NORTH CAROLINA
MARITIME Strategy

Maritime Advisory Council

July 11, 2011

Greensboro, NC

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Welcome & Introductions

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Agenda

- Goals for Today's Meeting
  - Feedback from Advisory Council; Input to Study Results
- NC Maritime Strategy Team Analysis Update
  - Market Scenarios, Port Capacity, Existing Infrastructure
- Focused Discussion Topics
  - Exports, Attracting Shippers to NC Ports, Infrastructure
- Stakeholder Coordination and Industry Workshops
- Public Comment
- Conclusions and Close

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Goals for Today's Meeting

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Feedback from Advisory Council

- Vast and varied knowledge of Advisory Council – members include importers/exporters, transportation, commodity, military and decision makers
- More time for discussion
- Topics of interest from online survey:
  - **Market:** demand-based goals for capture of regional waterborne trade; niche market opportunities
  - **Port competitiveness:** better coordination between port-related industries, increased port availability, "deep water" facility in NC
  - **Infrastructure needs:** road and rail access; container-handling capacity; reduction of total delivery time/cost

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Maritime Study Scope

- Evaluate North Carolina's position, opportunities and challenges as a portal for global maritime commerce;
- Examine the role of North Carolina ports in sustaining and strengthening the State's economy;
- Obtain input from freight transportation, economic development, and community interests, and
- Identify specific strategies to optimize benefits received from the State's investments in port and associated transportation infrastructure.

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Study Outcomes

- ✓ Decision tool and process for evaluating port and related multi-modal investments
- ✓ Basis for long- and short-term investment strategy for more efficient, effective and safe movement of waterborne cargo in and out of the state
- ✓ Identification of priority projects
- ✓ Support for long-range planning
- ✓ Address institutional issues to approach maritime transportation issues in a more seamless manner

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Market Scenarios

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Initial Profile

- North Carolina ports have available capacity for business growth and some ability to expand (with limitations)
- A large import/export trade imbalance
- Strength in non-containerized cargo
- Comparatively uncongested highway access relative to other Atlantic ports, but rail and highway landside issues at Wilmington and Morehead City add to delivered costs
- Low port costs, but offset by landside costs and distance to ocean
- Not likely to be a primary port of call
- Strategic military port

Port	Miles to sea buoy
Wilmington	26
Morehead City	4
Norfolk	18 (estimated)
Charleston	16
Savannah	13
Jacksonville	10 (Dames Point)

Source: Port websites and NOAA

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The starting point for framing the market scenarios is the data analysis that is currently underway. Though not complete, the review of documents and data analysis have highlighted a number of initial findings.

Initial assessment of port capacity – as will be discussed in the next section of this presentation – indicates that existing NC port facilities can accommodate some business growth (within existing facilities) and have some ability to expand (through improvement to existing facilities).

Not unlike other US ports, imports through North Carolina ports exceed exports.

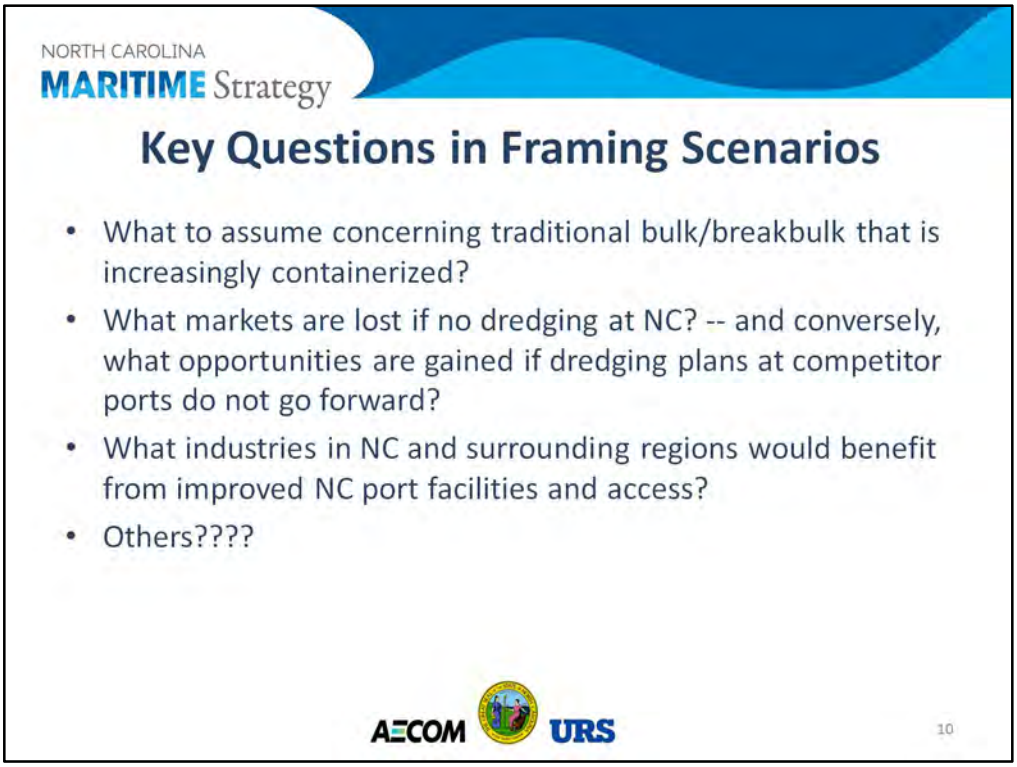
Much of the volume handled through the ports at Wilmington and Morehead City is non-containerized cargo (bulk and breakbulk).

