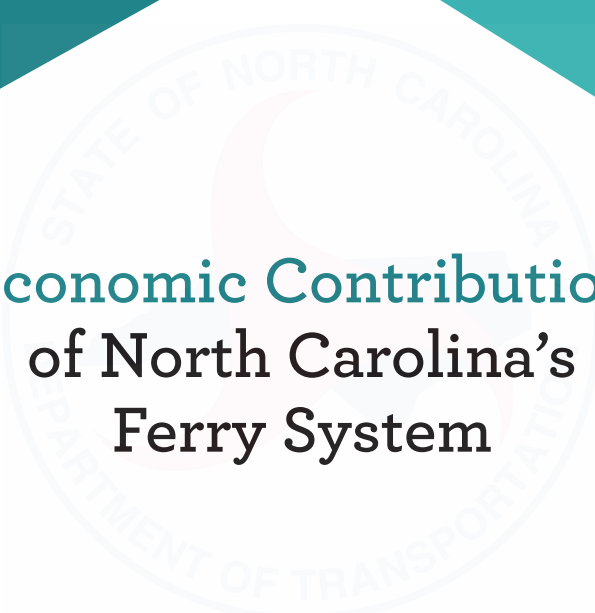
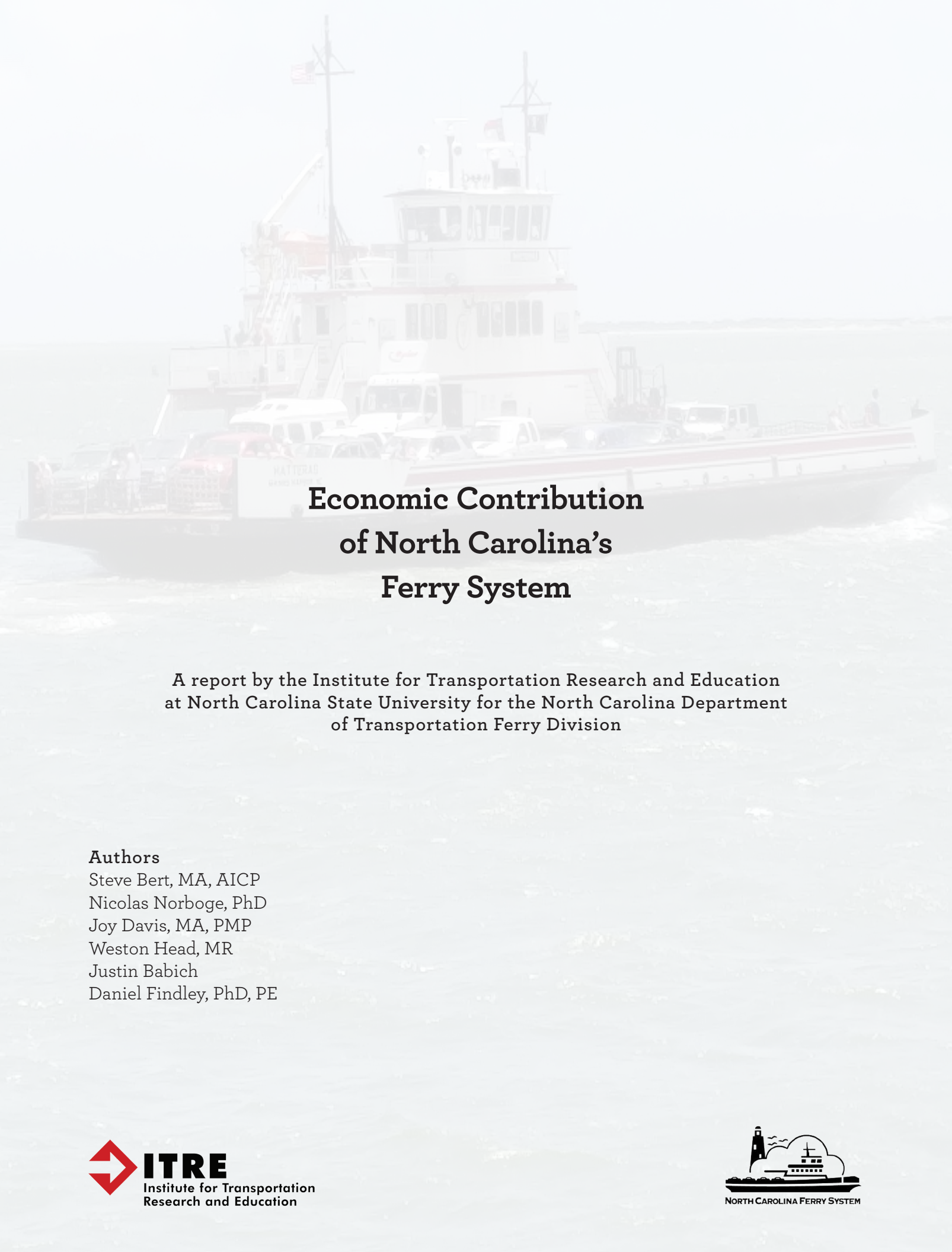




Economic Contribution  
of North Carolina's  
Ferry System



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# Economic Contribution of North Carolina's Ferry System

A report by the Institute for Transportation Research and Education  
at North Carolina State University for the North Carolina Department  
of Transportation Ferry Division

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<p>The North Carolina Ferry System provides a critical transportation link for North Carolina residents, visitors, and local business owners. Ferry operations in North Carolina can be traced back to several early efforts to better connect both the state's inner banks with its far-reaching outer banks and as a means for crossing some of the state's many bodies of water. Today, the state's ferry services provide visitors access to tourism destinations and enable residents to reach work, school, shopping, recreation, and other key locations. The North Carolina Department of Transportation (NCDOT) Ferry Division operates 21 vessels on seven routes along the eastern coast of North Carolina. North Carolina ferries transport over 800,000 vehicles, or approximately two million passengers, a year. This makes the NCDOT-operated ferry system the second largest state-run ferry system in the United States.</p> <p>To model the economic contribution of the North Carolina Ferry System, an economic input-output model was developed. To estimate the total economic contribution of the North Carolina Ferry system, expenditure data were collected from 3,770 ferry ridership surveys. Annualized direct expenditures were then input into IMPLAN® to estimate input-output relationships for the local economies and estimate the indirect and induced effects of each ferry route.</p> <p>Overall, this analysis found that the North Carolina Ferry System supports a total of 5,860 jobs, including 3,295 direct jobs, 1,385 indirect jobs, and 1,180 induced jobs. Furthermore, the NC Ferry System supports a total of \$217.3 million in labor income and \$735.2 million in total economic output. Detailed summaries of economic contribution by route are also presented as an appendix in this report.</p>			
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Photo source: NCDOT

## Study Overview

The Institute for Transportation Research and Education at N.C. State University used more than 3,770 surveys that were collected over four quarterly survey periods at each of the seven ferry routes to derive the economic contribution of NCDOT's Ferry System.

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“We have been using the North Carolina Ferry System for 25 years and love to visit Ocracoke at least 2-3 times a year. The ferries are crucial to our trip. Thank you for keeping this memory alive!”

Cedar Island-Ocracoke  
Survey Respondent

# Executive Summary

Annually, North Carolina's Ferry System supports:



**5,860 jobs**

Direct, Indirect and Induced  
(Including 400 direct ferry employee jobs)



**\$32.5 million**

In Local and State Tax Dollars



**\$217.3 million**

Direct, Indirect and Induced  
In North Carolina Employee Earnings



**\$40.3 million**

In Ferry Passenger Benefits:

- \$18.1 million in vehicle cost savings
- \$13.9 million in travel time savings
- \$8.3 million in safety benefits



**\$735.2 million**

Direct, Indirect and Induced  
In Statewide Economic Output

Source: ITRE data collection and analysis

The North Carolina Ferry System provides an important transportation link for North Carolina residents, visitors and local business owners. Ferry operations in North Carolina can be traced back to several early efforts to better connect the state's Inner Banks with its far-reaching Outer Banks. Today, the state's ferry services provide visitors access to tourism destinations and enable residents to reach work, school, shopping, recreation and other key locations.

The North Carolina Ferry Division operates 21 vessels on seven routes along the eastern coast of North Carolina (see Figure 1). North Carolina ferries transport more than 800,000 vehicles, or approximately 2 million passengers a year. This makes the NCDOT-operated ferry system the second largest state-run ferry system in the United States (see Figure 2).

Two routes, Hatteras-Ocracoke and Ocracoke-Cedar Island, are officially part of the Outer Banks Scenic Byway. These ferries also serve important community

service and public safety roles by providing emergency services. North Carolina ferries also help with emergency evacuation of residents and visitors. For some residents of islands on the Outer Banks such as Ocracoke Island, the ferry system provides the only system for public transportation on and off the islands. Additionally, the ferry system operates a shipyard for vessel repairs (located in Manns Harbor) and includes a fleet of support vessels that perform marine maintenance and dredging activities.

The North Carolina Ferry System facilitates a number of economic activities. This report was produced to describe the economic contribution of the ferry system on North Carolina's economy, including employment, earned income, economic output, tax revenue and other economic and quality of life benefits. A brief summary of the economic activities that ferry operations facilitate can be seen below, while the full discussion can be found in the report.

*Photo courtesy of Ocracoke Preservation Society*



# Background

## History of the North Carolina Ferry System

Ferry operations in North Carolina can be traced back to early efforts to better connect the state's mainland with its Outer Banks and traverse the state's rivers and streams. Facing demands by early North Carolina settlers and farmers, some of the state's first ferry systems were established to transport livestock, wagons and people. These first ferries connected the state's primarily agricultural-based, eastern coastal economies.

In 1947, the North Carolina Ferry System was created with the first route connecting Manns Harbor and Roanoke Island in Dare County. The image above depicts an early automobile ferry on Hatteras Island.

Today, NCDOT operates seven ferry routes. While the Hatteras-Ocracoke began service in 1953, the six other routes were established in the 1960s and 1970s. These routes have crossing times that range from 20 minutes to 2 hours and 40 minutes. Of the seven routes that NCDOT operates, a toll is imposed on only three routes (see Figure 1).

The state ferry system consists of seven scheduled routes (see Figure 3), one emergency route, 12 terminals, a state-owned shipyard, four field maintenance shops, 21 ferries and a support fleet that consists of four tugs, three barges, one crane barge and one dredge.



Figure 1: NCDOT Operated Ferry Routes, Key Summary Statistics

NCDOT Route	Year Created	Fare Type	Distance (Miles)	Crossing Time (Minutes)
Hatteras - Ocracoke	1953	Free	8.5	60
Cedar Island - Ocracoke	1961	Toll	23	135
Knott's Island - Curritick	1962	Free	5	45
Southpoint - Fort Fisher	1965	Toll	3.5	35
Aurora - Bayview	1966	Free	3.5	30
Cherry Branch - Minnesott Beach	1973	Free	2.5	20
Swan Quarter - Ocracoke	1977	Toll	27	160

Source: NCDOT Ferry Division

Figure 2: NCDOT Ferry System Fleet Statistics

Class	Ferry Name	Year Built	Vehicle Capacity	Passenger Capacity	Gross Tonnage	Length (Feet)	Breadth (Feet)	Draft (Feet/Inches)
Hatteras	Kinnakeet	1989	30	149	280	150	42	4'
	Chicamacomico	1990	30	149	275	150	42	4'
	Cape Point	1990	30	149	275	150	42	4'
	Ocracoke	1990	30	149	275	150	42	4'
	Frisco	1990	30	149	275	150	42	4'
	Roanoke	1993	30	149	248	150	42	4'
	Thomas A. Baum*	1995	30	149	248	150	42	4'
River	Daniel Russell	1993	42	300	418	180	44	6'
	Southport	1996	42	300	424	180	44	6'
	Neuse	1998	42	300	374	180	44	6'
	Floyd J. Lupton	2000	40	300	374	180	44	6'
	Fort Fisher	2000	40	300	374	180	44	6'
	Croatoan	2003	40	300	376	180	44	5'6"
	W. Stanford White	2003	40	300	372	180	44	5'6"
	Hatteras	2006	40	300	374	180	44	5'6"
	James B. Hunt	1984	20	149	462	125	40	5'
Sound	Silver Lake	1965	50	300	688	220	48	6'
	Carteret	1989	50	300	771	220	50	6'6"
	Cedar Island	1994	50	300	648	220	50	6'6"
	Swan Quarter	2011	46	300	867	220	50	7'6"
	Sea Level	2012	46	300	867	220	50	7'6"

Source: NCDOT Ferry Division

\*The *Thomas A. Baum* ferry was recently retired and replaced by the *Rodanthe*.

