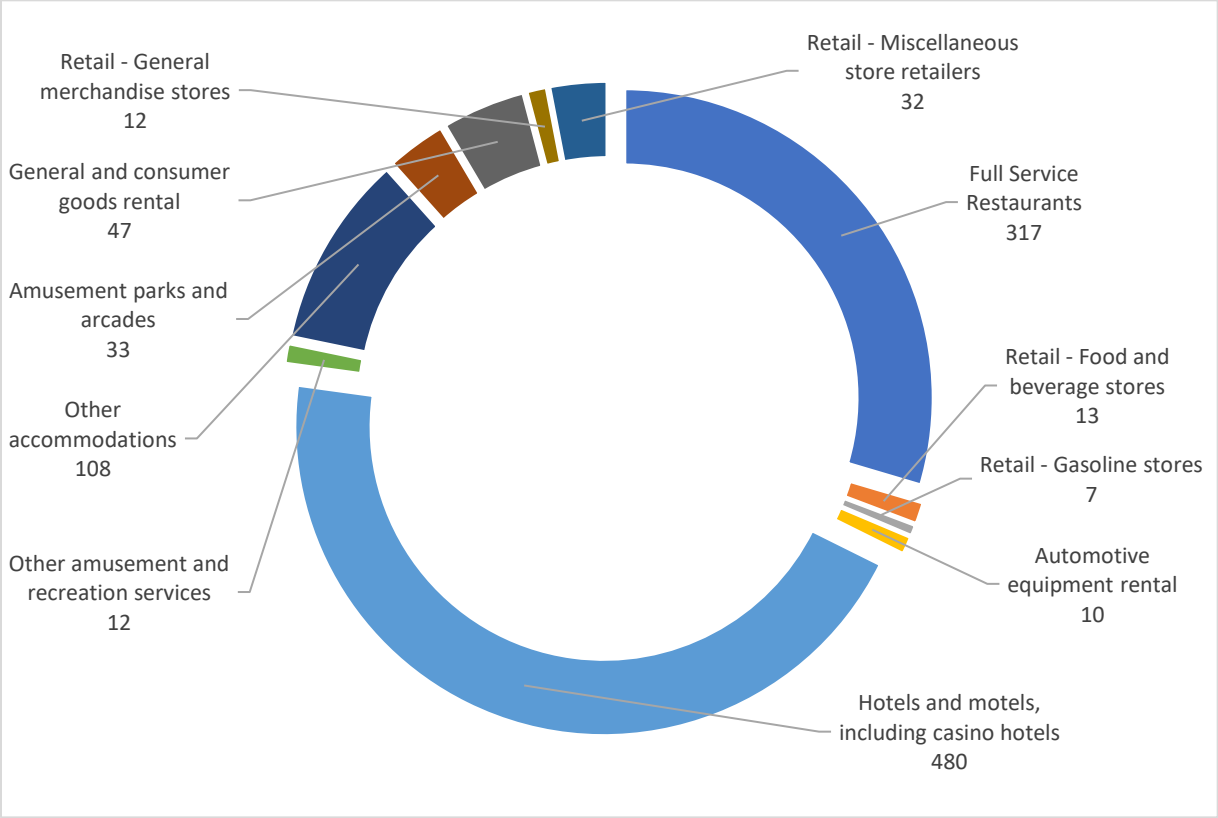
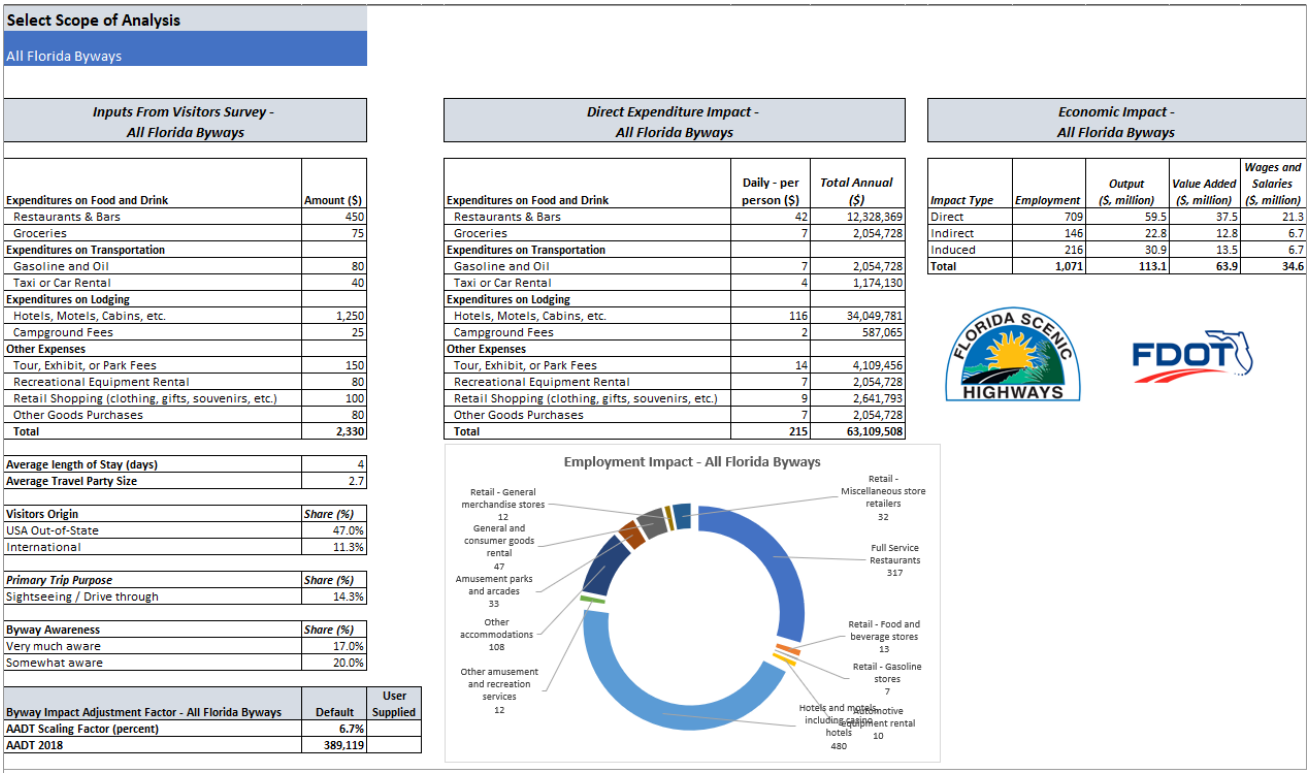


