Table A-3. Corridor 3 Road Inventory

Main Street	Cross Street	Lanes NB / EB	Lanes SB / WB	Speed Limit	Stop Sign	Signal	Laneage For Intersections	Mile Marker	Note Anything Odd
US 701	State Line	1	1	55					
US 701	SR 26-1282	1	1		x				
US 701	Hwy 141 - SR 26-141	1	1		x				
US 701	Cheryl Road	1	1		x				
US 701	SR 26-930	1	1		x				
US 701	Twin City Circle	1	1		x				
US 701	Airport Road	1	1		x		Divided Hwy		
US 701	Ramps	1	1		x				
US 701	SR 26-747	1	1	40	x		Divided Hwy ends		
US 701	Russ Road	1	1		x				
US 701	Carolina Drive	1	1		x				
US 701	Ralph Ellis Blvd	1	2		x				
US 701	SR 26-570	1	2		x				
SR 26-570	Allen Street	1	1		x				
SR 26-570	St James Drive	1	1		x				
SR 26-570	Tiger Paw Road	1	1		x				
SR 26-570	SC 66	1	1		x				
SC 66	SC 9	1	1	45	x		Sucide Lane Begins & End before & After		
SC 66	Loris Lions Road	1	1	55	x				
SC 66	Norris Lane	1	1	35	x		School Zone		
SC 66	Colts Neck Road	1	1	55	x		School Zone Ends		
SC 66	Hewitt Road	1	1		x				
SC 66	Lawndale Drive	1	1		x				
SC 66	Simpson Creek Drive	1	1		x				
SC 66	Sunshine Road	1	1		x				
SC 66	Holly Hill Road	1	1		x				
SC 66	SC 915	1	1		x				
SC 66	Red Bluff Road	1	1		x		4 way Stop		
Red Bluff Road	Daisy Road	1	1	35	x		Sucide Lane - School Zone		
Red Bluff Road	Alton Road	1	1	55	x		Sucide Lane End		
Red Bluff Road	Carter Road	1	1		x				
Red Bluff Road	Neil Branch Road	1	1		x				
Red Bluff Road	Sam Graham Road	1	1		x				
Red Bluff Road	SC 366	1	1		x				
Red Bluff Road	Emery Road	1	1		x				
Red Bluff Road	SR 26-777	1	1		x				
Red Bluff Road	Rigsbee Road	1	1		x				
Red Bluff Road	Sandpiper Road	1	1		x				
Red Bluff Road	Winding Path Driv	1	1		x				
Red Bluff Road	SC 905	1	1			x			
SC 905	Stalvey Antique Drive	1	1	45	x		Sucide Lane Begins		
SC 905	Mckinley Shortcut Road	1	1		x				
SC 905	SC 22	1	1		x				
SC 22	On Ramp	2	2	65					
SC 22	SC 90 Ramps	2	2						
SC 22	SC 31 Ramps	2	2						

Table A-3. Corridor 3 Road Inventory (Cont'd.)

Main Street	Cross Street	Lanes NB / EB	Lanes SB / WB	Speed Limit	Stop Sign	Signal	Laneage For Intersections	Mile Marker	Note Anything Odd
SC 22	US 17 Ramps	3	3	45					
SC 22	Chestnut Road	3	3			x			
SC 22	Lake Arrowhead Road	3	3			x			
SC 22	Cove Drive	3	3		x				
SC 22	US 17 Bus Ramps	2	2	50					
US 17 Bus	Kings Road	2	2	45					
Kings Hwy	Grande Dunes Blvd	2	2		x				
Kings Hwy	82nd Pkwy	2	2			x			
Kings Hwy	79th Pkwy	2	2			x			
Kings Hwy	76th Pkwy	2	2			x			
Kings Hwy	75th Pkwy	2	2		x				
Kings Hwy	67th Pkwy	2	2			x			
Kings Hwy	62nd Ave	2	2			x			
Kings Hwy	61st Ave	3	3		x				
Kings Hwy	Poinsett Road	3	3		x				
Kings Hwy	Woodside Aven	3	3		x				
Kings Hwy	Pinewood Road	3	3			x			
Kings Hwy	52nd Ave	3	3		x				
Kings Hwy	48th Ave	3	3			x			
Kings Hwy	46th Ave	3	3		x				
Kings Hwy	44th Ave	3	3		x				
Kings Hwy	38th Ave	3	3			x			
Kings Hwy	29th Ave	3	3			x			
Kings Hwy	Myrtle Place	3	3	35	x				
Kings Hwy	21st Ave	3	3			x			
Kings Hwy	16th Ave	3	3			x			
Kings Hwy	Mr Joe White Ave	3	3			x			
Kings Hwy	9th Ave	3	3			x			
Kings Hwy	US 501	3	3	25		x			
Kings Hwy	7th Avenue	2	2	35	x				
Kings Hwy	6th Avenue	2	2		x				
Kings Hwy	5th Avenue	2	2		x				
Kings Hwy	4th Avenue	2	2		x				
Kings Hwy	3rd Avenue	2	2		x				
Kings Hwy	2nd Avenue	2	2		x				
Kings Hwy	1st Avenue	2	2		x				
Kings Hwy	2nd Avenue S	2	2		x				
Kings Hwy	3rd Avenue S	2	2			x			
Kings Hwy	6th Avenue S	2	2			x			
Kings Hwy	7th Avenue S	2	2		x				
Kings Hwy	8th Avenue S	2	2		x				

Table A-4. Corridor 4 Road Inventory

Main Street	Cross Street	Lanes NB / EB	Lanes SB / WB	Speed Limit	Stop Sign	Signal	Laneage For Intersections	Mile Marker	Note Anything Odd
6th Avenue	N Main Street	1	1		x				
Main Street	6th Avenue	1	1	45					
US 501	Oak Street	2	2						
US 501	7th Avenue	2	2						
US 501	SR 26-24	2	2						
US 501	9th Avenue	2	2		x				
US 501	11th Avenue	2	2						Suicide Lanes Starts South of 9th
US 501	Wisteria Drive	2	2						
US 501	Webster Road	2	2	60					Suicide Lane Ends South of Webster
US 501	Cook Road	2	2						
US 501	Bill Jones Road	2	2		x				
US 501	SR 26-1048	2	2						
US 501	SR 26-132	2	2						
US 501	Sherwood Drive	2	2						
US 501	Shanda Lane	2	2						
US 501	White Oak Lane	2	2						
US 501	Hucks Road	2	2						
US 501	Pine Oaks Farm Road	2	2						
US 501	Sparkman Road	2	2						
US 501	Rabon Road	2	2		x				
US 501	Horry Road - SR 26-97	2	2						
US 501	Lambert Road	2	2						
US 501	SR 847	2	2						
US 501	Roleigh Road - Brown	2	2						
US 501	Murray Johnson Road	2	2						
US 501	Landmark Road	2	2		x				
US 501	Enoch Road	2	2						
US 501	Hallie Martin Road	2	2						
US 501	Hardwick Road	2	2						
US 501	D Street	2	2						
US 501	Eldon Road	2	2						
US 501	SR 26-1010	2	2						
US 501	Booth Circle	2	2						
US 501	4 Mile Road - SR 548	2	2	55		x			
US 501	Sioux Swamp Drive	2	2						
US 501	SR 26-165	2	2						Suicide Lane Begins
US 501	Rivertown Blvd	2	2						

Table A-5. Corridor 5 Road Inventory

Main Street	Cross Street	Lanes NB / EB	Lanes SB / WB	Speed Limit	Stop Sign	Signal	Laneage For Intersections	Mile Marker	Note Anything Odd
SC 905	Kingston Street	2	2	25	x				
SC 905	US 501 Bus	2	2			x			
US 501 Bus	3rd Avenue	1	1	30		x			
US 501 Bus	2nd Avenue	1	1		x				
US 501 Bus	SC 26-14	1	1	55					
US 501 Bus	SC 90	1	1	55		x			
US 501 Bus	Claridy Road	1	1	40	x				
US 501 Bus	SC 26-14	1	2		x				
US 501 Bus	French Collins Road - SC 544	1	1			x			
SC 544	Washington Avenue	1	1	30	x				
SC 544	El Paso Drive	1	1		x				
SC 544	Savannah Bluff Road	1	1		x				
SC 544	US 501	1	1			x			
US 501	SC 544 Overpass	2	2						
US 501	Cox Ferry Road	2	2	50		x			
US 501	SC 26-1129	2	2		x				
US 501	SC 26-1127	2	2			x			
US 501	SC 26-1133	2	2			x			
US 501	University Blvd	2	2		x				
US 501	Victory Ln	2	2			x			
US 501	Singleton Ridge Road	2	2			x			
US 501	William Finlayson Road	2	2		x				
US 501	University Plaza Drive	2	2		x				
US 501	Burning Ridge Rd - Wild Wing Blvd	2	2			x			
US 501	Myrtle Ridge Dr - Gardner Lacy Road	2	2			x			
US 501	Conbraco Road	2	2		x				
US 501	Conbraco Road	2	2		x				
US 501	Sparks Toyota Driveway	2	2		x				
US 501	Perry Rd - Carolina Forest Blvd	2	2			x			
US 501	Legends Drive	2	2			x			
US 501	Las Palmas Drive	2	2			x			
US 501	SC 31 Interchange			55					No Access to cross streets
US 501	George Bishop Pkwy Overpass	2	2	55					
US 17	Pine Island Road	3	3	50					
US 17	Harrelson Blvd Overpass	3	3						
US 17	Shetland Lane	3	3						
US 17	Waterway Condo	2	2	45					Construction Zone
US 17	Farrow Pkwy	2	2			x			
US 17	Palmetto Pointe Blvd	2	2			x			
US 17	Azalea Lakes Blvd	2	2						
US 17	Esso Road	2	2						
US 17	Strand Drive	2	2			x			
us 17	Queens Harbour Blvd	2	2			x			
US 17	Sutter Drive	2	2			x			
US 17	Glenns Bay Road	2	2			x			
Glenns Bay Road	Andover Drive	1	1	30	x				
Glenns Bay Road	Spanish Oaks Drive	1	1		x				
Glenns Bay Road	Kessinger Drive	1	1		x				
Glenns Bay Road	Coachman Lane	1	1		x				
Glenns Bay Road	Indian Oak Lane	1	1		x				

Table A-5. Corridor 5 Road Inventory (Cont'd.)

Main Street	Cross Street	Lanes NB / EB	Lanes SB / WB	Speed Limit	Stop Sign	Signal	Laneage For Intersections	Mile Marker	Note Anything Odd
Glenns Bay Road	Sandy Lane - Azalea Drive	1	1		x				
Glenns Bay Road	Kings Hwy	1	1			x			
Surfside Drive	Poplar Drive	1	1		x				Divided Road
Surfside Drive	Cedar Drive	1	1		x				
Surfside Drive	Hollywood Drive	1	1		x				
Surfside Drive	Willow Drive	1	1		x				
Surfside Drive									

Appendix B

I-73 Stated Preference Survey Report

Resource Systems Group, Inc.

June 2015

DRAFT REPORT

I-73 STATED PREFERENCE SURVEY

RSG
the science of insight

6.18.2015

PREPARED FOR:
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

SUBMITTED BY:
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IN COOPERATION WITH:
C&M ASSOCIATES

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1.0 EXECUTIVE SUMMARY

The South Carolina Department of Transportation, in collaboration with C&M Associates (C&M), is evaluating the traffic and revenue potential of an extension of I-73 in South Carolina. The new extension would be tolled and would ultimately connect South Carolina to states as far north as Michigan. In South Carolina, I-73 would run northwest from SC Highway 22 north of Myrtle Beach to the North Carolina state border. The proposed corridor would be approximately 100 miles and includes two phases: Phase 1 from SC Highway 22 to I-95 (shown in yellow in **Figure 1-1**), and Phase 2 from I-95 to I-74 in North Carolina (shown in green in **Figure 1-1**). The South Carolina Department of Transportation is also considering potential contributing routes to I-73 such as the Southern Evacuation Lifeline (SELL), a potential toll facility that would link SC Highway 22 to US 17 south of Myrtle Beach.

From April 17 to June 3, 2015, Resource Systems Group, Inc. (RSG) conducted two stated preference (SP) surveys—one of passenger vehicle travelers and one of commercial vehicle travelers—in the greater Myrtle Beach area. RSG collaborated with C&M to design and conduct the surveys to support C&M's travel demand forecast for Dillon, Horry, Marion, Georgetown, and Marlboro Counties in South Carolina.

FIGURE 1-1: I-73 CORRIDOR

The primary purpose of the stated preference survey was to estimate value of time (VOT) of passenger and commercial vehicle travelers who are candidates for using the proposed extensions of I-73 and potential contributing routes such as the SELL corridor. The surveys provide an important analytical tool in evaluating traffic and revenue potential and in enhancing the credibility of the study for presentation to the financial community.

The questionnaires collected data on respondents' current travel behaviors (also referred to as "revealed preferences"), presented respondents with information about the proposed I-73 and contributing routes, and used stated preference experiments to collect data that were used to estimate values of time in the corridor.

The survey approach employed a computer-assisted self-interview (CASI) technique developed by RSG. The stated preference survey instrument was customized for each respondent by presenting questions and modifying language based on respondents' previous answers. These dynamic survey features provide an accurate and efficient means of data collection and allow the presentation of realistic future conditions that correspond with the respondents' reported experiences. RSG's proprietary software was customized for online administration to targeted audiences in the study region.

Respondents were recruited to take the survey through the following methods:

- Passenger vehicle survey:
    - E-mail invitations sent to organizations and businesses in the Myrtle Beach area
    - E-mail invitations sent through the Myrtle Beach Chamber of Commerce database to recent visitors to the Myrtle Beach area
- Commercial vehicle survey:
    - E-mail invitations sent to South Carolina Trucking Association members

A total of 1,973 valid passenger vehicle and 18 valid commercial vehicle surveys were collected between April and June 2015. Stated preference data from the passenger vehicle survey was analyzed using accepted statistical techniques to estimate the coefficients of a set of multinomial logit (MNL) models across different traveler market segments. The coefficients of the MNL models were used to estimate travelers' value of time (VOT). The average VOT across different income groups for the various segments generally fell within a range of $5 per hour to $17 per hour.

Because of opposition to the project from the South Carolina Trucking Association, the project team was unable to collect the minimum number of commercial vehicle surveys needed to conduct the choice model estimation to estimate values of time. To estimate commercial travelers' VOT, the project team used results from a selection of other similar commercial vehicle surveys conducted by RSG in the southeastern US. The average aggregate value of time for commercial drivers across these studies was calculated as $26.56 per hour.

This report documents the development and administration of the survey questionnaires, presents survey results, and summarizes the discrete choice model estimation methodology and findings. The full text of the survey questionnaire, survey screen captures, response tabulations, and respondents' comments about the project appear as appendices to this report.

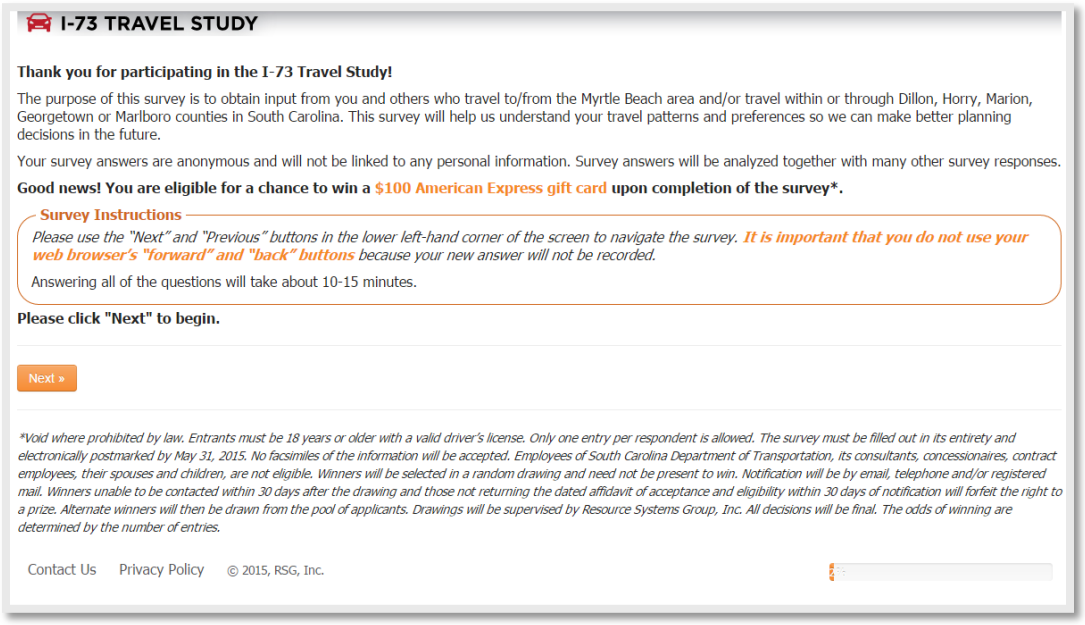
2.0 SURVEY QUESTIONNAIRES

RSG developed two stated preference questionnaires to meet the objectives of the study - one for passenger vehicle drivers and one for commercial vehicle drivers and dispatchers. The questionnaires were designed to collect the information necessary to estimate values of time for different traveler market segments. Both the passenger and commercial questionnaires followed the same general format, with questions customized by type of respondent.

Respondents were presented with an introduction screen at the beginning of the surveys with information about the study, the time required to complete the questionnaire, and instructions for how to navigate the online survey instrument. Further, passenger vehicle respondents were provided with information regarding a prize drawing offered by the Myrtle Beach Area Chamber of Commerce for respondents completing the survey.

Respondents were able to contact a member of the survey team with any technical questions about the survey via e-mail through the 'Contact Us' option included on all survey screens (**Figure 2-1**).

FIGURE 2-1: PASSENGER VEHICLE SAMPLE SURVEY SCREEN - INTRODUCTION AND INSTRUCTIONS



2.1 | PASSENGER VEHICLE SURVEY QUESTIONNAIRE

The passenger vehicle survey was designed to collect information about a recent trip that a respondent made in the study area and to find out how drivers might alter their travel behavior given the proposed tolled I-73 and contributing routes such as the Southern Evacuation Lifeline (SELL). The passenger vehicle survey questions were grouped into five main sections:

1. Qualification questions
2. Trip detail questions
3. Stated preference questions
4. Debrief and opinion questions
5. Demographic questions

The complete set of survey questions as they appeared to respondents on-screen is included in **Appendix A**.

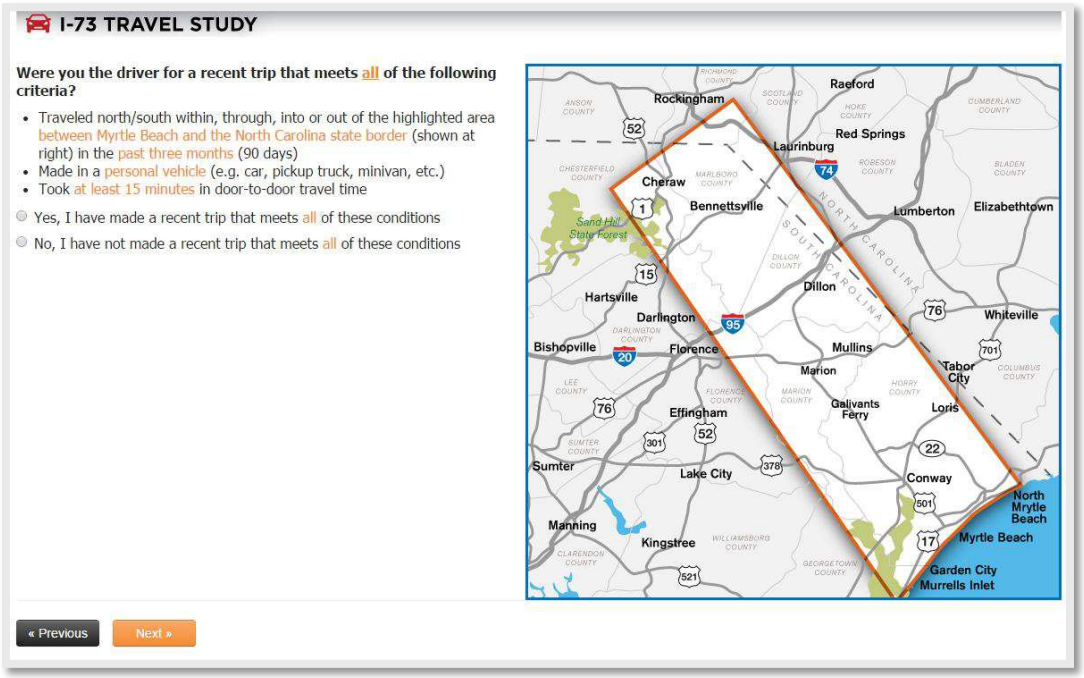
QUALIFICATION QUESTIONS

Following the survey introduction, respondents were asked about their residency status and ZIP code to determine whether they were a resident of the Myrtle Beach area or a visitor. Residents of Myrtle Beach (full-time and seasonal) and visitors were shown separate trip qualification questions to determine if they were eligible to participate in the survey. For a full-time or seasonal resident to be eligible, they must have made a recent trip that met the following conditions:

- **Traveled north/south within, through, into, or out of the study area.** This ensured that the sample included trips in the study corridor that could potentially use the proposed roadways.
- **The trip was made in the past three months (90 days).** This timeframe was selected to allow the sample to include respondents who make less frequent trips while ensuring that the trip was recent enough for the respondents to recall the specific trip details.
- **The trip was made in a personal vehicle (e.g., car, pickup, truck, or minivan).** This version of the survey was designed for passenger-vehicle travel.
- **The trip took at least 15 minutes in door-to-door travel time.** The 15-minute minimum travel time is reasonable for trips that could use at least part of the toll facility and allow enough travel time variation to be shown in the stated preference choice experiments for the corridor.

For reference, the screening question is shown below along with a map highlighting the study area (**Figure 2-2**).

