

NORTH CAROLINA
MARITIME Strategy

**NC Maritime Strategy
Target Market Conditions, Trends & Opportunities**

**Prepared for the
North Carolina Department of Transportation**

by

**AECOM
in association with URS**

February 15, 2012

This page intentionally blank

ACKNOWLEDGEMENTS

Initiated by the Governor's Logistics Task Force (GLTF), the *North Carolina Maritime Strategy* takes a fresh look at North Carolina's maritime assets and the needs for improvement to ensure that our State remains competitive in the future. A *Maritime Strategy* Executive Team has been formed to oversee this process, evaluate the results and provide an objective technical and economic analysis. The *Maritime Strategy* Executive Team includes: Lieutenant Governor Walter Dalton; the Governor's Senior Policy Advisor, Al Delia; Secretary of Transportation, Gene Conti; Secretary of Commerce, J. Keith Crisco; and Secretary of Environment and Natural Resources, Dee Freeman. The following North Carolina Department of Transportation (NCDOT) and North Carolina Department of Commerce (NCDOC) staff have provided day-to-day direction, guidance and support for study execution: NCDOT Director of Strategic Initiatives, Roberto Canales PE; NCDOT Project Manager, Virginia Mabry; NCDOT Liaison to the Lieutenant Governor, W. Seth Palmer; NCDOT/Commerce Liaison Joseph (Jed) McMillan; and Transportation Consultant to NCDOT and Global TransPark, Charles Diehl.

A Maritime Advisory Council, comprising State officials and staff, along with industry representatives from ocean shipping, trucking, rail and manufacturing interests, as well as community-at-large representatives, has provided further guidance and support to the study team. A roster of Advisory Council membership is included in the appendix of this report.

Finally, broad-based stakeholder outreach is key to successful development of the statewide *Maritime Strategy*. A comprehensive and ongoing public involvement program has provided additional input to the study by engaging the public, agencies and others through a series of informational meetings, public workshops and focused discussions with industry, as well as environmental and community groups.

This page intentionally blank

EXECUTIVE SUMMARY

The *North Carolina Maritime Strategy* is being developed to connect maritime goods and economic development in North Carolina. This is accomplished through the following primary tasks:

- Facilitated collaboration of freight transportation, economic development and community interests as input to the statewide strategy,
- Definition of North Carolina's economic context and maritime market positioning strategies that would offer the greatest economic benefit to the State, and
- Identification of infrastructure investments and policies that would most significantly enhance North Carolina's economy through improved performance of the State's maritime gateways and related trade corridors.

The *North Carolina Maritime Strategy* will define maritime market scenarios in which the State could realize economic and public benefit. Opportunities to be explored will include those associated with import and export of containerized cargo, as well as the potential for expanded bulk, breakbulk, petrochemical and military cargos. Special emphasis will be made to link potential market positions with industry in the State. The range of market position alternatives to be investigated may include regional transshipment of goods, container-on-barge service and major international container terminal operations.

For each viable market scenario, the Strategy will define its infrastructure needs. Transportation investments to be examined may include reconfiguration or modernization of existing port facilities, new terminal developments, wharf and channel improvements, road and rail connections, and inland intermodal facilities. A comparative analysis of development alternatives will be conducted to measure the relative benefits, effectiveness and costs associated with various alternatives for market positions and associated infrastructure.

As input to the definition of market opportunities for North Carolina, this *Target Market Conditions, Trends & Opportunities* technical report describes the criteria for selecting market opportunities, how the opportunities were identified, and provides an overview of the resulting candidate market alternatives that resulted from this process. Those market opportunities identified as the most promising have been carried forward for additional analysis to develop market scenarios.



This page intentionally blank

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	III
EXECUTIVE SUMMARY	V
TABLE OF CONTENTS	VII
1 CRITERIA FOR SELECTION OF MARKET OPPORTUNITIES	1
2 NORTH CAROLINA'S POSITION IN THE MARKETPLACE	3
2.1 North Carolina's Cost Structure.....	3
2.2 Existing Industrial Strengths.....	4
3 INDUSTRIES WITH GROWTH POTENTIAL.....	13
3.1 Exports	13
3.2 Imports	15
4 CANDIDATE MARKET OPPORTUNITIES	19
4.1 Chemicals	19
4.2 Containers and Refrigerated Cargo	19
4.3 Grain	20
4.4 Wood Products and Wood Pellets.....	20
4.5 Ro/Ro and Wind Power.....	21



This page intentionally blank

1 CRITERIA FOR SELECTION OF MARKET OPPORTUNITIES

One of the objectives of the North Carolina Maritime Strategy is to identify maritime alternatives that will support the creation of well-paying jobs and other favorable economic impacts for the state. The purpose of this technical memorandum is to describe the criteria for selecting market opportunities, how the opportunities were identified, and to describe the resulting candidate market alternatives that resulted from this process. Those market opportunities identified as the most promising will be carried forward for additional analysis to develop market scenarios.

By itself, transportation investment does not cause economic development. Rather, the investment fosters economic development by improving access to a region's comparative advantages—framed by costs, resources, and technical capabilities and allowing the global economy to capitalize on those strengths. In identifying and evaluating the candidate market opportunities that would be supported by maritime investments, the following criteria were applied. To be selected and carried through the subsequent market scenario analysis, candidate market opportunities should:

- Leverage North Carolina's existing comparative advantages;
- Have future growth potential in the global marketplace; and
- Should either:
 - Support an existing industry's ability to flourish in North Carolina over the long-term, or
 - Diversify an existing industry into new export markets, or
 - Support new markets for the state.

The subsequent sections outline North Carolina's cost structure and industrial strengths in order to highlight its comparative advantages; industries with the best growth potential are discussed, followed by a discussion of the leading market opportunities.



This page intentionally blank

2 NORTH CAROLINA'S POSITION IN THE MARKETPLACE

2.1 North Carolina's Cost Structure

An important element in identifying industries that might flourish or falter in North Carolina is the cost structure of the state relative to competing regions. Investments in maritime infrastructure will improve access between the state's producers and the global economy, but if the state has a high cost of doing business, businesses will still select other locations and the port investment will not foster the desired economic development. The table below provides a summary of North Carolina's business costs relative to other states in the region, as developed by Moody's Analytics, a nationally known economics firm. The total business cost is comprised of three components: unit labor costs, energy costs, and tax burden. Unit labor costs are a measure of labor compensation per dollar of output—wage costs adjusted for productivity. This is an important adjustment as firms are willing to pay higher costs for more productive labor, all else held equal. The energy cost component compares the average commercial and industrial electricity cost to the national average. Tax burden is measured as the total tax revenue as a percent of total income, indexed to the national effective tax rate. An index value of 100 means that the cost is equal to the US average cost. An index value of 105 by comparison means that the state's cost is 5 percent greater than the US average. An index value of 92 means the state's cost is eight percent lower than the US average; that is, a producer in that state saves eight cents for every dollar of production cost relative to other producers in the nation¹.

