ECONOMIC IMPACT OF THE PROPOSED REEDVILLE-CRISFIELD FERRY SERVICE

FINAL

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I. ECONOMIC IMPACT OF FERRY OPERATIONS

This chapter presents the estimated economic impacts generated by a proposed passenger and vehicle ferry service operating between Reedsville, Northumberland County, VA and Crisfield, Somerset County, MD. The impacts presented in this chapter focus on the impacts generated by the ferry's operations, that is, ferry service employees, local expenditures and passenger traffic. The potential impacts generated by the proposed service on trucking dependent business and the tourism sectors are presented in the following chapter. Multipurpose terminal operations are also addressed in Chapter III. The balance of this chapter presents a description of the hypothetical ferry service used in the economic impact analysis, cost data developed as inputs to the economic impact model and analysis, and the resulting economic impacts generated by the modeled ferry services.

1. DESCRIPTION OF THE PROTOTYPE FERRY SERVICE

Two earlier studies regarding cross-Chesapeake Bay ferry service feasibility prepared for Somerset County, the City of Crisfield, Northumberland County and Northern Neck Planning Commission in 2004 and 2005 identified three potential prototype ferry service operations.[1] The three ferry service scenarios are:

- High Speed Catamaran – 40 kts, up to 149 passengers and 54 autos, $35 million cost per vessel
- Medium Speed Catamaran – 20 kts, up to 244 passengers, 55 autos or 18 autos and 8 heavy trucks, $16-18 million cost per vessel
- Conventional Displacement Monohull – 16.5 kts, 149 persons, 35 autos or 14 trucks, $2.5-3 million cost per vessel.

The second report eliminated the High Speed service for further evaluation due to the high acquisition cost of the ferry. This report estimated total capital cost of the two remaining services (including two vessels; terminal, land and maintenance facilities costs) to be $47 million for the Medium Speed Service and $19 million for the Conventional Monohull service. The study recommended a 20+ kts vessel be used on this service.

The Martin Associates team reviewed the vessel operations and cost data of the recent study and interviewed nine ferry operators and naval architects/boat builders to estimate capital and operating costs associated with the ferry services to confirm the earlier data and to add additional costs and assumptions that were not included in the study. Administrative staff and terminal workers were added to operational pro forma of the service. These data were used as cost inputs for the Ferry Operations Cost Model developed for the economic impact analysis.

For the economic impact analysis, it is assumed two vessels are in operation in this service. A transit time of 1.5 hrs between Reedville and Crisfield was identified in the 2005 study as the required transit time for the service to be feasible. To achieve this transit time, a ferry would have to operate at speeds in excess of 23 kts. Vehicle queuing, loading and discharging times were assumed to be similar to that experienced with the Cape May-Lewes ferry. Trucks are requested to arrive 1 hour before sailing time for security measures and all vehicles must report in to the office no later than 30 minutes before the sailing time. All vehicles are off the

[1] Maryland – Virginia Ferry Feasibility Study, Step One Report, PB Consult, Inc., PBQ&D, Inc. and FMX Associates, June 2004.
Maryland – Virginia Ferry Feasibility Study, Step Two - A Report, PB Consult, Inc., PBQ&D, Inc. and FMX Associates, February 2005.

vessel within 10-15 minutes after arrival. For this analysis it was assumed queuing, loading and discharge would require 1.25 hours. (Currently the Cape May-Lewes ferry operation permits drive-up service but is transitioning towards a 100% reservation system for vehicles).

The proposed service operates 18 hours in the summer and 12 hours during the winter. On average there are 15 transits daily by the two ferries. Annual capacity of the ferry service is 220,000 cars and trucks. As a result, each ferry transit will transport 40 vehicles (cars and trucks).

The following section presents the operating costs of the ferry service described above which are used in the Ferry Costing Model developed for the economic impact analysis.

2. FERRY SERVICE COST OF OPERATIONS

The following operational assumptions were developed from interviews with ferry service operators, ferry agents and ferry designers/builders. The businesses interviewed included Tangier Island Cruises, Oxford-Bellevue Ferry, Golden Gate Ferries (the person interviewed is a recent former manager of the Wood's Hole Steamship Authority as well), Delaware River & Bay Authority (Cape May-Lewes Ferry), and Marcon International (agent) as well as designers and builders Kirilloff Associates, Art Anderson Associates and Sea Transport Solutions. The purpose of these interviews was to determine the amount of purchases by type of expenditure made by the vessels during the course of the year. Types of purchases include vessel purchases for:

- Ship stores - food, liquor, retail items
- Bunkers
- Water
- Local advertising
- Maintenance and repair
- Trash disposal
- Insurance.

The expenditure profile of the service in the 2005 study supplemented by the results of these interviews were used to develop a typical ship disbursement account profile. The following cost assumptions were incorporated into the Ferry Costing Model:

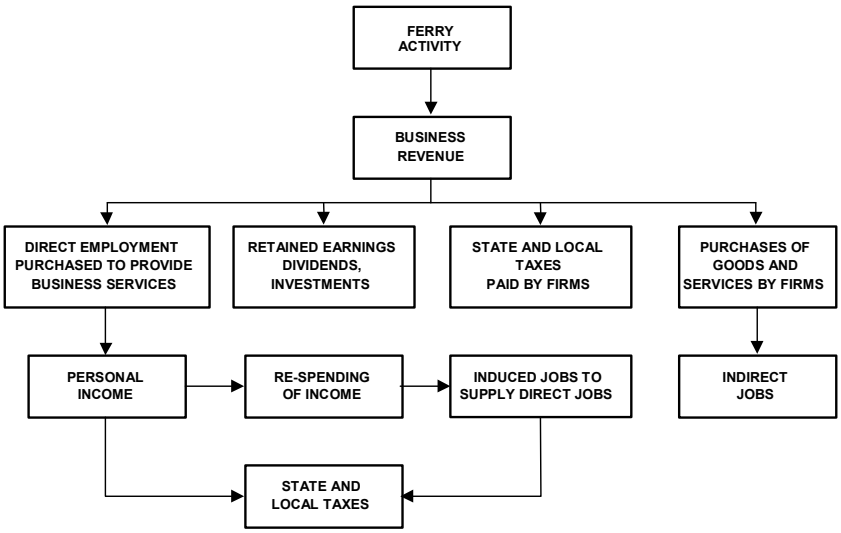
- 4-person crew per vessel
- 8 management and office staff personnel
- 2 ramp attendants per terminal
- $1.8 million annual payroll
- $4.3 million annual fuel cost
- $100,000 annual insurance
- $400,000 annual maintenance and repair costs
- $100,000 other miscellaneous annual costs

These data are entered into the Ferry Service Economic Impact Model to estimate the direct, indirect and induced impacts generated by the proposed ferry service. The estimated economic impacts of the proposed ferry service operations are presented in the following section.