FIGURE 2-2: PASSENGER VEHICLE SAMPLE SURVEY SCREEN - MAP OF STUDY AREA FOR RESIDENT TRIP QUALIFICATION

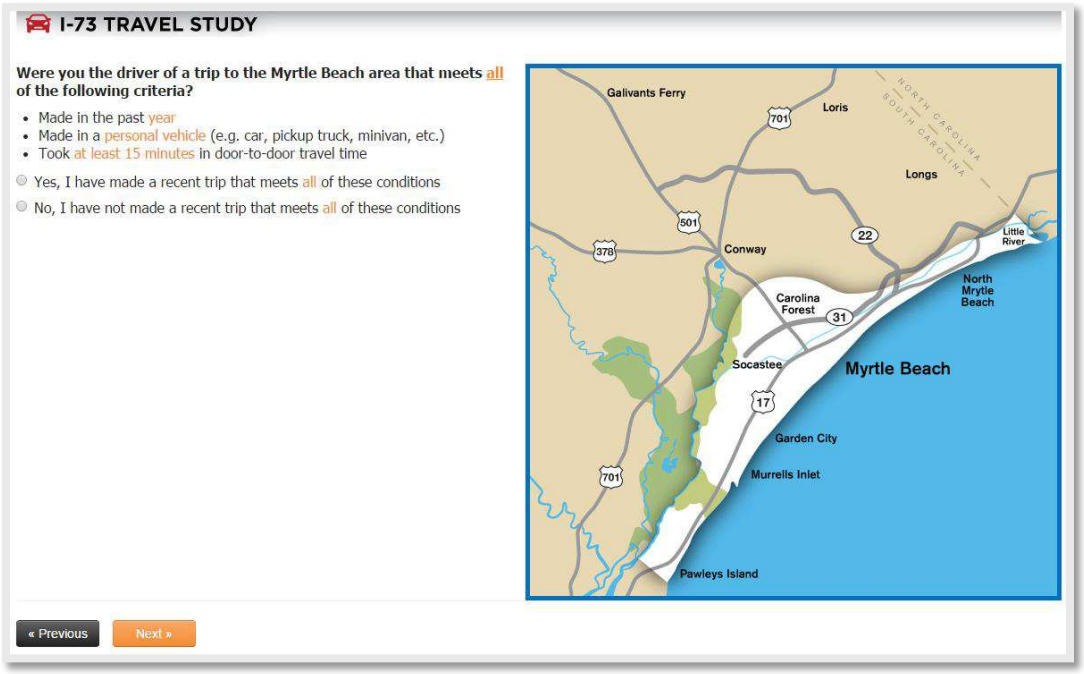


For visitors to be eligible, they must have made a trip to the Myrtle Beach area that met all of the following conditions:

- **The trip was made in the past year.** Because many vacation trips are made during holidays and summertime, this timeframe was selected to allow the sample to include respondents who have vacationed in Myrtle Beach sometime during the past year.
- **The trip was made in a personal vehicle (e.g., car, pickup, truck, or minivan).** This version of the survey was designed for passenger-vehicle travel.
- **The trip took at least 15 minutes in door-to-door travel time.** The 15-minute minimum travel time is reasonable for trips that could use at least part of the toll facility and allow enough travel time variation to be shown in the stated preference choice experiments for the corridor.

For reference, respondents were shown a map highlighting the Myrtle Beach area (**Figure 2-3**).

FIGURE 2-3: PASSENGER VEHICLE SAMPLE SURVEY SCREEN - MAP OF MYRTLE BEACH AREA FOR VISITOR TRIP QUALIFICATION



Residents and visitors who indicated that they had not made a trip that met all of the criteria were shown a series of demographic questions (described in an upcoming section) before exiting the survey.

TRIP DETAIL QUESTIONS

Qualifying respondents were asked to focus on their most recent trip that met all of the criteria as they continued through the survey. This most recent trip, referred to as the respondent's reference trip, formed the basis for the rest of the questions in this section of the survey. The survey specifically asked respondents to think about their most recent trip (and not a typical or average trip that they might make) to ensure that the sample included a diverse range of trip types and travel characteristics. This most recent trip also provided a frame of reference for respondents when completing the stated preference scenarios in the next section of the survey.

Respondents were instructed to think about the one-way portion of their trip, rather than the entire round trip, and were asked a series of questions regarding the specific details of their reference trip including:

- Day of week traveled;
- Trip purpose;
- Type of beginning and ending locations (e.g. home, work, or other);
- Road(s) used;
- Trip departure time;
- Door-to-door travel time;
- Travel time without delay;

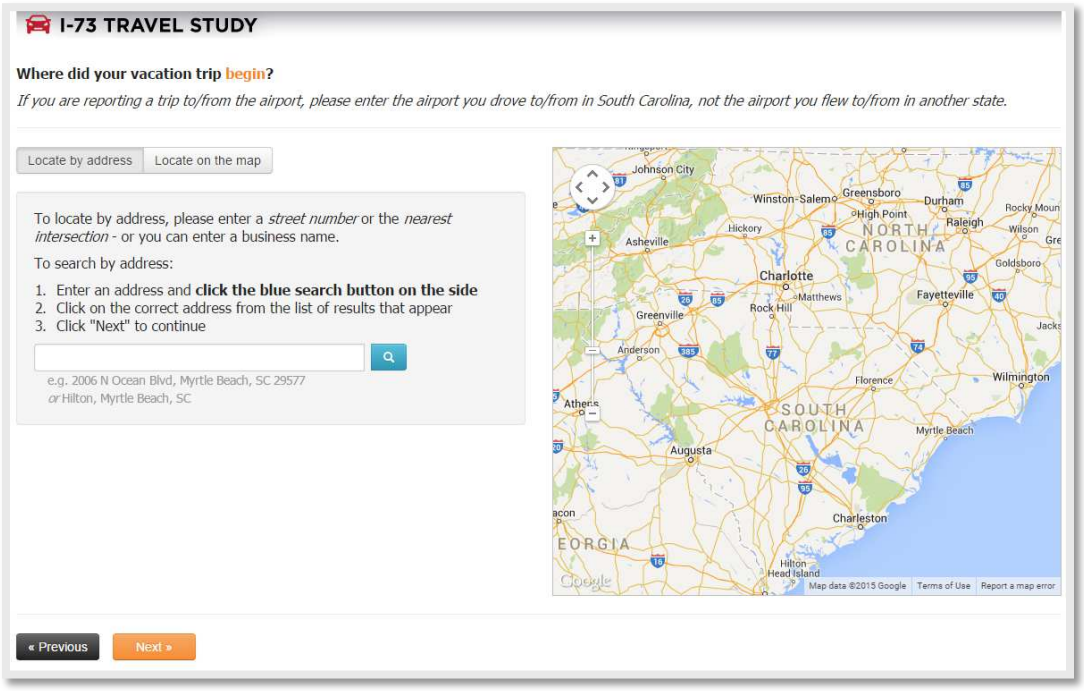
- Vehicle occupancy;
- Trip frequency and;
- ETC ownership.

These questions were asked before the stated-preference (SP) exercises in order to focus respondents on a specific, recent trip they made in the study area and to collect detailed information about that trip to use for constructing the SP exercises.

First, respondents were asked to select the day of the week that they made their most recent trip. They were then asked to indicate the primary purpose for the trip. Focusing on their trip in one direction only, respondents were asked to report whether their trip began or ended at home, work, or another place (such as hotel, beach, and airport) and then to identify the specific trip origin and destination using a Google Maps-based geocoder developed by RSG. Respondents identified the specific location of their origin and destination by entering a business name, a street intersection, or a full address, or by using an interactive map (**Figure 2-4**). The origin and destination locations were geocoded using a Google Maps application-programming interface to provide a latitude and longitude for both the trip origin and destination. The coordinates were used to verify that the trip began and ended in two different locations (i.e. was not a round-trip) and that the trip could have reasonably traveled through the study region. The geocoding application was also used to estimate the total trip distance and travel time that could be compared to respondents' reported travel times. If the location of the trip origin and destination suggested an invalid trip, respondents were reminded to describe a one-way portion of the trip and asked if they needed to change the beginning or ending location. Respondents who did not change their origin or destination were terminated from the survey.

The geocoding application was also used to segment trips into three categories, trips that could use I-73, trips that could use competing routes such as the SELL corridor, and trips that could use both corridors. These categories determined the project information respondents were shown in the stated preference section.

FIGURE 2-4: PASSENGER VEHICLE SAMPLE SURVEY SCREEN - ORIGIN ADDRESS AND MAP INTERFACE



Respondents were then provided with a list of major roads in the study area and asked to select which they used on their trip. The list of roads was customized depending on a respondent's reference trip. Respondents then entered their trip departure time and the amount of time they spent traveling (door-to-door) between their origin and destination. Additionally, respondents reported their estimated travel time without delay, if delay was encountered. Reported travel times were compared to travel times obtained from the Google Maps route-planning algorithm. Respondents who reported unrealistically long (2.5 times longer) or short trips (.75 shorter) compared to the Google Maps-estimated travel time were asked to confirm or correct their travel time.

After entering information about their trip, respondents were asked about the number of passengers in their vehicle. Those who indicated they were a resident or seasonal-resident were asked how frequently they make the same trip in the same direction. To conclude the trip details section, respondents were asked if they owned an electronic toll collection device (ETC) such as a Palmetto Pass or E-ZPass.

STATED PREFERENCE QUESTIONS

After completing the trip details section of the questionnaire, respondents completed a series of stated preference questions. Before the SP questions were administered, respondents were provided with details about the proposed I-73 and/or the SELL depending on their eligibility to use one or both of the corridors (**Figure 2-5** and **Figure 2-6**). Respondents were also shown information about the payment structure that would be utilized on the new roadways and brief instructions regarding the SP questions.

FIGURE 2-5: PASSENGER VEHICLE SAMPLE SURVEY SCREEN - I-73 PROJECT INFORMATION

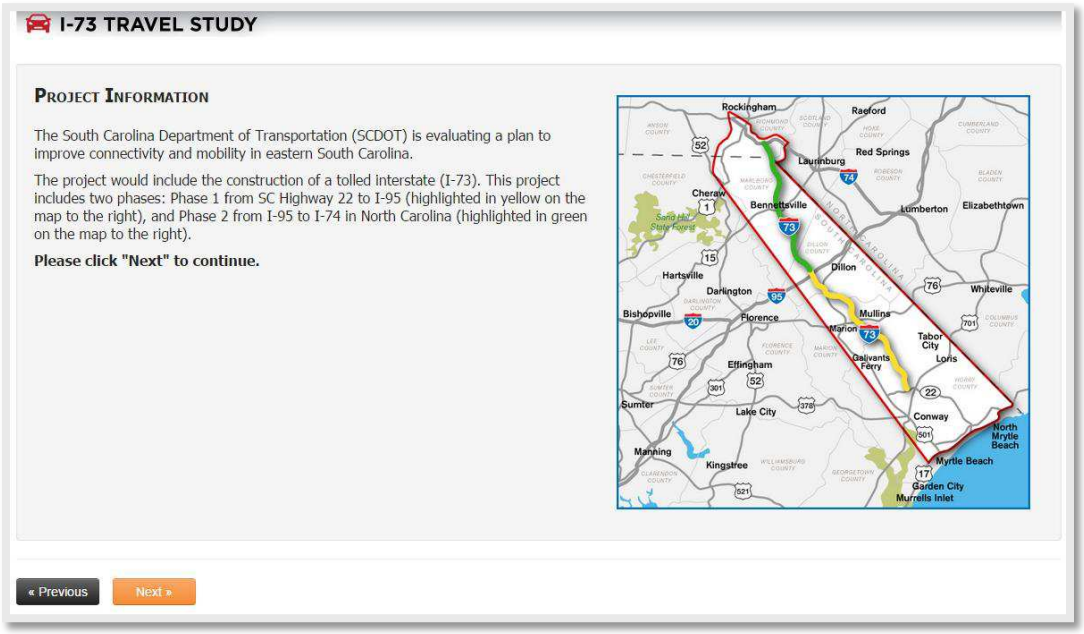
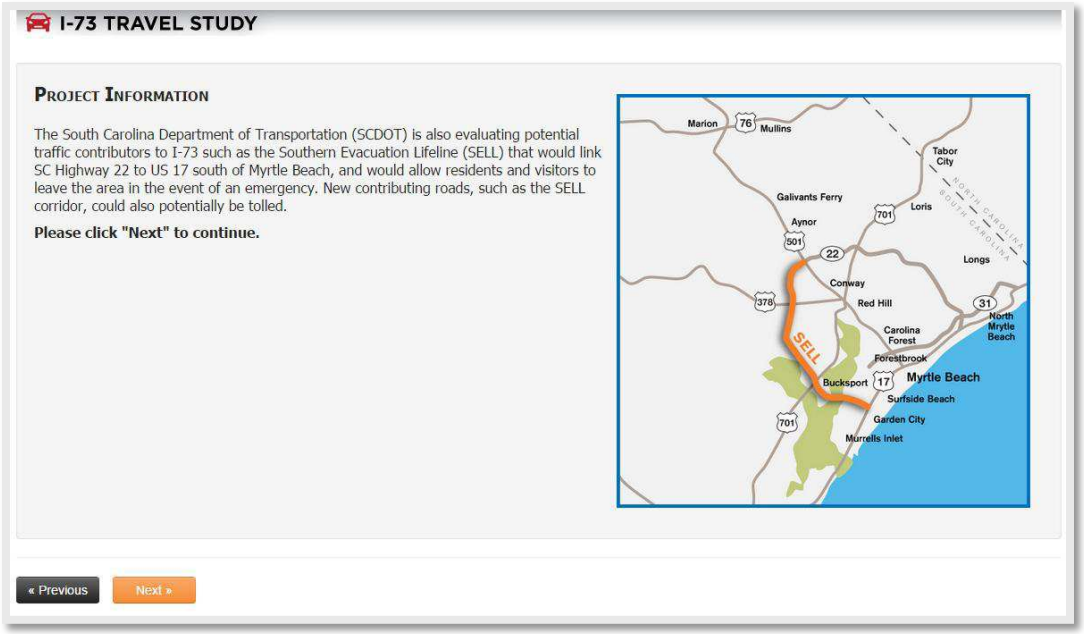


FIGURE 2-6: PASSENGER VEHICLE SAMPLE SURVEY SCREEN - SELL PROJECT INFORMATION

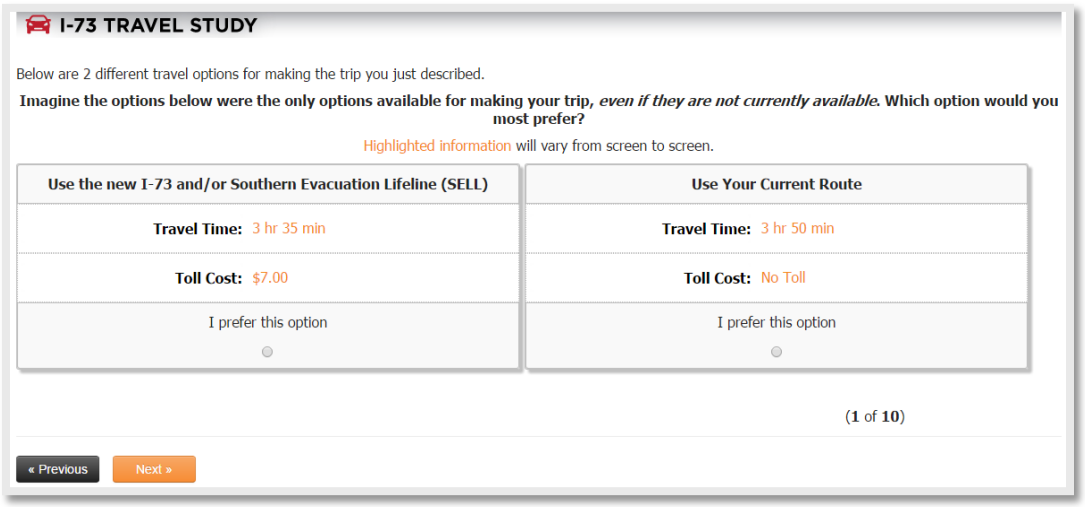


The goal of the stated preference questions is to collect quantitative data that can be used to estimate respondents' travel preferences and behavioral responses under hypothetical future conditions. The details of each respondent's reference trip were used to build a set of ten stated preference scenarios that included two travel alternatives for making their trip in the future. Travelers were presented with the following two alternatives:

1. Make your trip using your current route
2. Make your trip using the proposed I-73 *or* Southern Evacuation Lifeline (SELL) *or* I-73 and/or Southern Evacuation Lifeline (SELL)

Each alternative was described by two attributes: travel time and toll cost. The values of the attributes varied across the ten questions and respondents were asked to select the alternative they preferred the most under the conditions that were presented. **Figure 2-7** shows an example stated preference scenario with varying attribute values for each alternative. In order to avoid potential bias associated with the layout of the alternatives, the order of these alternatives was randomized for each respondent. Additional examples of the stated preference exercises are presented in **Appendix A**.

FIGURE 2-7: PASSENGER VEHICLE SAMPLE SURVEY SCREEN - EXAMPLE STATED PREFERENCE EXPERIMENT



The attribute values presented in each scenario varied around a set of base values. Trip characteristics of each respondent's reference trip were used as the base values for travel time and toll cost to ensure that the scenarios were realistic. These base values were then varied, according to an experimental design, to give a unique set of attribute values for each stated preference experiment. By varying the travel time and toll cost shown in each experiment, respondents were faced with different timesavings for different costs, allowing them to demonstrate their travel preferences across a range of values of time. **Table 2-1** presents the formulas used in the experimental design to calculate the attribute values.

The specific levels used in each stated preference experiment were determined by using an orthogonal experimental design. Orthogonal designs are commonly used for this type of research to ensure that the attribute values vary independently and to minimize correlation between attribute values. The experimental design used to generate the stated preference experiments in the survey included 100 total experiments divided into ten groups of ten. A respondent was randomly assigned to one of the ten blocks and then shown each of the ten experiments from that block in a random order. The multiplying 'factor' varied from one to five depending on the possible highway distance traveled on the proposed corridors.

Table 2-2 shows the factor vales for different highway distance categories.

TABLE 2-1: PASSENGER VEHICLE SURVEY - STATED PREFERENCE ATTRIBUTE LEVELS

Attribute	Level #	Alternative 1: Current Route		Alternative 2: I-73, SELL, I-73 and/or SELL	
		Description	Level	Description	Level
Travel Time (minutes)	1	Current travel time + (Factor * Level)	0	Current Travel Time - (Factor * Level)	2
	2		2		3
	3		3		4
	4		4		5
	5		5		6
Toll Cost (dollars)	1	Toll free		Factor * Level	0.20
	2				0.40
	3				0.60
	4				0.80
	5				1.00
	6				1.20
	7				1.40
	8				1.60
	9				1.80
	10				2.00

TABLE 2-2: PASSENGER VEHICLE SURVEY - FACTORS FOR ATTRIBUTE LEVELS

Possible Highway Distance on I-73 and/or SELL	Factor
Up to 15 miles	1
15-29 miles	2
30-44 miles	3
45-59 miles	4
60 miles or more	5

DEBRIEF AND OPINION QUESTIONS

After completing the ten stated preference scenarios, respondents answered a series of questions to assess underlying rationales for their choices and to identify any potential strategic bias in their responses.

Respondents who never selected a tolled route (I-73, SELL, or I-73 and/or SELL) alternative were asked to select the reason(s) for these choices. Based on the information presented in the survey, respondents were asked their opinion of the I-73 and/or SELL project. Those who indicated they were in favor of or opposed to the project were asked to explain their reasoning. Finally, all respondents were asked to indicate the level to which they agree or disagree with a set of attitude statements about tolls.

DEMOGRAPHIC QUESTIONS

The final section of the survey included a series of demographic questions. Respondents who identified themselves as visitors were asked about their stay in the Myrtle Beach area related to the following topics:

- Overnight stay;
- Length of stay (if stayed overnight) and;
- Frequency of visitation to the Myrtle Beach area.

All respondents were asked questions related to the following topics:

- Gender;
- Age;
- Employment status;
- Household size;
- Vehicle ownership and;
- 2014 household income, before taxes.

Responses to these questions were used to classify respondents, identify possible behavioral differences among demographic characteristics, and to confirm that the sample contained a diverse group of drivers that travel in the study region.

At the conclusion of the survey, respondents were asked if they were interested in being entered into a drawing for one of several prizes. They were also given the opportunity to leave comments about the project or the survey. These open-end comments are provided in **Appendix C**.

2.2 | COMMERCIAL VEHICLE SURVEY QUESTIONNAIRE

The commercial vehicle survey was designed to collect information about a recent commercial trip that a respondent dispatched or made in a commercial vehicle in the study area. The survey aimed to understand how dispatchers or drivers would change their behavior given the proposed I-73 and the contributing SELL corridor. Similar to the passenger vehicle survey, the survey questions were grouped into five main sections:

1. Qualification questions
2. Trip detail questions
3. Stated preference questions
4. Debrief and opinion questions
5. Company information questions

The complete set of survey questions as they appeared to respondents on-screen is included in **Appendix A**.

QUALIFICATION QUESTIONS

Following the introduction screen, respondents were asked to indicate their role: dispatcher or manager, owner-operator, contract owner-operator, fleet driver, or other. Respondents were asked to identify whether they or someone else makes vehicle routing decisions. Those who indicated that someone else makes vehicle routing decisions were asked whether they could describe the routing decisions made by others. Respondents who could not describe the routing decisions were disqualified from completing the survey.

Next, respondents were asked if they had made or dispatched a recent qualifying trip. To participate in the survey, respondents must have made or dispatched a trip that met the following conditions:

- **Traveled north/south within, through, into, or out of the study area.** This ensured that the sample included trips in the study corridor that could potentially use the proposed roadways.
- **The trip was made in the past month (30 days).** This timeframe was selected to allow the sample to include respondents who made less frequent trips while ensuring that the trip was recent enough for the respondents to recall the specific trip details.
- **The trip was made in a commercial vehicle.** This survey was designed to capture commercial-vehicle travel.
- **The trip took at least 15 minutes in door-to-door travel time**. The 15-minute minimum travel time is reasonable for trips that could use at least part of the toll facility and allow enough travel time variation to be shown in the stated preference choice experiments for the corridor.