Table 1: North Carolina's Business Costs Relative to Nearby States

State	Cost of Doing Business		Unit Labor Cost		Energy Cost		Tax Burden	
	Index	Rank	Index	Rank	Index	Rank	Index	Rank
NC	84	50	83	49	81	34	94	30
VA	97	26	101	17	86	28	85	42
SC	95	28	100	22	86	29	80	47
GA	98	20	101	16	89	27	92	33
TN	89	41	89	46	96	20	78	48
FL	102	13	102	13	116	15	94	27

Source: Moody's Analytics 2011 Cost of Doing Business Review. Updated April 2011 using the most recent available data as of December 2010. Rankings are out of 51 (50 states plus the District of Columbia). A rank of 51 indicates a location has the lowest cost; a rank of 1 indicates a location has the highest cost.

As the table above shows, North Carolina has very favorable business costs. It ranks 50 out of 51 (50 states plus the District of Columbia) in terms of overall business costs. Only South Dakota has lower overall business costs. Of particular note, North Carolina has a 10 percentage-point cost advantage relative to its coastal peers of Virginia, South Carolina,

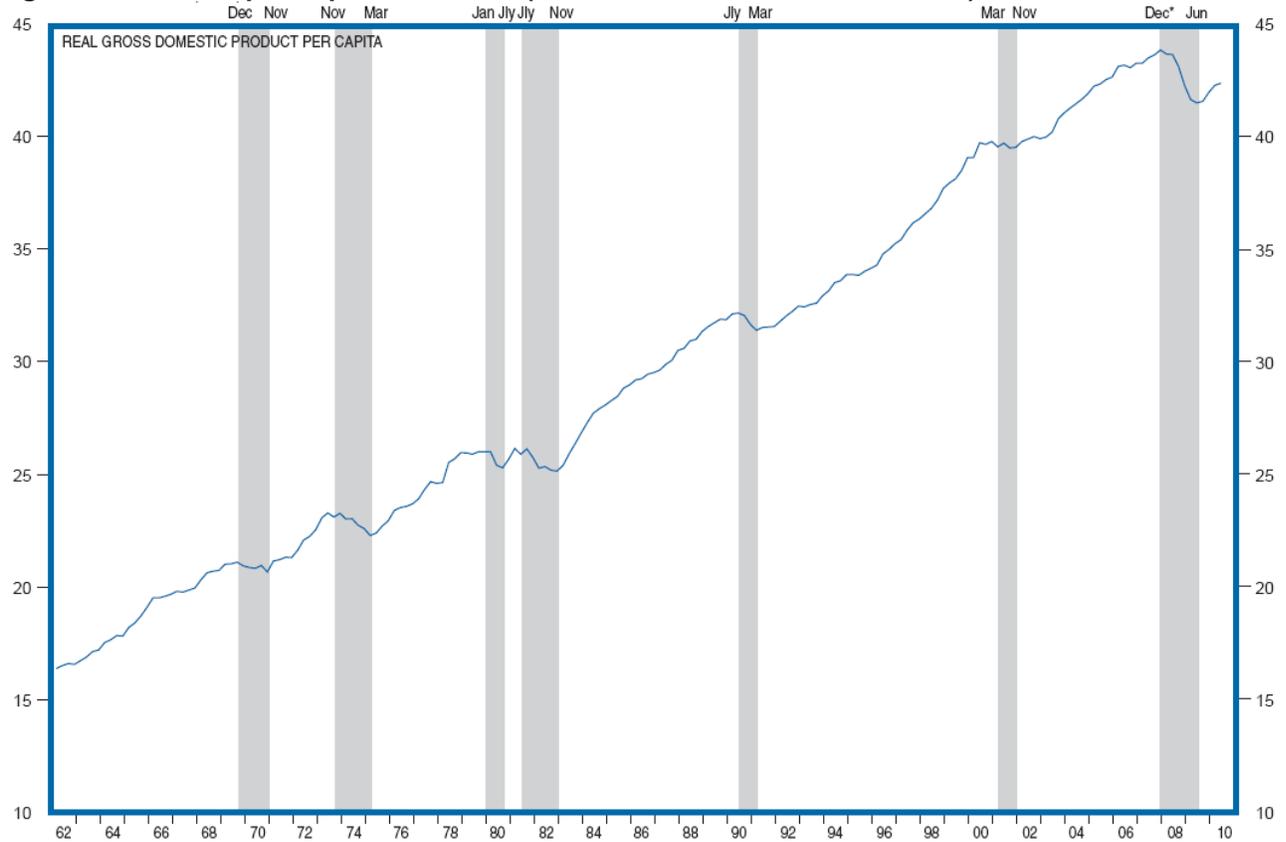
¹ The full methodological description of the Cost of Doing Business Index is provided in "2011 Cost of Doing Business Review," Moody's Analytics, updated annually, last updated April 2011 using the most recent available data as of December 2010. The index has been continuously published for 16 years and is used in Forbes' annual Best States for Business report, as well as numerous other studies.

Georgia and Florida, and a 5 percent advantage on Tennessee. Looking at the individual components, both labor and energy costs are low relative to North Carolina’s neighbors—these are particularly important costs for manufacturers of capital goods and agricultural processors who are likely port users. What this means for the Maritime Strategy is that the cost structure of the state’s landside economy is not an impediment to attracting the economic development that would benefit from candidate port investments.

2.2 Existing Industrial Strengths

North Carolina’s competitive industries are a barometer of the state’s resource and technical advantages; these are industries that are sources of particular strength for the state’s economy and future job creation. One consideration in framing the Maritime Strategy is ensuring that port investments support the needs of its most competitive port-using industries. Shift share analysis is applied to identify the state’s competitive industries, defined as one that outperforms the national average performance for that industry.

Figure 1: Real GDP per Capita, 1962-2010 (thousands of chained 2006 dollars)



Source: Selected NIPA Series." U.S. Bureau of Economic Analysis, 23 Jun 2011.