3. ECONOMIC IMPACT OF PROPOSED FERRY SERVICE OPERATIONS

The ferry service will contribute to the local economy by generating business revenue to firms providing vessel, passenger, and ship services. These firms, in turn, provide employment and income to individuals, and pay taxes to state and local governments. Exhibit 1 shows how ferry activity generates impacts throughout the local and states economies. As this exhibit indicates, the impact of the ferry activity cannot be reduced to a single number, but instead, creates several impacts. These are the **revenue impact, employment impact, personal income impact,** and **tax impact**. These impacts are non-additive. For example, the income impact is a part of the revenue impact, and adding these impacts together would result in double counting. Exhibit 1 shows graphically how the ferry activity generates economic impacts.

Exhibit 1
Flow of Economic Impacts Generated by Ferry Activity



At the outset, ferry activity generates **business revenue** for firms which provide services. This business revenue impact is dispersed throughout the economy in several ways. It is used to hire people to provide the services, to purchase goods and to make federal, state and local tax payments. The remainder is used to pay stockholders, retire debt, make investments, or is held as retained earnings. It is to be emphasized that the only portions of the revenue impact that can be definitely identified as remaining in the local economy are those portions paid out in salaries to local employees, for local purchases by individuals and businesses directly dependent on the seaport, and in contributions to state and local taxes.

The **employment impact** of the ferry service consists of three levels of job impacts.

- Direct employment impact - jobs directly generated by the ferry service. Direct jobs include jobs with the firms providing services to the vessel and passengers as well as ship repair activity. It is to be emphasized that these are classified as directly generated in the sense that these jobs would experience near term dislocation if the ferry activity were to be discontinued.

- Induced employment impact - jobs created throughout the local economy because ***individuals*** directly employed due to the ferry service spend their wages locally on goods and services such as food, housing and clothing. These jobs are held by residents

located throughout the region, since they are estimated based on local and regional purchases.

- Indirect Jobs - jobs created locally due to purchases of goods and services ***by firms, not by individuals***. These jobs are estimated directly from local purchases data supplied to the Martin Associates team by the companies interviewed as part of this study, and include jobs with local office supply firms, maintenance and repair firms, parts and equipment suppliers, etc. It is to be emphasized that special care was taken to avoid double counting, since the current study counts certain jobs as direct (i.e., jobs with local suppliers of liquor, food, hotel services, etc.) which are often classified as indirect by other approaches, notably the input/output model approach.

The **personal earnings impact** is the measure of employee wages and salaries (excluding benefits) received by individuals directly employed due to the ferry service. Re-spending of these earnings throughout the regional economy for purchases of goods and services is also estimated. This, in turn, generates additional jobs -- the induced employment impact. This re-spending throughout the region is estimated using a regional personal earnings multiplier, which reflects the percentage of purchases made by individuals that are spent within the area's economy.

Federal, state and local **tax impacts** are tax payments to the federal, state and local governments by firms and by individuals whose jobs are directly dependent upon and supported (induced jobs) by the ferry service. For this study, which focuses on the impacts on the Reedville, VA and Crisfield, MD regional economies, only state and local taxes are included.

3.1 Potential Economic Impacts of a Ferry Service on the Local Reedville and Crisfield Economies

The ferry service will create impact in two sectors of the local economy:

- Maritime and Vessel Support Services Sector
- Visitor Industry Sector.

The **maritime and vessel support services sector** includes those firms that provide services to the ferry vessel while in port at Reedville or Crisfield, such as:

- Chandlers and other local retailers and wholesalers that provide ship stores and provisions to be used by passengers and crew
- Bunkering services that provide fuel to the vessels
- Local laundry services
- Local electronics and communications support services
- Local repair and maintenance services
- Local insurance agents
- Local security.

It is also assumed that terminal workers directing traffic and ticket operations will also be stationed at the terminal to support the ferry service. The estimated expenditures by category for this service, identified in Section 2, were associated with jobs to sales ratios with the types of

firms providing the goods and services to the ferry call. These jobs to sales ratios, as well as personal income levels, were developed from the U.S. Bureau of Census data sources for the Commonwealth of Virginia and the State of Maryland. The total annual expenditures, by type of service, is multiplied by the corresponding jobs to sales ratios to estimate the total direct job impacts in the maritime support service sector. The revenue impacts are estimated directly from the expenditure profiles as well as from estimated fare revenue generated by the service. Direct income is estimated from the average annual salaries developed by type of firm, from the interviews.

If all vessel support services purchases are made in Reedville or Crisfield areas, it is estimated that the service will generate about $4.9 million of local purchases to support the vessel operations annually assuming 365 days of operation with 15 transits daily. This does not include the revenue from the passenger's purchases ashore.

The **visitor industry sector** consists of firms providing services to the passengers and crew of the cruises prior to and after the cruise. Included in this category are:

- Hotels and motels
- Restaurants/bars
- Retail goods.

The jobs generated in the Visitor Industry/Tourism Sector (for example, hotels, restaurants, etc.) are driven by the number of passengers per vessel call, the percent stopping on a day trip and spending money locally, and the percent of these individuals that will spend one night in the Reedville or Crisfield areas prior to boarding or after departing the ferry. To gather information about tourism spending in the Reedville and Crisfield areas, Martin Associates conducted interviews with the Northern Neck Tourism Council, Virginia Tourism Corporation, Somerset County Tourism and the Maryland Office of Tourism. Additional in-house data maintained by Martin Associates from previous economic impact studies of ferry service were also incorporated.

The drive-through market represents those persons using personal automobiles for commuting or other personal/pleasure reasons. Commuter activity would occur during morning and afternoon rush hours and is concerned with transit time and ferry schedule. Depending on their time constraints, it is unlikely commuter will rely on the ferry operation. Pleasure users of the ferry are likely to use the service anytime of day and are not dependent following timelines with specific start and stop times. Persons in this market may or may not follow the same route on their return trip and if they do, their return may be days, weeks or months away. This market will include persons looking to avoid using the CBBT, those looking for a break in driving as well as those willing to divert from their normal route of travel to experience the "novelty" of riding the ferry. A portion these patrons are likely to stop on either side of the Chesapeake Bay for food and beverages if they choose not to purchase these items aboard the ferry (if available). The remaining pass-through patrons will likely continue on to their destination as quickly as possible. Local "sightseeing" activity may occur however their primary purpose for using the ferry is to pass through the local area. Somerset County Tourism estimates over 10,000 calls are received annually regarding a possible ferry service in the area to bypass the CBBT. Other potential users are interested in avoiding delays around metropolitan areas, looking for a short-cut or looking to find a faster way across the Bay.