Figure 5-2 Employment Impact by Industry–All Florida Byways

5.5. Refinements to Estimates

The research team developed a spreadsheet that can revise the economic impact estimates as more accurate information on byway visitor expenditures and traveling profiles becomes available via the new survey instrument developed as part of this research.

Figure 3 provides a snapshot of the spreadsheet. By selecting the Scope of Analysis, the user can select to obtain impact estimates for a specific byway or for the entire system as presented in the previous section. The spreadsheet comes loaded with default values, including the 2018 AADT estimates for each of the 26 byways and for the entire Florida byway system. All default input parameters can be overridden with custom values, including the estimated AADT scaling factor.



Select Scope of Analysis

All Florida Byways

Inputs From Visitors Survey - All Florida Byways

Expenditures on Food and Drink	Amount ($)
Restaurants & Bars	450
Groceries	75
Expenditures on Transportation	
Gasoline and Oil	80
Taxi or Car Rental	40
Expenditures on Lodging	
Hotels, Motels, Cabins, etc.	1,250
Campground Fees	25
Other Expenses	
Tour, Exhibit, or Park Fees	150
Recreational Equipment Rental	80
Retail Shopping (clothing, gifts, souvenirs, etc.)	100
Other Goods Purchases	80
Total	**2,330**

Average length of Stay (days)	4
Average Travel Party Size	2.7

Visitors Origin	*Share (%)*
USA Out-of-State	47.0%
International	11.3%

Primary Trip Purpose	*Share (%)*
Sightseeing / Drive through	14.3%

Byway Awareness	*Share (%)*
Very much aware	17.0%
Somewhat aware	20.0%

Byway Impact Adjustment Factor - All Florida Byways	Default	User Supplied
AADT Scaling Factor (percent)	6.7%	
AADT 2018	389,119	

Direct Expenditure Impact - All Florida Byways

Expenditures on Food and Drink	Daily - per person ($)	*Total Annual ($)*
Restaurants & Bars	42	12,328,369
Groceries	7	2,054,728
Expenditures on Transportation		
Gasoline and Oil	7	2,054,728
Taxi or Car Rental	4	1,174,130
Expenditures on Lodging		
Hotels, Motels, Cabins, etc.	116	34,049,781
Campground Fees	2	587,065
Other Expenses		
Tour, Exhibit, or Park Fees	14	4,109,456
Recreational Equipment Rental	7	2,054,728
Retail Shopping (clothing, gifts, souvenirs, etc.)	9	2,641,793
Other Goods Purchases	7	2,054,728
Total	**215**	**63,109,508**