Figure 3: North Carolina Ferry System Map

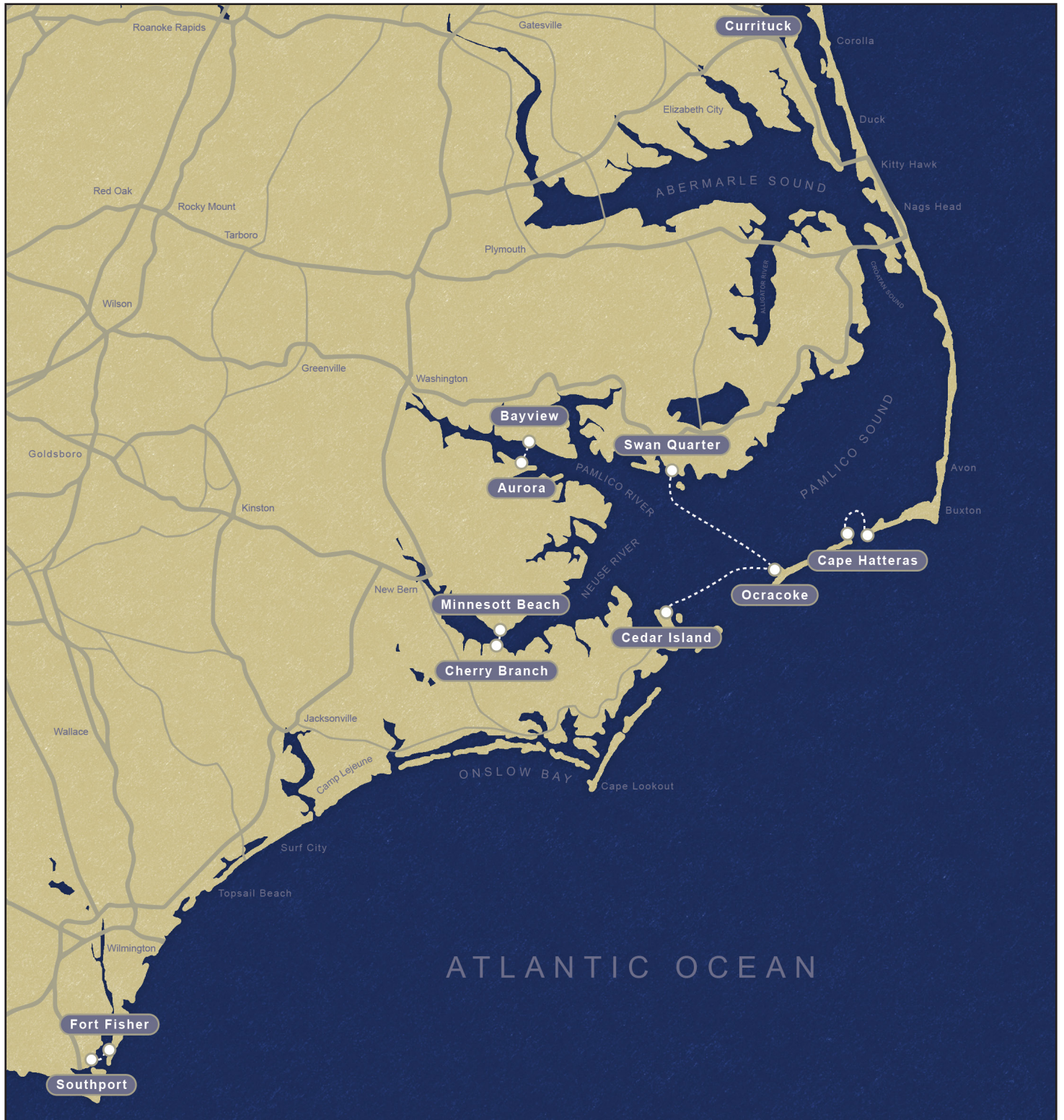


Photo source: ITRF



# Methodology

**Passenger Survey.** Passenger surveys are a commonly used tool for estimating visitor expenditures. For this study, ferry passengers were surveyed on a seasonal basis in the fall, winter, spring and summer months of 2017 and 2018 - for a total of four collection periods that yielded more than 3,770 completed surveys.

During each collection period, surveys were distributed on one weekday (Monday-Thursday) and one weekend day (Saturday or Sunday) to capture weekday and weekend passenger profiles. The survey solicited information on ferry boarding time, travel group size, travel vehicle type, trip purpose, frequency of ferry use, length of visit and type of passenger expenditures (the survey instrument can be found in Appendix A). Passenger expenses were placed into five categories: lodging, restaurants, groceries, entertainment and rentals (boat, bike and other).

**Expenditure Profiles.** Survey data were used to estimate the expenditure behavior of a typical passenger. Based on the data collected, unique expenditure profiles were created for all seven of the North Carolina Ferry System's routes, taking into account the variations in travel behavior and passenger characteristics of each route. Typical passenger expenditures were extrapolated over the entire set of annual ferry passengers to calculate an estimate of total direct spending facilitated by the North Carolina Ferry System.

**Input/Output Economic Modeling.** Once direct expenditures were derived, the research team used an input/output model to calculate the secondary effects (indirect and induced effects) of passenger expenditures as they circulate through the economy (process shown in image above). A description of direct, indirect and induced effects is as follows:

- **Direct effects** – first round of spending that is facilitated by ferry passengers reaching destinations where they make purchases. An Input-Output model is used to estimate the indirect and induced effects that result from direct effects.
- **Indirect effects** – second round of spending that emerges as businesses make purchases as a result of their new income from ferry passenger expenditures. For example, as ferry passengers spend money at a restaurant accessed through ferry service, that restaurant may decide to purchase additional kitchen supplies to grow its business. The kitchen supplies provider receives income as a result of this indirect effect.
- **Induced effects** – additional round of spending that emerges as employees of direct and indirect beneficiary firms spend their earnings in the economy. The locations supported by the direct and indirect businesses' spending receive income as a result of this induced or multiplier effect.

To model the economic contribution of the North Carolina Ferry System, an Impact Analysis for Planning (IMPLAN®) input-output model was created. The model is based on the concept that an output of one sector can be the input for another sector, creating an indirect impact and that money flows between sectors, creating an induced impact. This flow continues to circulate throughout the local economy until the stream of money passes out of an area of activity through imports, non-local spending or other means.

The Input-Output Model (I-O model) was developed by Wassily Leontief in 1951 as a tool to quantify the interdependencies between sectors of an economy. Today, I-O models are used to estimate multiplier effects in economic contribution and impact studies. The model developed in this study was used to project how ferry operations affect the industries and local economies in North Carolina. The findings of this effort should be interpreted as the number of jobs, the level of output, employee compensation, and state and local tax revenue supported by NCDOT's ferry operations.

**Deriving Economic Contribution.** Before inputting the annualized ferry passenger expenditure data into the IMPLAN model, data were sorted into expenditure categories. Group expenses were placed into five categories: lodging, restaurants, groceries, entertainment and rentals (boat, bike, other). Each of these five categories has an IMPLAN sector code and distinct indirect and induced multipliers, the mechanism that determines the total economic impact. Average group size and length of stay were also computed to obtain the average expenditure per person from the average expenditure per group that was estimated from the survey results. This number was then multiplied by the percentage of the survey respondents who spent money in that category during their trip. This number is the estimated annual expenditure per visitor which was then multiplied by the number of annual visitors to obtain a total annual expenditure.

To estimate the total economic contribution of the North Carolina Ferry System, expenditure data collected from approximately 3,770 ferry ridership surveys were evaluated. Annualized direct expenditures were then entered into IMPLAN, which is part of the modeling software used to estimate Input-Output relationships for the local economies, to estimate the indirect and induced effects of each ferry route.

**Estimating the Wider Economic Benefits of the Ferry System.** North Carolina's Ferry System offers economic benefits to its ridership. One benefit is transportation cost savings. By taking the ferry, instead of an alternate driving route, passengers can save money on fuel and vehicle wear and tear. Another benefit of ferry service includes a reduction in travel time costs. As found in our analysis, ferry trips are often shorter than alternate driving routes and save passengers time. Additionally, North Carolina's ferry services are often safer than driving.

**Calculating Vehicle Operating Cost Savings.** For this study, the research team compared driving costs to ferry ticket costs. The research team used costs per minute as the unit of comparison for driving and ferry costs. NCDOT's ferry schedule provides ticket fares and

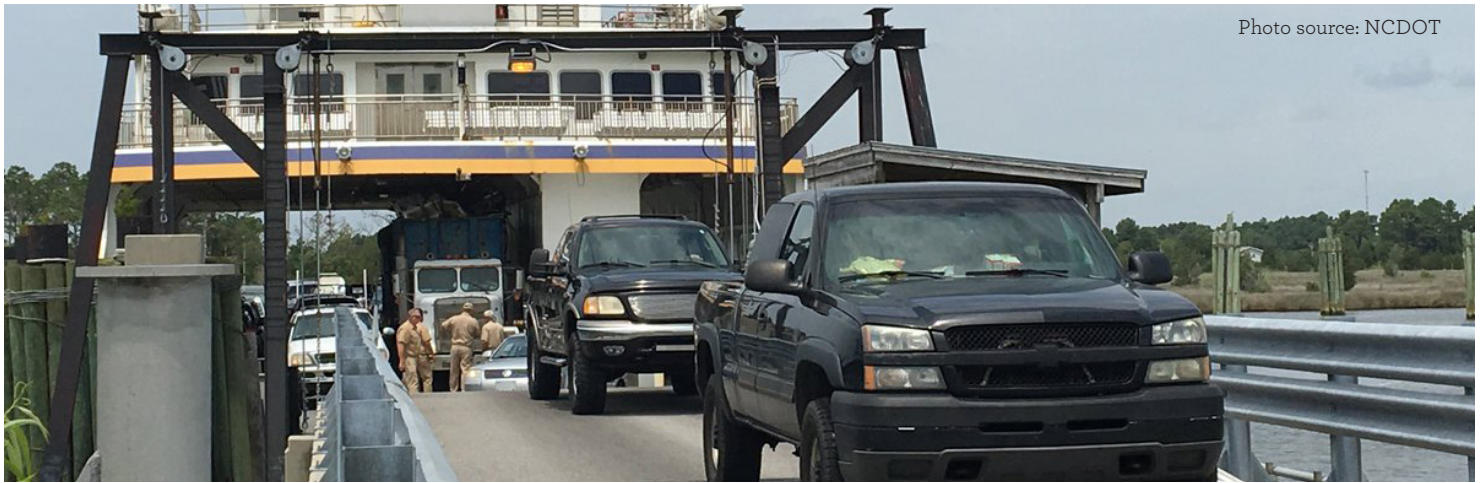


Photo source: NCDOT

estimated crossing times, which were used to derive ferry ticket costs on a per minute basis. Estimated vehicle travel times for the alternate driving trip were used in conjunction with vehicle costs per mile (from AAA's cost per mile report) to determine driving costs per minute. The net difference between driving and ferry costs resulted in the vehicle operating cost savings an individual realizes by taking the ferry instead of driving. These savings were then aggregated and annualized using NCDOT data for annual vehicles transported by ferry route. The derived values are shown in the "Results" section.

**Calculating Travel Time Benefits.** Various studies have quantified travel time unit costs and the value of travel time savings based on analyses of business costs, traveler surveys and measurement of behavioral responses of travelers faced with a trade-off between time and money. The U.S. Department of Transportation (USDOT) uses the median wage rate as an initial value to estimate the costs that individuals experience while traveling. Additionally, travel conditions affect whether the transportation cost an individual experiences is equal to or less than their wage rate.

The NCDOT Strategic Prioritization Office (SPOT) values of time for automobile and freight traffic and the NCDOT Ferry Division data were used to derive travel time costs.

Value of time research findings illustrate that travel conditions affect value of time. For example, travel can exhibit low unit costs when people enjoy the

experience or are able to complete work during the journey, which is often the case for ferry travel.

Unit time costs are typically low for the first 20-40 minutes of travel and increase substantially beyond that. For this study, a travel amenity index was applied to account for the lower unit time costs associated with the first 30 minutes of ferry travel. Estimated values of time benefits are shown in the "Results" section.

**Calculating Inferred Safety Benefits.** In 2017, there were 1,412 traffic fatality deaths in North Carolina and zero fatalities that resulted from ferry service provision. This difference in fatalities, or travel safety, can be monetized using a statistical expected value methodology, which predicts the expected value of a crash per mile or crash per minute of travel time. The National Highway Traffic Safety Administration (NHTSA) provides data for traffic fatalities on a county basis.

For this study, 2017 NHTSA data for fatality rates and a mapping tool for predicted alternate drive routes and times were used. The research team used this information to derive the expected value of a traffic fatality per minute of drive time, if an individual were to drive an alternate route instead of taking a North Carolina ferry. The USDOT value of statistical life was used in conjunction with expected fatality incidence to estimate the monetized fatality cost per minute of drive time. The derived values of safety benefits are shown in the "Results" section.

Photo source: NCDOT



# Results

The N.C. Department of Transportation's seven ferry routes support numerous community needs in various contexts. Three of the routes (Hatteras-Ocracoke, Cedar Island-Ocracoke, and Swan Quarter-Ocracoke) serve as connectors to Ocracoke Island residents and as destinations for North Carolina's tourism industry. These routes are primarily occupied by visitors (Hatteras: 82 percent visitors; Cedar Island: 66 percent visitors, Swan Quarter: 53 percent visitors). Other ferry routes primarily serve their local communities by enabling residents to reach work, school, medical and other key destinations. The Aurora-Bayview

and Cherry Branch-Minnesott Beach ferry routes, for example, exhibit a community focus with their residential ridership comprising 92 percent and 80 percent of ferry passengers, respectively. Meanwhile, the Currituck-Knotts Island and the Southport-Fort Fisher ferry routes support a mix of local and tourism trip purposes. For example, a unique function of the Currituck-Knotts Island ferry route is to transport students in school buses across the Currituck Sound. Figure 4 shows the classification of ferry passengers (resident, seasonal resident, visitor) by route.