The intuition behind shift share analysis is that the growth of a candidate industry is comprised of three components: the national share, the industry mix and the regional shift. The national share measures how much employment in a local area increased because of growth in the national economy. The industry mix effect measures the amount of growth attributable to the mix of industries in the economy—an industry in an economy with a higher proportion of fast-growing industries would be likely to grow more quickly because of the favorable mix, all else

held equal. Finally, the regional shift (sometimes known as the competitive effect) measures the state industry’s growth relative to the same industry in the nation. If it outperforms the national pace, it is competitive; if it lags the national pace, it is less competitive. The sum of the national share, the industry mix, and the regional shift equals the actual growth that has been observed².

The shift share analysis is complemented by the addition of a location quotient. The location quotient compares an industry’s share of the local economy to the same industry’s share of the national economy. When the location quotient equals 1.0 the local share and national share are exactly equal—the local share is what one would expect for a typical economy. When the local share is greater than the national share, the industry’s presence in the local economy is greater than one would expect – a signal that the industry is producing more than what is needed for local consumption and is exporting to domestic or foreign locations outside the state. A location quotient greater than 1.0 is a sign of strength. By contrast, a location quotient less than one signals that the industry is producing less than what is needed for local consumption and is importing from outside the state.

Together, the regional shift factor and the location quotient identify the sources of industrial strength in North Carolina’s economy. In order to perform shift share analysis, the data for the US and North Carolina are collected for two time frames. Employment data are the most commonly used indicator of economic performance; the analysis uses data from the Bureau of Economic Analysis (BEA). For this analysis, 2001 and 2009 were selected as reference points due to these years coinciding with the end of a recession. Thus, the analysis spans a full business cycle measured trough to trough. Using times with similar economic climates creates consistency to the analysis. The troughs of the economic cycles in 2001 and 2009 can be seen in Figure 1 as the right edges of the shaded bars, November 2001 and June 2009.

The calculation of the national share, the industry mix, and the regional shift components of the shift share are shown below.

National economic growth is calculated as:

$$\left(\frac{\text{total employment of reference economy in year 2}}{\text{total employment of reference economy in year 1}} \right) - 1$$

Industry mix effect is calculated:

$$\left(\frac{\text{regional employment of industry } i \text{ in year 2}}{\text{regional employment of industry } i \text{ in year 1}} \right) - \left(\frac{\text{total employment of reference economy in year 2}}{\text{total employment of reference economy in year 1}} \right)$$

And finally, regional shift is calculated:

$$\left(\frac{\text{local employment of industry } i \text{ in year 2}}{\text{local employment of industry } i \text{ in year 1}} \right) - \left(\frac{\text{regional employment of industry } i \text{ in year 2}}{\text{regional employment of industry } i \text{ in year 1}} \right)$$

² Landis, John D. (1985) ‘Planner’s Notebook: Electronic Spreadsheets in Planning The Case of Shiftshare Analysis’, Journal of the American Planning Association, 51: 2, 216-224

Location quotient is calculated by:

$$\left(\frac{\text{local employment in industry } i / \text{total local employment}}{\text{regional employment in industry } i / \text{total regional employment}} \right)$$

The results of the calculations are displayed in Table 2.

Table 2: Shift Share and Location Quotient Analysis of North Carolina's Economy, 2001-2009

Description	US	NC	US	NC	2001-2009			
	2001	2001	2009	2009	Nat. Growth Factor	Industry Mix	Regional Shift	Location Quotient
Wage and salary employment by place of work (number of jobs)	137,322,000	4,078,381	136,736,000	4,163,274	-0.004	0.000	0.025	1.000
Farm wage and salary employment	870,000	26,527	739,000	20,680	-0.004	-0.146	-0.070	0.919
Nonfarm wage and salary employment	136,452,000	4,051,854	135,997,000	4,142,594	-0.004	0.001	0.026	1.00
Private wage and salary employment	113,301,000	3,305,867	111,348,000	3,286,966	-0.004	-0.013	0.012	0.970
Forestry, fishing, and related activities	507,000	12,544	487,000	12,889	-0.004	-0.035	0.067	0.869
Forestry and logging	80,000	4,364	58,000	3,171	-0.004	-0.271	0.002	1.796
Fishing, hunting, and trapping	14,000	186	12,000	51	-0.004	-0.139	-0.583	0.140
Agriculture and forestry support activities	413,000	7,994	417,000	9,667	-0.004	0.014	0.200	0.761
Mining	536,000	4,222	640,000	3,406	-0.004	0.198	-0.387	0.175
Oil and gas extraction	125,000	(D)	162,000	15	-0.004	0.300	--	0.003
Mining (except oil and gas)	221,000	3,659	207,000	3,252	-0.004	-0.059	-0.048	0.516
Support activities for mining	190,000	(D)	271,000	139	-0.004	0.431	--	0.017
Utilities	600,000	(D)	561,000	12,642	-0.004	-0.061	--	0.740
Construction	7,043,000	236,886	6,242,000	201,705	-0.004	-0.109	-0.035	1.061
Construction of buildings	1,635,000	57,151	1,408,000	43,102	-0.004	-0.135	-0.107	1.005
Heavy and civil engineering construction	991,000	38,161	899,000	27,616	-0.004	-0.089	-0.183	1.009
Specialty trade contractors	4,417,000	141,574	3,935,000	130,987	-0.004	-0.105	0.034	1.093
Manufacturing	16,454,000	704,573	11,850,000	450,177	-0.004	-0.276	-0.081	1.248
Durable goods manufacturing	10,351,000	357,878	7,284,000	233,065	-0.004	-0.292	-0.052	1.051
<i>Wood product manufacturing</i>	575,000	28,165	361,000	16,762	-0.004	-0.368	-0.033	1.525
<i>Nonmetallic mineral product manufacturing</i>	545,000	21,538	390,000	14,178	-0.004	-0.280	-0.057	1.194
<i>Primary metal manufacturing</i>	568,000	7,729	364,000	7,179	-0.004	-0.355	0.288	0.648
<i>Fabricated metal product manufacturing</i>	1,679,000	43,124	1,312,000	33,453	-0.004	-0.214	-0.006	0.837
<i>Machinery manufacturing</i>	1,367,000	37,492	1,025,000	27,481	-0.004	-0.246	-0.017	0.881
<i>Computer and electronic product manufacturing</i>	1,756,000	58,001	1,135,000	36,390	-0.004	-0.349	-0.019	1.053
<i>Electrical equipment and appliance manufacturing</i>	555,000	38,269	372,000	21,953	-0.004	-0.325	-0.097	1.938
<i>Motor vehicles, bodies and trailers, and parts manufacturing</i>	1,213,000	28,720	675,000	20,185	-0.004	-0.439	0.146	0.982
<i>Other transportation equipment manufacturing</i>	727,000	6,315	680,000	5,952	-0.004	-0.060	0.007	0.287
<i>Furniture and related product manufacturing</i>	648,000	71,728	386,000	35,239	-0.004	-0.400	-0.104	2.998
<i>Miscellaneous manufacturing</i>	718,000	16,797	584,000	14,293	-0.004	-0.182	0.038	0.804
Nondurable goods manufacturing	6,103,000	346,695	4,566,000	217,112	-0.004	-0.248	-0.122	1.562
<i>Food manufacturing</i>	1,560,000	51,303	1,457,000	52,502	-0.004	-0.062	0.089	1.183
<i>Beverage and tobacco product manufacturing</i>	211,000	18,265	187,000	12,813	-0.004	-0.109	-0.185	2.250
<i>Textile mills</i>	332,000	93,050	125,000	30,140	-0.004	-0.619	-0.053	7.919
<i>Textile product mills</i>	202,000	17,047	126,000	6,958	-0.004	-0.372	-0.216	1.814
<i>Apparel manufacturing</i>	428,000	40,168	169,000	12,456	-0.004	-0.601	-0.085	2.421
<i>Leather and allied product manufacturing</i>	59,000	1,120	30,000	576	-0.004	-0.487	0.006	0.631
<i>Paper manufacturing</i>	577,000	21,964	406,000	16,843	-0.004	-0.292	0.063	1.363
<i>Printing and related support activities</i>	769,000	17,263	524,000	12,979	-0.004	-0.314	0.070	0.814