Respondents who indicated that they had not made or dispatched a trip that met all of the criteria were also disqualified from completing the survey.

TRIP DETAIL QUESTIONS

Qualifying respondents were asked to focus on the most recent trip that met the trip qualification criteria as they continued with the survey. The commercial vehicle survey asked respondents to think about their most recent trip (and not a typical or average trip that they might make) to ensure that the sample included a diverse range of trip types and travel characteristics. This most recent trip also provided a frame of reference for respondents when completing the stated preference scenarios in the next section of the survey.

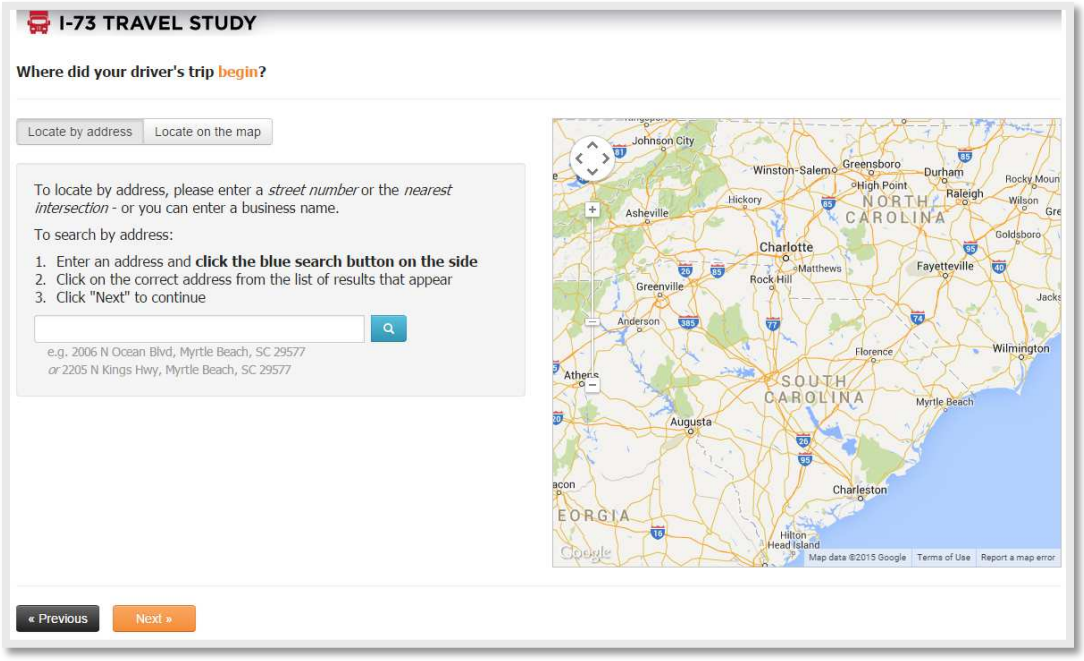
Respondents were instructed to think about the one-way portion of their trip from one commercial stop to another, and were asked a series of questions regarding the specific details of their reference trip, including:

- Length of trip in days;
- Trip origin and destination;
- Trip distance;
- Travel time;
- Travel time without delay;

- Number of vehicle axles;
- Trip frequency and;
- ETC ownership.

As in the passenger vehicle survey, trip origin and destination information collected as part of the trip detail questions was obtained using a custom Google Maps-based interface (**Figure 2-8**). The coordinates were used to verify that the trip began and ended in two different locations (i.e. was not a round-trip) and that the trip could have reasonably traveled through the study region. The geocoding application was also used to estimate the total trip distance and travel time that could be compared to a respondent's reported travel time. If the location of the trip origin and destination suggested an invalid trip, respondents were reminded to describe a one-way portion of the trip and asked if they needed to change the beginning or ending location. Respondents who did not change their origin or destination were terminated from the survey.

FIGURE 2-8: COMMERCIAL VEHICLE SAMPLE SURVEY SCREEN - ORIGIN ADDRESS AND MAP INTERFACE



Additionally, the origin and destination coordinates were used to estimate how many miles of the I-73 and/or SELL corridor a respondent could have used for their trip. This highway distance estimate was then used as one of the inputs of the stated preference attribute level design.

STATED PREFERENCE QUESTIONS

As in the passenger vehicle survey, respondents completed a series of stated preference questions. First, respondents were provided with details about the proposed I-73 and/or Southern Evacuation Lifeline (SELL) corridors and the payment information that would be

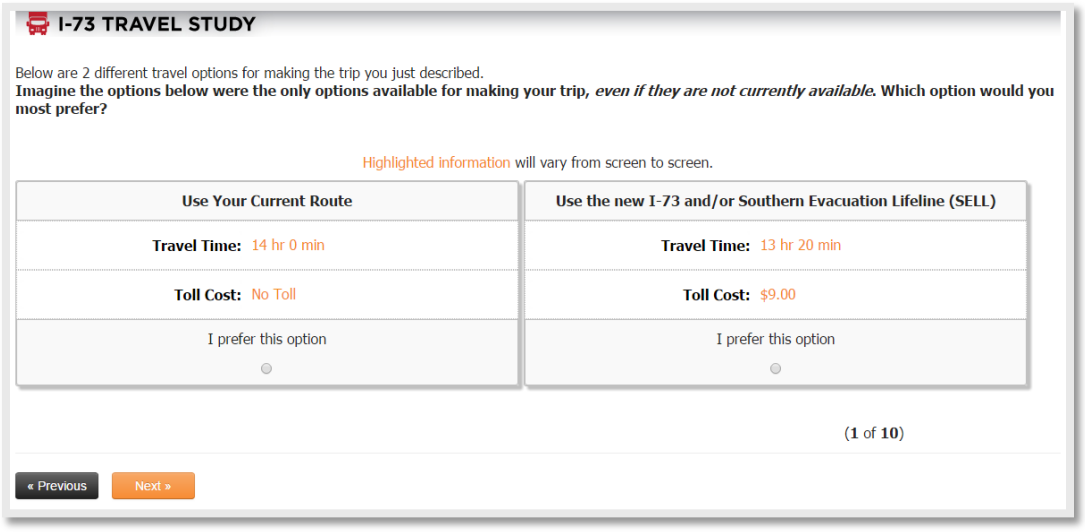
utilized on the new roadways. Respondents then received brief instructions regarding the SP questions.

The goal of the stated preference questions is to collect quantitative data that can be used to estimate respondents' travel preferences and behavioral responses under hypothetical future conditions. The details of each respondent's reference trip were used to build a set of ten stated preference scenarios that included two travel alternatives for making their trip in the future. Travelers were presented with the following two alternatives:

1. Make the trip using your/your driver's current route
2. Make the trip using the proposed I-73 *or* Southern Evacuation Lifeline (SELL) *or* I-73 and/or Southern Evacuation Lifeline (SELL)

Each alternative was described by two attributes: travel time and toll cost. The values of the attributes varied across the ten questions and respondents were asked to select the alternative they preferred the most under the conditions that were presented. **Figure 2-9** shows an example commercial vehicle stated preference scenario with varying attribute values. In order to avoid potential bias associated with the layout of the alternatives, the order of these alternatives was randomized for each respondent. Additional examples of the stated preference exercises are presented in **Appendix A**.

FIGURE 2-9: COMMERCIAL VEHICLE SAMPLE SURVEY SCREEN - EXAMPLE STATED PREFERENCE EXPERIMENT



Again, the attribute values presented in each scenario varied around a set of base values and number of axles. Trip characteristics of each respondent's reference trip were used as the base values for travel time and toll cost to ensure that the scenarios were realistic. These base values were then varied, according to an experimental design, to give a unique set of attribute values for each stated preference experiment. By varying the travel time and toll cost shown in each experiment, respondents were faced with different timesavings for different costs, allowing them to demonstrate their travel preferences across a range of values of time.

Table 2-3 details the formulas that were used in the experimental design to calculate the attribute values.

The specific levels used in each stated preference experiment were determined by using an orthogonal experimental design. The experimental design used to generate the stated preference experiments in the survey included 100 total experiments divided into ten groups of ten. A respondent was randomly assigned to one of the ten blocks and then shown each of the ten experiments from that block in a random order. The multiplying 'factor' varied from one to five depending on the possible highway distance traveled on the proposed corridors. **Table 2-2** shows the factor vales for different highway distance categories.

TABLE 2-3: COMMERCIAL VEHICLE SURVEY - STATED PREFERENCE ATTRIBUTE LEVELS

Attribute	Level #	Alternative 1: Current Route		Alternative 2: I-73, SELL, I-73 and/or SELL					
		Description	Level	Description	Level				
Travel Time (minutes)	1	Current travel time + (Factor * Level)	0	Current Travel Time - (Factor * Level)	6				
	2		2		5				
	3		3		4				
	4		4		3				
	5		5		2				
Number of Axles					2	3	4	5	6+
Toll Cost (dollars)	1	Toll Free		Factor * Level	0.20	0.40	0.60	0.80	1.00
	2				0.40	0.80	1.20	1.60	2.00
	3				0.60	1.20	1.80	2.40	3.00
	4				0.80	1.60	2.40	3.20	4.00
	5				1.00	2.00	3.00	4.00	5.00
	6				1.20	2.40	3.60	4.80	6.00
	7				1.40	2.80	4.20	5.60	7.00
	8				1.60	3.20	4.80	6.40	8.00
	9				1.80	3.60	5.40	7.20	9.00
	10				2.00	4.00	6.00	8.00	10.00

DEBRIEF AND OPINION QUESTIONS

After completing the ten stated preference scenarios, respondents answered a series of questions to assess underlying rationales for their choices and to identify any potential strategic bias in their responses.

Respondents who never selected a tolled route (I-73, SELL, or I-73 and/or SELL) alternative were asked to select the reason(s) for these choices. Based on the information presented in the survey, respondents were asked their opinion of the I-73, SELL, or I-73 and/or SELL. Those who indicated they were in favor of or opposed to the project were asked to explain their reasoning. Finally, all respondents were asked to indicate the level to which they agree or disagree with a set of statements about tolls.

COMPANY INFORMATION QUESTIONS

To ensure the survey collected information from a range of commercial trips, all respondents answered a series of background questions related to their company's operation. All respondents reported:

- Company location;
- Company size (number of vehicles);
- Typical trip length;
- Type of delivery schedule (flexible or fixed);
- Party responsible for paying tolls;
- If and how company charges customers for tolls and;
- How drivers are paid.

The survey concluded with an opportunity to leave comments about the project or survey. These open-end comments are provided in **Appendix C**.

3.0 SURVEY ADMINISTRATION

RSG worked closely with the project team to develop an efficient, timely, and cost-effective sampling plan to produce a generally representative sample of passenger and commercial vehicle travelers. The sampling plan included sufficient representation from different trip purposes, household incomes, and geographies to accurately reflect any behavioral differences in the resulting discrete choice models. It was therefore possible to identify the ways in which different characteristics affect route choice behavior. These differences are reflected in the structure and coefficients of the resulting choice model.

RSG designed a sampling plan to collect data from visitors who travel to the Myrtle Beach area as well as seasonal and full-time residents who travel in and around the proposed I-73 and competing routes such as the SELL corridor. RSG recruited travelers to participate in the stated preference survey using three methods:

1. E-mail invitations sent to recent visitors to the Myrtle Beach area (passenger vehicle survey only)
2. E-mail invitations sent to businesses and organizations located in the study area (passenger vehicle survey only)
3. E-mail invitations sent to members of the South Carolina Trucking Association (commercial vehicle survey only)

The survey instrument was administered entirely online through RSG's proprietary online survey platform, rSurvey. RSG began survey administration for the passenger vehicle survey on April 17, 2015 and concluded administration on May 13, 2015. The commercial survey administration began on April 29, 2015 and concluded on June 3, 2015. The administration methods and number of completed surveys are presented in **Table 3-1**.

TABLE 3-1: COMPLETED SURVEYS BY ADMINISTRATION METHOD

Data Source	Completed Surveys	
	Passenger	Commercial
E-mail invitation to Myrtle Beach area visitors	1,206	n/a
E-mail invitation to area businesses/organizations	767	n/a
E-mail invitation to South Carolina Trucking Association	n/a	18
Total	**1,973**	**18**

3.1 | E-MAIL INVITATION TO MYRTLE BEACH AREA VISITORS

RSG worked closely with the Myrtle Beach Area Chamber of Commerce to reach travelers who have made a recent trip to the Myrtle Beach area. The Chamber sent out the survey to a random sample of approximately 24,500 e-mail addresses from their database of over 600,000 visitor e-mails, inviting respondents to participate in the stated preference survey. The invitation included a brief description of the survey and a link to the survey website. After the initial invitation, e-mail reminders were sent to respondents who did not complete

the survey. The outreach to Myrtle Beach area visitors yielded 1,206 completed surveys, indicating a response rate of approximately 5%.

3.2 | E-MAIL INVITATION TO BUSINESSES IN THE STUDY AREA

RSG worked closely with the Myrtle Beach Area Chamber of Commerce to contact a number of local businesses and organizations with the purpose of distributing the survey link to their employees. In addition to these businesses and organizations, an e-mail invitation was sent to the Chamber's membership database. This administration method yielded 556 completed passenger vehicle survey responses.

In addition to the business outreach, a link to the survey was also posted on a local news station website. WMBF News broadcast a story about the survey project on April 30, 2015. The television news story directed area residents to the WMBF website, which included information about the study and the link to the survey (**Figure 3-1**). The broadcast resulted in 211 completed surveys. A list of the number of completed responses by businesses or organization is provided below in **Table 3-2**. This administration method yielded 767 completed passenger vehicle survey responses.

TABLE 3-2: COMPLETED SURVEYS FROM EMPLOYER OUTREACH

Business or Organization	Completed Surveys
Horry County Government	278
Survey link published on WMBF News website	211
Horry-Georgetown Technical College	105
Myrtle Beach Chamber of Commerce Members	75
Myrtle Beach Chamber of Commerce Staff	63
Santee Cooper	33
Coastal Organization of Human Resources (COHR)	1
Horry Telephone Cooperative (HTC)	1
Total	**767**

FIGURE 3-1: SCREENSHOT OF ARTICLE POSTED ON WMBF NEWS WEBSITE

Researchers want drivers to take I-73 survey for feedback on tolls

Posted: Apr 30, 2015 3:44 PM CDT
Updated: Apr 30, 2015 4:40 PM CDT

By Brooke Holden CONNECT

Researchers taking survey to gauge feelings on paying toll to fund I-73

00:44

(WMBF) - The South Carolina Department of Transportation (SCDOT) is conducting a travel survey of automobile drivers in the greater Myrtle Beach area.

The purpose of this survey is to obtain input from you and others who travel within or through Dillon, Horry, Marion, Georgetown or Marlboro Counties in South Carolina.

This survey will help analysts understand travel patterns and preferences to inform future transportation planning decisions.

If you would like to participate, please click on the link below to begin the 10-15 minute survey. Please only complete the survey one time.

https://rsgresearch.com/sci73a?anon=anon&business=99

These surveys could go a long way in determining the future of I-73. The interstate would be the gateway to a new path for millions wanting to get to and from the beach every year.

I-73 would connect Grand Strand and Pee Dee to an interstate system that runs all the way to Michigan. Those for the project say not only could I-73 offer a potentially easier and quicker route through our area but it could also help bring new businesses and jobs.

"For example a company that would need to have 100, 200, or so trucks on the road that's just not feasible for our area at this time because of the lack of accessibility," added Morgan Dendy with the MBREDC, "They have to get on interstates."

The firm conducting the surveys said there is not a timetable for competition of this study, adding that the final date depends on how many people take part.

3.3 | E-MAIL INVITATION TO SOUTH CAROLINA TRUCKING ASSOCIATION

C&M worked with the South Carolina Trucking Association (SCTA) to distribute the survey to its membership base. The SCTA is a non-profit trade organization, with approximately 600 members, that represents the trucking industry in South Carolina. The SCTA distributed an e-mail with the survey link to its members, which yielded only 18 completed surveys. The desired sample size for the commercial vehicle survey was between 150 and 300 complete responses, which would have required a response rate of 25% to 50%. However, the actual response rate was only about 3%, assuming that the e-mails went out to the entire membership base of 600 members. The trucking association indicated general opposition to the project as a toll facility, which severely impacted the number of members willing to cooperate with the research.

4.0 SURVEY RESULTS

Summary tabulations and statistics are presented in the following section for select survey questions. A complete set of survey tabulations for each question can be found in **Appendix B**. Before beginning model estimation work, the data was screened for outliers. The screening process is detailed below.

4.1 | IDENTIFICATION OF OUTLIERS

The survey data was screened to ensure that all observations included in the data analysis and model estimation represented realistic trips in the study corridor and reasonable tradeoffs in the SP exercises. Several variables were used for screening purposes, including an examination of trip origins and destinations and inconsistent or irrational choice behavior.

PASSENGER VEHICLE SURVEY OUTLIERS

One thousand nine hundred seventy-three (1,973) respondents completed the passenger-vehicle survey during the data collection phase of the project. After reviewing these variables and the effects extreme values had on the model results, it was determined that respondents who met the following conditions should be excluded from the final analysis. The categories listed below are not mutually exclusive:

- Respondents demonstrating inconsistent or irrational choice behavior in the SP exercises. For example, respondents who established a certain dollar amount for willingness to pay for timesavings and then rejected paying less money for equal or more timesavings (37 respondents).
- Respondents whose origin and destination coordinate implied their trip could not make reasonable use of I-73 or the Southern Evacuation Lifeline (SELL) corridors for their reference trip (28 respondents).
- Respondents whose implied speed (60 * Google-calculated trip distance / reported travel time) for their trip was greater than 100 mph or less than 3 mph (31 respondents).
- Respondents who completed the entire survey in less than six minutes (2 respondents).

Additionally, during the initial launch of the survey, respondents were able to report trips up to 12 hours 55 minutes in length. During survey administration, it became evident that many respondents were attempting to report trips longer than the time the survey instrument allowed. As respondents' reported travel times directly correspond with the toll-cost tradeoffs, the survey team chose to update the survey instrument to accept travel times up to 24 hours in length. Therefore, 48 respondents who reported trips with the maximum trip time allowed before the survey instrument was updated were removed from the sample.

Based on the analysis described above, 1,840 respondents (18,400 observations) were included in the final dataset and used to estimate the models presented in the report in **Section 5** below.

COMMERCIAL VEHICLE SURVEY OUTLIERS

Eighteen respondents completed the commercial vehicle stated preference survey. Data from all completed surveys was included in the final sample.

4.2 | PASSENGER VEHICLE SURVEY RESULTS

The descriptive analysis of the data presented in this section of the report is based on the 1,840 respondents who were included in the model estimation. The analysis is presented in four sections: trip detail, stated preference, debrief and opinion, and demographic questions.

For the purpose of data analysis, respondents were grouped into segments by trip purpose as defined below:

1. Vacation: Trips where the primary purpose was to go on vacation or go to the beach
2. Non-vacation: Trips where the primary purpose was something other than going on vacation or going to the beach (e.g., a work related trip or a social or recreational trip)

TRIP DETAIL QUESTIONS

At the beginning of the survey, respondents were asked if they were a resident of the Myrtle Beach area as defined by the highlighted area in the map in **Figure 4-1**. Approximately 27% of respondents qualified as a full-time resident, three percent as a seasonal or part-time resident, and 70% indicated they lived outside of the Myrtle Beach area.

FIGURE 4-1: MYRTLE BEACH AREA

After further analysis of the SP data, the project team concluded that trip purpose, rather than residency status, should be used to determine whether a respondent reported a vacation trip. Respondents who indicated the main purpose of their trip was vacation or going to the beach were included in the 'Vacation' segment, and those that reported other types of trips such as for business or a personal errands were included in the 'Non-Vacation' segment.

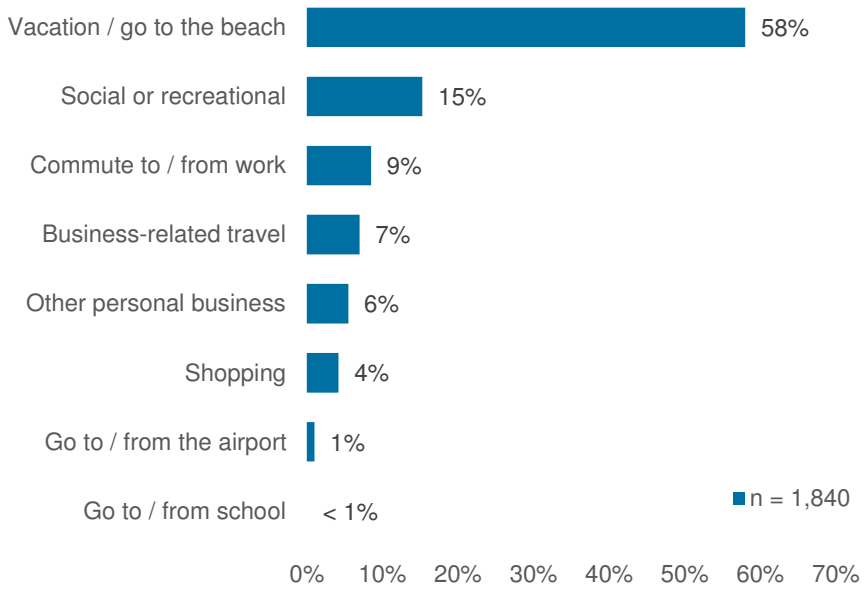
Of the 1,840 reported trips, 1,071 trips were Vacation trips and 769 trips were Non-Vacation trips. The number and percent of completed surveys by traveler type is shown in **Table 4-1**. Many of the tabulations presented in the remainder of this section and in **Appendix B** are segmented by these categories.