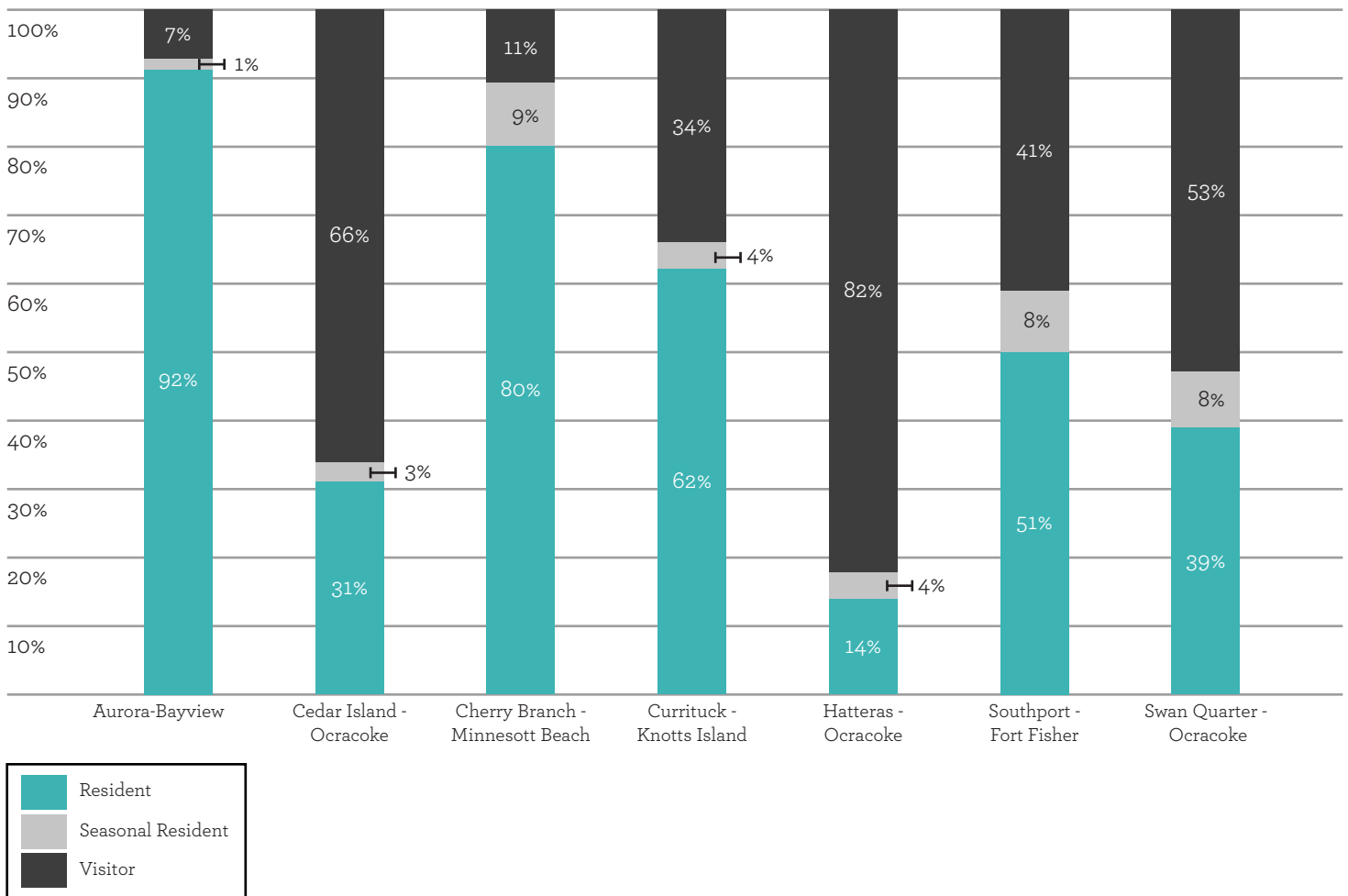
*“We enjoy the ferry. Most days we utilize it twice a day to get to and from school.”*

Aurora-Bayview Survey Respondent

Photo source: ITRE



Figure 4: Residents, Seasonal Residents and Visitors by Route



**Economic Contribution Findings.** North Carolina's Ferry System facilitates economic activity throughout the state connecting its ridership to work, shopping, dining and other destinations that result in business transactions. Figures 5 through 10 show the total economic activity that the N.C. Department of Transportation's ferry operations facilitate.

The N.C. Ferry System supports 5,860 jobs, including

3,295 direct jobs, 1,385 indirect jobs and 1,180 induced jobs (direct, indirect and induced classifications and definitions are on page 5 of the methodology section).

Furthermore, the N.C. Ferry System supports \$217.3 million in total labor income, \$735.2 million in economic output (gross business sales), and enables tax generation, including \$32.5 million in local and state tax dollars.

**Figure 5: Jobs Facilitated by the NCDOT Ferry System**

Ferry Route	Jobs			
	Direct	Indirect	Induced	Total
Aurora - Bayview	55	35	30	120
Cedar Island - Ocracoke	230	75	75	380
Cherry Branch - Minnesott Beach	310	170	130	610
Currituck - Knotts Island	30	15	15	60
Hatteras - Ocracoke	1,925	770	665	3,360
Southport - Fort Fisher	595	265	215	1,075
Swan Quarter - Ocracoke	150	55	50	255
<b>All Ferry Routes</b>	<b>3,295</b>	<b>1,385</b>	<b>1,180</b>	<b>5,860</b>

Source: ITRF

**Figure 6: Employee Earnings Facilitated by the NCDOT Ferry System**

Ferry Route	Employee Earnings			
	Direct	Indirect	Induced	Total
Aurora - Bayview	\$2,000,000	\$1,900,000	\$1,100,000	\$5,000,000
Cedar Island - Ocracoke	\$7,400,000	\$3,400,000	\$3,000,000	\$13,800,000
Cherry Branch - Minnesott Beach	\$10,200,000	\$8,500,000	\$5,200,000	\$24,000,000
Currituck - Knotts Island	\$1,200,000	\$900,000	\$600,000	\$2,700,000
Hatteras - Ocracoke	\$60,900,000	\$35,500,000	\$26,700,000	\$123,100,000
Southport - Fort Fisher	\$18,700,000	\$12,300,000	\$8,600,000	\$39,600,000
Swan Quarter - Ocracoke	\$4,900,000	\$2,300,000	\$2,000,000	\$9,100,000
<b>All Ferry Routes</b>	<b>\$105,300,000</b>	<b>\$64,800,000</b>	<b>\$47,200,000</b>	<b>\$217,300,000</b>

Source: ITRF



Figure 7: Economic Output Facilitated by the NCDOT Ferry System

Ferry Route	Economic Output			
	Direct	Indirect	Induced	Total
Aurora - Bayview	\$8,400,000	\$6,000,000	\$3,500,000	\$17,900,000
Cedar Island - Ocracoke	\$24,100,000	\$10,200,000	\$9,700,000	\$44,100,000
Cherry Branch - Minnesott Beach	\$41,200,000	\$26,700,000	\$16,900,000	\$84,800,000
Currituck - Knotts Island	\$4,500,000	\$2,700,000	\$1,900,000	\$9,100,000
Hatteras - Ocracoke	\$218,300,000	\$108,800,000	\$87,000,000	\$414,000,000
Southport - Fort Fisher	\$69,800,000	\$38,000,000	\$28,000,000	\$135,700,000
Swan Quarter - Ocracoke	\$16,200,000	\$7,000,000	\$6,400,000	\$29,600,000
<b>All Ferry Routes</b>	<b>\$382,500,000</b>	<b>\$199,400,000</b>	<b>\$153,400,000</b>	<b>\$735,200,000</b>

Source: ITRE

Figure 8: Tax Revenue Facilitated by the NCDOT Ferry System

Ferry Route	State & Local Tax Revenue
Aurora - Bayview	\$400,000
Cedar Island - Ocracoke	\$2,400,000
Cherry Branch - Minnesott Beach	\$2,600,000
Currituck - Knotts Island	\$300,000
Hatteras - Ocracoke	\$19,500,000
Southport - Fort Fisher	\$5,700,000
Swan Quarter - Ocracoke	\$1,600,000
<b>All Ferry Routes</b>	<b>\$32,500,000</b>

Source: ITRE



Photo source: NCDOT

Photo source: ITRE






Figure 9: Ferry Passenger Transportation Benefits

Ferry Route	Vehicle Cost Savings	Travel Time Benefits	Safety Benefits	Net Travel Benefits
Aurora - Bayview	\$2,100,000	\$900,000	\$400,000	\$3,400,000
Cedar Island - Ocracoke	\$6,200,000	\$7,200,000	\$3,700,000	\$17,100,000
Cherry Branch - Minnesott Beach	\$4,900,000	\$3,100,000	\$2,100,000	\$10,100,000
Currituck - Knotts Island	\$600,000	\$400,000	\$500,000	\$1,500,000
Hatteras - Ocracoke	N/A - no alternative driving route			
Southport - Fort Fisher	\$2,300,000	\$1,100,000	\$1,200,000	\$4,600,000
Swan Quarter - Ocracoke	\$2,000,000	\$1,200,000	\$400,000	\$3,600,000
<b>All Ferry Routes</b>	<b>\$18,100,000</b>	<b>\$13,900,000</b>	<b>\$8,300,000</b>	<b>\$40,300,000</b>

Source: ITRE

\*Currently, there are no alternatives for travel between Hatteras and Ocracoke beyond ferry service, so safety, travel time and vehicle operating cost savings valuations, which compare ferry service to alternative travel, were not appropriate for this route (methodology found on page 5).

Three components make up ferry passenger transportation benefits:

-  Vehicle cost savings
-  Travel time benefits
-  Safety benefits

For this analysis, vehicle cost savings, travel time benefits, and safety benefits were calculated by subtracting estimated ferry costs by the estimated costs incurred in the absence of ferry service. These three factors were used to estimate the total net travel benefits of N.C. Ferry operations in 2018. A full description of the valuation approach used to monetize vehicle cost savings, travel time benefits, and safety benefits is found in the “Methodology” section.

**Figure 10: Contribution of Ferry Division Operations & Capital Expenditures**

Impact Category	Jobs	Employee Earnings	Economic Output
Direct	400	\$21,900,000	\$106,300,000
Indirect	690	\$30,400,000	\$96,900,000
Induced	350	\$14,500,000	\$47,200,000
<b>Total</b>	<b>1,440</b>	<b>\$66,800,000</b>	<b>\$250,300,000</b>

Source: ITRE

North Carolina's ferry system supports economic activity through a variety of its services. The North Carolina Ferry Division employs more than 400 people, with approximately 100 staff working at the Mann's Harbor shipyard. This has a direct, indirect and induced effect upon North Carolina's economy. The North Carolina Ferry Division directly employs staff to conduct its daily operations (direct effect). As staff conduct their daily operations, they support indirect economic activity through the purchase of supplies, maintenance equipment, tools, ferry vessel parts and components, information technology hardware and software, and business services. These expenditures help support the employee earnings of individuals who provide these goods and services (indirect effect). When NCDOT employees and the goods and services providers of support industries spend the earnings from their paychecks, it has an additional economic effect of supporting other workers (induced effect). In this manner, NCDOT's capital, operating and maintenance budgets help support North Carolina's economy.

At the shipyard, ferry division staff maintain three classes of ferries (sound, river and double-enders) ranging in length from 120-220 feet. Maintenance activities include numerous interior and exterior ferry vessel repairs and retrofits such as welding, electrical work, facade painting and part replacement.

In addition to maintenance activities at Mann's Harbor, the daily operations of each of North



Photo source: NCDOT

Carolina's seven ferry routes support economic activity. Ferry Division staff manage passenger ticketing, ferry terminal and ferry vessel upkeep, information technology, emergency management and other services. Ferry staff include executive leadership, administrative professionals, field maintenance workers, security personnel, human resources staff, as well as facility and marine maintenance crew members.

Ferry operations facilitate the employment of 1,440 jobs, \$66.8 million in employee earnings and \$250.3 million in economic output (see Figure 10). Altogether, ferry operations comprise approximately 30 percent of the total economic activity facilitated by the North Carolina Ferry System (see pages 10 and 11).

Photo source: ITRE



# Conclusions

The purpose of this analysis was three-fold. First, it provided history and context of the North Carolina Ferry system. From there, it presented a methodology and results from a comprehensive economic impact survey. Finally, it summarized overall findings of the entire system, providing evidence to suggest that the N.C. Ferry system is an important transportation and economic link for North Carolina.

From its days as an early British Colony, North Carolina featured one of the most extensive ferry networks. These early ferries were used to connect the state's eastern coastal economies with inland cities. Today, while the state's ferry system is owned and operated by NCDOT, it provides economic support to the state.

Ferry passenger survey data were used to conduct an economic contribution analysis of North Carolina's Ferry System. Based on this analysis, the N.C. Ferry System is estimated to support a total of 5,860 jobs in which these employees earn an estimated \$217.3 million in collective earnings. The NC Ferry System facilitates approximately \$735.2 million in gross business sales (economic output). Additionally, it facilitates \$32.5

million in tax revenue generation for the state. Finally, the N.C. Ferry System provides vehicle cost savings (\$18.1 million), travel time benefits (\$13.9 million) and safety benefits (\$8.3 million) to passengers who take the ferry instead of driving an alternative route.

Furthermore, based on responses collected by the research team, the N.C. Ferry system is an important link connecting residents to work, medical, school, shopping and other destinations on the coast. The ferry system provides a link to visitors from around the U.S., leading to direct investment and additional tax revenue for state and local governments.