While there are some landside access issues that increase total delivered cargo costs, highways surrounding NC ports are relatively uncongested, as compared to many peer ports.

The small size of NC port facilities and limitations of water access (channel length and depth) make existing NC ports unlikely to be primary port of call.

Importantly, Wilmington and Morehead City are two of only 14 designated military ports.

The list above is not exhaustive, but rather an initial sketch of the port profile that is emerging from this work.



Just as the review of documents and data has begun to provide a profile of the ports' strengths and weaknesses, there are also a number of uncertainties about future market growth trends that are being identified. An initial list is provided above, but we would like to get any feedback from the Advisory Committee members about key questions that we've not identified or that they want to ensure are addressed in the market scenarios.

The market scenarios are important as they are carried forward in the study and they underpin the development of alternatives and the assessments of benefits and any disbenefits. We propose to define each scenario in terms of four attributes: the market growth outcome, the conditions that would be necessary to achieve that market outcome, risks to achieving that market outcome (this is where some of the key questions can be factored in as part of a sensitivity analysis), and strategies for achieving the market growth outcome. The application of this approach is sketched out in the next slide as an illustration of the approach.

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Strawman Scenarios for Discussion

Scenario Element	Scenario 1: NC Ports Gain Market Share 1a–containers; 1b–bulk	Scenario 2: Maintain Market Share 2a–containers; 2b– bulk	Scenario 3: Declining Market Share 3a–containers; 3b–bulk
Growth Outcome	• 1a: Market share increases by X% • 1b: Market share increases by Y%	• 2a&b: Modest growth maintains current market share	• 3a: Market share falls by X% • 3b: Market share falls by Y%
Necessary Conditions	• 1a: Invest to handle greater container volume beyond existing capacity • 1b: Invest in specialized equipment for ag • 1a&b: Growth in niche exports • 1a&b: Landside access improves • 1a&b: Existing base remains solid	• 2a: Retain/ add frequency/diversity of calls • 2b: Forest products and bulk/breakbulk remain areas of strength • 2b: NC military footprint remains large	• 3a&b: None
Risks	• 1a&b: Improvements at competitors improve reliability and cost, not just capacity • 1a&b: Ongoing rail investment in corridors closes NC ports out of fastest corridors	• 2a: Spending profile of aging NC population shifts to services away from goods; migration weakens • 2b: Business costs rise in NC, tempering manufacturing growth	• 3a: Competitor ports attract greater frequency of ship calls • 3b: Containerization of bulk/breakbulk accelerates allowing competitors to absorb market • 3b: Key bulk and breakbulk markets falter—ex. forest products blocked
Strategies	• 1a&b: Develop cooperative agreement with partner ports and other strategic partners • 1b: Leverage existing strength in bulk and breakbulk cargoes • 1b: Invest in specialized equipment to support niche cargos	• 2a&b: Develop cooperative agreement with partner ports and other strategic partners such as railroads • 2b: Leverage existing strength in bulk and breakbulk cargoes	• 3a&b: Effort to be all types of port dilutes resources and marketing focus • 3a&b: Landside rail issues fail to be resolved