TABLE 4-1: PASSENGER VEHICLE RESULTS - NUMBER OF COMPLETED SURVEYS BY SEGMENT

Traveler Segment	Count	Percent
Vacation	1,071	58%
Non-Vacation	769	42%
Total	**1,840**	**100%**

As shown above, vacation and beach trips represented the majority (58%) of trips. Additionally, fifteen percent of respondents reported a social or recreational trip, nine percent reported a commute trip to or from work, and seven percent reported a business-related trip (**Figure 4-2**).

FIGURE 4-2: PASSENGER VEHICLE RESULTS - PRIMARY TRIP PURPOSE



Eighty-nine percent of reported trips began at home and 83% of reported trips ended at another place, such as hotel, beach, airport, etc. The most commonly reported trip started at home and ended at another place (76%).

The latitude and longitude coordinates for each trip's origin-destination pair were used to calculate the trip distance and expected trip travel times using a Google Maps route-planning algorithm. Mean and median trip distances, and respondent-reported travel times by segment, are displayed in **Table 4-2**. Overall, the median trip distance was 237 miles and the median travel time was 270 minutes, or 4 hours 30 minutes. While the sample represents many long distance trips, vacation trips are longer in both distance and duration than trips reported for other trip purposes.

TABLE 4-2: PASSENGER VEHICLE RESULTS - TRIP TRAVEL TIME AND DISTANCE BY SEGMENT

Segment	Reported Travel Time (minutes)		Travel Distance (miles)	
	Mean	Median	Mean	Median
Vacation	501	490	464	447
Non-Vacation	165	75	135	48

Trip origins and destinations, stratified by distance, are displayed in **Figure 4-3**, **Figure 4-4**, **Figure 4-5**, and **Figure 4-6**. As shown in **Figure 4-3**, reported trips originated both in and outside of South Carolina. Many long distance trips began in North Carolina, Virginia, Ohio, Pennsylvania and a handful of trips originated in Indiana, Michigan, Iowa, and Southeastern Canada. **Figure 4-4**, which illustrates trip origins in the study corridor shows many shorter distance trips less than 25 miles in length originated near Conway, South Carolina. In comparison to trip origins, fewer reported trips ended outside of the Myrtle Beach area

(**Figure 4-5**). The majority of trips greater than 100 miles had destinations along the Myrtle Beach area coast (**Figure 4-6**).

FIGURE 4-3: PASSENGER VEHICLE RESULTS - TRIP ORIGINS BY DISTANCE TRAVELED (ALL RESPONDENTS)

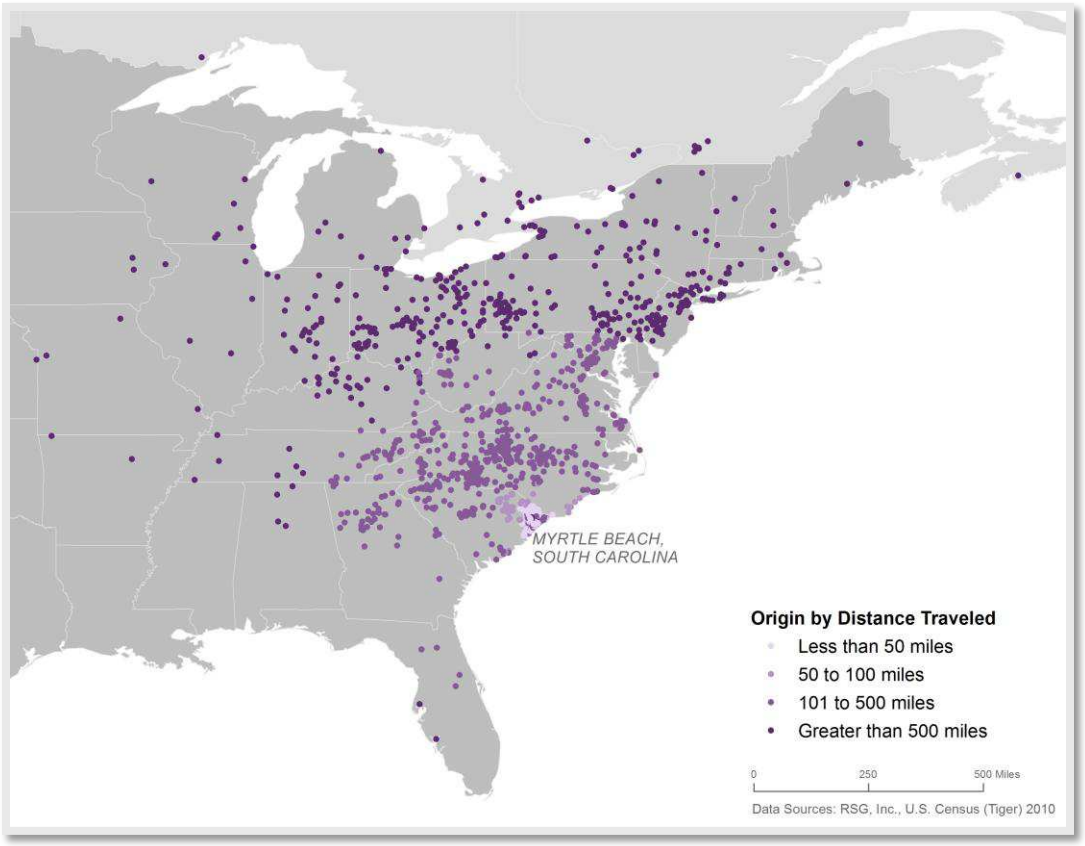


FIGURE 4-4: PASSENGER VEHICLE RESULTS - TRIP ORIGINS BY DISTANCE TRAVELED (STUDY AREA RESPONDENTS ONLY)

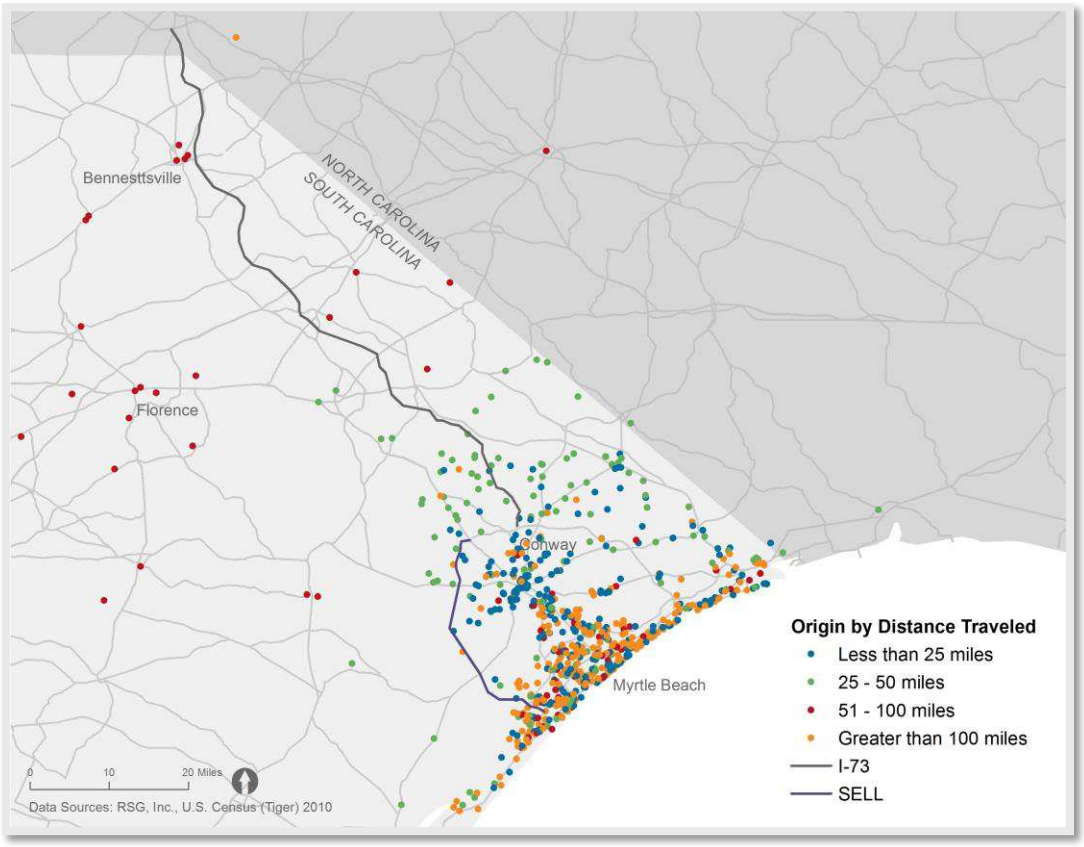


FIGURE 4-5: PASSENGER VEHICLE RESULTS - TRIP DESTINATIONS BY DISTANCE TRAVELED (ALL RESPONDENTS)

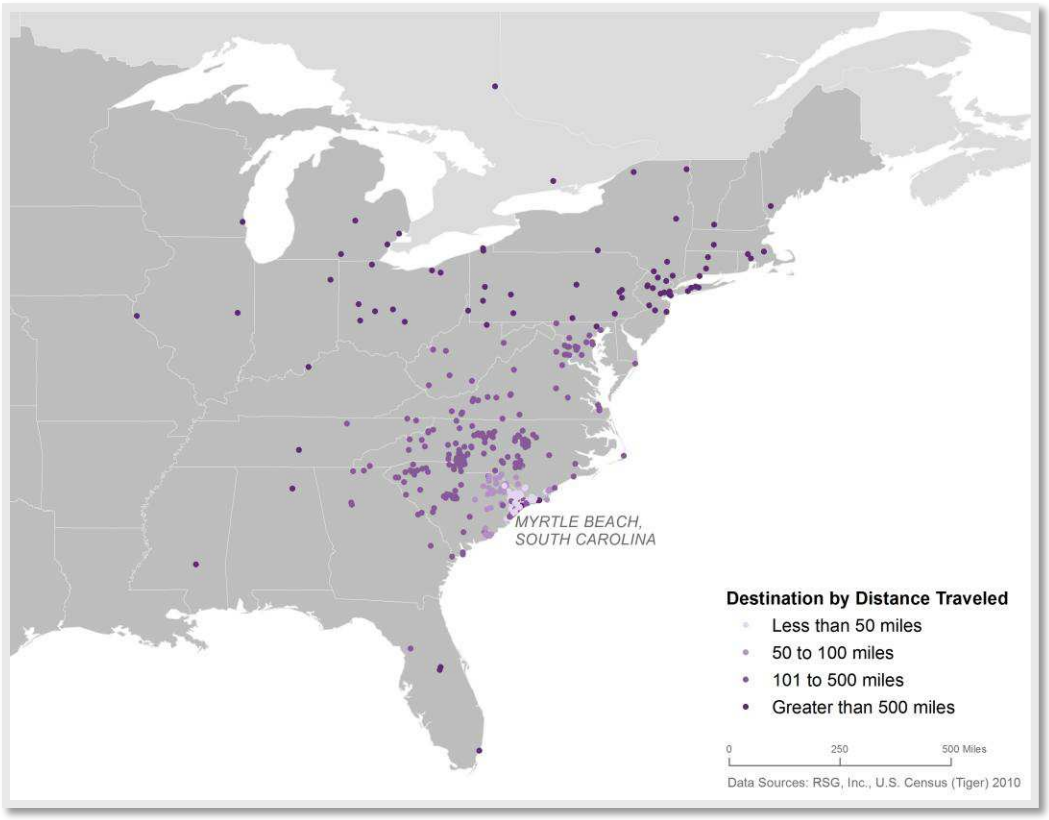
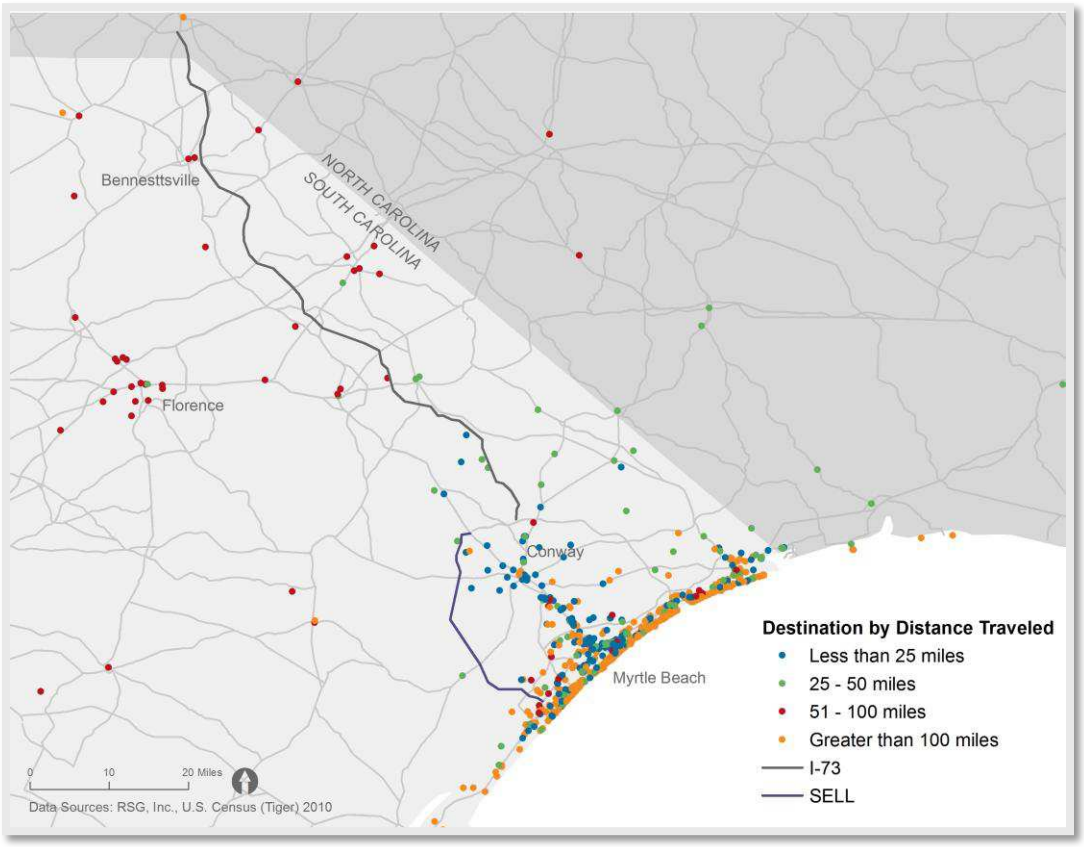


FIGURE 4-6: PASSENGER VEHICLE RESULTS - TRIP DESTINATIONS BY DISTANCE TRAVELED (STUDY AREA RESPONDENTS ONLY)



Respondents were asked to identify which road(s) they used during their trip. I-95 was used by over 50% of Vacation travelers. US 501 was used by 49% of Vacation travelers and 59% of Non-Vacation travelers. Additionally, 35% and 43% of Vacation and Non-Vacation travelers, respectively, reported using Route 17 on their trip. The percentage of respondents who reported using each of the major roads in the study area is shown in **Figure 4-3**. Respondents were shown some or all of the roadways depending on their reported trip.

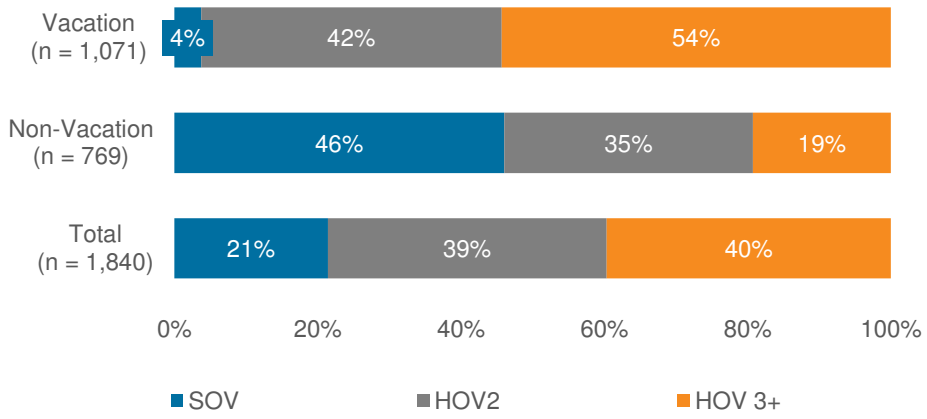
TABLE 4-3: PASSENGER VEHICLE RESULTS - ROAD(S) USED BY SEGMENT (SELECT ALL THAT APPLY)

Roads Used	Vacation		Non-Vacation	
	Count	Percent	Count	Percent
I-95	570	54%	176	31%
US Route 501	529	49%	451	59%
US Route 17	458	43%	266	35%
Other Roads	339	32%	249	32%
SC 22 (Conway Bypass / Veterans Highway)	304	28%	153	20%
SC 38	183	17%	92	16%
SC 31	137	13%	195	25%
US Route 701	100	9%	104	14%
US Route 76	95	9%	63	11%
SC 544	91	8%	199	26%
US Route 301	83	8%	30	5%
SC 410	57	5%	33	6%
Holmestown Road	40	4%	26	3%
Pee Dee Highway	38	4%	16	2%
US Route 378	26	2%	46	6%
SC 707	19	2%	60	8%
SC 57	6	1%	9	2%
SC 381	6	1%	5	1%
SC 917	4	< 1%	10	2%
Total Number of Respondents	**1,071**	**-**	**769**	**-**

Respondents were asked whether they experienced delay due to traffic congestion on their trip. Forty-eight percent of Vacation travelers and 63% of Non-Vacation travelers indicated they experienced traffic congestion. Of those that experienced delay, the median time spent in traffic congestion for all travelers was 30 minutes. Vacation travelers who experienced delay had a median delay time of 60 minutes, while Non-Vacation travelers had a median delay time of 20 minutes.

Reported vehicle occupancy by segment is shown in **Figure 4-7**. Only four percent of Vacation trips were made in a single occupancy vehicle (SOV), while the majority of trips (54%) were made in a high occupancy vehicle with three or more passengers (HOV 3+). On the other hand, 46% of Non-Vacation trips were made in an SOV and 35% were made in a high occupancy vehicle with two passengers (HOV2). For all reported trips, the mean occupancy was 2.61 passengers.

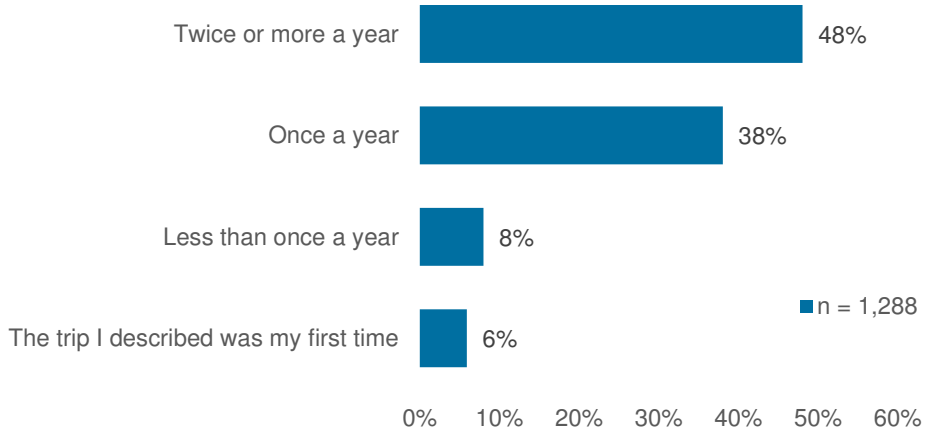
FIGURE 4-7: PASSENGER VEHICLE RESULTS - VEHICLE OCCUPANCY BY SEGMENT



Respondents who indicated they were a full-time or part-time resident of Myrtle Beach were asked to report how often they make the same trip as the one they described. Forty-two percent of residents reported that they make their reference trip infrequently (less than one time per month) while 24% indicated they make the same trip one time or more per week.

Visitors to the Myrtle Beach area were asked a series of questions about the frequency of their visits to Myrtle Beach. Eighty-one percent of visitors indicated they stayed overnight during the trip they described. For visitors who stayed overnight, the median length of their stay (number of nights) was five nights. Visitors were also asked to indicate how often they visit the Myrtle Beach area. Forty-eight percent of visitors travel to the Myrtle Beach area two or more times a year, and 38% visit once a year (**Figure 4-8**).

FIGURE 4-8: PASSENGER VEHICLE RESULTS - VISITOR FREQUENCY



Respondents were asked to indicate whether they owned a PAL PASS or other type of electronic toll collection device. The majority of Vacation respondents (76%) and Non-Vacation respondents (88%) indicated they did not own any type of transponder. Twenty-two percent of Vacation respondents and 10% of Non-Vacation respondents indicated they owned an E-ZPass transponder (**Table 4-4**).