Local, regional and state tourism offices in Virginia and Maryland were interviewed regarding the visitor/tourism in the Somerset County, MD and Northumberland County, VA areas. Visitor counts and expenditure data for the areas are limited. Estimated visitor expenditure data are available by county in Maryland but visitor count data associated with those expenditures do not exist. Visitor counts by attraction are available for some attractions but there are no

expenditure data and there is the potential of double counting visitors who visit multiple attractions.

Findings from the tourism interviews indicate an average one night stay at local hotels. Somerset County Tourism reports 155,000 visitors to the County's two Visitor Centers, 40,000 visitors to yearly events in Crisfield and 14,500 visitors to the County Historical Museum. It reports the average overnight stay in the area by visitors is one night and the average hotel rate is $105/night. Northern Neck Tourism Council estimates 350,000-400,000 tourists annually. Hotel rates in the region range from $60-80/night and bed & breakfasts are around $100/night.

The interviews, as well as review of earlier reports, suggest the ferry service will benefit the local/regional tourism market. Expectations are that the number of tourists passing through Reedville and Crisfield will increase but have not/cannot be quantified. For those wishing to tour or vacation on both sides of the Chesapeake Bay in areas local to Reedville and Crisfield, the ferry service may be an attractive alternative if not just for the "novelty" of the service.

Based on the available data, it is assumed 75% of the ferry passengers will stop in either Reedville or Crisfield to eat; spending $5 per person; and make other purchases of $3 per person on retail items. It is also assumed that 30% of the passengers will spend one night in either the Reedville or Crisfield areas before or after the ferry trip. Furthermore, it is assumed that two people are traveling together in one auto and there is one occupant per truck. It is assumed that the average overnight accommodation (hotel or B&B) is $105 per night based on data provided by the local tourism organizations. It is assumed each crew member will spend $5 per day on food.

The average expenditures on hotel lodging and nights stayed as well as food and retail purchases are entered into the visitor industry model. Using these purchase patterns, and the appropriate jobs to sales ratios and personal income measures for the supplying firms, the visitor industry model calculates the direct, induced and indirect impacts that are generated by the types of turnaround cruise service on the Bay.

An induced impact model was then developed by Martin Associates to estimate the impact of local purchases by those directly employed due to the ferry service.

Much of the personal income that is directly generated by the ferry service and received by the individuals directly employed both in the visitors industry as well as in supplying support services to the ferry vessel is spent and re-spent throughout the local, regional and national economies. As a result of the purchases of goods and services with this personal income, additional jobs in the local and regional economies will be generated. To estimate this induced employment impact, the following steps were undertaken:

- The percentage of income spent by Virginia and Maryland area residents on various expenditure categories of the economy (i.e., housing, services, food, etc.) was estimated from the U.S. Bureau of Labor Statistics Consumer Expenditure Survey for this region.

- The ratio of employment to sales in each of the expenditure categories for both wholesale and retail purchases was then developed for the region.

- The ferry-induced consumption impact was allocated to the various expenditure categories based on the Bureau of Labor Statistics breakdown for a typical consumer in the region.

- The personal consumption impact allocated to each expenditure category will be multiplied by the ratio of employment to sales in that category to estimate the number of induced jobs for regional residents.

It should be emphasized that an input/output model is not used to estimate induced jobs. Instead of using a regionalized input/output model, we will develop our own respending categories based on area specific data, and data specific to the region in which employees dependent upon each of the airports reside.

Indirect impacts are generated by the local purchases of firms directly dependent upon the ferry activity. These impacts are estimated based on local purchase patterns, as developed during the interview process. The local and in-state purchases by the firms providing direct support services to the ferry operations are then combined with jobs-to-sales coefficients derived from the Bureau of Economic Analysis, Regional Input-Output Modeling System (RIMS II).

3.2 Ferry Service Impact Model

In order to assess the economic impacts of potential growth in the ferry business between Reedville and Crisfield, Martin Associates developed a spreadsheet framework, which can be used to assess the impacts of changes in such factors as:

- Number of vessel calls
- Passenger levels
- Passenger characteristics
  - Local expenditures
  - Day visitors versus overnight stays
- Different levels of vessel support services purchases
- Number of crew

3.3 Economic Impacts of the Proposed Ferry Operations

Three ridership scenarios were developed for the ferry service described in Sections 1 and 2 above. The three scenarios are for low, medium and high levels of ridership for the ferry. The High Scenario assumes the 15 daily average departures year-round will carry 40 autos, small trucks and heavy trucks per transit. The Medium Scenario assumes the ferry will be operating at 75% capacity year-round, or 30 autos, small trucks and heavy trucks per transit. The Low Scenario assumes a 50% year-round utilization of 20 autos, small trucks and heavy trucks. Exhibit 2 summarizes the economic impact of the proposed Reedville-Crisfield Ferry Service under the low, medium and high utilization scenarios.

Exhibit 2
Potential Economic Impacts of Ferry Service By Throughput Scenario
(Assumes all Vessel Support Services made Locally)

Economic Impact Category	Low	Medium	High
Jobs			
Direct	182	250	317
Induced	49	67	85
Indirect	206	285	364
Total	437	602	767
Personal Income ($1,000)			
Direct	$6,240	$8,671	$11,101
Induced	$3,432	$4,769	$6,105
Indirect	$4,308	$5,896	$7,483
Total	$13,981	$19,335	$24,690
Revenue ($1,000)	$16,071	$21,017	$25,963
State and Local Taxes ($1,000)	$1,482	$2,050	$2,617

Totals may not add due to rounding

Assuming all vessel support services are purchased in either Reedville or Crisfield, the proposed ferry service is estimated to support between 437 and 767 direct, induced and indirect jobs in the Reedville and Crisfield area economies, depending upon the level of passenger traffic. These are estimated in full- time equivalent jobs, for example, part-time jobs generating 20 hours of work per week (50% of a workweek) are classified as 0.5 full-time equivalent jobs. The ferry service will potentially create between $16.1 million and $26.0 million of local revenue to businesses, including the ferry operation, hotels/motels, insurance, agents, suppliers of marine bunkers and suppliers of maintenance and repair services to the ferry. Those directly employed by the ferry, both the crew and terminal jobs, as well as the jobs directly supported in the vessel support service suppliers and the visitors industry will receive between $6.2 million and $11.1 million of direct wages and salaries. As a result of the local purchases by the direct jobholders, additional induced jobs are created ranging between 49 and 85 jobs. The induced income generated by these jobs ranges from $3.4 million under the low scenario to $6.1 million under the high scenario.