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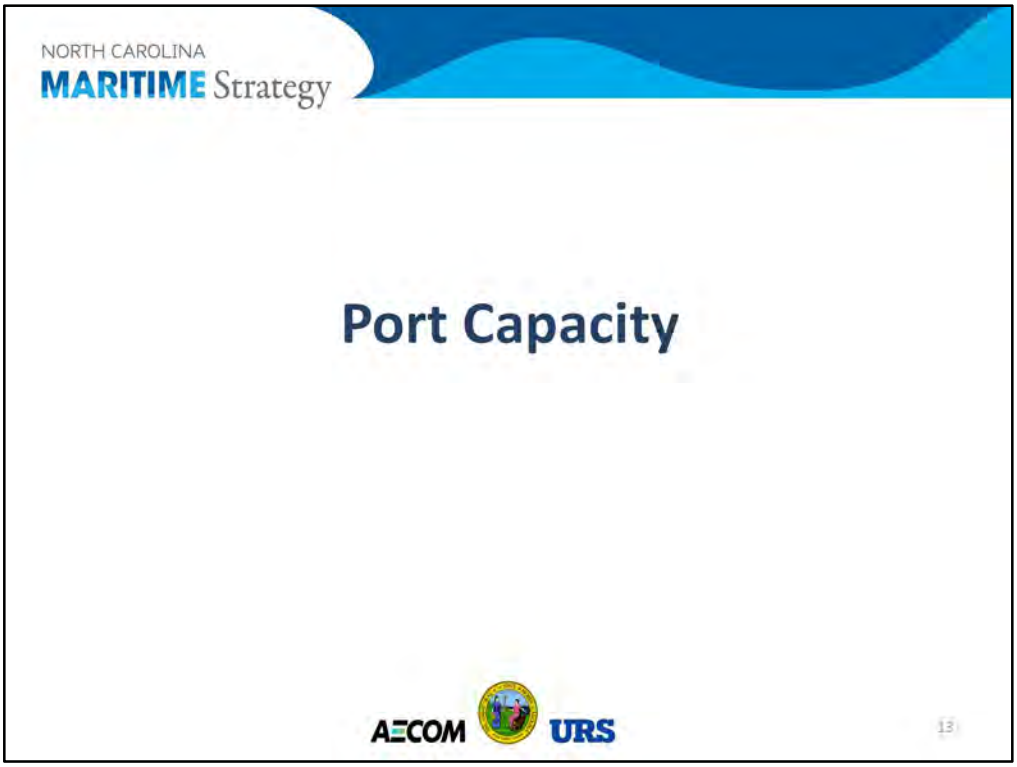
The slide above is a strawman, provided to illustrate how we propose to structure and articulate the market scenarios. Advisory Committee revision and comment are welcome and encouraged. It is important that these be defined as carefully as possible to ensure that the study provides good information to decision-makers. There are two variations for each scenario—one for the container market and one for the bulk/breakbulk market.

The column on the left is an optimistic scenario; the central column describes a moderate scenario; the right-hand column provides a pessimistic scenario.