Description	US	NC	US	NC	2001-2009			
	2001	2001	2009	2009	Nat. Growth Factor	Industry Mix	Regional Shift	Location Quotient
<i>Petroleum and coal products manufacturing</i>	118,000	1,256	115,000	1,007	-0.004	-0.021	-0.173	0.288
<i>Chemical manufacturing</i>	957,000	48,279	801,000	41,627	-0.004	-0.159	0.025	1.707
<i>Plastics and rubber products manufacturing</i>	890,000	36,980	626,000	29,211	-0.004	-0.292	0.087	1.533
Wholesale trade	5,787,000	161,015	5,624,000	169,021	-0.004	-0.024	0.078	0.987
Retail trade	15,395,000	452,437	14,800,000	445,101	-0.004	-0.034	0.022	0.988
Motor vehicle and parts dealers	1,888,000	57,973	1,671,000	54,857	-0.004	-0.111	0.061	1.078
Furniture and home furnishings stores	548,000	17,924	457,000	15,790	-0.004	-0.162	0.047	1.135
Electronics and appliance stores	563,000	16,142	497,000	14,598	-0.004	-0.113	0.022	0.965
Building material and garden supply stores	1,149,000	38,434	1,170,000	39,553	-0.004	0.023	0.011	1.110
Food and beverage stores	3,003,000	86,374	2,883,000	74,414	-0.004	-0.036	-0.099	0.848
Health and personal care stores	949,000	26,404	996,000	30,940	-0.004	0.054	0.122	1.020
Gasoline stations	932,000	28,833	838,000	27,661	-0.004	-0.097	0.060	1.084
Clothing and clothing accessories stores	1,342,000	36,912	1,387,000	36,747	-0.004	0.038	-0.038	0.870
Sporting goods, hobby, book and music stores	689,000	16,983	625,000	16,759	-0.004	-0.089	0.080	0.881
General merchandise stores	2,819,000	83,496	3,017,000	98,208	-0.004	0.075	0.106	1.069
Miscellaneous store retailers	1,017,000	31,824	821,000	25,178	-0.004	-0.188	-0.016	1.007
Nonstore retailers	496,000	11,138	438,000	10,396	-0.004	-0.113	0.050	0.780
Transportation and warehousing	4,420,000	123,766	4,264,000	106,631	-0.004	-0.031	-0.103	0.821
Air transportation	617,000	17,528	464,000	12,495	-0.004	-0.244	-0.039	0.884
Rail transportation	202,000	2,545	187,000	2,513	-0.004	-0.070	0.062	0.441
Water transportation	53,000	261	64,000	766	-0.004	0.212	1.727	0.393
Truck transportation	1,426,000	53,370	1,313,000	41,462	-0.004	-0.075	-0.144	1.037
Transit and ground passenger	389,000	4,453	438,000	4,961	-0.004	0.130	-0.012	0.372
Pipeline transportation	44,000	141	41,000	170	-0.004	-0.064	0.274	0.136
Scenic and sightseeing transportation	30,000	369	26,000	371	-0.004	-0.129	0.139	0.469
Support activities for transportation	537,000	12,391	547,000	12,132	-0.004	0.023	-0.040	0.728
Couriers and messengers	606,000	14,916	546,000	14,392	-0.004	-0.095	0.064	0.866
Warehousing and storage	516,000	17,792	638,000	17,369	-0.004	0.241	-0.260	0.894
Information	3,632,000	(D)	2,824,000	69,961	-0.004	-0.218	--	0.814
Publishing industries, except Internet	1,016,000	22,870	804,000	19,059	-0.004	-0.204	0.042	0.779
Motion picture and sound recording industries	402,000	4,734	364,000	4,637	-0.004	-0.090	0.074	0.418
Broadcasting, except Internet	345,000	9,454	304,000	11,065	-0.004	-0.115	0.289	1.195
Internet publishing and broadcasting 2/	42,000	(D)	(NA)	(NA)	-0.004	--	--	--
Telecommunications	1,294,000	29,435	970,000	23,631	-0.004	-0.246	0.053	0.800
ISPs, search portals, and data processing	487,000	14,874	247,000	9,537	-0.004	-0.489	0.134	1.268
Other information services 2/	46,000	606	135,000	2,032	-0.004	1.939	0.418	0.494
Finance and insurance	5,844,000	139,672	5,782,000	151,697	-0.004	-0.006	0.097	0.862
Monetary authorities – central bank	23,000	(D)	21,000	705	-0.004	-0.083	--	1.103
Credit intermediation and related activities	2,629,000	79,717	2,596,000	83,606	-0.004	-0.008	0.061	1.058
Securities, commodity contracts, investments	841,000	11,262	816,000	16,839	-0.004	-0.025	0.525	0.678
Insurance carriers and related activities	2,264,000	47,572	2,264,000	49,584	-0.004	0.004	0.042	0.719
Funds, trusts, and other financial vehicles	87,000	(D)	85,000	963	-0.004	-0.019	--	0.372