Local purchases by the firms directly involved in supplying the vessels support services as well as those firms providing visitor industry services such as hotels and restaurants support another 206 to 364 indirect jobs, with indirect income ranging from $4.3 million to $7.5 million. Therefore, the total wages and salaries expected to be generated for local direct, induced and indirect job holders will range from $14 million to nearly $24.7 million.

State and local taxes generated by the ferry service will range from $1.5 million to $2.6 million annually, which includes not only personal income taxes but property, sales and hotel taxes, as well.

II. IMPACT OF PROPOSED FERRY OPERATIONS ON TRUCKING-DEPENDENT BUSINESSES AND LOCAL COMMUNITIES

This chapter presents the potential impact of the proposed Chesapeake Bay Ferry service on local or regional businesses dependent on shipping or receiving products by truck as well as the potential impacts on the local communities. The impacted businesses could possibly benefit from a shorter, quicker and lower cost transportation alternative potentially offered by the proposed service to current routings overland via the Bay and Nice Bridges to the north and the Chesapeake Bay Bridge and Tunnel (CBBT) to the south of the proposed ferry service location. Similarly, the impact of the proposed ferry service on non-commercial vehicular traffic (such as local residents, tourists and pass-through automobile traffic) is addressed in this chapter as well.

The economic impact study does not include a re-assessment of the ferry market. It does include a review of the earlier market assessments and addressing issues in those analyses or from surveys of businesses for the economic impact study that may affect the potential market identified earlier.

1. IMPACT OF FERRY SERVICE ON TRUCKING ACTIVITY

The 2005 Ferry Feasibility Study surveyed area businesses dependent on trucking to identify the potential impact of the ferry service on routings and markets. The report estimated 120-150 round-trips per day for larger heavy trucks and 40-80 round-trips per day for smaller commercial trucks for trucking dependent shippers and receivers in the Northern Neck and Crisfield areas Monday through Friday. This equates to a demand of 31,200-39,000 heavy truck round-trips and 10,400-20,800 small truck round-trips annually. The businesses anticipate using the ferry if it lowers transportation costs and reduces transit times between markets through a shorter routing and/or avoiding delays around major metropolitan areas and at bridges and tunnels. The 2004 report identifies that these shippers anticipate the ferry service will reduce transit times by at least one or two hours.

Economic development agencies and county governments in the Northern Neck, VA and Somerset County, MD areas were interviewed to identify area/regional businesses that ship and/or receive products by truck that could potentially benefit from the proposed ferry service. Fourteen businesses were contacted to determine what routing and market benefits may be realized if the ferry service were in operation. Potential transportation cost saving, expanded markets and any other benefits generated by the ferry service identified in the interviews would be translated into economic impacts. Five Maryland businesses, three Virginia businesses and one Delaware business participated in the survey.

Of the three Virginia businesses, one company on the Western Shore serves a north-south market and stated it would not benefit from the ferry service. The company produces a unique product with no existing or potential customers on the Delmarva Peninsula. The second company located on the Delmarva also serves a north-south market. About 80% is trucked north to New Jersey, New York and Pennsylvania, and 20% is trucked south to North Carolina markets. Sister plants serve the Richmond, Washington, DC and Baltimore markets. This company foresees no use for the ferry service. The third company is on the Western Shore and serves a north-south market from North Carolina to Maine. Its Eastern Shore market is 220 miles away and a trucker can serve this market in eight hours round-trip. Although this market offers a potential opportunity for the ferry service, the customer takes delivery at 7am. The issue here is whether the ferry service would be operating early enough to ensure the same 7am delivery. This market may only present one round-trip truck movement per week.

The five Maryland businesses interviewed are located on the Eastern Shore. One company is a seafood company. The product is either flown fresh out of Baltimore-Washington International Airport or is trucked to freezers in Delaware. Customers then buy the product from the warehouses. This market does not present an opportunity for the ferry service. The second company receives multiple LTL loads of raw materials daily from suppliers along the East Coast from Florida to Vermont. Finished products are also trucked out in LTL loads to distribution centers in Florida, Georgia, Texas, Nevada, Illinois, Tennessee and Pennsylvania. All trucking is arranged through the parent company's national trucking contracts. Their transportation costs would remain the same regardless of whether the ferry was used or not. The routing would be determined by the individual trucking company and if it is to its benefit. Since the movements are LTL, the trucking companies would be routing trucks to coordinate multiple pick-ups and deliveries at various locations. This company may offer a very limited opportunity for the ferry. The third company ships 30 truckloads of products daily to markets on the Delmarva, New Jersey, Philadelphia, Annapolis and southern Maryland, and eastern North Carolina. Sister operations are serving markets from facilities in Philadelphia, Baltimore, Hampton Roads, Raleigh and other locations. Inbound products are railed to Baltimore, Philadelphia, southern New Jersey and Front Royal. From here the products are trucked to the Eastern Shore. The company stated there is no benefit of the ferry operation to their trucking operations. The fourth company could potential ship five trucks weekly for half the year and two trucks weekly the following six months. However, the trucks are 70-ft long and there is concern whether the ferry could accommodate them. The company is concerned about rough seas and the impact "shaking" will have on the trailers and also the impact of salt water spray will have on beginning the corrosion process on their product. At this point the company believes it is doubtful it would use the ferry. The fifth company trucks products between Georgia and its Eastern Shore location. They have stated the trucks use I-95 and would not divert this traffic to the ferry. They did state there is a potential for one weekly truck move to North Carolina. Currently this is a 6-7 hour trip one-way.

The Delaware business is a distribution center that serves the Delmarva, Philadelphia and southeast Pennsylvania, and eastern Baltimore. This market would not benefit from using the ferry service. Other sister operations are located in Southerland, VA (serves Washington, DC market), Williamsburg, VA and a new DC in Harrisonburg, VA will serve the Baltimore market. The company indicated no potential use of the ferry service.

The interview findings presented above indicate there is no potential benefit of the proposed ferry service among these companies. The principal reason for this is that their markets are exclusive to one side of the Chesapeake Bay, north-south markets that the companies will continue to serve with their existing trucking routes, or the companies are not in control of the truck routing decisions.

Despite these findings, the 2004 and 2005 reports indicate there is a local/regional east-west market that would potential use the ferry service if it saved time (one to two hours), money and could potentially expand markets at the same time. The current study interviews indicated a possible market for north-south truck traffic using the Cape May-Lewes ferry and the CBBT together. To assess the potential of diverting a portion of these markets to the ferry, transportation models were developed to estimate time savings offered by the ferry for these east-west and north-south routings. The identification of time savings for these routings can be seen as potential economic benefits of the ferry service and their potential economic impacts can then be estimated. Transportation routing software was used to identify the most practical routing between origin-destination pairs.[2] The software estimates the transit time along the selected route based on type of road used (interstate or state highways, local roads, etc.), the distance traveled on each road type and an associated speed for that type of road. The software does not estimate delays due to traffic congestion. The following sections present the findings of these additionally analyses.