Ultimately, the N.C. Ferry System is a source of job creation, local revenue and tax creation that benefits the coast and the state. It provides economic and quality-of-life benefits for its ferry passengers accessing communities along the state's extensive coastline.



Photo source: NCDOT

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*Photo source: NCDOT*



## Appendix A

Appendix A contains the survey instrument the research team used in this study.

15. Where is your permanent residence (where is home)?

City & State: \_\_\_\_\_ Zip code: \_\_\_\_\_

State of the license plate on the vehicle you are in today: \_\_\_\_\_

**16. Additional Comments**

Please share additional comments or questions you have about the survey or the North Carolina's ferry service below:



**Thank you for your participation!**

For more information, contact Daniel Findley, Institute for Transportation Research and Education, at (919) 515-8564 or Daniel\_Findley@ncsu.edu



**Welcome aboard the NCDOT  
Ferry System Customer Survey!**



The North Carolina Department of Transportation's (NCDOT) Ferry System is studying their impact on the economy. Your participation in this survey is completely voluntary. You can choose not to answer any questions and can stop participating at any time with no penalty. There are no risks involved in filling out this survey and you will not be compensated in any way. Your responses will remain anonymous. You must be 18 years of age or older to participate.

**Please fill out only ONE survey per traveling party PER DAY (families/groups that share expenses for this trip).** For example, if you are traveling with your spouse/partner and children living in the same household, only one survey should be completed. If you are traveling as a couple/group who shares expenses, only one person needs to complete a survey. But, if you are traveling with friends and do not share expenses, each person should complete a survey.

Do you agree to participate in this survey?  Yes  No (Return survey)

- 
1. What date is it today (*Example: March 22*)? \_\_\_\_\_
  2. What time did your ferry depart? \_\_\_\_\_ AM/PM (circle one)
  3. Please provide details on the number of people in your trip group:
    - a. How many people are in your group (includes all those sharing expenses)? \_\_\_\_\_
    - b. How many of those, including you, live in your household? \_\_\_\_\_
    - c. How many in your group are less than 18 years old? \_\_\_\_\_
  4. Which best describes the type vehicle are you in today? Check one box.
 

<input type="checkbox"/> Personal/rental car, truck, van, SUV, etc.	<input type="checkbox"/> Walk
<input type="checkbox"/> Government vehicle	<input type="checkbox"/> Semi-/tanker truck
<input type="checkbox"/> School/activity bus	<input type="checkbox"/> Refrigerated truck
<input type="checkbox"/> Tour bus	<input type="checkbox"/> Delivery truck
<input type="checkbox"/> Bicycle	<input type="checkbox"/> Other: _____

Next

5. What is your living status in the area? Check one box and fill in details.

- Permanent Resident
- Seasonal resident or second home owner - live here part of the year
- Visitor – My visit to this area is \_\_\_\_\_ days long and I am staying in \_\_\_\_\_ (town/city) during this trip

6. **For Visitors ONLY:** How important was this ferry in your decision to visit this area? Check one box.

- Not very important
- Somewhat important
- Very important

7. **For All:** How much did/will your traveling party/group spend today? Enter estimates for the amount spent on the following. If you are a visitor, also fill out the next question about your total vacation costs.

Spending Type	Spent <u>Today</u>
Hotel/Housing/Lodging	\$
Restaurant meals and drinks	\$
Groceries/Convenience items	\$
Retail shopping	\$
Entertainment/Admissions	\$
Boat/Bike/Other Rentals	\$
Other: _____	\$

8. **For Visitors ONLY:** How much did/will your traveling party/group spend during your entire vacation. Enter estimates for the amount spent on the following. *Example: If your full vacation is 7 days long, then include the estimated total costs for all 7 days.*

Spending Type	Spent on <u>Entire Vacation</u>
Hotel/Housing/Lodging	\$
Restaurant meals and drinks	\$
Groceries/Convenience items	\$
Retail shopping	\$
Entertainment/Admissions	\$
Boat/Bike/Other Rentals	\$
Other: _____	\$

9. Please provide details about the purpose of today's trip below:

Trip Purpose	6a. What is the <u>main purpose of today's trip</u> ? Check one.	6b. What are any <u>other purpose(s) of today's trip</u> ? Check all that apply.
Work at city/place: _____	<input type="checkbox"/>	<input type="checkbox"/>
School at city/place: _____	<input type="checkbox"/>	<input type="checkbox"/>
Dining/Shopping/Running Errands	<input type="checkbox"/>	<input type="checkbox"/>
Beach/Fishing/Sightseeing/ Other Recreational Activity	<input type="checkbox"/>	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>

10. Was there an event or attraction in the area that influenced your decision to make this current trip? If so, list it below:  
\_\_\_\_\_

11. If the ferry was not available would your group still make today's trip another way?  Yes  No  Not Possible to Drive

a. If drivable, how many more minutes would it take to get to and from (round trip) your destination if you didn't ride the ferry? \_\_\_\_\_

12. When will you make a return trip on this ferry?

- Today
- Tomorrow
- Within the next 7 days
- Longer than 7 days from now
- I won't make a return trip on this ferry

13. How many trips have you taken this ferry route in the last 30 days (with round trips counting as two trips)? \_\_\_\_\_

14. In which months do you typically take these trips? Check all that apply.

- Jan Feb March April May June July Aug Sept Oct Nov Dec
- 

Next





Photo source: NCDOT

# Appendix B

Appendix B contains the Economic Contribution summaries by route, which is a companion to this report.

STATE OF NORTH CAROLINA



# 2020

ECONOMIC CONTRIBUTION  
OF NORTH CAROLINA'S FERRY SYSTEM

Study Conducted by the Institute for  
Transportation Research and Education's  
Economic & Policy Assessment Group at  
North Carolina State University



NORTH CAROLINA FERRY SYSTEM



**ITRE**

Institute for Transportation  
Research and Education

INSTITUTE OF TRANSPORTATION

## Economic

# Contribution of the Ferry System

The N.C. Department of Transportation's ferry system transports more than 800,000 vehicles and 2 million passengers a year, making it the second largest state-run ferry system in the United States. North Carolina's Ferry System operates 21 vessels on seven routes along the coast, carrying visitors, residents, commuters and school children. Each ferry route supports economic activity.

### NCDOT Ferry Routes

Aurora - Bayview

Cedar Island - Ocracoke

Cherry Branch - Minnesott Beach

Currituck - Knotts Island

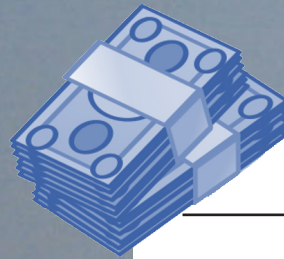
Fort Fisher - Southport

Hatteras - Ocracoke

Swan Quarter - Ocracoke

## Annual Economic Contribution

Ferry operations facilitate economic activity by enabling passengers to reach work, retail, recreational, educational and other destinations. As passengers conduct economic transactions at these locations, the state's economy is supported through employment, earned income, tax revenue and economic output. NCDOT's Ferry Division directly employs ferry staff, but also facilitates employment effects by providing ferry passengers access to commercial destinations. The total jobs, employee earnings, tax revenue generated and business output (gross sales) facilitated by the N.C. Ferry System is in the table below. The "Methodology, Data Collection, and Definitions" section contains the methodologies and sources used to value the economic contribution of North Carolina's Ferry System.



### The Ferry System Supports

**5,860**  
Total Jobs

**\$217.3M**  
Earned Wages

**\$32.5M**  
Tax Revenue

**\$735.2M**  
Business Output

Source: ITRE

## TRAVEL BENEFITS



**\$8.3M**  
SAFETY  
BENEFITS\*



**\$13.9M**  
TRAVEL TIME  
BENEFITS\*



**\$18.1M**  
TRANSPORT  
COST SAVINGS\*



**\$40.3M**  
NET TRAVEL  
BENEFITS

\*The full report contains the methodologies used to calculate travel benefits.

## Annual Travel Benefits

Trips made using ferry services are often safer, more time-efficient and less expensive than driving. Based on responses from a passenger survey, in some instances people would forego making medical, shopping, dining, and other trips that support the economy, in the absence of ferry services. The "Methodology, Data Collection, and Definitions" section contains the methodologies and sources used to value these types of travel benefits that NCDOT's ferry services provide.



Photo source: ITRE

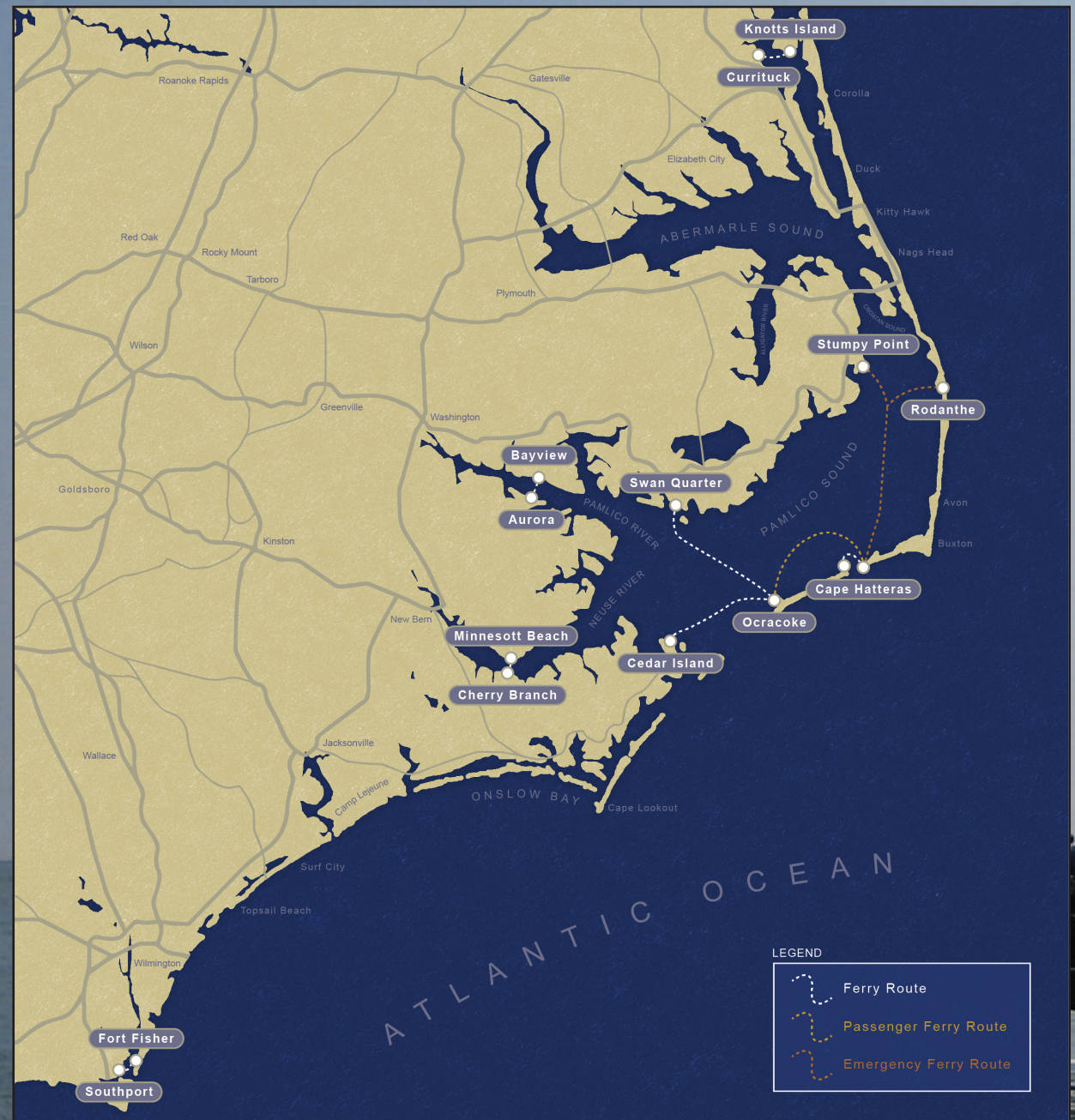
# Overview

Ferry operations in North Carolina can be traced back to several early efforts to better connect the state's mainland with its Outer Banks and as a means for crossing the state's many rivers and streams. Facing demands by early North Carolina settlers and farmers, some of the state's first ferry systems were established to transport livestock, wagons and people. These first ferries connected the state's primarily agricultural-based, eastern coastal economies together.

In 1947, the North Carolina Ferry System was created. The first route connected Manns Harbor with Roanoke Island in Dare County.

Today, NCDOT operates seven ferry routes. While the Hatteras-Ocracoke began service in 1953, the six other routes were established in the 1960s and 1970s. Today, the state ferry system consists of seven scheduled routes, one emergency route, 12 terminals, a state-owned shipyard, four field maintenance shops, 21 ferries and a support fleet that consists of four tugs, three barges, one crane barge and two dredges.

## North Carolina Ferry System Map



# Methodology, Data Collection and Definitions

For this study, ferry passengers were surveyed on a seasonal basis, in the fall, winter, spring and summer months of 2017 and 2018 – for a total of four collection periods that yielded more than 3,770 completed surveys. During each collection period, surveys were distributed on one weekday (Monday-Thursday) and one weekend day (Saturday or Sunday) to capture weekday and weekend passenger profiles.