Economic Impact - All Florida Byways

Impact Type	*Employment*	*Output ($, million)*	*Value Added ($, million)*	*Wages and Salaries ($, million)*
Direct	709	59.5	37.5	21.3
Indirect	146	22.8	12.8	6.7
Induced	216	30.9	13.5	6.7
Total	**1,071**	**113.1**	**63.9**	**34.6**

Figure 5-3 Economic Impact Analysis Spreadsheet

6. Conclusion

The purpose of the study was to refine and develop data collection instruments that will assist the FDOT FSHP in evaluating and quantifying the contribution of FSHP efforts to Florida's economy and quality of life of Floridians.

A situational analysis of Florida's scenic byways was conducted to better understand the individual characteristics of each scenic byway. The research gathered socio-demographic and economic data pertaining to each scenic byway to inform the subsequent tasks of the study, consisting of a visitor survey, a quality of life of residents, two analytical tools, and a summary of economic impacts of the entire Scenic Byway Program.

The scenic byway visitor survey uses a trickle-down approach to determine the impact of each scenic byway on Florida's economy. Respondents who are aware of the scenic byway designation can be asked about their motivations to visit, as well as their levels of satisfaction regarding scenic byway elements. Capturing relevant information on site-specific characteristics is a means for FSHP staff and byway organizations to undertake cost-effective resource allocation and promotional efforts.

A similar effort was undertaken to design the local quality of life survey of residents who live near the scenic byways (as determined by their residential zip code). The survey instruments also collected relevant information conducive to a detailed Importance-Performance Analysis to ascertain the importance of 14 byway-related attributes to the respondents and also to examine the performance of the scenic byways under these selected attributes.

To assist FHSP staff and byway organization in analyzing the surveys responses, this research developed two custom spreadsheet applications. The tools will help analyze byway-specific trends, allowing a more efficient utilization of resources to promote the work of FSHP and the byway organizations.

Finally, this research estimated the contribution of scenic byways to economic development by adopting a framework that links byway tourist expenditures from the byway visitor survey to the portion of vehicular traffic that can be ascribed to scenic byway designation. This approach built on existing research efforts by scaling tourist expenditure from the visitor survey to an entire byway system using current levels of annual average daily traffic (AADT). The estimate shows that direct visitor expenditure impacts on all Florida byways contributes to about $63.9 million in state Gross Domestic Product. In addition, scenic byway-driven visitor expenditure helps support about 1,070 jobs in the State. A spreadsheet tool developed as part of this task

can be used to revise these estimates as more accurate information on byway visitor expenditure and traveling profiles becomes available a data collection.

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Appendix A. ACS 5-Year Estimates Socio-demographic Data

Table A-1 ACS Socio-demographic Data

Variables	
Total Population:	**Total Households:**
Male:	Married-couple family
Under 5 years	Other family:
5 to 9 years	Male householder, no wife present
10 to 14 years	Female householder, no husband present
15 to 17 years	Nonfamily households:
18 and 19 years	Householder living alone
20 years	Householder not living alone
21 years	**Total Households:**
22 to 24 years	Less than $10,000
25 to 29 years	$10,000 to $14,999
30 to 34 years	$15,000 to $19,999
35 to 39 years	$20,000 to $24,999
40 to 44 years	$25,000 to $29,999
45 to 49 years	$30,000 to $34,999
50 to 54 years	$35,000 to $39,999
55 to 59 years	$40,000 to $44,999
60 and 61 years	$45,000 to $49,999
62 to 64 years	$50,000 to $59,999
65 and 66 years	$60,000 to $74,999
67 to 69 years	$75,000 to $99,999
70 to 74 years	$100,000 to $124,999
75 to 79 years	$125,000 to $149,999
80 to 84 years	$150,000 to $199,999
85 years and over	$200,000 or more
Female:	**Total Population 16 and over:**
Under 5 years	In labor force:
5 to 9 years	Civilian labor force:
10 to 14 years	Employed
15 to 17 years	Unemployed
18 and 19 years	Armed Forces
20 years	Not in labor force
21 years	**Total Housing Units:**
22 to 24 years	Occupied

25 to 29 years	Vacant
30 to 34 years	**Total Housing Units:**
35 to 39 years	Owner occupied
40 to 44 years	Renter occupied
45 to 49 years	Total Structures:
50 to 54 years	Owner occupied
55 to 59 years	Renter occupied
60 and 61 years	
62 to 64 years	
65 and 66 years	
67 to 69 years	
70 to 74 years	
75 to 79 years	
80 to 84 years	
85 years and over	
Total Population:	
White alone	
Black or African American alone	
American Indian and Alaska Native alone	
Asian alone	
Native Hawaiian and Other Pacific Islander alone	
Some other race alone	
Two or more races	
Hispanic or Latino	

Appendix B. County Business Patterns Data

CBP data are available at the zip-code level. The 1-mile buffer is overlaid on a GIS dataset identifying zip codes around each scenic byway and CBP data are extracted. According to the U.S. Census, CBP data are useful for studying the economic activity of small areas and analyzing economic changes over time. These data are augmented using business location data from Google Places API.