TABLE 4-4: PASSENGER VEHICLE RESULTS - ETC OWNERSHIP BY SEGMENT (SELECT ALL THAT APPLY)

ETC Ownership	Vacation		Non-Vacation		Total	
	Count	Percent	Count	Percent	Count	Percent
No transponder	819	76%	676	88%	1495	81%
E-ZPass	232	22%	79	10%	311	17%
Other transponder	16	1%	10	1%	26	1%
Don't know	6	1%	8	1%	14	1%
PAL PASS	1	0%	4	1%	5	0%
Total Number of Respondents	**1,071**	**-**	**769**	**-**	**1,840**	**-**

STATED PREFERENCE QUESTIONS

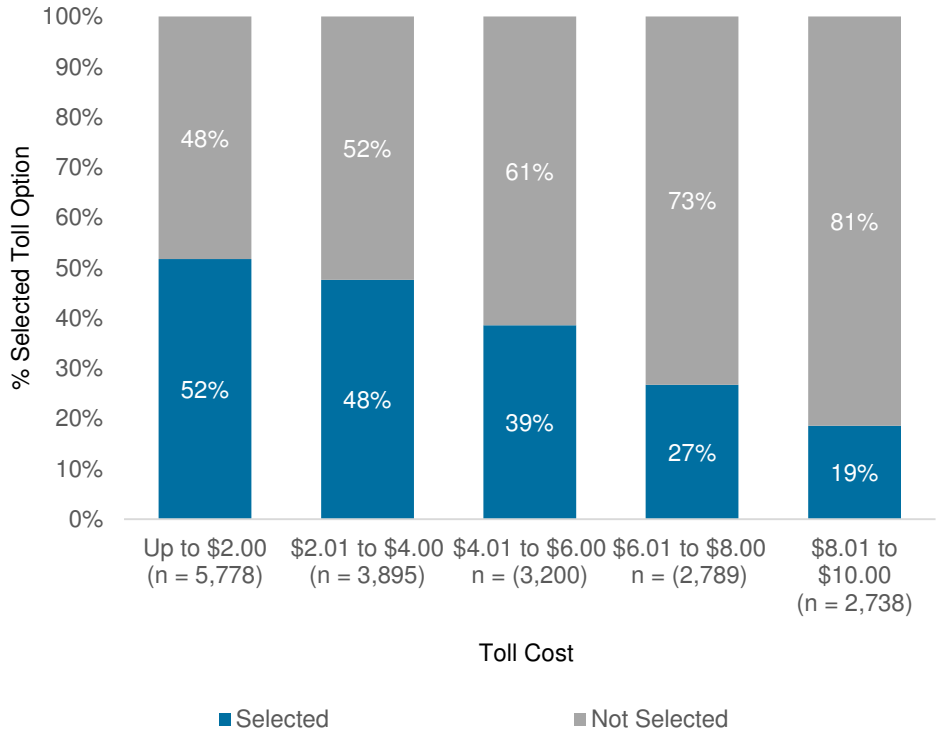
After completing the trip characteristic portion of the survey, respondents answered a series of ten SP tradeoff exercises tailored to their reference trip. Survey respondents chose the I-73, SELL, or I-73 and/or SELL option in 40% of experiments, and the toll-free route in 60% of experiments. Approximately 22% of respondents always chose the toll-free alternative and approximately nine percent always chose I-73, SELL, or I-73 and/or SELL. Sixty-nine percent of the sample chose both the current route and the toll option at least once during the ten exercises, revealing their marginal sensitivities to travel time and cost (**Table 4-5**).

TABLE 4-5: PASSENGER VEHICLE RESULTS - STATED PREFERENCE CHOICES BY ALTERNATIVE

Alternative	Number of Experiments Shown	Number of Experiments Selected	Percent Selected
Alternative 1: Toll-Free Route	18,400	11,070	60%
Alternative 2: I-73, SELL, or I-73 and/or SELL	18,400	7,330	40%

Figure 4-9 shows the percentage of time that the toll alternative was chosen in the SP experiments at different toll costs. When presented with toll costs of $2.00 or less, the tolled option was selected 52% of the time, compared to only 19% of the time when the toll cost was more than $8.00. In general, as the toll cost increased, respondents were less likely to choose the toll alternative.

FIGURE 4-9: PASSENGER VEHICLE RESULTS - TOLL ALTERNATIVE SELECTION BY TOLL COST



DEBRIEF AND OPINION QUESTIONS

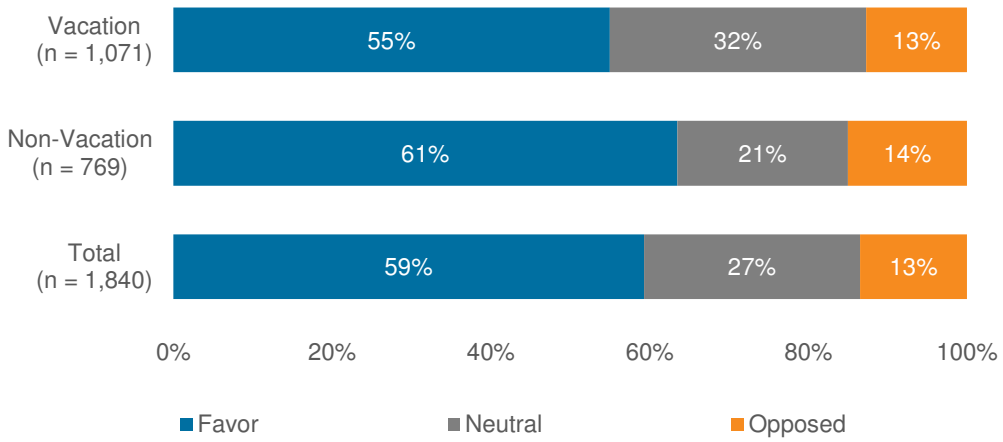
After completing the series of SP questions, respondents were asked to share their opinions about the proposed roadways to understand the underlying reasons for their choices. Respondents who never chose I-73, SELL, or I-73 and/or SELL to make their trip in the previous section were asked to select the reason(s) for their choice. Of the 1,840 respondents, 413 (22%) never chose the toll alternative. The most commonly selected reason, chosen by 62% of respondents was "time savings not worth the toll cost." Another frequently cited reason was "opposed to paying tolls," selected by 52% of respondents as shown in **Table 4-6**.

TABLE 4-6: PASSENGER VEHICLE RESULTS - REASON(S) FOR NEVER SELECTING I-73 AND/OR SELL (SELECT ALL THAT APPLY)

Reason	Count	Percent
Time savings not worth the toll cost	255	62%
Opposed to paying tolls	214	52%
Not enough time savings	127	31%
Current route is more convenient	119	29%
Do not want to pay tolls electronically	99	24%
Other	49	12%
Environmental concerns	29	7%
Opposed to building new roads	28	7%
Total Number of Respondents	**413**	**-**

Respondents were then asked about their overall opinion of the proposed I-73 and/or SELL project based on the information presented in the survey. About 59% of all respondents favored the project while only 13% were opposed to it. Sixty-one percent of Non-Vacation respondents favored the project, with 40% strongly favoring the project (**Figure 4-10**).

FIGURE 4-10: PASSENGER VEHICLE RESULTS - OPINION OF I-73 AND/OR SELL



Respondents who indicated they favor or oppose the project were asked to identify the reason(s) for their opinion, which are illustrated in **Table 4-7** and

Table 4-8, respectively. The most commonly selected reasons for favoring the project included "faster travel times," "less congestion," and "additional evacuation route from Myrtle Beach area." Reasons for opposing the project included "opposed to paying tolls," and "the toll rates shown were too high."

TABLE 4-7: PASSENGER VEHICLE RESULTS - REASON(S) FOR FAVORING I-73 AND/OR SELL (SELECT ALL THAT APPLY)

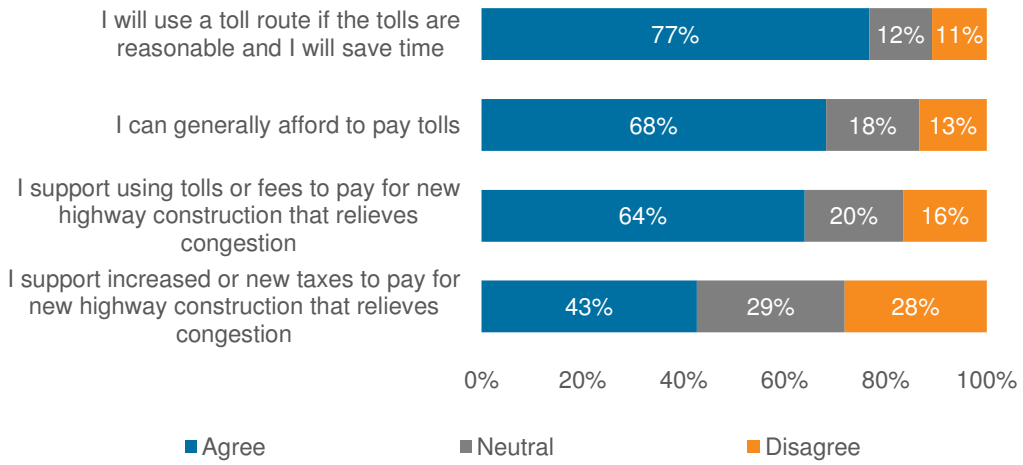
Reason	Count	Percent
Faster travel times	912	84%
Less congestion	818	75%
Additional evacuation route from Myrtle Beach area	667	61%
More reliable travel times	585	54%
Safe road conditions	504	46%
User fees are a fair way to pay for new construction	433	40%
Reduced emissions and improved air quality	184	17%
Other	65	6%
Total Number of Respondents	**1,088**	-

TABLE 4-8: PASSENGER VEHICLE RESULTS - REASON(S) FOR OPPOSING I-73 AND/OR SELL (SELECT ALL THAT APPLY)

Reason	Count	Percent
Opposed to paying tolls	175	71%
The toll rates shown were too high	126	51%
Do not want to pay tolls electronically	84	34%
Adverse environmental impact	48	19%
It will bring too much traffic / development	38	15%
Other	33	13%
Opposed to new roads in general	27	11%
Total Number of Respondents	**247**	-

Respondents were presented with a series of statements about tolls and were asked to indicate the level to which they agree or disagree with the statements. **Figure 4-11** illustrates the responses to these statements. Seventy-seven percent of respondents agreed with the statement "I will use a toll route if the tolls are reasonable and I will save time" while only 43% agreed with the statement "I support increased or new taxes to pay for new highway construction that relieves congestion."

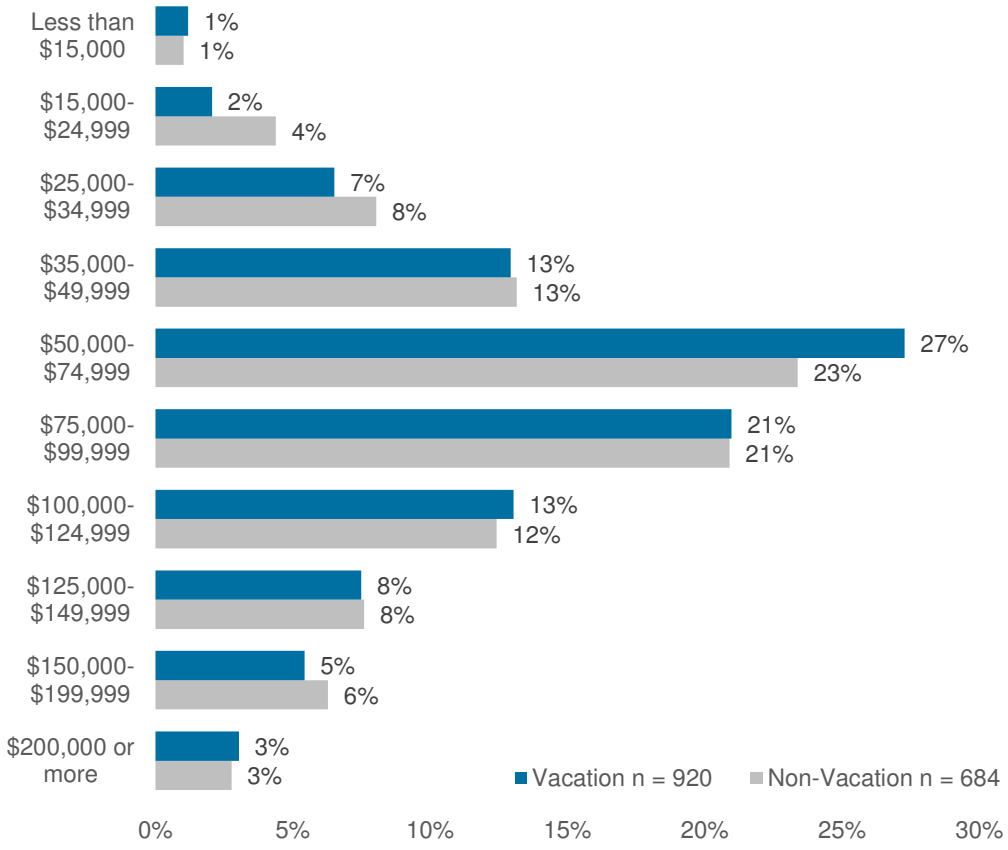
FIGURE 4-11: PASSENGER VEHICLE RESULTS - TOLL ATTITUDE STATEMENTS



DEMOGRAPHIC QUESTIONS

Respondents were asked a series of demographic questions at the survey's conclusion. Fifty-six percent (56%) of respondents identified as female and 44% identified as male. The median age of the sample fell in the 45-54 year-old category. Forty-one percent of respondents indicated they live in a two-person household and approximately 50% of respondents indicated they live in a household with two vehicles. A majority of respondents (71%) are employed full-time and 13% are retired. For respondents that chose to report their household income, the median household income fell between $50,000 and $74,999. The income distributions for the two traveler segments are shown below in **Figure 4-12**. Approximately 13% of respondents chose not to report their household income.

FIGURE 4-12: PASSENGER VEHICLE RESULTS - ANNUAL HOUSEHOLD INCOME BY SEGMENT



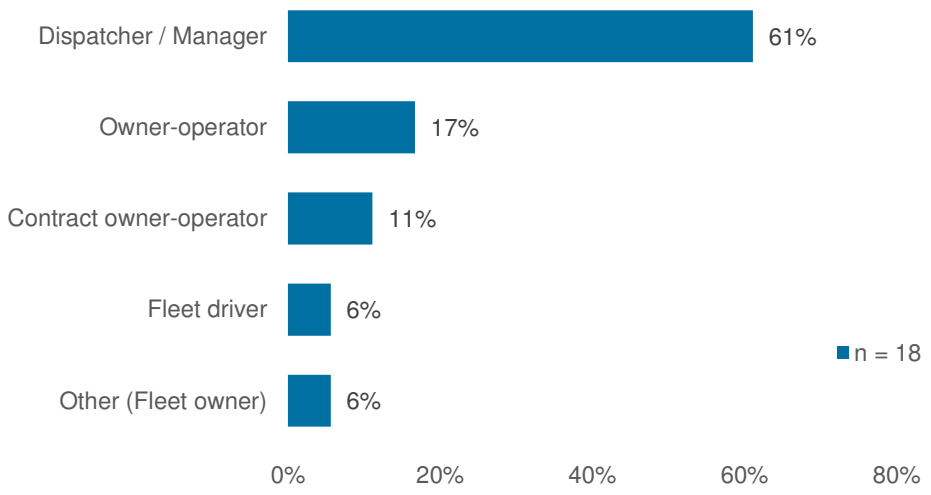
4.3 | COMMERCIAL VEHICLE SURVEY RESULTS

The descriptive analysis of the data presented in this section of the report is based on 18 completed commercial vehicle surveys. This size sample is only representative of the small subset of commercial drivers who chose to participate in the survey, and therefore should not be extrapolated to the entire population**.** The analysis is presented in four sections: trip detail, stated preference, debrief and opinion, and company information questions.

TRIP DETAIL QUESTIONS

Sixty-one percent (n=11) of all commercial vehicle respondents were dispatchers or managers and 17% were owner-operators (**Figure 4-13**). A little over one-third of respondents make their own routing decisions, while 28% percent of respondents make some, but not all routing decisions.

FIGURE 4-13: COMMERCIAL VEHICLE RESULTS - RESPONDENT TYPE



The trip details section of the questionnaire defined the respondent's trip as the one-way portion from one commercial stop to another. Respondents were asked to provide the beginning and end locations of their one-way trip. The most common trip originated in and ended in South Carolina (56%). Twenty-eight percent of trips began in South Carolina and ended in North Carolina, and 11% of trips began outside of South Carolina.

The median reported trip length was 145 miles and the median trip time was 193 minutes, or 3 hours 13 minutes. Twenty-eight percent of respondents indicated making or dispatching the same trip less than one time per month, and 22% indicated making or dispatching the same trip six or more times per week.

To conclude this section, respondents were asked if they or their driver was equipped with an ETC transponder such as a PAL PASS, E-ZPass, or other type of transponder. The majority (78%) of respondents indicated they or their driver did not have an ETC device.

STATED PREFERENCE QUESTIONS

After completing the trip detail portion of the survey, respondents answered ten stated preference tradeoff exercises, each tailored to their reported trip. One third of respondents always chose the toll-free alternative. Fifty-six percent of the sample chose both the current route and the toll option at least once during the ten exercises, revealing their marginal sensitivities to travel time and cost. **Table 4-9** shows the number of times each alternative was selected.

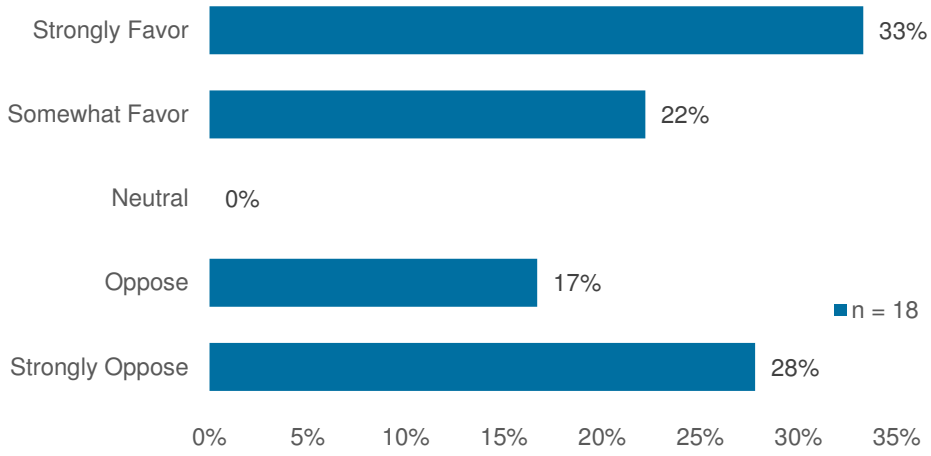
TABLE 4-9: COMMERCIAL VEHICLE RESULTS - SP STATED PREFERENCE CHOICES BY ALTERNATIVE

Alternative	Number of Experiments Shown	Number of Experiments Selected	Percent Selected
Alternative 1: Toll-Free Route	180	110	61%
Alternative 2: I-73, SELL, or I-73 and/or SELL	180	70	39%

DEBRIEF AND OPINION QUESTIONS

After completing the stated preference tradeoff exercises, respondents were asked to answer a set of debrief questions aimed at better understanding the reasoning behind their choices. Respondents were asked to provide their opinion of the proposed I-73, SELL, or I-73, and/or SELL roadway(s). Fifty-five percent of respondents favored the project and 45% were opposed, with zero respondents indicating a neutral opinion (**Figure 4-14**).

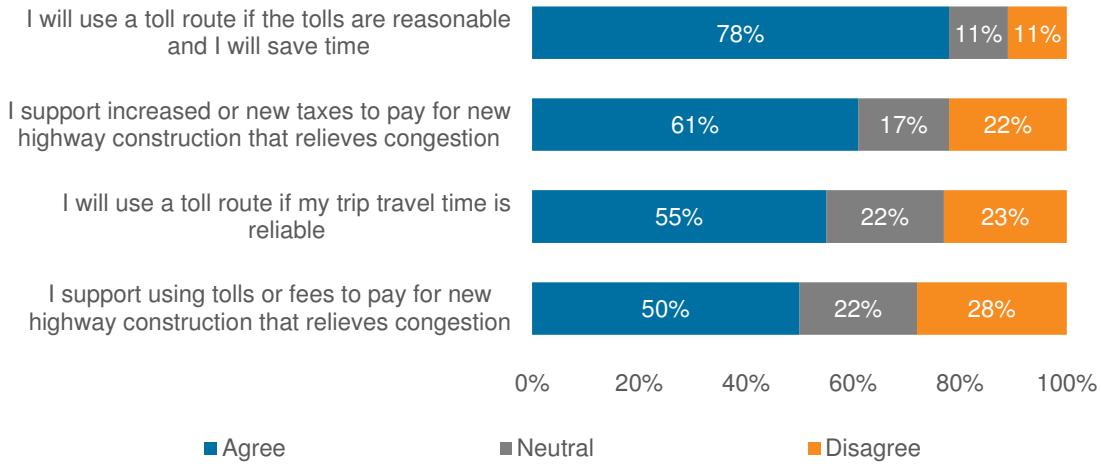
FIGURE 4-14: COMMERCIAL VEHICLE RESULTS - OPINION OF I-73 AND/OR SELL



The most common reasons for favoring the I-73, SELL, or I-73 and/or SELL was "Additional evacuation route from Myrtle Beach," "Faster travel times," and "Safe road conditions." Over half of respondents (54%) who opposed the project cited general opposition to paying tolls.

Finally, when presented with a series of questions regarding their attitudes concerning tolls, respondents were most likely to indicate, "I will use a toll route if the tolls are reasonable and I will save time." Conversely, respondents were most likely to disagree with the statement, "I support using tolls or fees to pay for new highway construction that relieves congestion" (**Figure 4-15**).

FIGURE 4-15: COMMERCIAL VEHICLE RESULTS - TOLL ATTITUDE STATEMENTS



COMPANY INFORMATION QUESTIONS

The last section of the commercial vehicle survey collected information from respondents about their company. Eighty-three percent of respondents indicated that their company's base of operations is located in South Carolina. Respondents who were not owner-operators indicated how many vehicles their company operates. The majority (53%) indicated their company operates between 20 and 99 vehicles. Respondents also indicated the typical length of a trip they make or dispatch. Half (50%) of respondents indicated they usually make or dispatch trips between 50 and 199 miles in length and 33% indicated they typically make or dispatch trips between 200 and 499 miles. Respondents reported how much flexibility they have with their delivery schedule and 61% indicated they typically have flexibility when making deliveries.

Finally, respondents reported how toll costs, if incurred, are paid. Thirty-nine percent of respondents reported their company pays tolls directly using a transponder device, and 44% reported they never use toll roads. To conclude, respondents were asked how they or their drivers are paid. Thirty-nine percent of respondents indicated that drivers are paid hourly, while 28% reported drivers are paid by the mile.