Survey data were used to estimate the expenditure behavior of a typical passenger. Unique expenditure profiles were created for all seven of the North Carolina Ferry System's routes, taking into account the variations in travel behavior and passenger characteristics of each route. Typical passenger expenditures were extrapolated over the entire set of annual ferry passengers to calculate an estimate of total direct spending facilitated by the North Carolina Ferry System.

**Economic Contribution Methodology.** Direct expenditures were estimated using ferry passenger surveys. Then the research team used an input/output model to calculate the secondary effects (indirect and induced effects) of passenger expenditures as they circulate through the economy. A description of direct, indirect and induced effects is as follows:

- **Direct effects** – first round of spending that is facilitated by ferry passengers reaching destinations where they make purchases, or by the ferry division making operations and capital expenditures to maintain or expand ferry service.
- **Indirect effects** – second round of spending that emerges from direct employers making expenditures that support indirect employers. IMPLAN (an input-output economic model) was used to estimate these industry linkages. For example, as ferry passengers spend money at a restaurant accessed through ferry service, that restaurant may decide to purchase additional kitchen supplies to grow its business. The kitchen supplies provider receives income as a result of this indirect effect.
- **Induced effects** – additional round of spending that emerges as employees of direct and indirect beneficiary firms spend their earnings in the economy. IMPLAN (an input-output economic model) was used to calculate industry linkages, including the magnitude of indirect and induced effects resulting from direct expenditures. The locations supported by the direct and indirect businesses' spending receive income as a result of this induced or multiplier effect.

**Wider Economic Benefits Methodology.** North Carolina's Ferry System offers a number of economic benefits to its ridership. Ferry services enable passengers to save money on fuel and vehicle wear and tear, experience shorter and more enjoyable travel times, and ferry services are often safer than driving.

**Vehicle Operating Cost Savings.** For this study, the research team compared driving costs to ferry ticket costs. NCDOT's ferry schedule provides ticket fares and estimated crossing times, which were used to derive ferry ticket costs on a per minute basis. Estimated vehicle travel times for the alternate driving trip (from an online mapping tool) were used in conjunction with vehicle costs per mile (using AAA data) to derive driving costs per minute.

**Travel Time Benefits.** The NCDOT Strategic Prioritization Office values of time for automobile and freight traffic and NCDOT Ferry Division mode share data were used to derive travel time costs. Additionally, value of time research findings illustrate that travel conditions affect value of time. Unit time costs are typically low for the first 20-40 minutes of travel and increase beyond that. For this study, a travel amenity index was applied to account for the lower unit time costs associated with the first 30 minutes of ferry travel. Consistent with the literature, a multiplier of 0.5 was applied to the first 30 minutes of ferry travel.

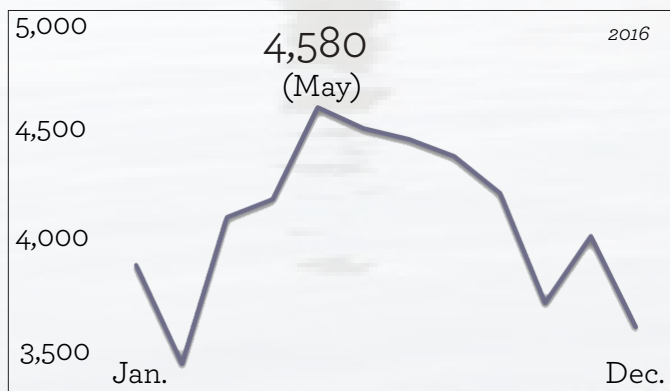
**Safety Benefits.** The research team used 2017 National Highway Safety Administration data for fatality rates and a mapping tool for predicted alternate drive routes and times. ITRE compared a base-case crash scenario (drive only) to an alternative crash scenario (drive with ferry ride as part of trip) to estimate safety benefits. For this study, the statistical probability (or expected value) of a fatality incident per minute of drive time (base-case scenario) was derived and compared to the statistical probability of a fatality incident per minute of ferry travel time (alternative scenario). Under each scenario, crash costs were tabulated and compared using fatality cost (VSL) and fatality incidence. NHTSA traffic fatality data were used for determining fatality incidence in the base-case scenario. NHTSA traffic fatality data and NCDOT ferry fatality reports were used to determine fatality incidence in the alternative scenario.

# Aurora-Bayview

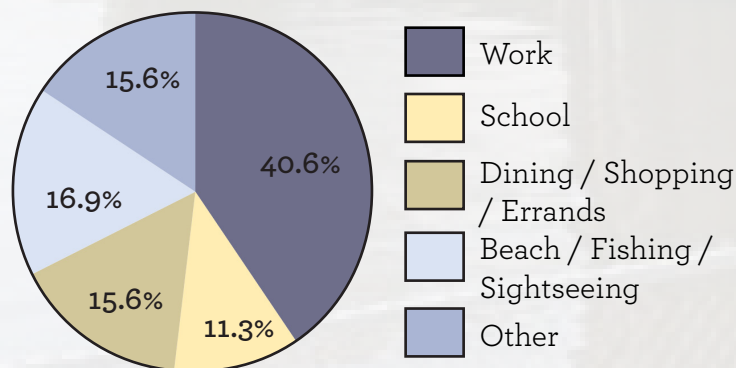
The Aurora-Bayview route connects the towns of Aurora and Bayview in Beaufort County, North Carolina. It transported 57,886 vehicles in 2016, with an average vehicle occupancy of 1.4 passengers. The Aurora-Bayview route reached peak operations during the months of May, June and July in 2016. Operating primarily as a local commuter route, 91.7 percent of ridership are permanent residents, 7.1 percent are visitors and 1.2 percent are seasonal residents. The highest proportion of ferry trips made by Aurora-Bayview customers are for work (40.6 percent), followed by beach/fishing/sightseeing trips (16.9 percent), dining/shopping/errand trips (15.6 percent) and school (11.3 percent). Trips made for other purposes comprise 15.6 percent of total trips.



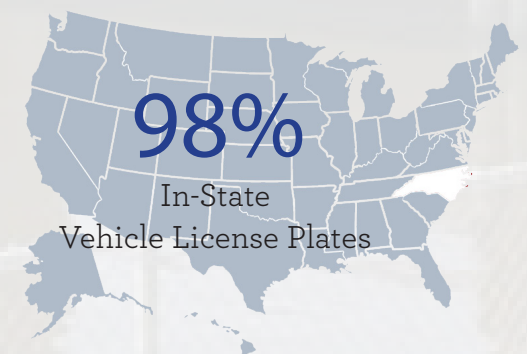
## Monthly Vehicle Trips



## Trip Purpose



## Origin of Riders



# Economic Contribution

Aurora-Bayview ferry operations facilitate economic activity by enabling passengers to reach work, retail, recreational, educational and other destinations. As passengers conduct economic transactions at these locations, it helps Beaufort County's community and North Carolina's economy by supporting employment, earned income, economic output and tax revenue. Additionally, study findings show that ferry operations enable passengers to achieve safety benefits, travel time savings and transportation cost savings (fuel and personal vehicle maintenance).

**120**  
Total Jobs  
(Direct, Indirect and Induced)

**\$5.0M**  
Earned Wages  
(Direct, Indirect and Induced)

**\$17.9M**  
Business Output  
(Direct, Indirect and Induced)

**\$0.4M**  
Tax Revenue  
(Local and State)

**91%**

said the ferry was **somewhat** or **very important** in their decision to make the trip.

## ANNUAL TRAVEL BENEFITS

 **\$0.4M**  
SAFETY BENEFITS\*

 **\$0.9M**  
TRAVEL TIME BENEFITS\*

 **\$2.1M**  
TRANSPORT COST SAVINGS\*


 **\$3.4M**  
NET TRAVEL BENEFITS  
Source: ITRE



Photo Source: ITRE

“  
*By me catching the ferry, it saves me time and money for my trips to work!*  
”  
Aurora - Bayview Survey Respondent

\*Study findings demonstrate that trips made using ferry services can be safer, more time-efficient, and less expensive than driving. Passenger survey data shows that in some instances, people would forego making trips, such as medical, shopping, dining and other trips that support the economy, in the absence of ferry services. The full report contains the methodologies used to calculate the travel benefits that NCDOT's ferry services provide.

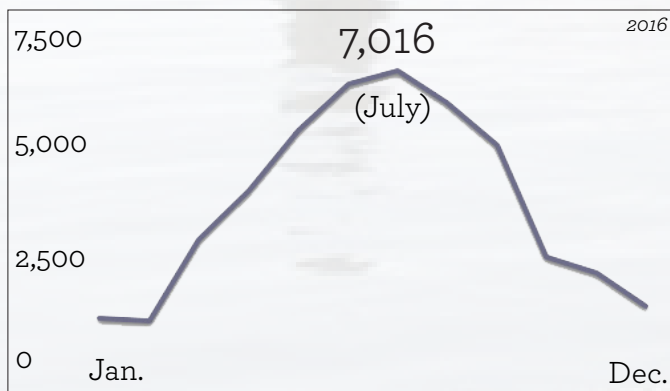


# Cedar Island - Ocracoke

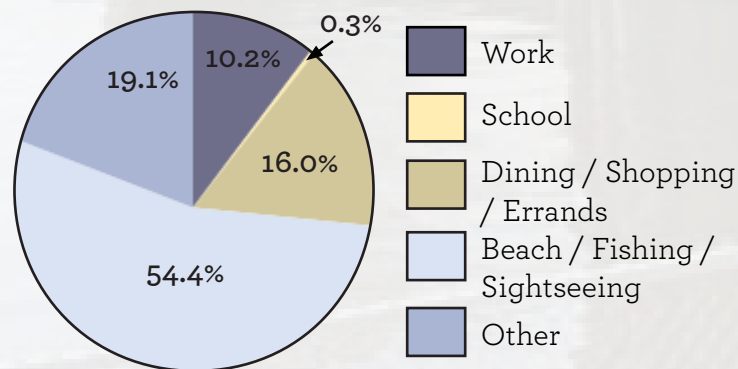
The Cedar Island–Ocracoke route connects Cedar Island to Ocracoke Island in North Carolina's Carteret and Hyde counties. It transported 49,626 vehicles in 2016 with an average vehicle occupancy of 2.3 passengers. The Cedar Island–Ocracoke route reached peak operations during July 2016. Operating both as a local and tourism route, 66.1 percent of its riders are visitors, 31 percent are permanent residents and 2.9 percent are seasonal residents. The highest proportion of ferry trips made by Cedar Island–Ocracoke passengers are for beach/fishing/sightseeing trips (54.4 percent), followed by dining/shopping/errand trips (16.0 percent), work (10.2 percent) and school (0.3 percent). Trips made for other purposes comprise 19.1 percent of total trips.



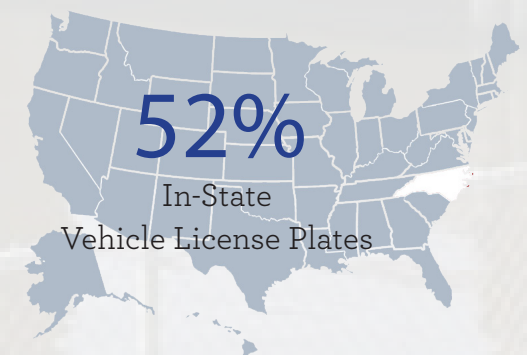
## Monthly Vehicle Trips



## Trip Purpose



## Origin of Riders



# Economic Contribution

Cedar Island-Ocracoke ferry operations facilitate economic activity by enabling passengers to reach work, retail, recreational, educational and other destinations. As passengers conduct economic transactions at these locations, it helps support Carteret County's community and North Carolina's economy by supporting employment, earned income, economic output and tax revenue. Additionally, study findings show that ferry operations enable passengers to achieve safety benefits, travel time savings and transportation cost savings (fuel and personal vehicle maintenance).

**380**  
Total Jobs  
(Direct, Indirect and Induced)

**\$44.1M**  
Business Output  
(Direct, Indirect and Induced)

**\$13.8M**  
Earned Wages  
(Direct, Indirect and Induced)

**\$2.4M**  
Tax Revenue  
(Local and State)

**95%**

said the ferry was **somewhat** or **very important** in their decision to make the trip.

## ANNUAL TRAVEL BENEFITS

 **\$3.7M**  
SAFETY BENEFITS\*

 **\$7.2M**  
TRAVEL TIME BENEFITS\*

 **\$6.2M**  
TRANSPORT COST SAVINGS\*

 **\$17.1M**  
NET TRAVEL BENEFITS

\*Study findings demonstrate that trips made using ferry services can be safer, more time-efficient, and less expensive than driving. Passenger survey data shows that in some instances, people would forego making trips, such as medical, shopping, dining and other trips that support the economy, in the absence of ferry services. The full report contains the methodologies used to calculate the travel benefits that NCDOT's ferry services provide.