Table B-1 County Business Patterns Data

Variable	***Description***
naics	Industry Code 6-digit NAICS code
emp	Total Employment
ap	Total Annual Payroll
est	Total Number of Establishments
n1_4	Number of Establishments 1-4 Employee Size Class
n5_9	Number of Establishments 5-9 Employee Size Class
n10_19	Number of Establishments 10-19 Employee Size Class
n20_49	Number of Establishments 20-49 Employee Size Class
n50_99	Number of Establishments 50-99 Employee Size Class
n100_249	Number of Establishments 100-249 Employee Size Class
n250_499	Number of Establishments 250-499 Employee Size Class
n500_999	Number of Establishments 500-999 Employee Size Class
n1000	Number of Establishments 1000 or more Employee Size Class

Appendix C. Detailed Methodology for Standard Estimate of Economic Impacts

AADT Scaling Factor

To scale the visitor expenditures estimate to the entire byway system, the next step is to multiply the annualized tourist expenditures by the share of traffic on the scenic byways that is attributable to the designation.

To obtain a more accurate estimate of the contribution of the scenic byways to increased growth in travel, the research team defined an econometric model that relates the growth in AADT to the scenic byway designation event for each of the 26 byways [6]. The FDOT provides historical traffic and geographic information system (GIS) roadway data that can be readily used for this purpose. Note that each scenic byway contains several roadway segments, each with its own AADT counts. Table 3 reports average AADT counts along with byway characteristics, using the average AADT count for all roadway segment comprised in each byway.

Table C-1 Florida Scenic Byways Traffic Levels, 2018

Scenic Byway	***Facility Length (miles)***	***Designation Year***	***AADT 2018***
A1A Ocean Islands Trail	39	2016	19,007
A1A Scenic & Historic Coastal Byway	64	2002	12,966
Big Bend Scenic Highway	237	2006	4,182
Bradenton Beach Scenic Highway	3	2001	10,381
Broward County A1A Scenic Highway	33	2009	23,941
Courtney Campbell Scenic Highway	10	2005	47,363
Florida Black Bear National Scenic Byway	120	2008	9,244
Florida Keys Scenic Highway	110	2001	20,417
Green Mountain Scenic Byway	44	2004	6,263
Heritage Crossroads: Miles of History	95	2008	5,483
Indian River Lagoon - Treasure Coast	241	2000	15,923
Indian River Lagoon National Scenic Byway	41	2005	10,428
J.C. Penney Memorial Scenic Highway	5	2010	9,630
Lemon Bay/Myakka Trail Scenic Highway	44	2008	14,305
Martin Grade Scenic Highway	12	2015	2,800
Old Florida Heritage Highway	50	2001	3,895
Ormond Scenic Loop & Trail	35	2007	7,984
Palma Sola Scenic Highway	4	2004	28,500
Pensacola Scenic Bluffs	10	1998	20,800
River of Lakes Heritage Corridor	144	2009	11,809
Scenic Highway 30A	32	2008	6,296
Scenic Sumter Heritage Byway	62	2013	5,861
Suncoast Scenic Parkway	41	2006	33,975
Tamiami Trail - Windows to the Gulf Coast	68	2003	30,420
The Ridge Scenic Highway	35	2005	7,483
William Bartram Scenic & Historic Highway	17	2005	19,765
All Florida Byways	***61***		***14,966***

The research team compiled a database consisting of AADT data for the period 1990-2018 covering all roadways in Florida. The extended timeframe accounts for historical trends before and after a roadway designation to scenic highway. Next, the following equation was estimated using a pooled regression:

$$AADT_i = \beta_0 + \beta_1 length_i + \beta_2 scenehwy + \beta_3 scenehwyYR_i + \beta_4 T + u_i$$

where
$AADT_i$= Annual average daily bi-directional traffic of roadway segment (natural log)
$length_i$= length of roadway segment
$scenehwy$ = categorical variable indicating roadway belongs to scenic byway (*scenehwy*=1) or otherwise
$scenehwyYR_i$ = time period categorical variable indicating scenic highway designation (YR =1 beginning year designated, YR = 0 years before designation)
T = categorical set of time indicators to control for secular time trends.