[2] PC*Miler19, ALK Technologies, Inc., Princeton, NJ

1.1 Regional East-West Market

Five cities on each side of the southern end of the Chesapeake Bay were selected to estimate the truck transit times between locations to/from the Eastern and Western Shore. Transit times were estimated using the routing software for direct east-west routings between city pairs using bridges and tunnels and also for routings between the city pairs using the Reedville-Crisfield ferry. A ferry transit time of 2.75 hours (including queuing and unloading times), as discussed in Chapter I, was used in the analysis. The analysis does not include estimations of potential transit delays around metropolitan areas and bridges and tunnels. The roadway speeds used in the 2004 report's transit time analysis reflected lower speeds due to congestion delays and were used in the current study as well. The five Western Shore cities in Virginia used in the analysis are Reedville, West Point, Williamsburg, Warsaw and Richmond. Four Maryland cities on the Eastern Shore selected for analysis are Crisfield, Cambridge, Salisbury and Ocean City. Temperanceville, VA was also included in the Eastern Shore market area. A map of these locations is shown in Exhibit 3. Exhibit 4 shows the resulting estimated transit times between the Western and Eastern Shores city-pair routings via the Chesapeake Bay bridges and tunnels and via the proposed ferry service. The exhibit also shows the time difference between the two routing scenarios. As the exhibit shows, the ferry service results in a 0-3 hour increase in transit time in all but four of the 25 city-pair routings analyzed. The exceptions are Reedville-Crisfield (which is expected), Crisfield-Warsaw, Reedville-Salisbury and Reedville-Ocean City. The time savings via the ferry ranges from 29 minutes to one hour and fourteen minutes.

Exhibit 3
Location of Cities Identified for the East-West Analysis

Exhibit 4
Comparative Transit Times between City-Pairs on the Western and Eastern Shores

Routings	Crisfield, MD	Cambridge, MD	Salisbury, MD	Ocean City, MD	Temperanceville, VA
			direct over the road routing		
Reedville, VA	4:29	3:57	4:34	4:39	3:41
West Point, VA	3:31	4:24	3:44	3:53	2:55
Williamsburg, VA	3:07	4:04	3:20	3:29	2:31
Warsaw, VA	4:18	3:21	3:57	4:23	3:39
Richmond, VA	3:51	3:40	4:16	4:21	3:23
			via ferry		
Reedville, VA	3:15	4:25	3:41	4:10	3:43
West Point, VA	4:17	5:27	4:43	5:12	4:45
Williamsburg, VA	4:49	5:59	5:15	5:44	5:17
Warsaw, VA	3:39	4:49	4:05	4:34	4:07
Richmond, VA	4:42	5:52	5:08	5:37	5:10
			increase in transit time due to ferry service		
Reedville, VA	-1:14	0:28	-0:53	-0:29	0:02
West Point, VA	0:46	1:03	0:59	1:19	1:50
Williamsburg, VA	1:42	1:55	1:55	2:15	2:46
Warsaw, VA	-0:39	1:28	0:08	0:11	0:28
Richmond, VA	0:51	2:12	0:52	1:16	1:47

Source: Martin Associates

A similar analysis was conducted for the one business interviewed that suggested the ferry service may benefit a truck routing between Somerset County and Franklin County, NC. The company stated the typical transit time experienced, including delays, is 6-7 hours. The transit time model estimated the direct routing using the CBBT is 5.4 hours, implying 0.6-1.6 hours delays along the route. The model estimates the transit time using the ferry service is 7.5 hours. This is 0.5-1.5 hours longer than the current routing. This analysis assumes the truck will arrive at the ferry terminal one hour before sailing. Additional delay time will occur if the truck arrives at the terminal earlier than the one hour assumed. Based on these analyses, the ferry service is not practical for businesses trucking east-west across the region between locations on opposite sides of the Chesapeake Bay that are concerned about transit times and "shorter" routes. This market does not present economic benefits to be measured.

1.2 Extra-Regional North-South Market

A second potential market analyzed is the north-south trucking market that is now using the Cape May-Lewes Ferry and CBBT. The proposed ferry service would offer an alternative route for trucks transiting the Delmarva and bypassing the CBBT and hence, potentially generate a positive economic benefit or impact as a result. A market analysis was not conducted as part of this study so specific north-south markets and traffic volumes were not identified for this analysis. It is assumed for this transit time analysis the northern market for the current Delmarva routing is within southern New Jersey. There is also the potential for trucks traveling south on I-95 to leave the interstate at Wilmington, DE and continue down the Delmarva. The northern market that would use the Cape May-Lewes ferry is assumed in this analysis to be the New Jersey cities of Millville, Bridgeton, Hammonton, Glassboro and Camden. The City of Wilmington, DE is also included but this routing would not use the ferry across the Delaware River but would be a direct routing over the road to the CBBT. It is assumed for this transit time analysis that the southern markets served by the CBBT are in southeast Virginia and the eastern Carolinas along and east of I-95. The cities included in the southern market for the transit time analysis are:

Franklin, VA	Plymouth, NC	Kinston, NC
Emporia, VA	Greenville, NC	Raleigh, NC
Elizabeth City, NC	Washington, NC	Cherry Point, NC
Rocky Mount, NC	Goldsboro, NC	Jacksonville, NC

Fayetteville, NC	Wilmington, NC	Myrtle Beach, SC
Lumberton, NC	Florence, SC	Charleston, SC

Exhibit 5 shows the location of the cities used in the north-south analysis.