Photo Source: ITRE

“  
*We have many guests visit us and a special part of their trip to NC is the ferry rides they take while here. We explore Eastern NC often and plan trips based on the ferry.*  
”

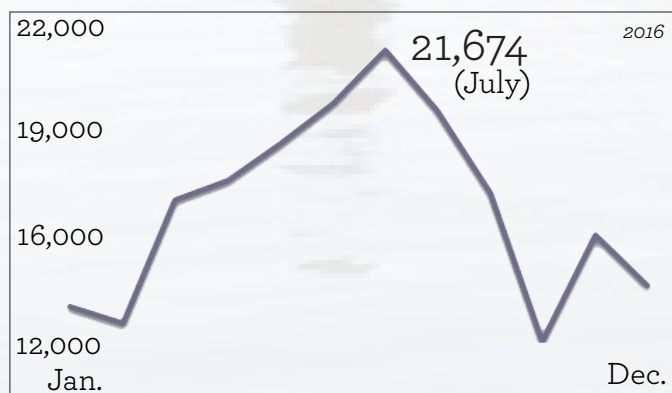
Cedar Island - Ocracoke Survey Respondent

# Cherry Branch - Minnesott Beach

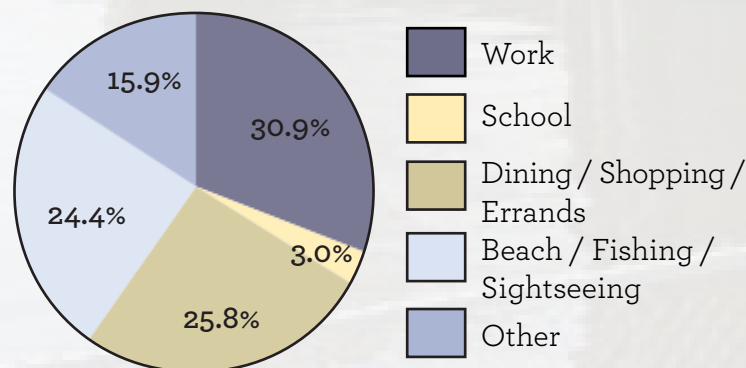
The Cherry Branch–Minnesott Beach ferry connects the towns of Havelock and Minnesott Beach (Craven and Pamlico counties). It transported 202,846 vehicles in 2016, with an average vehicle occupancy of 1.7 passengers. The ferry reached peak operations during the months of June, July and August in 2016. Operating primarily as a local commuter route, 79.9 percent of riders are permanent residents, 10.8 percent are visitors and 9.3 percent are seasonal residents. The highest proportion of ferry trips made by Cherry Branch–Minnesott Beach passengers are for work (30.9 percent), followed by dining/shopping/errand trips (25.8 percent), beach/fishing/sightseeing (24.4 percent) and school (3.0 percent). Trips made for other purposes comprise 15.9 percent of total trips.



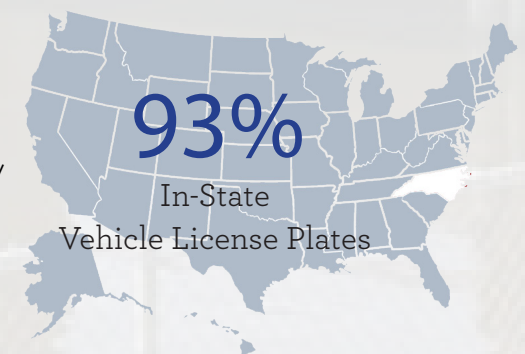
## Monthly Vehicle Trips



## Trip Purpose



## Origin of Riders



# Economic Contribution

Cherry Branch-Minnesott Beach ferry operations facilitate economic activity by enabling passengers to reach work, retail, recreational, educational and other destinations. As passengers conduct economic transactions at these locations, it helps support Craven and Pamlico counties and North Carolina’s economy by supporting employment, earned income, economic output and tax revenue. Additionally, study findings show that ferry operations enable passengers to achieve safety benefits, travel time savings and transportation cost savings (fuel and personal vehicle maintenance).

**610**  
Total Jobs  
(Direct, Indirect and Induced)

**\$24.0M**  
Earned Wages  
(Direct, Indirect and Induced)

**\$84.8M**  
Business Output  
(Direct, Indirect and Induced)

**\$2.6M**  
Tax Revenue  
(Local and State)

**84%**

said the ferry was **somewhat** or **very important** in their decision to make the trip.

## ANNUAL TRAVEL BENEFITS

 **\$2.1M**  
SAFETY BENEFITS\*

 **\$3.1M**  
TRAVEL TIME BENEFITS\*

 **\$4.9M**  
TRANSPORT COST SAVINGS\*

 **\$10.1M**  
NET TRAVEL BENEFITS

\*Study findings demonstrate that trips made using ferry services can be safer, more time-efficient, and less expensive than driving. Passenger survey data shows that in some instances, people would forego making trips, such as medical, shopping, dining and other trips that support the economy, in the absence of ferry services. The full report contains the methodologies used to calculate the travel benefits that NCDOT’s ferry services provide.



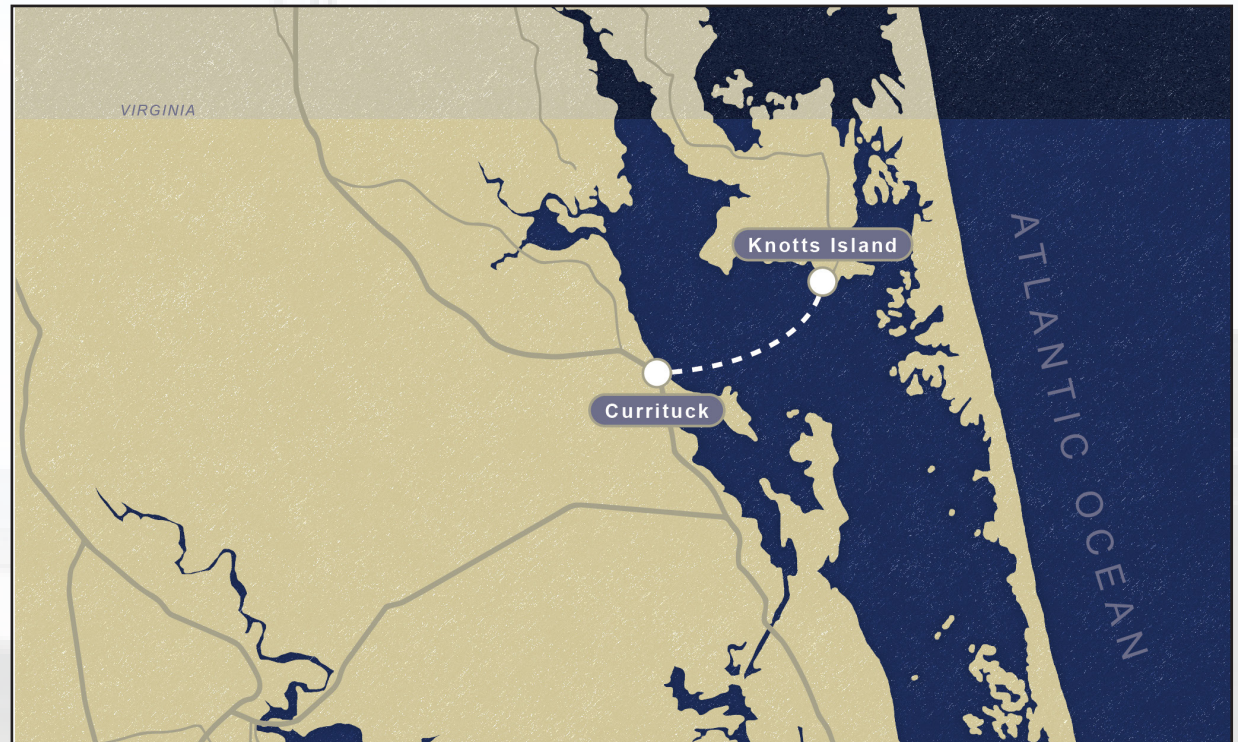
Photo Source: ITRE

“  
*Having the ferry is great! I prefer shopping in Havelock and Morehead. I wouldn’t come to those if there was no ferry.*  
”

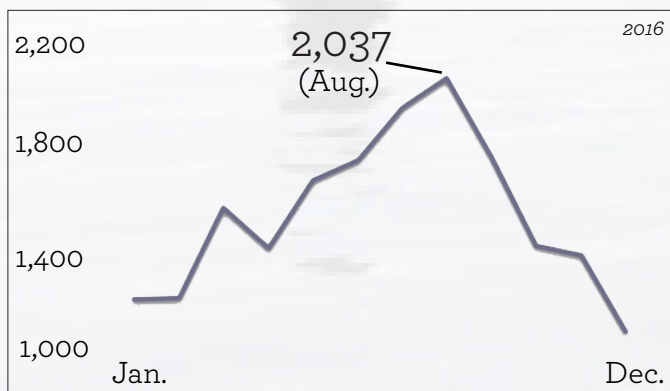
Cherry Branch - Minnesott Beach Survey Respondent

# Currituck - Knotts Island

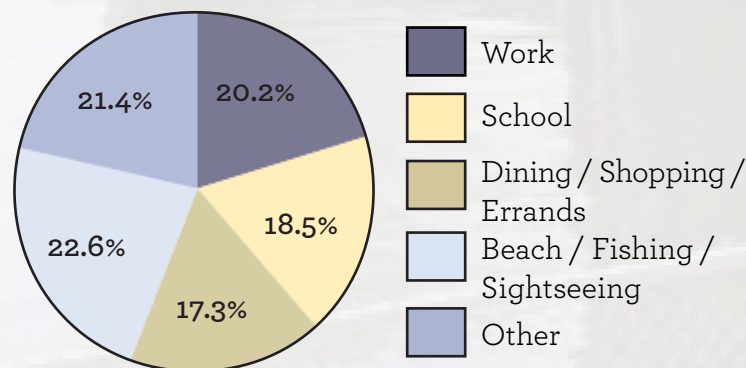
The Currituck-Knotts Island route connects North Carolina's mainland with Knotts Island (an island shared by Currituck County, North Carolina and Virginia Beach, Virginia). It transported 18,367 vehicles in 2016, with an average vehicle occupancy of 2.7 passengers. The ferry experienced peak operations during the months of July, August and September in 2016. Operating as both a local and tourism route, 62 percent of its ridership are permanent residents, 33.8 percent are visitors and 4.2 percent are seasonal residents. The highest proportion of ferry trips made by passengers are for beach/fishing/sightseeing trips (22.6 percent), followed by work (20.2 percent), school (18.5 percent) and dining/shopping/errands (17.3 percent). Trips made for other purposes comprise 21.4 percent of total trips.



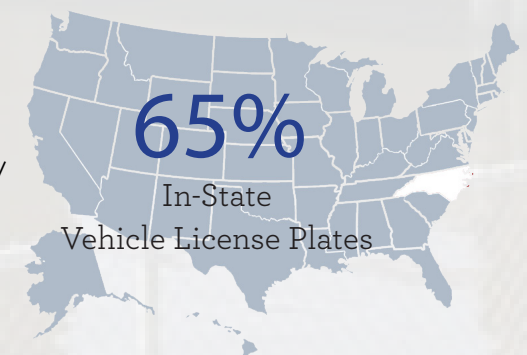
## Monthly Vehicle Trips



## Trip Purpose



## Origin of Riders



# Economic Contribution

**82%** said the ferry was **somewhat** or **very important** in their decision to make the trip.

Currituck-Knotts Island ferry operations facilitate economic activity by enabling passengers to reach work, retail, recreational, educational and other destinations. It operates as a connector for students to access school and enables fuel cost savings for school buses. As passengers conduct economic transactions at these locations, it helps support Currituck County’s community and North Carolina’s economy by supporting employment, earned income, economic output and tax revenue. Additionally, study findings show that ferry operations enable passengers to achieve safety benefits, travel time savings and transportation cost savings (fuel and personal vehicle maintenance).

**60**  
Total Jobs  
(Direct, Indirect and Induced)

**\$9.1M**  
Business Output  
(Direct, Indirect and Induced)

**\$2.7M**  
Earned Wages  
(Direct, Indirect and Induced)

**\$0.3M**  
Tax Revenue  
(Local and State)

## ANNUAL TRAVEL BENEFITS

 **\$0.5M**  
SAFETY BENEFITS\*

 **\$0.4M**  
TRAVEL TIME BENEFITS\*

 **\$0.6M**  
TRANSPORT COST SAVINGS\*

 **\$1.5M**  
NET TRAVEL BENEFITS

\*Study findings demonstrate that trips made using ferry services can be safer, more time-efficient, and less expensive than driving. Passenger survey data shows that in some instances, people would forego making trips, such as medical, shopping, dining and other trips that support the economy, in the absence of ferry services. The full report contains the methodologies used to calculate the travel benefits that NCDOT’s ferry services provide.