5.0 PASSENGER VEHICLE MODEL ESTIMATION

The primary objective of the SP survey was to estimate the value of time (VOT) for passenger and commercial vehicle travelers who make trips in the I-73 corridor. These VOT estimates will support estimates of future traffic and revenue for the facility. The choice observations for each passenger vehicle respondent were compiled into a dataset to support the estimation of VOT for the different tolling scenarios.

METHODOLOGY

Statistical analysis and discrete choice model estimation were conducted using the passenger vehicle SP survey data. The statistical estimation and specification testing were completed using a conventional maximum likelihood procedure that estimated coefficients for a set of MNL models. The MNL models were used to identify systematic differences in preference heterogeneity—for example, the difference in VOT by trip purpose or time-of-day. The model coefficients provide information about the respondents' sensitivities to the attributes that were tested in the tradeoff scenarios and can be used to calculate VOT for travelers in the corridor. The model specification and results are discussed in more detail below.

The multinomial logit model estimates a choice probability for each alternative presented in the stated preference tradeoff exercises. The alternatives are represented in the model by observed utility equations of the form:

$$U_1 = \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n$$

Where each X represents a variable specified by the researcher and each β is a coefficient estimated by the model that represents the sensitivity of the respondents in the sample to the corresponding variable.

Several utility equation structures were tested using the variables included in the stated preference scenarios, as well as trip characteristics, attitudinal indicators, and demographic variables. The models presented in this section are final model specifications, including only the variables that proved statistically significant.

MULTINOMIAL LOGIT (MNL) MODEL SPECIFICATION

In each SP experiment, passenger vehicle respondents who could have used the study corridor for their reference trip were presented with the following two alternatives:

1. Make your trip using your current route
2. Make your trip using the proposed I-73 *or* Southern Evacuation Lifeline (SELL) *or* I-73 and/or Southern Evacuation Lifeline (SELL)

The alternatives were described by attributes of travel time and travel cost. A complete description of the stated preference attributes and levels can be found above in **Section 2**.

Several utility equation structures were tested using different variables from the survey data. In addition to the travel times and toll costs presented in the SP experiments, tested variables

included trip characteristics, project opinion, and demographic variables. These variables were introduced, one at a time, to test potential interactions with the toll cost and travel time coefficients and to determine whether respondents' trip or personal characteristics significantly influenced their choices in the stated preference scenarios. Variables that were tested for interaction included:

- Beginning and ending locations
- Trip purpose
- ZIP code (urban versus rural)
- Opinion of project
- Income
- Trip distance

After reviewing the significance of each variable, the final model specification was chosen based on model fit, the intuitiveness and reasonableness of the model coefficients, and the expected application of the model results in the forecasting model. The final model specification includes variables for travel time and toll cost by six different market segments, described in **Table 5-1** below:

TABLE 5-1: PASSENGER VEHICLE RESULTS - MARKET SEGMENTS

Trip Type	Urban/Rural	Trip Location	Trip Purpose	Number of Observations
Vacation	All	Home-Based	All	10,730
	All	Non-Home-Based	All	350
Non-Vacation	Urban	Home-Based	Work	1,940
			Non-work	3,440
	Rural	Non-Home-Based	All	1,070
		All	All	870
Total				**18,400**

The toll cost coefficient was interacted with household income to identify the relationship between household income and sensitivity to toll prices. In addition to travel time and toll cost, binary (1,0) variables were included on the tolled alternative for respondents who are somewhat or strongly in favor of the proposed pricing, and respondents who are somewhat or strongly opposed to the proposed pricing. The binary variables capture the additional utility or disutility for the tolled alternative for respondents with these characteristics compared to other respondents. Finally, an alternative-specific constant was specified for the tolled alternative. The alternative-specific constant captures utility or disutility for that alternative that cannot be attributed to the other variables in the model.

MNL MODEL: COEFFICIENT ESTIMATES

The results of the final model specifications are presented below and include coefficients for different market segments. **Table 5-2** contains coefficient values, robust standard errors, robust t-statistics, and general model statistics.

The coefficient values are the values estimated by the choice model that represent the relative importance of each of the variables. It should be noted that these values are unit-specific and the units must be accounted for when comparing coefficients. The sign of the coefficient indicates a positive or negative relationship between utility and the associated variable. For example, a negative travel time coefficient implies that utility for a given travel alternative will decrease as the travel time associated with that alternative increases.

The standard error is a measure of error around the mean coefficient estimate. The t-statistic is the coefficient estimate divided by the standard error, which can be used to evaluate statistical significance. A t-statistic greater/less than ±1.96 indicates that the coefficient is statistically significantly different from 0 (unless otherwise reported) at the 95% level.

The model fit statistics presented below include the number of observations, the number of estimated parameters, the initial log-likelihood, the log-likelihood at convergence, rho-squared, and adjusted rho-squared. The log-likelihood is a model fit measure that indicates how well the model predicts the choices observed in the data. The null log-likelihood is the measure of the model fit with coefficient values of zero. The final log-likelihood is the measure of model fit with the final coefficient values at model convergence. A value closer to zero indicates better model fit. The log-likelihood cannot be evaluated independently, as it is a function of the number of observations, the number of alternatives, and the number of parameters in the choice model. The rho-square model fit measure accounts for this to some degree by evaluating the difference between the null log-likelihood and the final log-likelihood at convergence. The adjusted rho-square value takes into account the number of parameters estimated in the model.

TABLE 5-2: PASSENGER VEHICLE MULTINOMIAL MODEL: SEGMENTED COEFFICIENTS

Coefficient	Units	Toll Free Route	Toll Route	Value	Rob. Std. Error	Rob. T-stat
Travel Time - Non Vacation Trips						
Home-based Work - Urban	Minutes	X	X	-0.091	0.010	-9.760
Home-based Non-work - Urban	Minutes	X	X	-0.084	0.010	-16.100
Non-home-based - Urban	Minutes	X	X	-0.105	0.010	-8.520
Rural	Minutes	X	X	-0.107	0.020	-6.450
Travel Time - Vacation Trips						
Home-based	Minutes	X	X	-0.084	0.000	-29.780
Non-home-based	Minutes	X	X	-0.080	0.010	-7.720
Travel Cost - Non Vacation Trips						
Home-based Work - Urban*	$		X	-2.330	0.270	-8.750
Home-based Non-work - Urban*	$		X	-1.820	0.140	-12.740
Non-home-based - Urban*	$		X	-2.790	0.370	-7.530
Rural*	$		X	-3.400	0.470	-7.310
Travel Cost - Vacation Trips						
Home-based*	$		X	-1.830	0.060	-29.250
Non-home-based*	$		X	-1.450	0.280	-5.090
Dummy Variables						
Strongly Favor the Project	1,0		X	2.770	0.120	24.140
Somewhat Favor the Project	1,0		X	1.400	0.100	14.020
Strongly Oppose the Project**	1,0		X	-0.290	0.160	-1.800
Somewhat Oppose the Project	1,0		X	-2.010	0.330	-6.030
Alternative Specific Constant						
Toll alternative	1,0		X	-2.200	0.110	-19.370

**The toll cost variable enters the model in the form: Toll Cost * (LN(Income Midpoint/1000)).*

***Not significant at 95% level.*

Model Statistics	
Number of parameters	17
Number of observations	1840
Number of individuals	18400
Initial log-likelihood	-12753.91
Final log-likelihood	-8051.19
Rho-square	0.370
Adjusted rho-square	0.37

WILLINGNESS TO PAY FOR TRAVEL TIME SAVINGS (VALUE OF TIME)

One way to evaluate the sensitivities that are estimated in the MNL models is to calculate the marginal rates of substitution for different attributes of interest. In economic theory, the marginal rate of substitution is the amount of one good (e.g., money) that a person would

exchange for a second good (e.g., travel time), while maintaining the same level of utility, or satisfaction. In this analysis, the marginal rate of substitution of the travel time and toll cost coefficients provides the implied toll value that travelers would be willing to pay for a given amount of travel time savings offered by using the proposed toll lanes on I-73 compared to a toll-free alternative.

The willingness to pay for travel timesavings, or value of time, can be calculated by simply dividing the travel time coefficient by the toll cost coefficient after accounting for the income transformation that was applied in the model specification. The resulting value of time is in units of dollars per minute; multiplying by 60 will convert this into the more commonly cited units of dollars per hour:

$$VOT = 60 \times \frac{\beta Time}{\left[\frac{\beta Cost}{LN(income/1000)}\right]}$$

Where βTime is the value of the travel time coefficient (with units of 1/min), βCost is the value of the toll cost coefficient (with units of 1/$), and the log transformation controls for non-linear income effects.

Table 5-3 shows the values of time evaluated at each income category midpoint for the following segments:

1. Urban - Home-based Work (HBW)
2. Urban - Home-based Non-work (HBNW)
3. Urban - Non-home-based (NHB)
4. Rural
5. Vacation - Home-based (HB)
6. Vacation - Non-home-based (NHB)

TABLE 5-3: PASSENGER VEHICLE MULTINOMIAL MODEL - VALUES OF TIME BY SEGMENT AND INCOME

Income	Market Segments					
	Urban HBW	Urban HBNW	Urban NHB	Rural	Vacation HB	Vacation NHB
$15,000	$6.32	$7.51	$6.11	$5.11	$7.48	$8.93
$20,000	$6.99	$8.31	$6.76	$5.66	$8.28	$9.88
$30,000	$7.94	$9.43	$7.68	$6.42	$9.40	$11.22
$42,500	$8.75	$10.40	$8.47	$7.08	$10.36	$12.37
$62,500	$9.65	**$11.46***	$9.34	**$7.81***	**$11.43***	$13.64
$87,500	**$10.43***	$12.40	**$10.10***	$8.44	$12.36	**$14.75***
$112,500	$11.02	$13.09	$10.66	$8.92	$13.05	$15.58
$137,500	$11.49	$13.65	$11.12	$9.30	$13.61	$16.24
$175,500	$12.06	$14.33	$11.67	$9.76	$14.28	$17.04
$200,000	$12.36	$14.69	$11.96	$10.00	$14.64	$17.47

**Values of time at the median income level.*

6.0 COMMERCIAL VEHICLE VALUE OF TIME

The project team was unable to collect the minimum number of commercial vehicle stated preference surveys needed to conduct discreet choice model estimation and specification testing. Therefore, the project team decided to use results from a selection of other similar surveys RSG has done in the southeast US.

RSG has conducted three similar studies in the past five years that had both passenger and commercial stated preference surveys. **Table 6-1** summarizes the VOT findings from these studies. The average aggregate value of time for commercial drivers across three studies is calculated as $26.56 per hour. The average ratio between aggregate commercial value of time and passenger value of time is calculated as 2.532. In other words, the commercial value of time is about 2.532 times the aggregate passenger value of time, on an average. It should be noted that the values of time for commercial vehicles vary based on the number of axles, however, the results shown in the table below only indicates the aggregate value of time and aggregate ratio and should not be used for estimating disaggregated values of time for different commercial vehicle types.

TABLE 6-1: ESTIMATED AGGREGATE COMMERCIAL VEHCILE VALUE OF TIME

Vehicle Classification	Project Location			Average
	Florida	Georgia	North Carolina	
Aggregate Commercial VOT	$35.63	$27.27	$16.78	$26.56
Aggregate Passenger VOT	$13.66	$8.73	$9.01	$10.47
Ratio (Commercial/Passenger)	2.608	3.124	1.862	2.532

7.0 CONCLUSION

RSG developed and implemented two stated preference survey questionnaires that gathered information from 1,840 passenger vehicle and 18 commercial vehicle travelers who make trips in the proposed I-73 corridor in South Carolina. The questionnaires collected data on current travel behavior, presented respondents with information about the proposed corridor, and engaged the travelers in a series of stated preference scenarios.

Multinomial logit (MNL) choice models were developed using the survey data to produce estimates of value of time (VOT) of passenger vehicle travelers. Models were developed for six market segments for passenger vehicle travelers:

1. Urban - Home-based Work
2. Urban - Home-based Non-work
3. Urban - Non-home-based
4. Rural
5. Vacation - Home-based
6. Vacation - Non-home-based

The magnitude and signs of the sensitivity estimates are reasonable and intuitively correct, and the VOTs that were estimated are within the ranges found in other similar areas across the country. The average VOT across different income groups for the segments mentioned above generally fell within a range of $5 per hour to $17 per hour.

For commercial vehicle survey, the project team was unable to collect the minimum number of stated preference surveys needed to estimate values of time using discreet choice modeling. Therefore, results from three similar surveys that RSG has done in the southeast US were used to estimate values that can potentially be used for this project. Based on the analysis of these three previous studies, the average aggregate value of time for commercial drivers across three studies was calculated as $26.56 per hour. The average ratio between aggregate commercial value of time and passenger value of time was calculated as 2.532.

The survey and choice model results indicate that the toll amount and travel-time savings provided by the proposed I-73 corridor could have a significant impact on travel behavior. The incorporation of these results into the updated regional travel demand model will allow C&M Associates to evaluate a multitude of future tolling scenarios and travel conditions.

Appendix C

Projecting Social and Economic Indicators of the I-73 Corridor in South Carolina

Chmura Economics & Analytics

April 2015

DRAFT

CHMURA
Economics & Analytics

Projecting Social and Economic Indicators of the I-73 Corridor in South Carolina

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April 17, 2015

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1. Executive Summary

South Carolina's Department of Transportation (SCDOT) has contracted C&M Associates, Inc. (C&M), an engineering firm in Dallas, Texas, to conduct a traffic forecast for the planned Interstate 73 (I-73) in the state of South Carolina. C&M will forecast travel demand using traffic simulation models. To estimate traffic on I-73, C&M needs a projection of social and economic indicators of the I-73 Corridor, as well as for other South Carolina counties.[1] Chmura Economics & Analytics (Chmura) was contracted to perform such projections. The list of social and economic indicators includes population, household and dwelling units, income distribution, and employment in major industry sectors.

Historic trends of social and economic indicators in the I-73 Corridor are summarized as follows:

- In 2010, 710,211 people lived in the I-73 Corridor. From 1990 to 2010, the corridor population grew by an average rate of 1.4% per year. [2]
- In the past two decades, the number of households in the I-73 Corridor has increased from 192,226 in 1990 to 282,468 in 2010.[3] The annual household growth rate was 1.9%—faster than the population growth rate—implying that average household size in the I-73 Corridor has been getting slightly smaller over the past two decades.
- In the past two decades, the number of dwelling units in the I-73 Corridor has increased from 240,592 in 1990 to 386,218 in 2010. The annual growth rate of dwelling units is 2.4% since then, faster than the household growth rate of 1.9%.
- For the analysis of income distribution, all households are classified into three income groups: low-income, with annual household income below $15,000; middle-income, with annual income between $15,000 and $50,000; and high-income, with annual income higher than $50,000. Since 2000, the percentage of households in both the low- and middle-income groups has steadily decreased, while the percentage of high-income groups has steadily increased.
- Total employment in the I-73 Corridor was 260,992 in 2010, based on wage and salary data from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW) program.[4] From 1990 to 2013, corridor employment increased at an average rate of 0.9% per year. In 2013, the largest sector in the corridor was leisure, accounting for 22.4% of total employment in the region, followed by trade and manufacturing.

Chmura projected two scenarios for the I-73 Corridor's social and economic indicators: (1) the no-build scenario, and (2) the build scenario.

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[1] For a complete list of localities included in the I-73 Corridor, please see Appendix 1.

[2] Source: U.S. Census.

[3] Ibid.

[4] This is the official wage and salaries employment from BLS. It is smaller than estimated employment number from Dun & Bradstreet as it does not include number of proprietors. Chmura uses this in historic analysis to demonstrate the historic trend.

- The no-build scenario assumes that I-73 will not be constructed. Consequently, future growth of the I-73 Corridor's social and economic indicators will be consistent with historic growth patterns.
- The build scenario assumes that development of I-73 will result in faster job and population growth in both the I-73 Corridor and South Carolina. Based on Chmura research and inputs from community leaders, the boost to the economy comes primarily from roadside services such as gas stations, motels, and restaurants that are typically located along the highway. Other sources include potential distribution centers and subsequent tourism in the region, as well as proposed Southern Evacuation Lifeline (SELL) project.
- Under the no-build scenario, Chmura projects that population in the I-73 Corridor will increase at a rate of 0.94% per year from 2010 to 2050, reaching 1.03 million in 2050. Among those, 1.02 million will be living in households, while 11,051 will be living in group quarters. Under the build scenario, it is projected that in 2050, total population in the I-73 Corridor will be 1.08 million.
- Under the no-build scenario, household growth will be slightly faster than population growth, averaging 1.04% per year. As a result, household size in the I-73 Corridor will decline slightly, reflecting the aging population trend. For the no-build scenario, it is projected that total households in the I-73 Corridor in 2050 will be 427,035, while total households under the build scenario will reach 446,537 in 2050.
- Under the no-build scenario, Chmura assumes that the number of dwelling units will grow 0.79% per year from 2010 to 2050. It is projected in 2050 that the average number of dwelling units in the I-73 Corridor will be 528,740 under the no-build scenario and 559,200 under the build scenario.
- The projection of household income under the no-build scenario assumes modest growth. As a result, the percentage of I-73 Corridor households earning less than $15,000 per year will gradually decline from 18.5% in 2010 to 16.3% in 2050. On the other hand, the percentage of households earning more than $50,000 per year will gradually increase from 38.6% in 2010 to 40.9% in 2050.
- Under the build scenario, new jobs will bring upward mobility in income distribution, mostly elevating income from low-income to middle-income groups, as most jobs attracted are retail and service jobs. Compared with the no-build scenario for 2050, the percentage of middle-income households would increase from 42.8% in the no-build scenario to 45.3% in the build scenario, while that of low-income households would decline from 16.3% to 15.1%.
- Employment in the I-73 Corridor is projected to increase at a rate of 1.22% per year under the no-build scenario, resulting in 490,743 total employment in 2050. The employment growth is projected to outpace population growth due to several demographic trends, such as people retiring later, as well as higher labor force participation rates as more job opportunities are available in South Carolina. Chmura also projects that in 2050, total employment in the I-73 Corridor will be 512,805 under the build scenario, with additional jobs concentrated in retail, service, and manufacturing industries.[5]

[5] A separate spreadsheet contains detailed projections of each indicator for South Carolina counties and selected traffic analysis zones.

2. Background & Approach

In 1991, the United States Congress identified the need for a north-south corridor from Northern Michigan to Myrtle Beach, South Carolina. This highway was designated as Interstate 73. I-73 would pass through South Carolina, North Carolina, Virginia, West Virginia, Ohio, and Michigan. In South Carolina, I-73 will progress near the northeast portion of the state. Its north terminus would be in the vicinity of Bennettsville, at the North Carolina state line. From there, I-73 will travel in a southeast direction. It will cross I-95 just south of Dillon, South Carolina. After I-95, it will continue southeast, joining with current State Route 22, and will utilize the existing South Carolina Route 22 (SC-22). Interstate 73 would end at Myrtle Beach, where it intersects U.S. Route 17.

An initial corridor feasibility study was conducted in 1994 by South Carolina's Department of Transportation after the I-73/I-74 Corridor was designated a high priority. For this study, the southern terminus of I-73 was in Charleston. In 2003, SCDOT completed a second feasibility study for I-73, in response to the change of the I-73 southern terminus from Charleston to Myrtle Beach, South Carolina. The study cited the need for I-73 as fulfilling congressional intent and providing an interstate link to the Myrtle Beach area. This would in effect provide benefits such as improved hurricane evacuation, improved capacity for vehicular and freight movement in the area, and support of population and economic growth.[6]

After the feasibility study, two environmental impact studies were conducted for I-73 in South Carolina: one for the northern segment (from I-95 to the North Carolina state line) and one for the southern segment (from I-95 to SC-22 near Conway). For the northern segment, SCDOT completed the report *Interstate 73 Final Environmental Impact Statement: I-95 to North Carolina*. In 2008, the Federal Highway Administration (FHA) issued a Record of Decision (ROD), so the design and eventual construction of the highway could proceed. For the southern segment, the SCDOT completed a Final Environmental Impact Statement (FEIS) for the portion of the I-73 Corridor from I-95 to the SC-22 in the Myrtle Beach area. The FHA approved this on November 29, 2007. A ROD was signed by the FHA for the southern segment of I-73 in South Carolina on February 8, 2008, and final design of the project and right-of-way acquisition began in the summer of 2008.

SCDOT has contracted C&M Associates, Inc., an engineering firm in Dallas, Texas, to conduct the traffic forecast for the project. C&M will forecast travel demand using traffic simulation models. To project future traffic on I-73, C&M needs a projection of social and economic indicators of counties both in the I-73 Corridor and throughout South Carolina (Figure 2.1), as inputs to the traffic simulation models. Those social and economic indicators include total population, household and group quarter population, total household and dwelling units, household income distribution, total employment, and employment in different sectors. C&M commissioned Chmura Economics &

[6] Source: Economic Impact of I-73 in South Carolina, prepared for Northeastern Strategic Alliance (NESA), by Chmura Economics & Analytics, May 2011. http://www.i73.com/docs/sc_economic_impact_study_chmura.pdf

Analytics (Chmura), headquartered in Richmond, Virginia, to perform the projections of such social and economic indicators.

Figure 2.1: I-73 in South Carolina

Source: National I-73/I-74/I-75 Organization. Website: http://www.i73.com/map.htm.

The geographic units of forecast were provided by C&M, based on their modeling needs. They are either at county-level, combined Traffic Analysis Zone (TAZ)-level, or individual TAZ-level. All counties in South Carolina are included in this study. For the nine counties located adjacent to I-73, projections were made on TAZ- or combined TAZ-level.[7] For all other South Carolina counties, projections were made at the county level. In total, Chmura provided projections for 321 geographic units and social and economic indicators for 2025, 2030, 2035, 2040, and 2050.

Chmura's projection of social and economic indicators was under two scenarios. The first—a no-build scenario—assumes I-73 will not be constructed. Under this scenario, economic indicators will grow consistently with the projection in the SCDOT 2040 Multi-Modal Plan as well as the historic trend.[8] The

[7] Those nine counties are Chesterfield, Darlington, Marlboro, Dillon, Marion, Florence, Williamsburg, Horry, and Georgetown. Those nine counties are collectively referred to as the I-73 Corridor. Appendix 1 provides a list of geographic units for projections.