Exhibit 5
Location of Cities Identified for the East-West Analysis

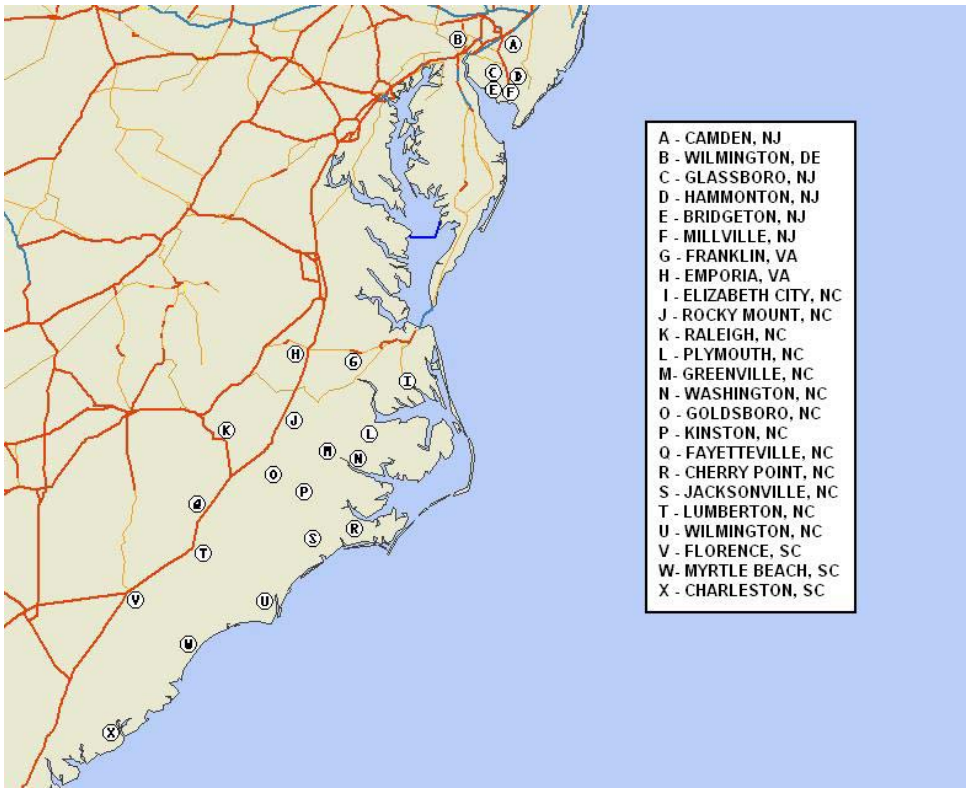


Exhibit 6 on the following page shows the estimated transit times between the New Jersey and southern market city pairs via the Cape May-Lewes ferry/CBBT routing and the Cape May-Lewes ferry/Reedville-Crisfield ferry routing. Transit times are also shown for the Wilmington-southern market routings via the CBBT routing and the Reedville-Crisfield ferry routing. The table also shows the time difference between all CBBT routings and the corresponding Reedville-Crisfield routings. As the exhibit shows, all routings via the proposed ferry service experience an increase in the transit time ranging from over 2 to 3.25 hours.

In addition to the potential increase in transit time posed by the ferry, increases in delay times will occur if trucks arrive at a ferry terminal sooner than the one hour requirement prior to sailing assumed in the analysis. Also impacting the wait time in queue is the potential incompatibility of the two ferry services' sailing schedules. Trucks departing Lewes may reach the Crisfield terminal well before the sailing time of that ferry and add to the delay time. The same would apply in the opposite direction. The decision by the DRBA to change to a 100% reservation system will also add to delays if a reserved slot on the ferry is not made and new reservations on the following ferries prove to be difficult to make (this will also be the case if the proposed Reedville-Crisfield service uses a reservation system). Based on this analysis, the ferry service is not practical for north-south routings through the Delmarva where transit times and "shorter" routes are key. The ferry routing does not identify a clear benefit in transit times to shippers that can be measured in terms of economic impacts.

Exhibit 6
Comparative Transit Times between North-South Routings through the Delmarva

Destination	CAPE MAY-LEWES FERRY ROUTING (Hours)							CAPE MAY-LEWES/CHESAPEAKE BAY FERRIES ROUTING (Hours)							INCREASE IN TRANSIT TIME WITH CHESAPEAKE BAY FERRY (Hours)						
	Atlantic City, NJ	Millville, NJ	Bridgeton, NJ	Hammonton, NJ	Glassboro, NJ	Camden, NJ	Wilmington direct to CBB&T	Atlantic City, NJ	Millville, NJ	Bridgeton, NJ	Hammonton, NJ	Glassboro, NJ	Camden, NJ	Wilmington direct to Crisfield	Atlantic City, NJ	Millville, NJ	Bridgeton, NJ	Hammonton, NJ	Glassboro, NJ	Camden, NJ	Wilmington direct to Crisfield
Franklin, VA	7:43	7:47	8:01	8:01	8:12	8:31	5:39	10:17	10:21	10:35	10:35	10:46	11:05	8:11	2:34	2:34	2:34	2:34	2:34	2:34	2:32
Emporia, VA	8:23	8:27	8:41	8:41	8:52	9:11	6:19	10:45	10:49	11:03	11:03	11:14	11:33	8:39	2:22	2:22	2:22	2:22	2:22	2:22	2:20
Elizabeth City, NC	7:48	7:52	8:06	8:06	8:17	8:36	5:44	10:46	10:50	11:04	11:04	11:15	11:34	8:40	2:58	2:58	2:58	2:58	2:58	2:58	2:56
Rocky Mount, NC	9:17	9:21	9:35	9:35	9:46	10:05	7:13	11:51	11:55	12:09	12:09	12:20	12:39	9:45	2:34	2:34	2:34	2:34	2:34	2:34	2:32
Plymouth, NC	8:48	8:52	9:06	9:06	9:17	9:36	6:44	11:39	11:43	11:57	11:57	12:08	12:27	9:33	2:51	2:51	2:51	2:51	2:51	2:51	2:49
Greenville, NC	9:20	9:24	9:38	9:38	9:49	10:08	7:16	12:35	12:39	12:53	12:53	13:04	13:23	10:29	3:15	3:15	3:15	3:15	3:15	3:15	3:13
Washington, NC	9:23	9:27	9:41	9:41	9:52	10:11	7:19	12:12	12:16	12:30	12:30	12:41	13:00	10:06	2:49	2:49	2:49	2:49	2:49	2:49	2:47
Goldsboro, NC	10:18	10:22	10:36	10:36	10:47	11:06	8:14	12:37	12:41	12:55	12:55	13:06	13:25	10:31	2:19	2:19	2:19	2:19	2:19	2:19	2:17
Kinston, NC	9:55	9:59	10:13	10:13	10:24	10:43	7:51	13:05	13:09	13:23	13:23	13:34	13:53	10:59	3:10	3:10	3:10	3:10	3:10	3:10	3:08
Raleigh, NC	10:19	10:23	10:37	10:37	10:48	11:07	8:15	12:38	12:42	12:56	12:56	13:07	13:26	10:32	2:19	2:19	2:19	2:19	2:19	2:19	2:17
Cherry Point, NC	10:32	10:36	10:50	10:50	11:01	11:20	8:28	13:21	13:25	13:39	13:39	13:50	14:09	11:15	2:49	2:49	2:49	2:49	2:49	2:49	2:47
Jacksonville, NC	10:53	10:57	11:11	11:11	11:22	11:41	8:49	13:49	13:53	14:07	14:07	14:18	14:37	11:43	2:56	2:56	2:56	2:56	2:56	2:56	2:54
Fayetteville, NC	11:05	11:09	11:23	11:23	11:34	11:53	9:01	13:24	13:28	13:42	13:42	13:53	14:12	11:18	2:19	2:19	2:19	2:19	2:19	2:19	2:17
Lumberton, NC	11:36	11:40	11:54	11:54	12:05	12:24	9:32	13:55	13:59	14:13	14:13	14:24	14:43	11:49	2:19	2:19	2:19	2:19	2:19	2:19	2:17
Wilmington, NC	12:01	12:05	12:19	12:19	12:30	12:49	9:57	14:21	14:25	14:39	14:39	14:50	15:09	12:15	2:20	2:20	2:20	2:20	2:20	2:20	2:18
Florence, SC	12:37	12:41	12:55	12:55	13:06	13:25	10:33	14:56	15:00	15:14	15:14	15:25	15:44	12:50	2:19	2:19	2:19	2:19	2:19	2:19	2:17
Myrtle Beach, SC	13:17	13:21	13:35	13:35	13:46	14:05	11:13	15:37	15:41	15:55	15:55	16:06	16:25	13:31	2:20	2:20	2:20	2:20	2:20	2:20	2:18
Charleston, SC	14:56	15:00	15:14	15:14	15:25	15:44	12:52	17:15	17:19	17:33	17:33	17:44	18:03	15:09	2:19	2:19	2:19	2:19	2:19	2:19	2:17