Description	US	NC	US	NC	2001-2009			
	2001	2001	2009	2009	Nat. Growth Factor	Industry Mix	Regional Shift	Location Quotient
Real estate and rental and leasing	2,115,000	48,576	2,060,000	51,361	-0.004	-0.022	0.083	0.819
Real estate	1,411,000	31,371	1,482,000	37,204	-0.004	0.055	0.136	0.824
Rental and leasing services	675,000	17,042	552,000	13,913	-0.004	-0.178	-0.001	0.828
Lessors of nonfinancial intangible assets	29,000	163	26,000	244	-0.004	-0.099	0.600	0.308
Professional, scientific, and technical services	6,991,000	153,134	7,618,000	182,515	-0.004	0.094	0.102	0.787
Management of companies and enterprises	1,708,000	61,455	1,854,000	73,036	-0.004	0.090	0.103	1.294
Administrative and waste management services	7,766,000	209,626	7,256,000	217,459	-0.004	-0.061	0.103	0.984
Administrative and support services	7,446,000	203,596	6,910,000	209,758	-0.004	-0.068	0.102	0.997
Waste management and remediation services	320,000	6,030	346,000	7,701	-0.004	0.086	0.196	0.731
Educational services	2,568,000	53,077	3,156,000	84,234	-0.004	0.233	0.358	0.877
Health care and social assistance	13,237,000	343,830	16,255,000	470,737	-0.004	0.232	0.141	0.951
Ambulatory health care services	4,511,000	123,268	5,838,000	178,233	-0.004	0.298	0.152	1.003
Hospitals	4,042,000	87,841	4,683,000	113,192	-0.004	0.163	0.130	0.794
Nursing and residential care facilities	2,727,000	84,163	3,108,000	101,905	-0.004	0.144	0.071	1.077
Social assistance	1,957,000	48,558	2,626,000	77,407	-0.004	0.346	0.252	0.968
Arts, entertainment, and recreation	1,817,000	46,062	1,956,000	57,378	-0.004	0.081	0.169	0.963
Performing arts and spectator sports	395,000	11,736	417,000	12,351	-0.004	0.060	-0.003	0.973
Museums, historical sites, zoos, and parks	115,000	2,203	128,000	3,050	-0.004	0.117	0.271	0.783
Amusement, gambling, and recreation	1,307,000	32,123	1,411,000	41,977	-0.004	0.084	0.227	0.977
Accommodation and food services	10,230,000	282,779	11,225,000	340,564	-0.004	0.102	0.107	0.996
Accommodation	1,837,000	38,337	1,759,000	37,118	-0.004	-0.038	0.011	0.693
Food services and drinking places	8,393,000	244,442	9,466,000	303,446	-0.004	0.132	0.114	1.053
Other services, except public administration	6,651,000	175,762	6,894,000	186,452	-0.004	0.041	0.024	0.888
Repair and maintenance	1,329,000	34,821	1,201,000	33,079	-0.004	-0.092	0.046	0.905
Personal and laundry services	1,336,000	34,612	1,382,000	34,219	-0.004	0.039	-0.046	0.813
Membership associations and organizations	2,807,000	81,083	3,022,000	90,040	-0.004	0.081	0.034	0.979
Private households	1,179,000	25,246	1,289,000	29,114	-0.004	0.098	0.060	0.742
Government and government enterprises	23,151,000	745,987	24,649,000	855,628	-0.004	0.069	0.082	1.140
Federal, civilian	2,729,000	60,358	2,879,000	67,749	-0.004	0.059	0.067	0.773
Military	2,071,000	116,886	2,092,000	142,715	-0.004	0.014	0.211	2.241
State and local	18,351,000	568,743	19,678,000	645,164	-0.004	0.077	0.062	1.077
State government	5,031,000	176,942	5,277,000	205,146	-0.004	0.053	0.111	1.277
Local government	13,320,000	391,801	14,401,000	440,018	-0.004	0.085	0.042	1.004

Source: Bureau of Economic Analysis, SA27N Full-time and part-time wage and salary employment by NAICS industry, North Carolina and the US, 2001 and 2009.

Notes: 1/ The estimates of wage and salary employment for 2001-2006 are based on the 2002 North American Industry Classification System (NAICS). The estimates for 2007 forward are based on the 2007 NAICS.

2/ Under the 2007 NAICS, internet publishing and broadcasting was reclassified to other information services.

(D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the total.

(T) Estimate for employment suppressed to cover corresponding estimate for earnings. Estimates for this item are included in the total.

(NA) Data not available for this year.

Data last updated: March 23, 2011

This page intentionally blank

The industries in the table above having positive regional shifts (once the national and industry mix effects are factored in) outperform the national average. As would be expected, the state's strength in finance, information and professional specialties are all highlighted. Of the competitive industries, those that are of interest for the Maritime Strategy are those that produce freight or help to move it. The strongest industries are those with both a positive regional shift factor **and** a location quotient above 1.0. These are followed by industries with a positive regional shift factor and smaller location quotient. Also of interest are those industries with large location quotients and low or negative regional shift factors as this signifies large industry anchors for the state's economy that are losing competitive position and would benefit from support.

Using the criteria outlined above, the most competitive industries that would benefit from port investments (taking care of the state's existing strengths) are:

- Forestry and logging
- Agriculture and forestry support activities
- Primary metal manufacturing
- Food manufacturing
- Paper manufacturing
- Chemical manufacturing
- Plastics and rubbery products manufacturing

And also of interest is wood product manufacturing which has a large location quotient and just a slightly negative regional shift factor. Also, transportation equipment manufacturing and motor vehicle parts manufacturing have positive shift effects though small location quotients. This indicates some competitiveness, but that they have not yet gained a foothold in the state's economy.



This page intentionally blank

3 INDUSTRIES WITH GROWTH POTENTIAL

Although building on North Carolina’s existing strengths is important, it is also necessary to assess what industries represent growing export markets for the region that might find North Carolina attractive and represent diversification or entirely new industries for the state. In this analysis, market opportunities are identified by both the projected volume of the trade flow from the southeast US region and its growth rate based on projections by IHS Global Insight, a nationally recognized provider of freight data. Data are identified by commodity and destination country; they are not identified by container/bulk/breakbulk. The data analysis is supplemented with information coming in from the stakeholder interviews conducted as part of the Maritime Strategy study.

3.1 Exports

Chemicals, metal products, rubber, machinery parts, wood products and food are among the major commodities for the North Carolina State Ports Authority (NCSPA). Several of NCSPA’s current key markets are projected to post strong growth over the next two decades. These are summarized below. Although aircraft is not a large flow, it is included as it is high-valued. It is a growing industry for North Carolina and was mentioned in interviews with shippers.