“  
*If not for the ferry, school buses and students would have to drive through Virginia Beach and Chesapeake, VA just to get back into N.C. to go to school.*  
”

Currituck - Knotts Island Survey Respondent



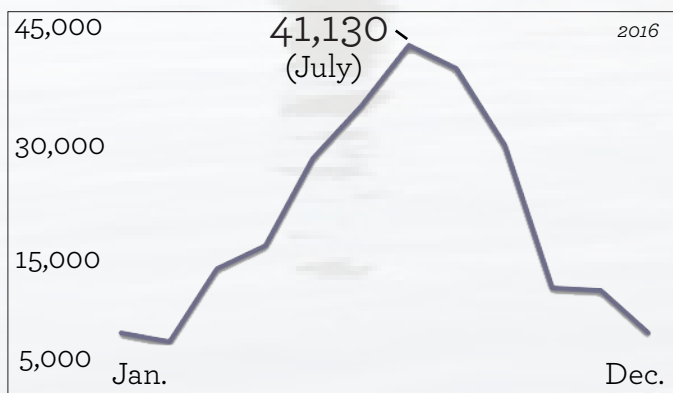
Photo Source: ITRE

# Hatteras - Ocracoke

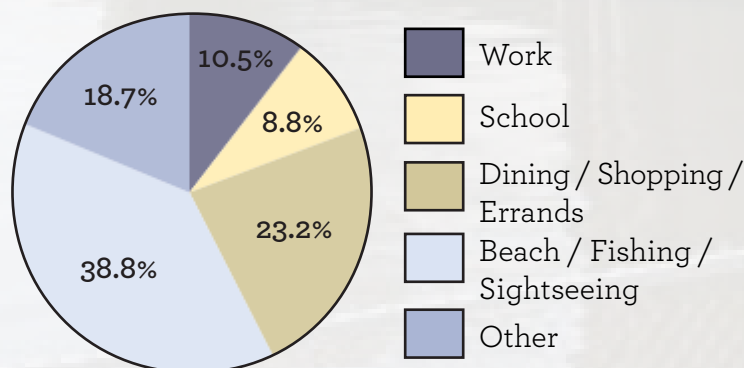
The Hatteras-Ocracoke route connects the Hatteras Inlet and Ocracoke Island in Hyde and Dare counties. It transported 255,055 vehicles in 2016 with an average vehicle occupancy of 2.5 passengers. The Hatteras - Ocracoke route experienced peak operations during the months of June, July and August in 2016. Operating largely as a route for tourists, 81.6 percent of its ridership are visitors, 14.1 percent are permanent residents and 4.3 percent are seasonal residents. The highest proportion of ferry trips made by Hatteras-Ocracoke passengers are for beach/fishing/sightseeing trips (38.8 percent), followed by dining/shopping/errands (23.2 percent), work (10.5 percent) and school (8.8 percent). Trips made for other purposes comprise 18.7 percent of total trips.



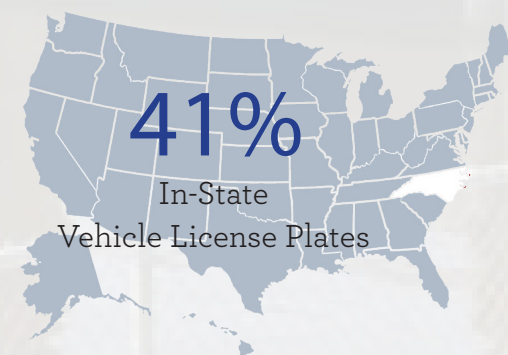
## Monthly Vehicle Trips



## Trip Purpose



## Origin of Riders



# Economic Contribution

# 91%

said the ferry was **somewhat** or **very important** in their decision to make the trip.

Hatteras - Ocracoke ferry operations facilitate economic activity by enabling passengers to reach work, retail, recreational, educational and other destinations. As passengers conduct economic transactions at these locations, it helps support Hyde and Dare counties and North Carolina's economy by supporting employment, earned income, economic output and tax revenue. Additionally, study findings show that ferry operations enable passengers to achieve safety benefits, travel time savings and transportation cost savings (fuel and personal vehicle maintenance).

## 3,360

### Total Jobs

(Direct, Indirect and Induced)

## \$414.0M

### Business Output

(Direct, Indirect and Induced)

## \$123.1M

### Earned Wages

(Direct, Indirect and Induced)

## \$19.5M

### Tax Revenue

(Local and State)

Hatteras and Ocracoke islands are key contributors to the economies of Dare and Hyde Counties, which directly employ more than 21,000 North Carolinians.<sup>1</sup> The Hatteras - Ocracoke ferry route facilitates much of this economic activity, connecting tourists and residents to shopping, dining, school, medical, work and other destinations.

The Hatteras - Ocracoke Route is the only viable way for locals on Ocracoke to get on and off the island for needed medical appointments or other necessities on the North Carolina mainland. Ocracoke island is only accessible by boat, and water transportation to the island is provided almost exclusively by ferry. Currently, there are no alternatives for travel between Hatteras and Ocracoke beyond ferry service, so safety, travel time, and vehicle operating cost savings valuations, which compare ferry service to alternative travel, were not appropriate for this route. However, it is important to note that Ocracoke businesses generate approximately \$40 million in annual sales revenue.<sup>2</sup>

# “

*The ferry is necessary for residents to have access to inland shopping, medical care, and keep our tourist activity strong.*

Hatteras - Ocracoke Survey Respondent

# ”



Photo Source: ITRE

<sup>1</sup>NC Department of Commerce. 2017. Online: available at: <http://accessnc.commerce.com/index.html>.

<sup>2</sup>US Business Locations and Business Summary Data. ESRI. 2018.

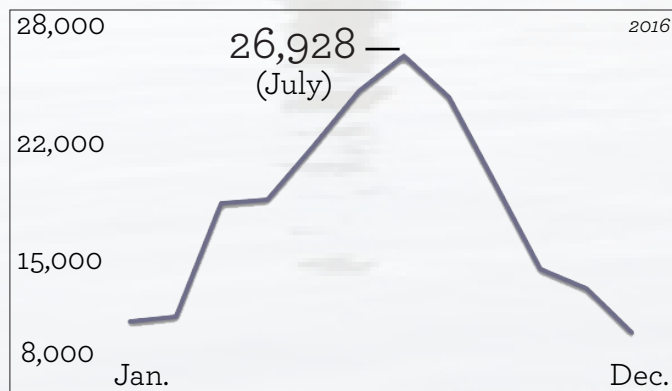


# Southport - Fort Fisher

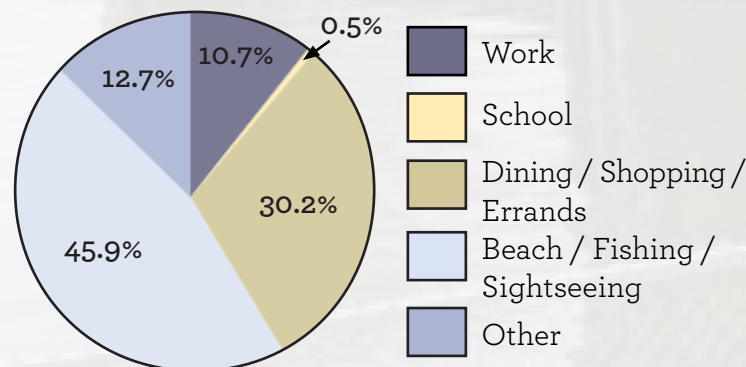
The Southport-Fort Fisher route connects the city of Southport with Fort Fisher, North Carolina. It transported 203,161 vehicles in 2016, with an average vehicle occupancy of 2.5 passengers. The Southport - Fort Fisher ferry reached peak operations during the months of June, July and August in 2016. Operating as both a local and tourism route, 50.4 percent of its ridership are permanent residents, 41.2 percent are visitors and 8.4 percent are seasonal residents. The highest proportion of ferry trips made by Southport - Fort Fisher passengers are for beach/fishing/sightseeing trips (45.9 percent), followed by dining/shopping/errands (30.2 percent), work (10.7 percent) and school (0.5 percent). Trips made for other purposes comprise 12.7 percent of total trips.



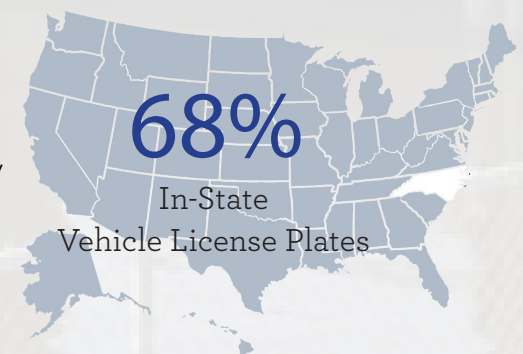
## Monthly Vehicle Trips



## Trip Purpose



## Origin of Riders



# Economic Contribution

Southport - Fort Fisher ferry operations facilitate economic activity by enabling passengers to reach work, retail, recreational, educational and other destinations. As passengers conduct economic transactions at these locations, it helps Brunswick and New Hanover counties and the North Carolina's economy by supporting employment, earned income, economic output and tax revenue. Additionally, study findings show that ferry operations enable passengers to achieve safety benefits, travel time savings and transportation cost savings (fuel and personal vehicle maintenance).

**1,075**  
Total Jobs  
(Direct, Indirect and Induced)

**\$135.7M**  
Business Output  
(Direct, Indirect and Induced)

**\$39.6M**  
Earned Wages  
(Direct, Indirect and Induced)

**\$5.7M**  
Tax Revenue  
(Local and State)

**72%**

said the ferry was **somewhat or very important** in their decision to make the trip.

## ANNUAL TRAVEL BENEFITS

 **\$1.2M**  
SAFETY BENEFITS\*

 **\$1.1M**  
TRAVEL TIME BENEFITS\*

 **\$2.3M**  
TRANSPORT COST SAVINGS\*

 **\$4.6M**  
NET TRAVEL BENEFITS

\*Study findings demonstrate that trips made using ferry services can be safer, more time-efficient, and less expensive than driving. Passenger survey data shows that in some instances, people would forego making trips, such as medical, shopping, dining and other trips that support the economy, in the absence of ferry services. The full report contains the methodologies used to calculate the travel benefits that NCDOT's ferry services provide.



Photo Source: ITRE

“

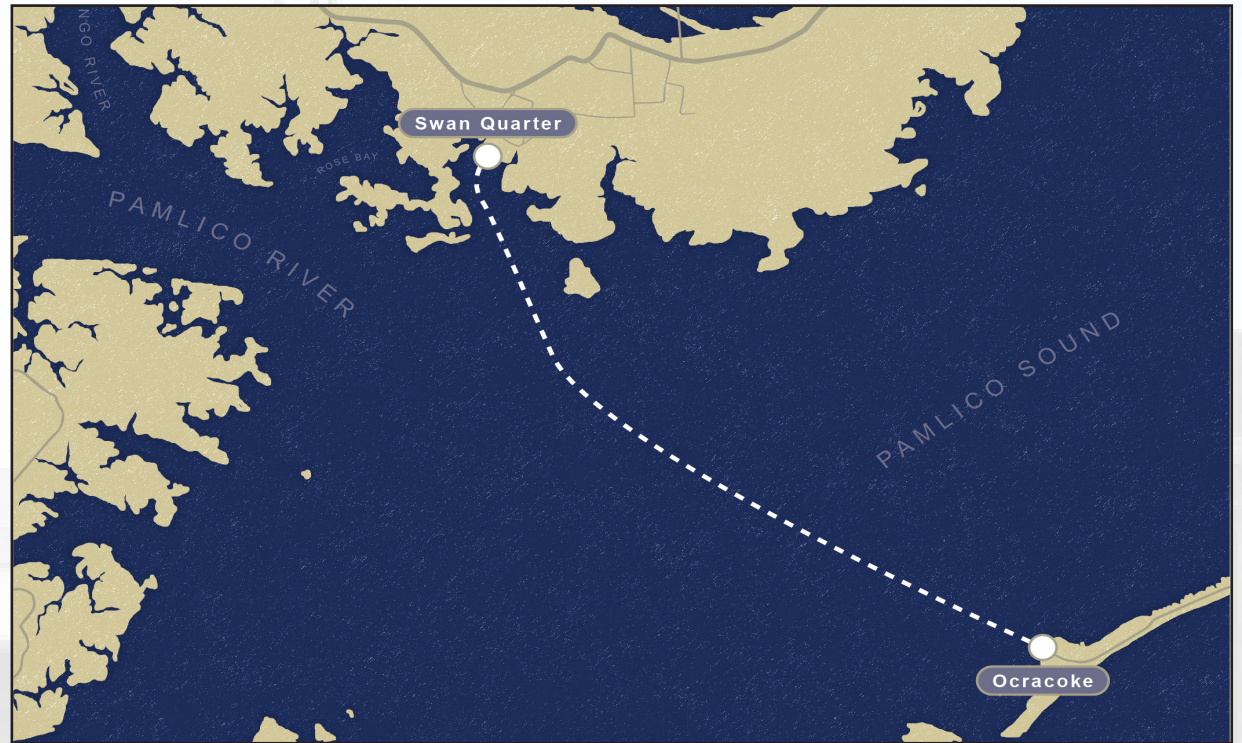
*I visit Southport via ferry once per month to enjoy coffee, food and baked goods. Plus, I just love the town's quaint atmosphere.*

Southport - Fort Fisher Survey Respondent

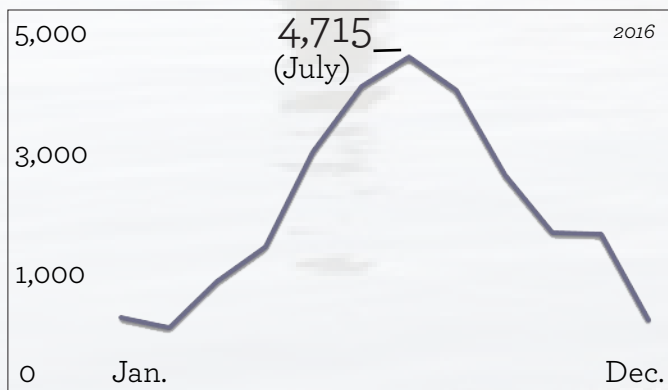
”

# Swan Quarter - Ocracoke

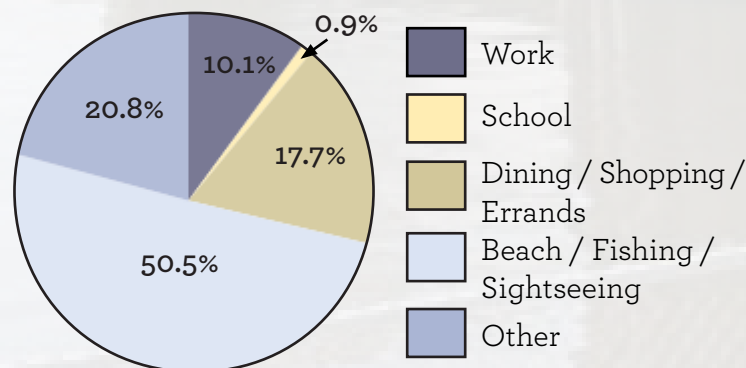
The Swan Quarter-Ocracoke ferry connects the town of Swan Quarter with Ocracoke Island. It transported 32,303 vehicles in 2016, with an average vehicle occupancy of 2.1 passengers. The route reached peak operations during the months of June, July and August in 2016. Operating as both a tourism and local route, 52.8 percent of its ridership are visitors, 38.9 percent are permanent residents and 8.3 percent are seasonal riders. The highest proportion of ferry trips made by Swan Quarter-Ocracoke passengers are for beach/fishing/sightseeing trips (50.5 percent), followed by dining/shopping/errands (17.7 percent), work (10.1 percent) and school (0.9 percent). Trips made for other purposes comprise 20.8 percent of total trips.