1.3 Summary of Trucking Activity Impacts

The previous sections presented the findings from interviews with trucking dependent businesses and transit time models regarding the potential impacts of the proposed Reedville-Crisfield Ferry service. These findings indicate there will be potentially little positive impact of the ferry service on businesses in the local and regional areas analyzed that are shipping and receiving products by truck. For those businesses looking to the ferry service as a shorter quicker route, and hence, lower cost alternative, the transit time of the ferry service itself (estimated to be 2.75 hours in the analyses) is equivalent to the increase in the total transit time of the ferry routing over the current routing excluding delays.

The timing logistics of the proposed ferry service poses an additional concern to businesses that rely on fixed shipment/delivery services. Early delivery times may not be possible if the ferry is not in operation at that time. A 7am delivery time may require a trucker to be at the departure ferry terminal at 4am or earlier to ensure that the delivery can be made if the ferry is operating at that hour. Conversely, a returning truck may not be able to make the last sailing of the day. In this instance or in the cases of a missed sailing (with the next sailing up to three hours away) or not able to leave on the next ferry, the trucker may opt to use the overland routing instead. There could be difficulty re-booking a slot on a reservation only service or making the next ferry waiting in line on a first come first served ferry service during peak periods during the day. The non-peak times for the service would be expected to be early morning and late evening. A non-reservation ferry service using a first-in/first-out operation will be less attractive to truckers particularly with a limited number of heavy truck slots per ferry in an auto-truck combination service. Based on data contained in the 2004 report and presented in Chapter I, the ferry has the potential to accommodate up to eight heavy trucks and 18 autos at one time. The use of both Chesapeake Bay and Delaware River ferry services in one direction may add to potential delays of up to 2 hours as these services' schedules may not permit an in-time arrival at the second ferry.

Based on the findings summarized above, it is unlikely the proposed ferry service will generate much interest and economic benefit to the trucking-related business sector in terms of decreased transit times and the corresponding lower transportation costs associated with it. In fact, the service has the potential to increase transit times. Therefore, economic impacts on trucking-dependent businesses were not estimated.

The same findings above imply that the projected trucking market identified in the 2005 feasibility study may be overstated. That report projected 120-150 round-trips per day for heavy trucks and 40-80 round-trips per day for small commercial trucks Monday through Friday. Based on the findings presented above, the potential truck market for the ferry service is perhaps much lower.

The potential economic impacts of the proposed ferry service on the non-trucking market is addressed in the following section.

2. IMPACT OF FERRY SERVICE ON NON-TRUCKING ACTIVITY

This section addresses the potential economic impact the proposed ferry service will have on non-trucking activity. This activity includes real estate development and other impacts on the community.

2.1 Economic Development

The Northern Neck and Somerset County areas are experiencing strong growth in the real estate market. Condominium development and single unit homes are being developed,

driven by the secondary home market. These homes are being used as weekend getaways and weekly vacation homes. One local realtor indicated the trend for these homes is for greater use during the year and estimates that secondary homes that have been purchased are approaching 50% occupancy during the year. No expenditure profiles for this market are available. There is no direct impact or linkage between residential development and the proposed ferry service. The ferry is an attraction and an amenity to persons choosing to reside in the area. Based on the transit time analyses presented earlier, the service will be a benefit to those moving between Reedville and Crisfield and less so for further origins and/or destinations. It is likely the service will be used by local residents but will not be a principal consideration in decisions to locate in the area.

2.2 Community Impacts

Interviews were conducted with ten operators of cruise, marina and fishing operations in Reedville and Crisfield to identify potential impacts of the proposed ferry service on their operations. Only one charter boat operation indicated that it does not anticipate the ferry service will increase its business activity. All other charter boat and cruise operators stated they anticipate the service will bring new business.

All businesses stated they anticipate no negative impact of the ferry operations on their abilities to move vessels into our out from their docks. Currently, all boats work around the activities of other boats on the water and the ferry will be another boat to work around. Peak time for charter boat operations in Crisfield is between 1-3pm when 20 to 25 charter boats may be returning to dock. If necessary, several experienced boat captains may make their transit outside the channel to avoid the ferry if necessary. Several of the operators interviewed stated their locations are not in close proximity to the proposed ferry terminal locations.

An issue raised is the potential impact of two new marinas under development in Crisfield associated with condo and townhouse developments that may impact slow transits through the harbor. All vessels are restricted to a speed of 6 knots in the Crisfield harbor. The Crisfield City Dock, a proposed terminal location, is located approximately one mile within the speed restricted waters. There has been mention that the new marina developments could potentially double this distance or more and thus may lengthen the transit time of the ferry service by a several minutes when entering and leaving the harbor. However this issue is not yet under discussion by the Coast Guard.

The eight ferry operations interviewed for this study stated there is no traffic impact from their terminal operations on off-terminal public roadways. They report their terminal access roads, queuing and parking areas are sufficient to handle the volume of traffic generated by arriving and departing vessels. The Cape May-Lewes ferry reported that infrequently traffic entering the Lewes terminal for departure may back up into the connecting public road. However, there are no commercial businesses on that portion of the public road to be impacted. Through traffic on the public road is able to easily pass by any stopped traffic trying to enter the terminal. This will be rectified as the ferry service goes to a 100% reservation system in the near future and drive-up traffic will not be permitted.