Table 3: Leading Export Prospects from the Southeastern US

	2009	2020	2029	2009 to 2020	2020 to 2029
Total Commodities	40,591,676	83,750,543	114,585,964	106%	37%
Pulp	3,655,484	6,568,343	8,326,847	80%	27%
Paper and Paperboard and Products	2,988,494	6,388,683	8,893,315	114%	39%
Cork and Wood	1,692,771.04	3,872,959.58	5,077,685.44	186%	28%
Waste Paper	1,549,948.51	3,444,864.47	5,986,618.96	70%	10%
Meat, Frozen	1,357,983.20	2,465,851.01	3,361,338.35	126%	52%
Animal Feed	1,295,194.61	1,776,941.61	1,997,645.60	129%	31%
Textiles	782,343.58	1,627,146.93	2,279,017.31	122%	71%
Cotton	549,994.86	829,780.85	1,030,553.24	155%	58%
Special Industrial Machinery	277,329.47	678,746.39	997,878.20	82%	36%
Aircraft	5,901	12,576	19,001	113%	51%

Source: IHS Global, August 2011 South Atlantic waterborne trade forecast

Other traditional North Carolina markets fare less well—either because they post strong growth but have lower overall volumes or have weak growth. Crude fertilizers (phosphate) remains a large market and posts solid growth over the forecast horizon, suggesting that it has the potential to remain an anchor for the port provided the company continues to use Morehead City. Processed fertilizers and pesticides are a much smaller market and post weaker growth. The tobacco industry is projected to continue growing until 2020 and then is projected to start contracting. North Carolina could still benefit if the US industry consolidated into North Carolina, but it is not a major freight opportunity for the state.

Wood products are projected to post strong growth, but are a comparatively smaller market in terms of volumes. This projection, however, is based on historical trends and may not be picking up the potential for wood pellets which is an emerging market. The shipper interviews are very positive about the potential for wood products overall for North Carolina, and wood pellets in particular. There is a consortium of wood producers working to develop a wood pellet facility to serve the UK and other places in Europe. A consequence of the Kyoto agreement, the UK and other countries in Europe are converting some of their power plants to be able to use biomass.

The consortium would like to develop a facility at the Port of Morehead City. Initial research suggests that European companies are willing to partner with US firms to develop the capability to source wood pellets.

Agriculture is another opportunity, with solid export growth projected for the region. North Carolina agricultural shippers reported that they could ship much more than they currently send, citing transportation cost as limiting access to international markets.

Table 4: Moderate or Emerging Export Prospects from the Southeastern US

	2009	2020	2029	2009 to 2020	2020 to 2029
Total Commodities	40,591,676	83,750,543	114,585,964	106%	37%
Wood Products	152,950	363,335	458,163	138%	26%
Grain	87,305	132,309	148,052	52%	12%
Meat, Fish and Dairy, Other	85,260	135,281	161,868	59%	20%
Meat, Fresh/Chilled	80,678	155,614	226,007	93%	45%
Other Raw Textile Materials	2,442	3,056	3,280	25%	7%
Other Agriculture	67,566	120,810	153,959	79%	27%
Fertilizers and Pesticides	108,534	135,111	152,194	24%	13%
Rubber Products	189,969	422,630	622,436	122%	47%
Other Food	451,179	734,866	986,991	63%	34%
Crude Fertilizers	6,203,100	10,364,843	12,330,645	67%	19%
Tobacco	44,924	62,309	52,221	39%	-16%

Source: IHS Global, August 2011 South Atlantic waterborne trade forecast

The commodities in the table below are projected to be strong markets for the south Atlantic overall; they are not necessarily good markets for North Carolina in all cases. As an example, the motor vehicles and parts industry is unlikely to be a strong export market for the state given the current location of existing southeastern US auto production. Should the state attract an auto plant in the next decade, this outlook would change. Frozen fruit juice is unlikely to move to North Carolina but rather remain a Florida specialty. Initial research indicates the state has several steel production facilities although they have not been identified in the stakeholder work to date. This combined with the state's historical strength in woodworking, suggests that the metal and woodworking machinery market is a special niche that pairs well with other key markets. Specialty chemicals are also an opportunity for the state and fit well with North Carolina's comparative advantages.

Table 5: Other Strong South Atlantic Export Markets

	2009	2020	2029	2009 to 2020	2020 to 2029
Total Commodities	40,591,676	83,750,543	114,585,964	106%	37%
Stone, Clay and Other Crude Minerals	2,861,549	8,173,372	10,434,525	186%	28%
Scrap	2,394,657	5,417,498	8,255,290	126%	52%
Synthetic Resins	1,492,299	3,799,329	6,016,794	155%	58%
Motor Vehicles	1,073,888	2,670,688	3,725,580	149%	39%
Parts of Motor Vehicles	272,560	571,543	746,546	110%	31%
Inorganic Chemicals	835,533	2,133,676	2,838,104	155%	33%
Chemical Products, nec	690,335	1,537,052	2,704,078	123%	76%
Iron and Steel	641,818	1,530,035	2,216,349	138%	45%
Organic Chemicals	565,356	1,951,261	3,253,054	245%	67%
Non-Metallic Products, nec	437,015	1,020,090	1,495,080	133%	47%
Machinery and Equipment, nec	392,852	906,337	1,419,025	131%	57%
Natural Gas	31,898	100,009	121,778	214%	22%
Metal and Wood Working Machinery	14,900	33,718	52,881	126%	57%
Fruits and Vegetables Fresh/Chilled/Frozen	138,955	333,754	509,205	140%	53%

Source: IHS Global, August 2011 South Atlantic waterborne trade forecast nec = not elsewhere covered

One other market opportunity was suggested in the stakeholder interviews, though not identified in the data. One of the stakeholders thought there was a fuel pipeline at the port that used to be used to bring in products for refining. The stakeholder projected that if the pipeline could be used in the other direction; there could be an opportunity to develop a biofuel processing plant in tandem with the state’s large agricultural industry and export the fuels. This innovation was not suggested by other stakeholders, but it is included here as a future avenue for development as it fits well with the state’s agricultural industry.

3.2 Imports

According to NCSPA data, the following commodities have consistently ranked among the top commodities handled at the facilities in recent years: chemicals, grain, cement, metal products, machinery parts, general merchandise, forest products, and coal. Several of NCSPA’s current key markets are projected to post strong export growth from the southeastern US over the next two decades. These are summarized in Table 6 below. Where multiple commodity classifications map to a general product group (inorganic, organic and chemical products for example), all are provided even if an individual segment is not large in volume or above average in pace of projected growth.