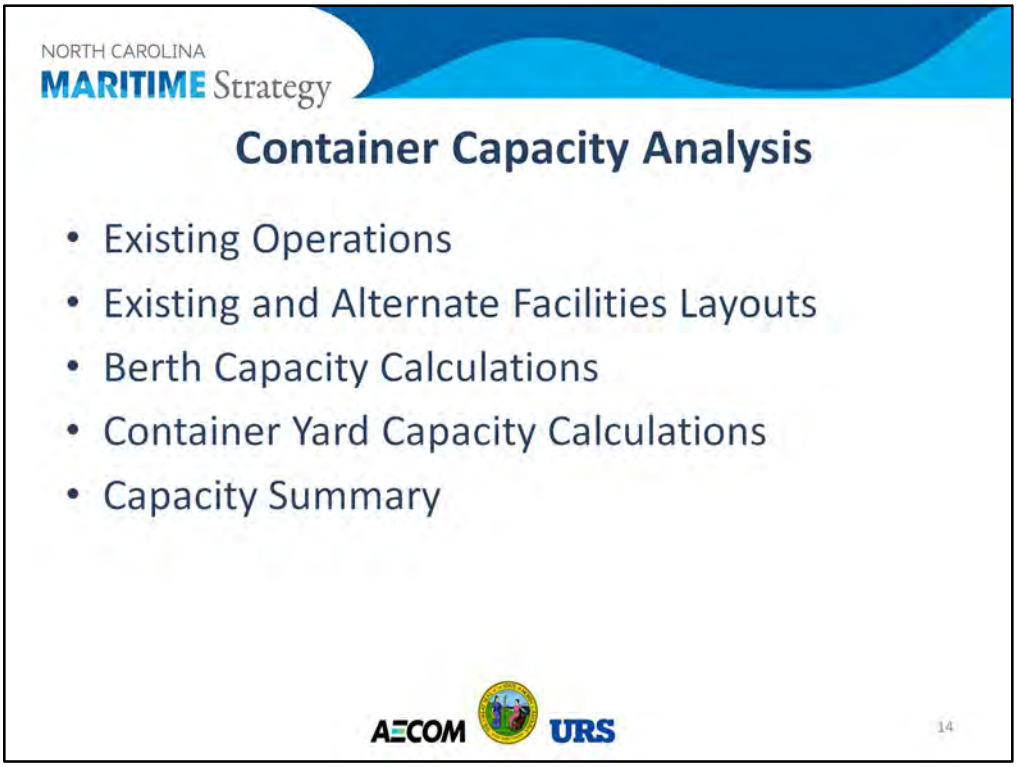
Scenario 1 is expected to involve significant and focused investment to attract new customers and markets to use North Carolina ports. Specific opportunities in containers and bulk – and the potential economic benefit of each – is under development based on global and regional market forecasts.

Scenario 2 would require some investment to maintain current market share within the context of regional competition. This scenario would target areas of strength, with possible disinvestment in lesser markets or commodities that offer limited economic benefit to North Carolina.

Scenario 3 is essentially the “do nothing” alternative. This pessimistic scenario helps to articulate what the economic cost associated with not investing in the ports would be.



In order to quantify NC Port's ability to meet the potential demand that may exist, a detailed analysis of NC Ports existing capacity was conducted for containerized and non-containerized cargo.



Based on the existing operations data and land use plan for the Port of Wilmington, alternate container handling terminal layouts were developed in order to determine the capacity of two key elements for each possible alternative. Capacity to handle containers over the berth, and inside the container storage yard, assuming landside access capacity can be increased in line with the overall terminal capacity.

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Port of Wilmington: Container Vessels Arrival Data

4/25/11 through 5/25/11

Call	Vessel Name	Dock cranes assigned	Total call duration (hours)	Actual vessel draft (if known)	Total Containers per Call	Lifts per Dock Crane	Net Crane Productivity (lifts per net Crane hour)
1	Hamburg	4	23:40:00	34.80	1,243	311	16.82
2	Marseilles	3	17:27:00	38.10	1,071	357	26.86
3	Ind. Accord	2	10:15:00	34.10	565	283	38.74
4	Roubaix	1	5:24:00	23.60	98	98	30.15
5	East	2	25:10:00	35.10	1,317	659	33.39
6	San Francisco	3	12:05	33.50	1,023	341	38.66
7	Julius S	2	25:50:00	30.80	901	451	22.22
8	Islandia	1	6:50	23.60	223	223	50.18
9	Seattle	3	16:45	32.50	1,346	449	35.30
10	Elizabeth	3	11:05	33.00	967	322	40.36
12	Ind. Concept	2	14:15	32.20	533	267	25.08
13	Roubaix	1	10:20	26.00	269	269	36.54
14	South	3	30:47:00	38.40	1,279	426	17.47
15	Valencia	4	10:50	32.80	1,041	260	33.46
16	Jumme Trader	2	15:47	31.50	843	422	35.41
17	Islandia	1	18:25	24.30	152	152	10.78
18	Malta	2	9:30	34.10	569	285	42.68
19	Los Angeles	3	26:05:00	36.70	1,386	462	22.55
	Average	2.3	16:08:20	32.0	824	335	30.93
	Max	4.0	30:47:00	38.4	1,386	659	50.18
	Min	1.0	5:24:00	23.6	98	98	10.78