[8] As part of the SCDOT's 2040 Multi-Modal Plan, demographic and employment data were developed for years 2010 and 2040. The development process included the use of 2010 Census, American Community Survey, South Carolina State Data Center, Dun and Bradstreet and Woods and Poole databases as well as estimates

second—a build scenario—assumes that the future I-73 will accelerate economic development. This growth will occur in the counties along the interstate, as well as throughout the state of South Carolina, as I-73 can increase the appeal of the region to relocating and expanding businesses. Interstate 73 is also expected to boost the tourism industry in the Myrtle Beach area. This scenario also incorporates economic boost from SELL corridor.

The remainder of this report is organized as follows:

- Section 3 summarizes historic trends of social and economic indicators of the I-73 Corridor, including population, household, and employment growth. Section 3 also provides a summary of discussions with business and community leaders in the I-73 Corridor, and incorporates their inputs into the projections.
- Section 4 provides projections of social and economic indicators in both the I-73 Corridor and South Carolina under the no-build and build scenarios.
- Section 5 offers both a summary and conclusion.

developed from South Carolina Metropolitan Planning Organizations (MPOs) and Council of Governments (COGs). Base year 2010 socio-economic data were developed using 2010 Census demographic data, Dun and Bradstreet employment data and data from local MPOs and COGs. Forecast year 2040 socio-economic data were developed using MPO and COG growth rates for the urban model areas and Woods and Poole data for the other areas. All 2040 forecasts were scaled to county control totals for population and employment based on South Carolina State Data Center and Woods and Poole forecasts, respectively, unless the MPOs and COGs provided specific projections.

3. Social and Economic Background

This section summarizes historic trends in population, employment, and other social and economic indicators. Trends are included for both the I-73 Corridor and the state of South Carolina as a whole, providing a background for the projection of these indicators. In addition, this section also summarizes economic development trends that could affect projections within both scenarios.

3.1. Historic Trends in Social and Economic Indicators

3.1.1. Population

Based on the 2010 Census, the I-73 Corridor had a population of 710,211. This was 15% of South Carolina's total population of 4.6 million (Table 3.1). From 1990 to 2010, corridor population grew by an average rate of 1.4% per year. However, population growth has slowed moderately in the most recent decade. For example, from 1990 to 2000, corridor population grew at an average rate of 1.5% per year, and that rate moderated to 1.4% per year from 2000 to 2010. The latest estimate from 2013 indicated that corridor population grew 0.8% per year from 2010 to 2013. Compared with South Carolina as a whole, corridor population growth has been lower than the state average since 2010.

Table 3.1: Total Population and Population Growth Rate

	1990	2000	2010	2013	Average Annual Growth Rate (1990-2000)	Average Annual Growth Rate (2000-2010)	Average Annual Growth Rate (2010-2013)
I-73 Corridor	534,316	620,572	710,211	726,919	1.51%	1.36%	0.78%
South Carolina	3,486,703	4,012,012	4,625,308	4,774,839	1.41%	1.43%	1.07%

Source: U.S. Census Bureau

Of the counties situated in the I-73 Corridor, three have experienced population decline since 1990. They are Marion, Marlboro, and Williamsburg Counties. All other counties in the corridor have exhibited population growth since 1990. Only Horry County, where Myrtle Beach is located, registered a population growth higher than the state average, at 3.1% per year. In fact, Horry County has been the fastest-growing county in the state since 1990. Georgetown County, another coastal county near Horry County, registered an annual population growth of 1.2%. The growth pattern in the I-73 Corridor suggests faster expansion in coastal counties due to tourism and an influx of retirees, and stagnant or declining population in interior and mostly rural counties.

The total population of the I-73 Corridor was further broken down by two major segments—those living in households and those living in group quarters such as college dormitories and prisons. In 2010, the vast majority of the population in the I-73 Corridor—98.0%—lived in households, compared with the statewide average of 97.0% (Table 3.2).

Since 1990, the percentage of individuals living in group quarters, as opposed to those living in households, remained fairly consistent in the corridor. There were slightly fewer people, as a

percentage of the total population, living in households in 2010, than in either 1990 or 2010. However, the changes are not significant for consideration in this study.

Table 3.2: Percentage of Population in Households and Group Quarters

	1990		2000		2010	
	Households	Group Quarters	Households	Group Quarters	Households	Group Quarters
I-73 Corridor	98.3%	1.7%	98.1%	1.9%	98.0%	2.0%
South Carolina	97.0%	3.0%	96.6%	3.4%	97.0%	3.0%

Source: U.S. Census Bureau

3.1.2. Household and Dwelling Units

In the past two decades, the number of households in the I-73 Corridor has increased from 192,226 in 1990 to 282,468 in 2010. The annual growth rate of households was 1.9% from 1990 to 2010, faster than the population growth rate of 1.4%. That means average household size in the I-73 Corridor is getting smaller, reflecting demographic trends such as later marriages, fewer children, and aging populations. However, the change in average household size is modest. Average household size in the I-73 Corridor was 2.51 in 2010, while in South Carolina it was 2.57 in 2010.

Table 3.3: Total Households and Household Growth Rate

	1990	2000	2010	Average Annual Growth Rate (1990-2000)	Average Annual Growth Rate (2000-2010)
I-73 Corridor	192,226	241,648	282,468	2.31%	1.57%
South Carolina	1,258,044	1,533,854	1,801,141	2.00%	1.62%

Source: U.S. Census Bureau

Total dwelling units is a measure of total housing units in a region. The difference between dwelling units and households is that dwelling units also include vacant homes or apartments. In the past two decades, the number of dwelling units in the I-73 Corridor has increased from 240,592 in 1990 to 386,218 in 2010. The average annual growth rate of dwelling units was 2.4% from 1990 to 2010, faster than the household growth rate of 1.9%. That means average vacancy rate in the I-73 Corridor is getting higher, from 20.1% in 1990 to 26.9% in 2010. South Carolina follows the similar trend that dwelling units grew faster than total households.

Table 3.4: Total Dwelling Units and Growth Rate

	1990	2000	2010	Average Annual Growth Rate (1990-2000)	Average Annual Growth Rate (2000-2010)
I-73 Corridor	240,592	305,231	386,218	2.41%	2.38%
South Carolina	1,424,155	1,753,670	2,137,662	2.10%	2.00%

Source: U.S. Census Bureau

3.1.3. Household Income Distribution

Household income distribution in the I-73 Corridor could affect travel demand. In this analysis, all households are classified into three income groups: low-income, with annual household income below $15,000 (or $15K), middle-income, with annual income between $15,000 and $50,000 ($50K), and high income, with annual income higher than $50K. In 2000, low-income households accounted for 21.9% of the total, while the middle- and high-income households accounted for 48.1% and 29.9%, respectively, of all households. Compared with the state average, the corridor had a lower percentage of high-income households (Table 3.5).

Since 2000, the percentage of households in low- and middle-income groups has steadily decreased while the percentage of households in high-income groups has steadily increased. The latest data for 2011 show that the percentage of low-income households in the I-73 Corridor declined to 18.7% while that of high-income households increased to 38.8%. That is not surprising, as economic growth should result in increased income and improved standards of living. Another reason for the increase in high-income households is inflation. If income increases at the same rate as inflation, the percentage of households in the high-income group will expand, as real income stays the same.

Table 3.5: Household Income Distribution

	2000			2008			2011		
	Low	**Middle**	**High**	**Low**	**Middle**	**High**	**Low**	**Middle**	**High**
I-73 Corridor	21.9%	48.1%	29.9%	18.4%	43.1%	38.6%	18.7%	42.5%	38.8%
South Carolina	18.8%	45.8%	35.4%	15.8%	39.9%	44.3%	15.7%	39.0%	45.3%

Source: U.S. Census Bureau

3.1.4. Employment

There are different measures of regional employment. For historic trend analysis, Chmura chose to use the wage and salaried data from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW) program.[9] In 2013, total wage and salaried employment in the I-73 Corridor was 256,785—14% of the state total employment of 1.8 million (Table 3.6). Over the last 23 years from 1990 to 2013, corridor employment increased at an average rate of 0.9% per year. Employment growth in South Carolina was slightly higher, averaging 1.0% per year from 1990 to 2013. Due to the fact that the regional economy is still recovering from the most recent recession that lasted from 2007 to 2009, employment growth from 2010 to 2013 was slower for the corridor, averaging 0.9% per year, while state employment enjoyed a healthy growth of 1.6% per year since 2010.

[9] This data source is used for analysis of historic trends only. The projection is based on Dun and Bradstreet (DNB) data provided by C&M. Those two sources do not always have the same employment figures. Chmura does not have access to historic DNB data in South Carolina.

Table 3.6: Total Employment and Employment Growth Rate

	1990	2000	2010	2013	Average Annual Growth Rate (1990-2000)	Average Annual Growth Rate (2000-2010)	Average Annual Growth Rate (2010-2013)
I-73 Corridor	211,067	260,992	249,985	256,785	2.1%	-0.4%	0.9%
South Carolina	1,460,542	1,749,190	1,758,205	1,846,622	1.8%	0.1%	1.6%

Source: Bureau of Labor Statistics, QCEW

There is a large disparity in employment growth among the counties within the I-73 Corridor. Similar to the population growth pattern, only Horry and Georgetown County achieved employment growth faster than the state average, averaging 2.5% and 1.1% per year from 1990 to 2013. In contrast, all other counties experienced varying degrees of employment contraction.

Total employment in the I-73 Corridor was further broken down into 12 industry sectors, according to the North American Industry Classification System (NAICS). In 2013, the largest sector in the I-73 Corridor was leisure, which accounted for 22.4% of total employment in the region (Table 3.7). This is not surprising considering that Myrtle Beach is a major tourism destination. After leisure, the trade sector supported 21.4% of total corridor employment, while 13.2% of employment was in education and health. As a comparison, the top sectors in South Carolina were trade, professional & business service, and education & health.

Table 3.7: Employment Mix by Major Sectors

	1990		2013	
	I-73 Corridor	South Carolina	I-73 Corridor	South Carolina
Construction	6.1%	6.9%	4.3%	4.4%
Education & Health	6.5%	6.7%	13.2%	14.2%
Finance, Insurance, Real Estate	5.9%	5.3%	6.1%	5.8%
Information	1.3%	1.7%	1.4%	1.7%
Leisure	15.2%	10.4%	22.4%	13.7%
Manufacturing	31.6%	27.9%	12.5%	13.9%
Natural Resource	0.4%	0.5%	0.8%	0.6%
Other Service	2.8%	3.0%	3.0%	3.0%
Professional & Business Service	4.1%	8.9%	9.1%	14.9%
Public Administration	3.9%	6.0%	3.7%	5.6%
Trade	20.1%	19.7%	21.4%	18.4%
Transportation, Warehousing, Utility	2.0%	3.0%	2.1%	3.7%
Grand Total	100.0%	100.0%	100.0%	100.0%

Source: Bureau of Labor Statistics

Since 1990, the industry mix in the I-73 Corridor has changed considerably. The most significant change occurred in manufacturing, whose employment share declined from 31.6% in 1990 to only

12.5% in 2013. Leisure and education & health sectors increased their employment share by 7.2 and 6.7 percentage points, respectively. For South Carolina, its employment also experienced an increase in education & health and a decline in manufacturing, but the state also saw a significant increase in professional and business service.

3.2. The Effect of I-73 on Jobs and Population Growth

This section summarizes current and future research on development in the I-73 Corridor which could affect traffic demand for I-73 after it is constructed.

3.2.1. I-73 Economic Impact Analysis

I-73 will generate jobs in counties located around the interstate. Community leaders in the northeast part of South Carolina have commissioned a study on the economic impact of I-73 in the corridor and the state of South Carolina. This study was completed in 2011, and results are available at the National I-73/74 Association website.[10] Chmura used the results of this study to assist in the projection of social and economic factors under the build scenario.

The 2011 Chmura study implied that the presence of an interstate highway can increase the appeal of the region to expanding and relocating firms, thus resulting in faster employment growth. The existence of I-73 will inject billions of dollars into the I-73 Corridor and South Carolina economies, which will provide tens of thousands of jobs in tourism, retail, service, and warehouse industries. After completion, it is estimated that I-73 can sustain 22,347 permanent jobs in South Carolina in 2030 and beyond.

Among those jobs, the most immediate new businesses associated with I-73 will be service businesses clustered around interchanges. These service businesses will serve both motorists on I-73 and local residents. They can support 3,205 jobs per year in South Carolina in 2030, most of them located in the I-73 Corridor. It is likely that I-73 can support a distribution center in the western rural portion of the I-73 Corridor, bringing 286 jobs to the area in 2030. The Myrtle Beach portion of I-73, the route taken by most visitors, could boost tourism in the region by 7.1%, and support 18,856 jobs in the region's tourism sector.

3.2.2. Inputs from the Local Chamber of Commerce

The estimates in the Chmura study are conservative. They only include quantifiable businesses clustering around interstate highways, and do not include direct potential job attractions in other sectors such as manufacturing. Transportation is critical for manufacturing plants which tend to locate close to major highways for ease of moving supplies and finished products. But the Chmura 2011 Study included the economic ripple impacts resulting from new retail and service businesses in the I-73 Corridor, which can benefit the manufacturing sector to a certain degree. [11]

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[10] Source: Economic Impact of I-73 in South Carolina, prepared for Northeastern Strategic Alliance (NESA), by Chmura Economics & Analytics, May 2011. http://www.i73.com/docs/sc_economic_impact_study_chmura.pdf

[11] It is possible that I-73 can attract manufacturing businesses. A review of documents provided by Myrtle Beach Chamber of Commerce does not yield any estimates for manufacturing expansion after I-73.

On March 23, Chmura participated in a conference call with Myrtle Beach Chamber of Commerce. The focus of the conference call was to understand the impact of I-73 on the region, especially regional economic development prospects. The community leaders believed that I-73 will help grow tourism and enhance their regional competitive position in attracting non-tourism jobs. Manufacturing, distribution, warehousing, agribusiness, and possible aeronautical industries are likely targets for development. The jobs in those industries will likely generate above-average wages, considering that regional average wages are strongly influenced by the tourism industry.[12]

[12] By the time of this draft, no quantitative data were provided to be included in the build-scenario. As a result, Chmura's build scenario projection should be considered as being conservative.

4. Projection of Social and Economic Indicators

4.1. Two Scenarios

This section provides projections of social and economic indicators of both South Carolina and the I-73 Corridor under the no-build and build scenarios. The no-build scenario assumes that I-73 will not be constructed, and population and employment growth of the I-73 Corridor will grow consistently with its past historic trend as well as with the 2040 projection by SCDOT. The build scenario refers to the situation that I-73 will be constructed, with its first segment operational in 2025. That could potentially generate additional economic benefits for the region, such as more residents and employment.

Under the no-build scenario, Chmura assumes that future growth of various social and economic indicators are consistent with the historic growth trajectory—without construction of the interstate. In addition, C&M Associates provided Chmura with the projection in SCDOT 2040 Multi-Modal Plan of social and economic indicators for each geographic unit. Chmura first computed the implied annual growth rate of the projection in the SCDOT 2040 Multi-Modal Plan from 2010 to 2040. Chmura then applied a varied growth rate for each time period based on academic research. For example, since the historic data implies a slow-down in population growth, Chmura assumed that population growth from 2010 to 2020 would be higher than from 2020 to 2030, and from 2030 to 2040. Chmura adjusted for different population growth rates in each period, while maintaining overall growth consistent with the projection the in SCDOT 2040 Multi-Modal Plan.

The build scenario assumes that I-73 will be constructed. After completion, I-73 will attract roadside service businesses such as restaurants, motels, and gas stations along the way. Those businesses cluster around interchanges and are reliably associated with limited-access highways.[13] I-73 can also attract distribution centers and boost the tourism sector in the corridor. In 2011, a study conducted by Chmura Economics & Analytics[14] estimated that after it is fully completed, the construction of I-73 can sustain 22,347 permanent jobs per year in South Carolina. This will serve as the input in generating the build scenario projections. In addition, the likely scenario also incorporates the proposed Southern Evacuation Lifeline (SELL) project in Horry County. This road could attract additional business and residents to areas around SELL corridor. Using I-73 economic impact study as a benchmark, it is estimated that the SELL corridor can benefit from over four thousand new employment opportunities, all of them located in 49 TAZs in Horry County. While most jobs will be located in the counties where I-73 passes through, all South Carolina counties will benefit from I-73. For example, if a new gasoline station/convenience store on I-73 expands its operation, it will also increase its purchase of supplies for the store, which can benefit other South Carolina counties that manufacture and ship those

[13] Source: Hartgen, David, Janet O'Callaghan, Wayne Walcott, and Jane Opgenorth, 1992. Growth at Rural Interchanges: What, Where, Why. Transportation Research Records 1359: 141-150.
[14] Source: Economic Impact of I-73 in South Carolina, prepared for Northeastern Strategic Alliance (NESA), by Chmura Economics & Analytics, May 2011. http://www.i73.com/docs/sc_economic_impact_study_chmura.pdf.

products. Chmura uses the IMPLAN model[15] to estimate ripple economic impacts elsewhere in South Carolina and distributes them in individual counties based on their industry structure.

4.2. Population Projection

4.2.1. No-Build Scenario

Under the no-build scenario, it is projected that the future population in the I-73 Corridor will increase at a rate of 0.94% per year from 2010 to 2050. This projected population growth is slightly lower than the growth rate of the corridor in the past two decades, reflecting overall demographic trends in the United States that people tend to get married later and have fewer children. It is projected that total population in the I-73 Corridor in 2025, 2035, and 2050 will be 822,698, 903,610, and 1.0 million, respectively (Table 4.1). From 2010 to 2050, state population growth is expected to grow at 0.88% per year.[16]

Table 4.1: I-73 Corridor Population Projection--No-build Scenario

		2010	2020	2025	2030	2035	2040	2050
I-73 Corridor	Household	695,837	770,586	809,094	849,138	890,888	935,143	1,019,918
	Group Quarter	14,374	13,928	13,604	13,174	12,722	12,155	11,051
	Total Population	**710,211**	**784,515**	**822,698**	**862,312**	**903,610**	**947,298**	**1,030,969**
South Carolina	Household	4,486,158	4,970,764	5,206,716	5,451,188	5,687,589	5,924,959	6,427,670
	Group Quarter	139,150	138,454	137,916	136,936	136,324	135,139	135,066
	Total Population	**4,625,308**	**5,109,218**	**5,344,632**	**5,588,124**	**5,823,913**	**6,060,098**	**6,562,737**

Source: Chmura Economics & Analytics

Previous data indicated that of the total population, the percentages for individuals living in households were consistent, with a slight increase in the future. The Chmura model assumes the percentage of household populations will increase from 98% in 2010 to 99% in 2050 in the I-73 Corridor. It is projected that in 2050, of the 1,030,969 total individuals in the I-73 Corridor, 1,019,994 people will be living in households while 10,975 will be living in group quarters.

4.2.2. Build Scenario

The build scenario assumes that construction of I-73 will proceed. Based on the 2011 Chmura study on the economic impact of I-73,[17] it is estimated that I-73 can sustain 22,347 permanent jobs per year in South Carolina when it is fully completed. It is further assumed that 80% of those jobs will be located in the I-73 Corridor while the rest will be in other South Carolina counties.

New jobs will also attract new residents. As people move in to take newly-generated jobs, their families (including children) will follow. Based on 2010 data, South Carolina had a population/employment ratio of 2.24. As a result, I-73 could boost the state population by 50,246,

[15] IMPLAN model is one of the most widely used economic simulation model to estimate economic impact and its allocation in different regions.

[16] The detailed projection for individual geographic units is delivered in a companion spreadsheet.

[17] Source: Economic Impact of I-73 in South Carolina, prepared for Northeastern Strategic Alliance (NESA), by Chmura Economics & Analytics, May 2011. http://www.i73.com/docs/sc_economic_impact_study_chmura.pdf.

with additional population resulting in SELL corridor. Since the first segment of I-73 will not be completed until 2025, it is assumed that those benefits will accrue from 2025 to 2050.

Using the current population mix to distribute incremental residents into different counties and TAZ-levels, Table 4.2 presents the population projection of the build scenario. From 2010 to 2020, the population projection is the same as the no-build scenario, but growth picks up from 2025 onward. The population growth rate is projected to be 1.05% per year from 2010 to 2050, higher than the 0.94% rate in the no-build scenario. I-73 can boost South Carolina's population growth rate from 0.88% to 0.90% per year from 2010 to 2050.

Table 4.2: I-73 Corridor Population Projection--Build Scenario

		2010	2020	2025	2030	2035	2040	2050
I-73 Corridor	Household	695,837	787,756	810,982	860,474	911,686	965,415	1,069,186
	Group Quarter	14,374	14,112	13,624	13,285	12,910	12,409	11,388
	Total Population	**710,211**	**801,868**	**824,606**	**873,759**	**924,596**	**977,824**	**1,080,573**
South Carolina	Household	4,486,158	4,987,934	5,208,969	5,464,717	5,712,413	5,961,093	6,486,481
	Group Quarter	139,150	138,637	137,947	137,110	136,622	135,546	135,635
	Total Population	**4,625,308**	**5,126,571**	**5,346,916**	**5,601,827**	**5,849,035**	**6,096,639**	**6,622,116**

Source: Chmura Economics & Analytics

For the I-73 Corridor under the build scenario, it is projected that in 2050, 1.1 million individuals will be living in households while 11,311 will be living in group quarters. The percentage of the population living in households is similar to the no-build scenario.

4.3. Household Units

Under the no-build scenario, Chmura assumes that the average household size will decline slightly—consistent with historic demographic changes. Demographic trends suggest that people are living longer, getting married later, having children later, and having less children than before. Those factors imply that there are more single households or households without children, driving down average household size. As a result, projected household growth would be slightly faster than population growth, averaging 1.04% per year. For the no-build scenario, it is projected that total households in the I-73 Corridor in 2025, 2035, and 2050 will be 331,933, 368,492, and 427,035, respectively.