Table 6: Strongest Southeastern Import Markets That Are Currently Served by NC Ports (Total Regional Tons)

	2009	2020	2029	2009 to 2020	2020 to 2029
Total Commodities	79,578,018	118,911,098	151,291,294	49%	27%
Inorganic Chemicals	2,505,619	3,772,249	4,484,133	51%	19%
Chemical Products, nec.	1,034,013	1,319,777	2,112,491	28%	60%
Organic Chemicals	1,011,598	2,199,983	3,821,071	117%	74%
Metal Products	684,948	1,515,300	2,265,076	121%	49%
Stone, Clay and Other Crude Minerals	6,181,801	8,675,418	9,054,265	40%	4%
Non-Metallic Products, nec.	1,956,082	3,462,126	6,128,983	77%	77%
Machinery and Equipment, nec.	527,108	1,335,959	2,407,142	153%	80%
Special Industrial Machinery	205,265	365,687	462,506	78%	26%
Engines and Turbines	177,614	334,764	559,895	88%	67%
Electrical Industrial Machinery	166,134	345,920	520,851	108%	51%
Agricultural Machinery	71,852	171,920	301,738	139%	76%
Transport Equipment, nec.	48,866	128,949	254,121	164%	97%
Metal and Wood Working Machinery	45,058	71,320	113,293	58%	59%

Source: IHS Global, August 2011 South Atlantic waterborne trade forecast

Other significant components of NCSPA import volumes in categories not listed above are projected to fare less well—either because they post strong growth but have lower overall volumes or have weaker growth. None of these markets is projected to contract; all can serve as an anchor or economic base of activity for the ports but they are unlikely to drive a significant expansion of activity but could serve as profitable niche markets—especially grains and wood products. Regional growth for the strongest regional import markets are presented in Table 7 below.

Table 7: Moderate or Emerging Southeastern Import Markets

	2009	2020	2029	2009 to 2020	2020 to 2029
Total Commodities	79,578,018	118,911,098	151,291,294	49%	27%
Grain	451,832	683,300	853,954	51%	25%
Animal Feed	116,189	142,772	149,032	23%	4%
Goods not classified by kind	172,665	378,983	639,132	119%	69%
Coal	5,171,882	8,175,388	10,839,437	58%	33%
Wood Products	567,013	843,332	1,125,789	49%	33%
Cork and Wood	385,520	479,234	614,886	24%	28%

Source: IHS Global, August 2011 South Atlantic waterborne trade forecast

The one caveat here is coal, which is projected to be a one of the largest single commodities imported via south Atlantic ports. While posting just average growth, the overall size of the market makes it an important opportunity for regional ports—not because of the dynamics of the market itself, but because of the potential to increase market share. Because of the size of the market, even a small increase in market share would translate into a noticeable increase in volume for the port. Coal is not manufactured in North Carolina, however, so this would be a “pass through” commodity rather than a market area supporting one of the state’s industrial strengths.

Other strong south Atlantic import markets include those listed in the table below. These are projected to be strong markets for the south Atlantic overall; they are not necessarily good markets for North Carolina in all cases. Areas of particular strength for North Carolina include plastics, rubber, pulp, agriculture, and possibly resins.

Table 8: Additional Strong Southeastern Import Markets

	2009	2020	2029	2009 to 2020	2020 to 2029
Total Commodities	79,578,018	118,911,098	151,291,294	49%	27%
Crude Petroleum	17,395,790	24,339,319	27,930,355	40%	15%
Petroleum Refineries	17,242,877	22,109,163	24,646,062	28%	11%
Furniture and Fixtures	976,408	2,509,228	5,086,899	157%	103%
Textiles	901,425	1,820,339	2,683,677	102%	47%
Motor Vehicles	796,529	1,373,022	1,492,282	72%	9%
Synthetic Resins	711,962	1,582,050	2,367,513	122%	50%
Bananas	361,334	640,914	846,576	77%	32%
Plastic Products, nec.	355,872	785,286	1,311,024	121%	67%
Natural Rubber	309,204	441,194	414,559	43%	-6%
Pulp	254,128	429,700	602,957	69%	40%
Electrical Appliances and Houseware	161,002	407,100	756,946	153%	86%
Fruits, Exotics	137,491	223,392	307,535	62%	38%
Paints, Varnishes and Lacquers	60,251	119,676	164,067	99%	37%
Other Agriculture	56,482	97,941	125,974	73%	29%
Other Communications Equipment	56,345	167,051	358,237	196%	114%

Source: IHS Global, August 2011 South Atlantic waterborne trade forecast

Another way to look at the data, apart from overall volume and pace of growth, is to combine commodities by the type of specialized equipment required for their handling. The following commodities are all potential users of specialized refrigeration equipment. This list omits several specialty products that fall with the larger commodity aggregates reported. For example, stakeholder interviews have identified that some types of textiles and rubber products must be kept cool. Shippers reported using the Port of New Orleans and other ports specifically for this reason; the requisite facilities to keep the commodity at a proper temperature were not available at the North Carolina port facilities.

In addition, these imports would pair well with the state's existing strengths in exporting agricultural products requiring refrigeration such as sweet potatoes and frozen poultry and meat.

Table 9: Export Outlook for Refrigerated Commodities

	2009	2020	2029	2009 to 2020	2020 to 2029
Total Commodities	79,578,018	118,911,098	151,291,294	49%	27%
Beverages	1,007,407	1,501,440	2,031,706	49%	35%
Fruits and Vegetables Fresh/Chilled (Sensitive)	578,265	699,339	936,454	21%	34%
Fruits and Vegetables Fresh/Chilled/Frozen	473,692	680,582	1,134,349	44%	67%
Fish and Seafood, Frozen	176,912	252,814	324,708	43%	28%
Meat, Fish and Dairy, Other	139,150	177,421	216,128	28%	22%
Fruits, Exotics	137,491	223,392	307,535	62%	38%
Meat, Frozen	49,704	47,723	53,439	-4%	12%
Fish and Seafood, Fresh/Chilled	20,296	26,493	33,236	31%	25%
Dairy	17,248	18,738	22,314	9%	19%
Meat, Fresh/Chilled	11,146	11,166	12,179	0%	9%
Fresh Cut Flowers, Foliage	2,420	5,224	5,638	116%	8%
Total Commodities Potentially Using Refrigeration	2,613,730	3,664,332	5,077,688	39%	39%

Source: IHS Global, August 2011 South Atlantic waterborne trade forecast



This page intentionally blank

4 CANDIDATE MARKET OPPORTUNITIES

Based on the analysis described above, the following candidate market opportunities were selected for further development: chemicals, containers, refrigerated cargo, grain, wood products (traditional), wood pellets, Ro/Ro, and wind power. Wind power was identified through the stakeholder interviews and is consistent with the state's competitiveness in metals and machinery. Additional information on the market potential for each is provided below. Of note, many of the scenarios outlined here utilize resources from rural areas; as much of the state's growth takes place in its metropolitan areas, maritime investment is a way of supporting continued economic growth in the state's rural areas.