Proposed terminal locations in Reedville and Crisfield should be selected and designed to have ample space for queuing of vehicles boarding the ferries and parking for employees. A proposed vehicle ferry service in Gloucester, MA identified the need for an off-terminal queuing area for autos and trucks boarding the ferries. The vehicles in queue would then drive to the dock for boarding as the ferry was entering the harbor. The movement of these vehicles from queuing area to dock could potentially impact local traffic for 15 minutes.

A ferry terminal at the Crisfield City Dock for example would benefit from this type of off-terminal operation. Local traffic around the City Dock would be impacted temporarily as the

queue moves to the dock and vehicles leave the ferry and terminal. Traffic control measures would have to be in place to ensure efficient traffic flow. Assuming 12 arrivals/departures per day (six round-trips) over an 18-hour period, ferry traffic would impact the Reedville and Crisfield areas every 1.5 hours. Without such an operation the vehicles queuing for ferry passage will back into the public streets and impact local traffic. This back-up could exist for long periods of time, perhaps 1-1.5 hours, as vehicles arrive early for the ferry. The potential impact on the local roadways would be more severe if the ferry operated on a "first come-first serve" basis with overflow vehicles having to wait on city streets for the next ferry.

Ferry queues on public roads will impact local businesses located on the route. Congestion on the roads and lack of access to parking for these businesses have the potential of preventing customers from reaching the businesses and causing them to seek vendors elsewhere. Again, temporary traffic impacts will occur if an off-terminal queuing area is used. Greater impacts will occur if public streets are used for queuing.

Regardless of whether a self-contained terminal is developed or not, vehicles arriving and departing the terminal will drive through the towns adding to the local traffic. Assuming two 35-vehicle ferries will carry the maximum auto load (35 autos) on 12 daily arrivals and departures, a total of 420 vehicles will be added daily to the local traffic volume. Larger vessels and/or a greater number of vessels in service offering increased frequency of sailings will add to the ferry traffic.

The additional ferry traffic may generate concern in the community for a need to improve the roadway/highway system leading to the terminals. However, the potential volume of ferry traffic may be insufficient to cause significant improvements. For example, the Maryland State Highway Administration will not consider upgrading a roadway to a dual-lane highway until traffic volume on the roadway has reached and average 8,000 vehicles per day.

III. MULTIPURPOSE TERMINAL ACTIVITY

Eight ferry service operators were interviewed to identify non-ferry operations at their terminals that could potentially be incorporated into terminal operations at Reedville and/or Crisfield. Such activities would offer additional potential economic impacts to these towns. The findings from these interviews are discussed below.

Four ferry services surveyed operate multipurpose terminals. Typically these additional activities focus on the ferry service's passengers. One operator's activities attract non-passenger patrons as well. These terminal operations are described below:

- Cape May-Lewes Ferry operated by the DRBA – The terminals in Cape May, NJ and Lewes, DE provide a number of amenities. The Lewes terminal is located at a former fish factory. The terminal includes food courts (used by passengers and non-passengers), gift shops, miniature golf course, arcades, small concession stands (privately owned) and limited function rooms. The Cape May terminal is more extensive and is located on 800 acres. Similar to the activities at the Lewes terminal, the Cape May Terminal also includes a restaurant and an exhibit hall that in the past has drawn 500,000 visitors annually (now closed). The terminal also hosts weddings, parties and meetings. Between 30-40% of the terminal's patrons are not ferry passengers. The ferry service employs 200 persons year-round and hires an additional 150 people between March and October during peak ferry demand. The operator estimate only 12 of these jobs would be related to non-ferry activity. Non-ferry related revenues now amount to $200,000.

- Wood's Hole Steamship Authority – The terminals are located in Wood's Hole, Hyannis, Martha's Vineyard and Nantucket. There are concessions and small souvenir stands at the terminals and the ferries also have food and beverage concessions on the ferries (the Hyannis-Martha's Vineyard run is 2.5 hours long).

- Lake Champlain Transportation - Operates six terminals serving three crossings. The transit times of the crossings range from 12-60 minutes. Four of the terminals have small snack bars operated by local restaurants.

- Cross Sound Ferry – The principal terminal is in New London, CT that provides service to Orion Point, NY on Long Island and to Block Island, RI. Upscale food service facilities are located adjacent to all three terminals and are provided by the operator.

Four ferry services interviewed operate out of single-purpose terminals. There are virtually no amenities at these terminal operations, other than for vending machines and/or bathrooms at some of the facilities. These ferry operations are the Madeline Island Ferry Line in Wisconsin, the Maine State Ferry Service, the South Ferry in New York and the Port Aransas Ferry operated by the Texas Department of Transportation.

Although not a ferry terminal operation, the Commonwealth of Massachusetts is developing a multipurpose maritime and recreational facility on the Fall River waterfront. The 60,000 ft^2 footprint terminal will house a marine cargo terminal for roll-on/roll-off (trucked) cargo on the first floor. The projected market for the terminal is the potential shortsea trade lanes that could develop in the future along the East Coast serving New York, North Carolina and Florida. The second floor will house a coastal cruise terminal, a performing arts center and walk-around observation/boarding deck. The third floor will house a restaurant. Parking will be available on-site as well as in a parking lot across the street. This terminal is adjacent to several attractions including Battleship Cove, advertised as the world's largest naval ship exhibit. This is tourist attraction that includes the battleship Massachusetts, the destroyer Joseph P. Kennedy, Jr. and several other naval vessels and military equipment. The attraction complex also houses an historic 1920 carousel. Heritage State Park is also adjacent to Battleship Cove along the water

front. The marine cargo operation underdevelopment is projected to generate 800 jobs throughout the region once fully operational and generate $102 million in business revenue.

In summary, only one ferry service interviewed operates out of significant multipurpose terminals. The Cape May-Lewes ferry terminals attract a large number of non-ferry patrons. The Exhibition Hall has shown in the past to be an attraction in itself, but is not currently open. The terminal facilities host meetings, parties and weddings and also provide recreational activities including miniature golf and arcades. Currently the non-ferry related activities are generating $200,000 in annual revenue. Potential multipurpose terminal activities for the Reedville and Crisfield terminals could incorporate similar type activities but will be limited by the sizes of the potential terminals as well as the amount of parking available for non-ferry patrons using these facilities. For example, the Cape May terminal is located on 800 acres owned by the DRBA. Also only one multipurpose facility, the planned multipurpose terminal in Fall River, MA will be able to accommodate multiple vessels simultaneously if necessary with two perpendicular docks.