Table 4.3: I-73 Corridor Household Projection

		2010	2020	2025	2030	2035	2040	2050
No-Build	I-73 Corridor	282,468	314,928	331,933	349,735	368,492	388,553	427,035
	South Carolina	1,801,141	1,994,214	2,088,696	2,186,627	2,281,934	2,377,833	2,580,150
Build Scenario	I-73 Corridor	282,468	321,751	332,683	354,235	376,743	400,554	446,537
	South Carolina	1,801,141	2,001,037	2,089,594	2,192,014	2,291,811	2,392,200	2,603,495

Source: Chmura Economics & Analytics

Under the build scenario, Chmura projects that household size in the I-73 Corridor will be marginally higher than under the no-build scenario. The reason is that under the build scenario, there will be a large influx of jobs in the I-73 Corridor. This will likely increase household size, as people taking jobs are working-age adults that tend to have families. Another source of population growth will be immigrants. If immigrants come with their families, which tend to have more children than American families due to cultural or religious reasons, this situation may increase the average household size in the corridor. It is projected that the number of households in the I-73 Corridor in 2025, 2035, and 2050 will be 332,683, 376,743, and 446,537, respectively. For the state of South Carolina, this population influx will not be large enough to cause any significant change in household size.

4.4. Dwelling Units

Under the no-build scenario, Chmura assumes that the number of dwelling units will grow slightly slower than the household growth rate, averaging 0.78% per year from 2010 to 2050. This will result in lower property vacancy rates in the future. For the no-build scenario, it is projected that the average number of dwelling units in the I-73 Corridor in 2025, 2035, and 2050 will be 440,641, 475,313 and 528,740, respectively.

Table 4.4: I-73 Corridor Dwelling Units Projection

		2010	2020	2025	2030	2035	2040	2050
No-Build	I-73 Corridor	386,218	422,822	440,641	458,169	475,313	492,300	528,740
	South Carolina	2,137,662	2,339,011	2,434,594	2,531,993	2,624,077	2,714,351	2,920,496
Build Scenario	I-73 Corridor	386,218	431,923	441,952	465,821	489,026	511,925	559,200
	South Carolina	2,137,662	2,348,112	2,436,072	2,540,643	2,639,611	2,736,612	2,955,216

Source: Chmura Economics & Analytics

Under the build scenario, dwelling unit growth in the I-73 Corridor will be higher than under the no-build scenario. Housing development may also accelerate around the corridor. Without further information, Chmura assumes that high demand and high supply growth will offset each other, resulting in stable vacancy rates for the future. It is projected that the number of dwelling units in the I-73 Corridor in 2025, 2035, and 2050 will be 441,952, 489,026, and 559,200, respectively.

4.5. Household Income Distribution

4.5.1. No-Build Scenario

The projection of household income under the no-build scenario assumes modest income growth. As a result, the percentage of I-73 Corridor households earning less than $15,000 ($15K) per year will gradually decline from 18.5% in 2010 to 16.3% in 2050. On the other hand, the percentage of corridor households earning more than $50K per year will gradually increase from 38.6% in 2010 to 40.8% in

2050. The income dynamic for the state is similar. The resulting number of households in each income bracket is presented in Table 4.5.[18]

Table 4.5: I-73 Corridor Household Income Projection--No-build Scenario

		2010	2020	2025	2030	2035	2040	2050
I-73 Corridor	Less than 15K	52,194	56,372	58,418	60,521	62,686	64,958	69,616
	15K-50K	121,293	135,078	142,258	149,806	157,749	166,200	182,832
	More than 50K	108,946	123,478	131,256	139,407	148,057	157,395	174,587
	Total Households	**282,433**	**314,928**	**331,933**	**349,735**	**368,492**	**388,553**	**427,035**
South Carolina	Less than 15K	283,017	309,211	321,681	334,502	346,749	358,902	384,977
	15K-50K	713,438	788,163	824,570	862,278	898,896	935,649	1,013,379
	More than 50K	804,641	896,840	942,445	989,847	1,036,289	1,083,282	1,181,794
	Total Households	**1,801,097**	**1,994,214**	**2,088,696**	**2,186,627**	**2,281,934**	**2,377,833**	**2,580,150**

Source: Chmura Economics & Analytics

4.5.2. Build Scenario

Under the build scenario, household income distribution in both the I-73 Corridor and South Carolina will experience changes. I-73 could generate over 20,000 jobs in the state, with the majority of them in the corridor. In addition, the SELL corridor could add additional more than 4,000 jobs in select TAZs in Horry County. While some of those jobs will be taken by people moving into the area, some of the unemployed or underemployed residents in the region can also benefit from those new job opportunities and increase their household income. The general projection is that I-73 could result in upward mobility in household income distribution.

To what degree households in each income group will benefit from I-73 will depend on the jobs attracted by the project. Based on the I-73 economic impact study in 2011,[19] most new jobs will be in retail and foodservice, such as roadside service and tourism jobs, and only a small number are warehouse and distribution center jobs. The latest data indicate that those jobs will be concentrated in the income brackets of $15K-$50K. For example, the average wage for foodservice occupations in the corridor was $19,500 in 2014. It was $30,300 for transportation and material moving occupations, and $31,400 for sales and related occupations.[20] Those data imply that the vast majority of new jobs will be in the middle-income group, and only a small percentage (those in management positions) will have wages over $50K. That implies that the share increase will be largest in the middle income households.

Allocating those jobs into different income brackets, Table 4.6 lists the projected number of households in each income group for the I-73 Corridor and South Carolina under the build scenario. In the corridor, I-73 can potentially reduce the number of low-income households and increase

[18] The sum of households for the three income brackets in 2010 is slightly different from actual 2010 household numbers presented in Section 4.4, due to rounding.

[19] Source: Economic Impact of I-73 in South Carolina, prepared for Northeastern Strategic Alliance (NESA), by Chmura Economics & Analytics, May 2011. http://www.i73.com/docs/sc_economic_impact_study_chmura.pdf

[20] Source: JobsEQ, Occupation Wages in South Carolina 2013.

middle- income households. The most significant increase will be in the middle-income group due to the nature of jobs attracted. Compared with the no-build scenario, the percentage of middle-income households could increase from 42.8% in the no-build scenario to 45.3% in the build scenario. The share of high-income households could decrease from 40.8% in the no-build scenario to 39.6% in the build scenario, while the low-income group would decline from 16.3% to 15.1%.

Table 4.6: I-73 Corridor Population Projection--Build Scenario

		2010	2020	2025	2030	2035	2040	2050
I-73 Corridor	Less than 15K	52,194	56,372	58,337	60,035	61,795	63,662	67,510
	15K-50K	121,293	135,078	143,006	154,289	165,967	178,153	202,256
	More than 50K	108,946	130,301	131,340	139,911	148,982	158,739	176,771
	Total Households	**282,433**	**321,751**	**332,683**	**354,235**	**376,743**	**400,554**	**446,537**
South Carolina	Less than 15K	283,017	309,211	321,584	333,920	345,683	357,350	382,456
	15K-50K	713,438	788,163	825,464	867,644	908,733	949,958	1,036,630
	More than 50K	804,641	903,663	942,546	990,450	1,037,395	1,084,891	1,184,409
	Total Households	**1,801,097**	**2,001,037**	**2,089,594**	**2,192,014**	**2,291,811**	**2,392,200**	**2,603,495**

Source: Chmura Economics & Analytics

4.6. Employment Projection

4.6.1. No-Build Scenario

Under the no-build scenario, it is projected that future employment will likely increase at a rate of 1.2% per year. This estimated growth rate was based on the 2040 projection conducted by SCDOT. Under this scenario, total corridor employment in 2025, 2035, and 2050 will be 364,129, 410,462, and 490,743, respectively.

Table 4.7: Employment Projection in I-73 Corridor (No-Build Scenario)

	2010	**2020**	**2025**	**2030**	**2035**	**2040**	**2050**
Agriculture, Forestry, Fishing	5,223	5,257	5,224	5,155	5,032	4,866	5,019
Mining	292	347	388	443	512	603	741
Construction	20,435	22,313	23,280	24,266	25,198	26,114	29,854
Manufacturing	30,915	31,943	32,115	32,052	31,666	31,036	31,519
Transportation & Communication	13,032	15,242	16,625	18,279	19,737	22,608	26,582
Wholesale	9,872	11,052	11,676	12,334	12,999	13,712	15,158
Retail	66,295	81,713	104,574	121,664	141,487	165,143	198,493
Finance, Insurance, Real Estate	20,796	21,689	21,901	21,932	21,699	21,231	22,643
Service	122,255	129,798	132,091	133,169	132,452	130,006	135,859
Public Administration	12,680	14,898	16,255	17,845	19,679	21,870	24,876
Total Employment	**301,795**	**334,252**	**364,129**	**387,138**	**410,462**	**437,189**	**490,743**

Note: Total employment may not be the same as figures provided by C&M due to rounding

Source: Chmura Economics & Analytics

For major industry sectors, Chmura's model assumes that corridor employment in mining, transportation and communication, retail, and public administration will grow faster than the corridor average of 1.2% per year from 2010 to 2050. Other sectors will grow modestly—except the agriculture, forestry, and fishing industry—which will decline from 2010 to 2050.

Employment growth for the state of South Carolina follows a similar pattern, but general growth will average 1.0% per year from 2010 to 2050. Under this scenario, total employment in 2025, 2035, and 2050 will be 2.4 million, 2.6 million and 3.1 million, respectively.

Table 4.8: Employment Projection in South Carolina (No-Build Scenario)

	2010	2020	2025	2030	2035	2040	2050
Agriculture, Forestry, Fishing	34,257	37,833	39,640	41,497	43,335	45,298	49,271
Mining	1,646	2,003	2,207	2,436	2,688	2,977	3,363
Construction	129,424	145,611	154,094	163,009	172,082	181,881	201,013
Manufacturing	249,996	274,590	286,959	299,694	312,313	325,896	354,077
Transportation & Communication	104,759	117,748	124,753	132,322	139,300	149,305	165,553
Wholesale	80,363	89,779	94,676	99,815	105,040	110,719	121,335
Retail	375,648	424,769	465,904	501,610	540,367	584,697	658,543
Finance, Insurance, Real Estate	118,903	132,890	139,943	147,160	154,273	161,782	176,223
Service	831,169	904,240	940,085	976,278	1,011,003	1,047,454	1,138,622
Public Administration	130,511	142,912	149,395	156,298	163,420	171,381	186,371
Total Employment	**2,056,676**	**2,272,375**	**2,397,655**	**2,520,118**	**2,643,822**	**2,781,390**	**3,054,370**

Note: Total employment may not be the same as figures provided by C&M due to rounding

Source: Chmura Economics & Analytics

4.6.2. Build Scenario

For employment under the build scenario, it is assumed that the annual employment growth rate will average 1.33%, higher than under the no-build scenario. This is due to additional jobs supported by I-73, as well as SELL, which total over 26,000. It is projected that total employment in 2025, 2035, and 2050 will be 364,978, 419,796, and 512,805, respectively.

Table 4.9: Employment Projection in I-73 Corridor--Build Scenario

	2010	2020	2025	2030	2035	2040	2050
Agriculture, Forestry, Fishing	5,223	5,307	5,225	5,165	5,052	4,895	5,066
Mining	292	349	389	443	514	605	744
Construction	20,435	27,187	23,287	24,310	25,278	26,231	30,043
Manufacturing	30,915	32,312	32,128	32,130	31,809	31,245	31,858
Transportation & Communication	13,032	15,396	16,670	18,546	20,227	23,321	27,741
Wholesale	9,872	11,171	11,681	12,360	13,048	13,783	15,273
Retail	66,295	82,267	104,805	123,050	144,027	168,837	204,496
Finance, Insurance, Real Estate	20,796	21,864	21,907	21,970	21,771	21,335	22,812
Service	122,255	131,025	132,624	136,367	138,315	138,534	149,717
Public Administration	12,680	15,091	16,262	17,886	19,754	21,980	25,054
Total Employment	**301,795**	**341,970**	**364,978**	**392,229**	**419,796**	**450,766**	**512,805**

Note: The total employment may not be the same as those provided by C&M due to rounding

Source: Chmura Economics & Analytics

Chmura used the following methodology to distribute jobs into different sectors. Based on the 2011 economic impact study of I-73, Chmura allocated 17,999 direct jobs in the I-73 Corridor into retail, service, and transportation sectors. For additional jobs resulting from ripple economic impact, Chmura allocated them into all sectors across the corridor and the state based on the industry mix of each geographic unit, with the majority of them in the corridor counties. Chmura uses the same methodology to allocate SELL Corridor jobs but only to Horry County. While overall projected employment in the I-73 Corridor is 4.5% higher than under the no-build scenario in 2050, projected service employment will be 10.2% higher under the build scenario.

Table 4.10 lists the statewide employment projection. Under the build scenario, total employment in 2025, 2035, and 2050 will be 2.4 million, 2.7 million and 3.1 million, respectively.

Table 4.10: Employment Projection in South Carolina--Build Scenario

	2010	2020	2025	2030	2035	2040	2050
Agriculture, Forestry, Fishing	34,257	37,884	39,644	41,524	43,385	45,371	49,389
Mining	1,646	2,005	2,208	2,438	2,691	2,982	3,371
Construction	129,424	150,485	154,112	163,119	172,283	182,173	201,487
Manufacturing	249,996	274,959	286,991	299,890	312,672	326,418	354,926
Transportation & Communication	104,759	117,903	124,806	132,643	139,889	150,162	166,945
Wholesale	80,363	89,897	94,687	99,881	105,162	110,896	121,623
Retail	375,648	425,323	466,170	503,206	543,294	588,954	665,461
Finance, Insurance, Real Estate	118,903	133,065	139,959	147,257	154,452	162,042	176,644
Service	831,169	905,467	940,681	979,853	1,017,558	1,056,989	1,154,117
Public Administration	130,511	143,104	149,412	156,401	163,609	171,655	186,818
Total Employment	**2,056,676**	**2,280,093**	**2,398,670**	**2,526,212**	**2,654,995**	**2,797,642**	**3,080,780**

Note: The total employment may not be the same as those provided by C&M due to rounding

Source: Chmura Economics & Analytics

4.7. Comparison with Third-Party Projections

Chmura obtained two sets of third-party projections from C&M Associates and compared them with the no-build scenario projections by Chmura. The first set of projections were prepared by Moody's Analytics, which provided projections of retail sales, as well as employment in hotels, restaurants, and healthcare industries for Horry County only. Another set of projections were prepared by Woods and Poole (W&P), which provided county-level estimates on a wide range of demographic, social, and economic variables.

Direct comparisons with third-party projections are not practical. First, the variables are different—Moody's projections involve retail sales and sector employment in Horry County. Retail sales are not part of Chmura's projections in this report. Second, even for the same variables, the definition could

be different. For example, W&P sector projections used the NAICS-based system, while Chmura's projections used the Standard Industrial Classification (SIC) system to be consistent with projections in the SCDOT Multi-Modal Plan. In addition, forecasting horizons are different as well. The third-party projections end at 2040, while Chmura's projections extend to 2050. More importantly, both Moody's and W&P's projections are not available at the traffic analysis zone-level; the smallest unit of projection is at the county level. However, Chmura attempted to compare the overall long-term projections. To achieve that, Chmura computed the implied annual growth rates of high-level variables (total population, households, and employment) from those projections, and compared them with the annual growth rate embedded in the Chmura no-build scenario projections to evaluate the third-party projections.

Moody's projection for Horry County shows a healthy expansion of lodging, food service, and health care sectors. From 2010 to 2040, employments in those three sectors are projected to grow 1.2%, 2.6%, and 1.9%, respectively, per year for the county, where Myrtle Beach is located. Chmura's projection did not break down sector employment in the same manner as Moody's, but is in agreement that overall county employment would grow 1.7% per year. From that perspective, Moody's projections are reasonable.

For W&P, Chmura was able to evaluate those projections for total population, total households, and total employment, as presented in Table 4.11.[21] W&P's population and employment projections are more optimistic than Chmura's projections. For example, W&P forecasts an annual population growth of 1.1% per year for the state from 2010 to 2040, which is higher than Chmura's 0.9% annual long-term growth projection. For employment, W&P forecasts an annual growth of 1.4% per year for the state from 2010 to 2040, which is higher than Chmura's 1.0% annual long-term growth projection. While Chmura's no-build scenario may be conservative, this projection is constrained by the projections in the SCDOT Multi-Modal Plan for 2040.[22]

Table 4.11: Third-Party Projection Comparison

		W&P Projection			Chmura Projection		
Variable	**Location**	**2010**	**2040**	**Annual Average Growth Rate**	**2010**	**2040**	**Annual Average Growth Rate**
Total Population	I-73 Corridor	711,515	1,041,272	1.28%	710,211	947,298	0.96%
	State	4,637,106	6,364,889	1.06%	4,625,308	6,060,098	0.90%
Total Households	I-73 Corridor	283,033	417,607	1.31%	282,468	388,553	1.07%
	State	1,805,891	2,474,754	1.06%	1,801,141	2,377,833	0.93%
Total Employment	I-73 Corridor	358,534	562,286	1.51%	301,795	437,189	1.24%
	State	2,451,222	3,742,910	1.42%	2,056,676	2,781,390	1.01%

Source: C&M and Chmura

[21] While W&P provided employment by industry, it is based on NAICS, not SIC. W&P's projection includes income distribution, but with different income brackets.

[22] Chmura's scope of work requires that the projection is consistent with SCDOT's projection.

There are some issues with W&P's projection. First, Chmura's population base for 2010 is directly from the 2010 Census, so these population numbers match precisely. But W&P's population base is different from the 2010 Census. For example, the 2010 Census lists total state population at 4.63 million, while the W&P projection indicated 4.64 million. While this does not appear to be a significant difference, this added value will increase exponentially over the next four decades. Similarly, W&P's base year employment projection is larger as well, at 2.45 million. BLS data implied total statewide employment of 1.92 million,[23] which is closer to Chmura's baseline of 2.06 million.

Another concern is with W&P's household projection. As Table 4.11 shows, W&P's projection indicates that total households in South Carolina will grow at the same rate as population, which implies household size in the state will remain constant over the next 30 years. However, most demographic literature projects that household size in America will continue to shrink. This reflects trends such as later marriages, fewer children, and aging populations. W&P's projection suggests that the state of South Carolina will follow the opposite trend.

[23] Source: Bureau of Labor Statistics. http://data.bls.gov/timeseries/LASST450000000000005?data_tool=XGtable.

5. Summary

Under the no-build scenario, it is projected that population in the I-73 Corridor will increase at a rate of 0.94% per year from 2010 to 2050. Employment in the corridor will expand at a higher rate of 1.22% per year, from 2010 to 2050. For other economic and social indicators, it is projected that the number of households will grow faster than the population, reflecting an aging population in both the corridor and state. For employment growth, the percentage of households in middle- and high-income groups (more than $50K per year) will expand steadily.

Under the build scenario, all social and economic indicators in the I-73 Corridor will expand at higher annual rates than under the no-build scenario. This will be boosted by new jobs and an increase in population attracted by I-73. For South Carolina, all social and economic indicators will grow at similar rates for the state as a whole.

Appendix 1: List of Geographic Units in Study Corridor

Geographic Units of Distribution

Aggregate (AGG) ID	TAZ Number	I-73 Corridor	County
10011601		0	Abbeville SC
30010101		0	Aiken SC
50010506		0	Allendale SC
70010206		0	Anderson SC
90010503		0	Bamberg SC
110010504		0	Barnwell SC
130010904		0	Beaufort SC
150010301		0	Berkeley SC
170011502		0	Calhoun SC
190011401		0	Charleston S
210010205		0	Cherokee SC
230010402		0	Chester SC
250210501		1	Chesterfield
250410502		1	Chesterfield
250610503		1	Chesterfield
250810504		1	Chesterfield
251010505		1	Chesterfield
251210506		1	Chesterfield
251410507		1	Chesterfield
251610508		1	Chesterfield
251810509		1	Chesterfield
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290010901		0	Colleton
314010501		1	Darlington
314211301		1	Darlington
314410502		1	Darlington
314610503		1	Darlington
314810504		1	Darlington
315010505		1	Darlington
315210506		1	Darlington
315411302		1	Darlington
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316010508		1	Darlington
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330000006	33050678	1	Dillon SC
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370011604		0	Edgefield SC

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410510712	1	Florence SC
410710713	1	Florence SC
410910714	1	Florence SC
411110715	1	Florence SC
411310716	1	Florence SC
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418810702	1	Florence SC
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419810706	1	Florence SC
431710801	1	Georgetown
431910802	1	Georgetown
432110803	1	Georgetown
432310804	1	Georgetown
432510805	1	Georgetown
432710806	1	Georgetown
432910807	1	Georgetown
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433310809	1	Georgetown
433510810	1	Georgetown
433710811	1	Georgetown
450010203	0	Greenville
470011602	0	Greenwood SC
490010903	0	Hampton SC

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550011101		0	Kershaw SC
570010403		0	Lancaster SC
590010207		0	Laurens SC
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630011501		0	Lexington SC
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730010201		0	Oconee SC
750010505		0	Orangeburg SC
770010202		0	Pickens SC
790011503		0	Richland SC
810011604		0	Saluda SC
830010204		0	Spartanburg
850011101		0	Sumter SC
870010401		0	Union SC
892010501		1	Williamsburg
892210502		1	Williamsburg
892410503		1	Williamsburg
892610504		1	Williamsburg
892810505		1	Williamsburg
893010506		1	Williamsburg
893210507		1	Williamsburg
893410508		1	Williamsburg
893610509		1	Williamsburg
894010510		1	Williamsburg
910011001		0	York SC
4110610717		1	Florence SC
5110110832		1	Horry SC
5110210833		1	Horry SC
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5110410835		1	Horry SC

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