4.1 Chemicals

Chemicals are a major existing export for North Carolina's port facilities, show up as a comparative strength for the state's economy, and have solid export prospects going forward. The anchor for the state's industry, PCS, has a long-term lease on a terminal at Morehead City and mines potash in Aurora, NC. The company's phosphate operations "mine phosphate ore and manufacture phosphoric acid, solid and liquid fertilizers, animal feed supplements, purified phosphoric acid which is used in food products and industrial."³ The Aurora facility has a capacity of 1.2 million tons of P205 of phosphoric acid per year; the company reports that it is the largest integrated phosphate mine and phosphate processing complex at one site in the world.

Transportation costs add significantly to the total cost of potash and bulk chemical products. Producers with integrated production processes or that serve markets close to their sources of supply have a market advantage. With respect to phosphates, the company has long-term leases on shipping terminals in Morehead City and Beaufort, North Carolina, through which the company receives and stores Aurora facility raw materials and finished product. Barges and tugboats are used to transport solid products, phosphoric acid and sulfur between the Aurora facility and shipping terminals. Raw materials and products, including sulfur, are also transported to and from the Aurora facility by rail, according to the company's reports. Existing reserves for the Aurora facility would permit mining for about 33 years. If deposits covered by permits are classified as resources, the mine life extends to about 52 years, confirming that this is a long-term opportunity for North Carolina.

4.2 Containers and Refrigerated Cargo

North Carolina added 1.5 million people between 2000 and 2010, one of only six states to add more than 1 million during the decade. To put that in perspective, 12 states have **total** populations less than 1.5 million—the number that North Carolina added in a decade. Moreover, the state's metropolitan communities frame the northern segment of the emerging Piedmont Atlantic Megaregion. In short, the state is becoming one of the nation's most populous states and is becoming part of a growing urban economy. This consumer market is attractive to retailers and will generate demand for a full range of consumer goods.

³ Summary of PCS operations drawn from 2010 10K report and supplemental filings with the US SEC. Report accessed at http://www.potashcorp.com/annual_reports/2010/media/PotashCorp_10-K_110225.pdf.

Container handling supports both export and import activity across a large variety of industries--everything from sweet potatoes and frozen chickens to consumer goods destined for local retailers. Growth in container activity at the port would make North Carolina facilities more attractive ports of call for shipping lines, expanding the market reach for NC producers, making it easier to secure containers, and creating scale economies.

4.3 Grain

Soybean exports account for 10 percent of North Carolina's agricultural exports; adding in wheat and feed grains and products, and the combined grain total rises to 18 percent of the state's exports and about \$490 million for the state's economy.⁴ As a result, market options are important for the state. North Carolina's soybeans are attractive to export customers because they tend to have higher protein and oil content than the average bean grown nationally.⁵ The data analysis above finds solid prospects for grain exports and growers reported in interviews that they could produce more than they currently do.

Grain markets are seasonal; soybean producers, for example, market about 65 percent of their beans between October and December.⁶

As the state's ports do not have a bulk handling facility, the majority of North Carolina's exports go to out of state ports, adding to producers' costs and paring back margins. A small portion travels by container through Wilmington. Even a small savings in transportation costs could yield significant savings for this industry, with multiplier effects for the North Carolina economy.

4.4 Wood Products and Wood Pellets

Heavy commodities such as wood and wood products are particularly sensitive to transportation costs. Potential for improved landside access and handling facilities at North Carolina's ports supports this large industry's ability to capture its maximum share of the world market. The state has an above average concentration in the wood products industry, but its competitiveness is weakening based on the shift share analysis presented above. Support for this industry and opening up opportunities to capture the wood pellets market would bolster this industry.

The wood pellets industry is driven by UK and European initiatives to convert energy sources to renewable ones. For example, in the UK 15 percent of energy consumption must be from forms of renewable energy by 2020 (versus approximately 1 percent in 2007). Electricity supply must be 35 percent from renewable sources by 2020, in comparison to about 5 percent in 2007. This is creating a large market for wood biomass that cannot be met domestically. North Carolina is well positioned in terms of resources to serve this market. One pellet facility has already opened in the state; its location near the Virginia state line and the company's purchase of a port terminal in Chesapeake mean that this first firm will export out of Virginia rather than North Carolina. The example, however, underpins the importance of transportation costs for this

⁴ Based on 2010 data compiled from the USDA Economic Research Service using data from the US Department of Commerce, the Census Bureau and the US Department of Agriculture, National Agricultural Statistics Service and reported in North Carolina's Agricultural Statistics, page 35.

⁵ Stakeholder interviews and reported in "Opportunities for Containerized Exports of North Carolina Soybeans," a report to the North Carolina Soybean Producers Association prepared by Market Solutions LLC, September 2008.

⁶ Ibid.

industry—favoring locations such as North Carolina with both the wood resource and port access.

4.5 Ro/Ro and Wind Power

The state's low costs of doing business make it an attractive location for producers of capital goods. Moreover, the state's competitiveness in metals and machinery supports the outlook for a growing capital goods industry. Ensuring that the state has the capability to handle large project cargoes supports important existing firms and industries such as the local military facilities as well as Spirit and Caterpillar. Military facilities support over 416,000 workers, about 8 percent of total state employment, through direct military or Coast Guard employment or jobs supported by military installations in the state such as contractors or support services. It also makes the state an attractive candidate for the relocation and expansion of other capital goods producers; these are attractive firms because they purchase significant inputs from their host economies, generating larger than average multiplier effects.

In addition, North Carolina is actively considering offshore wind power as a new industry. The Governor has convened a task force to evaluate whether and how best to pursue the opportunity. A study by the University of North Carolina concluded that the state could supply 100 percent of its power from off-shore turbines. Moreover, the state has a goal of supplying 12.5 percent of its power from renewable sources. This initiative represents an opportunity for the port. During the construction phase, North Carolina's ports would be the focus for imports and exports of equipment and materials for the offshore site. Once built, the freight volumes would fall, but the ports would serve as a service base to maintain and operate the offshore facility. Finally, the presence of the large scale facility and the state's attractive business costs could attract wind power manufacturers to the state, creating upside potential for equipment exports from the state.



This page intentionally blank