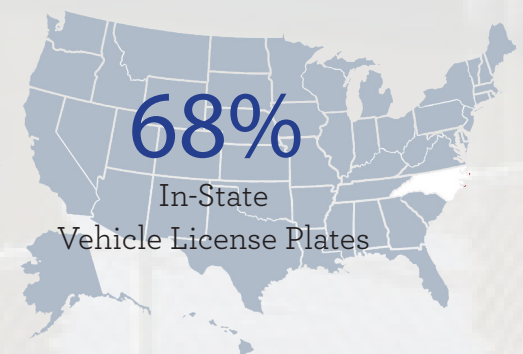
## Monthly Vehicle Trips



## Trip Purpose



## Origin of Riders



# Economic Contribution

Swan Quarter-Ocracoke ferry operations facilitate economic activity by enabling passengers to reach work, retail, recreational, educational and other destinations. As passengers conduct economic transactions at these locations, it helps support Hyde County and North Carolina's economy by supporting employment, earned income, economic output and tax revenue. Additionally, study findings show that ferry operations enable passengers to achieve safety benefits, travel time savings and transportation cost savings (fuel and personal vehicle maintenance).

**255**  
Total Jobs  
(Direct, Indirect and Induced)

**\$29.6M**  
Business Output  
(Direct, Indirect and Induced)

**\$9.1M**  
Earned Wages  
(Direct, Indirect and Induced)

**\$1.6M**  
Tax Revenue  
(Local and State)

**90%**

said the ferry was **somewhat or very important** in their decision to make the trip.

## ANNUAL TRAVEL BENEFITS

 **\$0.4M**  
SAFETY BENEFITS\*

 **\$1.2M**  
TRAVEL TIME BENEFITS\*

 **\$2.0M**  
TRANSPORT COST SAVINGS\*

 **\$3.6M**  
NET TRAVEL BENEFITS

\*Study findings demonstrate that trips made using ferry services can be safer, more time-efficient, and less expensive than driving. Passenger survey data shows that in some instances, people would forego making trips, such as medical, shopping, dining and other trips that support the economy, in the absence of ferry services. The full report contains the methodologies used to calculate the travel benefits that NCDOT's ferry services provide.



Photo Source: ITRE

“

*I travel with my toddler 1-2 times a month to visit family in Swan Quarter, grocery shop for essentials, attend medical and dental appointments, and visit the DMV or NC Works. We always feel safe and we appreciate ferry runs.*

Swan Quarter - Ocracoke Survey Respondent

”

# Local Attractions Within Proximity of the Ferry System

**N**CDOT's ferry division facilitates employment by providing ferry passengers access to commercial destinations. As passengers conduct economic transactions at these locations the state's economy is supported through employment, earned income, tax revenue, and economic output. Each of North Carolina's seven ferry routes offers services to coastal communities with a variety of local attractions. Below is a list of local attractions within the vicinity of the North Carolina ferry system's terminals. This list is not exhaustive; it is meant to be representative of a sample of the attractions proximate to the ferry terminals.

**A**urora-Bayview: Operating in Beaufort County, this ferry route's terminals are proximate to four golf courses, six museums (Aurora Fossil, Belhaven Memorial, and Pantego Academy, Palmer-Marsh House, Bonner House, Washington Waterfront Underground Railroad Museum), art galleries with rotating exhibits, a state-of-the-art palace theatre, tennis courts, Goose Creek State Park, and a plethora of waterways (Pamlico River, Pungo River, Pantego Creek, Blounts Creek, Tranter's Creek, their tributaries and other creeks) available for boating, fishing, and paddlers.

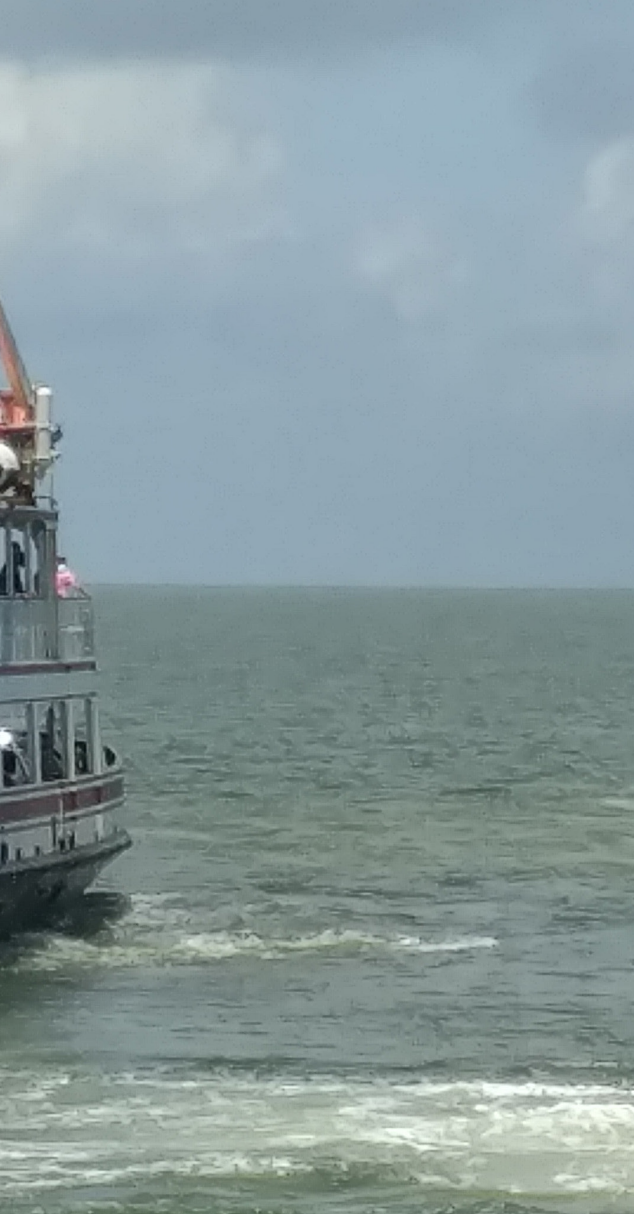
**C**edar Island: Located in Carteret County, the Cedar Island ferry terminal is near Beaufort, Morehead City, Harkers Island, Shackelford Banks, the Cape Lookout National Seashore, as well as other



Photo Source: ITRE

popular tourist destinations on North Carolina's Crystal Coast. Beaufort was named by *Travel + Leisure* as "America's Favorite Town." It offers state parks (Fort Macon, Hammocks Beach, Elliot Coues Nature Trail), the Cape Lookout National Seashore, museums (Beaufort Historic Site, N.C. Maritime Museum, Harvey W. Smith Watercraft Center, History Museum of Carteret County, Core Sound

Waterfowl Museum), cocktails and seafood overlooking the water, kayaking, among other visitors' favorites. Morehead City is the largest community in North Carolina's Crystal Coast; it features boutique shops, eateries and live entertainment. Atlantic Beach has access to one of the nation's "Best Beaches," according to *Coastal Living Magazine*. Harkers Island



hosts the Cape Lookout National Seashore Visitor Center and the Core Sound Waterfowl and History Museum. Cape Lookout National Seashore offers 56 miles of undeveloped beach sand, accessible only by boat. One of the most popular draws to this region are the Shackleford Banks, part of the Cape Lookout National Seashore, where visitors can see wild

horses, go shelling, fishing, lighthouse climbing or kayaking. (For information about Ocracoke attractions see the Hatteras-Ocracoke section.)

**C**herry Branch-Minnesott Beach: Connecting the southeast corner of Craven County with Pamlico County, the Cherry Branch- Minnesott Beach ferry terminals are close to numerous recreational activities. Visitors to the region can enjoy more than 1,200 miles of mapped paddle trails, as well as fishing, hunting and golfing. People can also visit art galleries, ride horses, and photograph scenery and wildlife.

**C**urrituck-Knotts Island: This mainland-island connector joins the region that has been branded as the “heart and soul” of the Outer Banks. The Currituck mainland hosts museums, the Currituck Beach lighthouse, breweries, vineyards, and hang gliding lessons. Knotts Island offers a variety of recreational activities including bird watching, hiking, biking, hunting, fishing, boating and camping.

**H**atteras-Ocracoke: The Hatteras-Ocracoke ferry boasts the highest number of annual ferry passengers and connects the Cape Hatteras National Seashore to Ocracoke Island. There are many attractions for visitors to enjoy including historic sites and museums, restaurants, breweries, art galleries and recreational opportunities (beaches, nature trails, surfing, kite surfing). According to the National Park Service, more than 2.1 million people visited the Cape Hatteras National Seashore and its surrounding attractions in 2016.

**S**outhport-Fort Fisher: Operating in Brunswick County, this ferry crosses the Cape Fear River to connect historic Southport with North Carolina’s southeastern coastline. Southport features beautifully restored homes, churches, public buildings and tree-lined streets. It has been the setting of more than a dozen feature films, documentaries or TV series and draws tourists who are interested in visiting its numerous Hollywood film locations. In addition to on-screen locations, other Southport and Fort Fisher attractions include: the North Carolina Aquarium at Fort Fisher, Fort Fisher State Historic Site, North Carolina Maritime Museum at Southport, Southport Pier and Riverwalk, Bald Head Island, Fort Fisher State Recreation Area, Zeke’s Island Reserve, art galleries, seaside restaurants, creameries, wineries and breweries.

**S**wan Quarter: Operating in Hyde County, the Swan Quarter ferry terminal is near local attractions (Mattie Arts Center, Lake Mattamuskeet and the Historic Mattamuskeet Lodge), boating, fishing, hunting locations for waterfowl, bear and deer, restaurants on the Outer Banks Catch registry for local and fresh seafood, the Cedar Island National Wildlife Refuge and other destinations. (For information about Ocracoke attractions see the Hatteras-Ocracoke section.)

## Economic Contribution Summary with Ferry-Supported Tourism and Its Effect on Economic Output

Route	Tax Revenue (Local and State)	Total Jobs (Direct, Indirect, Induced)	Earned Wages (Direct, Indirect, Induced)	Economic Output (Direct, Indirect, Induced)	Tourism % of Economic Output	Output Supported by Tourism
Aurora - Bayview	\$400,000	120	\$5,000,000	\$17,900,000	8%	\$1,400,000
Cedar Island - Ocracoke	\$2,400,000	380	\$13,800,000	\$44,100,000	68%	\$29,800,000
Cherry Branch - Minnesott Beach	\$2,600,000	610	\$24,000,000	\$84,800,000	19%	\$16,200,000
Currituck - Knotts Island	\$300,000	60	\$2,700,000	\$9,100,000	37%	\$3,400,000
Hatteras - Ocracoke	\$19,500,000	3,360	\$123,100,000	\$414,000,000	79%	\$327,400,000
Southport - Fort Fisher	\$5,700,000	1075	\$39,600,000	\$135,700,000	47%	\$63,500,000
Swan Quarter - Ocracoke	\$1,600,000	255	\$9,100,000	\$29,600,000	60%	\$17,700,000
<b>NCDOT Ferry System</b>	<b>\$32,500,000</b>	<b>5,860</b>	<b>\$217,300,000</b>	<b>\$735,200,000</b>	<b>62%</b>	<b>\$459,400,000</b>

Source: ITRE

North Carolina's seven ferry routes facilitate economic activity by enabling residents and tourists to reach local attractions where they make purchases (as shown by passenger survey data). These purchases help support North Carolina's economy. The table above demonstrates the estimated share of economic output supported by tourist expenditures as modeled from

fall, winter, spring, and summer passenger ferry surveys (the approach used to estimate jobs, earned wages, economic output and tax revenue is discussed in the "Methodology, Data Collection, and Definitions" section). Purchases made by passengers who identified as visitors or seasonal residents were classified as tourism expenditures. Economic output supported by permanent residents and

the N.C. Ferry Division operations and capital expenditures were not included in the "tourism percentage of economic output" or "economic output supported by tourism" columns. Direct, indirect and induced economic output supported by visitor and seasonal resident spending were aggregated by route.