The parameter of interest reflecting the change in traffic volumes associated the scenic byway designation status (*scenehwyYR*) is statistically significant and with the expected sign. Given the natural log-level specification of the model, the parameter estimate corresponds to 6.8 percent.[1] This means that the designation resulted, on average, in an increase of about 6.8 percent in AADT. This estimate is then used as scaling factor in the visitor expenditure aggregation.

Table C-2 AADT Scaling Factor Estimation Results

Independent Variable	*Description*	*Estimated Parameter*
length	Roadway length (natural log)	0.102*** (0.00224)
scenehwy	Scenic Byway	0.0893*** (0.0247)
scenehwyYR	Scenic Byway designation†	0.0692** (0.0351)
cons	Constant term	8.279*** (0.0349)
	Observations	136227
	Adjusted R-square	0.52

*t-statistics in parenthesis: * p<0.10; **p<0.05, ***p<0.01*
†Years prior to designation represent *the baseline*
Note: Model includes year dummy variables (not shown)

[1] The proportional change can be obtained by applying the formula [exp(β)-1)*100, β is the estimated parameter associated to the variable *scenehwyYR*.

Input-Output (I-O) Multipliers

Input-output (I-O) modeling, originally introduced by Leontief [27], describes commodity flows from producers to intermediate and final consumers. It depicts an economic system as a set of tables where the total industry purchases of commodities, services, employment compensation, value added, and imports is equal to the value of the commodities produced. Purchases for final use (final demand) drive the model. Industries producing goods and services for final demand purchase goods and services from other producers. These other producers, in turn, purchase goods and services. This buying of goods and services (indirect purchases) continues until leakages from the region (imports and value added) stop the cycle. These indirect and induced effects (the effects of household spending) can be mathematically derived. The derivation is called the Leontief inverse. The resulting sets of multipliers describe the change of output for each regional industry caused by a one-dollar change in final demand for any given industry.

This study makes use of the IMPLAN model to generate I-O tables and multipliers. IMPLAN and the associated datasets are supported by the IMPLAN Group LLC [21]. IMPLAN is a widely used, nationally recognized input-output economic impact model.

The model was run using baseline data comprising all counties comprising the State of Florida. The model was refined to account for the fact that expenditures on retail establishments has a local impact to capture only the portions of revenues used to run the stores locally.

The model estimates changes in the total local economic activity caused by economic changes in the area. In this analysis, the economic activities associated with the visitor expenditures require the purchase of goods and services from the local economy. These purchases cause changes in the overall economic activity of the region. The I-O model assesses the new level of overall economic activity. As an example, when a business purchases goods from a second business, the first business is helping support the second. The model estimates all levels of activity supported by the first business.

Indirect and Induced Impacts

The scenic byway tourist expenditures result in a demand for spending in the economy, directly affecting the demand for goods and services of businesses. These businesses rely on other businesses to purchase inputs. Indirect impacts measure the economic activity of secondary businesses producing goods and services because of primary businesses' production of goods and services. The wages of the workers employed in primary and secondary businesses generate additional retail sales for businesses, resulting in additional induced impacts. Changes

in household spending spanning from improvements in the transportation network (i.e., household cost savings), also generate indirect and induced impacts.

Total Output

Total industry output measures the value of production of goods and services by businesses in the local economy. Generally, total industry output is equivalent to total business sales plus what businesses place into (or remove from) inventory. Total output measures how the region's economy would be affected by the direct impacts generated by the visitors' expenditures.

Value Added

Total value added is equivalent to gross domestic product. It is a subset of total output that measures total output minus the cost of labor and materials. Total output is analogous to the definition of Gross Domestic Product as identified by the Bureau of Economic Analysis, and measures only the value of final goods and services. In economic analysis, value added is the preferred impact measure of contribution to economic growth generated by investments.

Wages

Wages includes employee compensation. Total employee compensation represents the total payroll costs, including wages and salaries, paid to workers by employers, as well as benefits such as health and life insurance, retirement payments, and non-cash compensation.

Definition of Impact Area

Economic impact study regions vary in size from single counties to multiple states, depending on the nature of the study and the industries assessed. The choice of the study area must strike a balance between covering an area large enough to capture the most important aspects of the impact, but not so large that unconnected economic activities mask the impacts. This study considers statewide impacts.