Source: NCSPA

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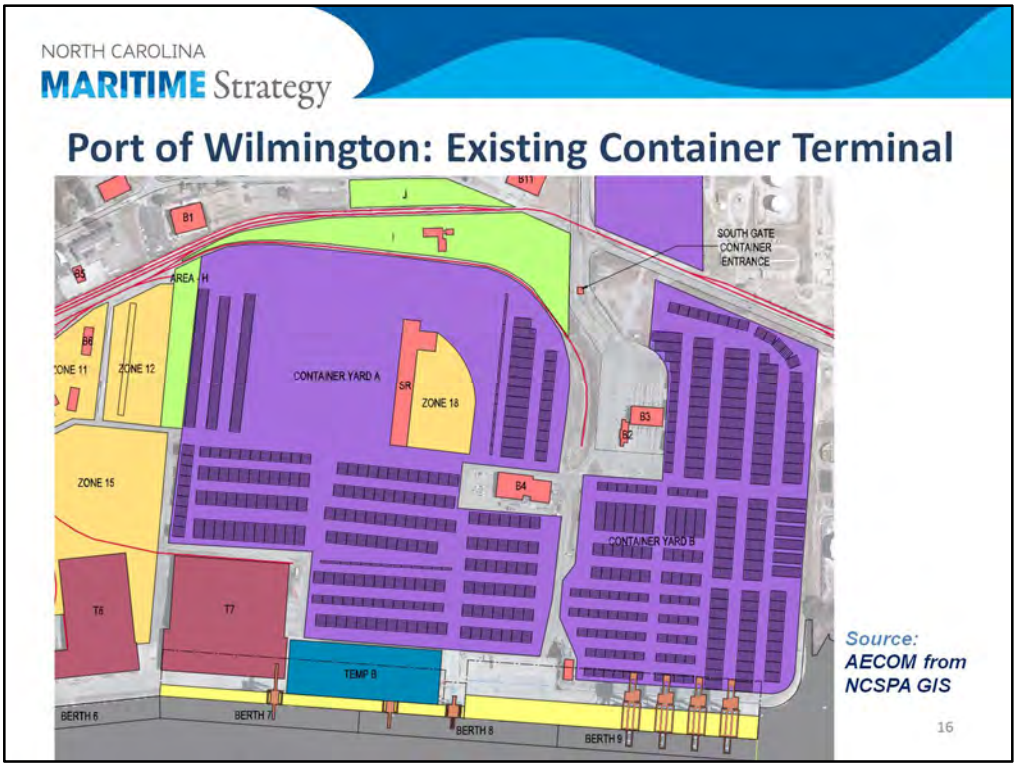
As a basis for assessment of container capacity analysis at Port of Wilmington (POW)

Berth capacity is mainly dependent on average number of containers being handled per vessel call and how fast a vessel can be worked. From the actual vessel arrival data, these values were calculated in order to determine the annual berth capacity. Relationship between the number of containers handled per vessel call and dock cranes deployed was used for future cases. Similar relationship between the number of container handled and vessel draft was used as a reference to derive future vessel call size at bigger vessels.



The existing container storage area within the terminal at the Port of Wilmington (POW) is shown here in purple. A complete map of the land uses at Port of Wilmington are presented in the appendix.

While the Port of Wilmington has other berths (Berth 6, 7, and 8 in this image), this container yard is currently served by a single premium berth (Berth 9) with four 100' gauge cranes. The 100' gauge cranes have sufficient reach to load/unload container vessels up to about 8000-8500 TEU (twenty-foot equivalent units).

The existing gate that provides truck access to the container yard is located in the South end of the terminal, but situated in the middle of the container storage area. All containers are handled with Reach Stackers inside the yard. A reach stacker is a mobile loader that is used to pick up and move containers within the terminal once they are unloaded from the vessel.

As a means to improve the capacity and efficiency of container operations within the existing Wilmington terminal, the AECOM / URS examined two alternative layouts.

This first potential terminal layout increases the gross terminal area dedicated to container use by 26 acres over the existing area.

A second berth, with two additional 100' gage cranes, is added. Total berth length (existing Berth 9 plus upgraded Berth 8) is 2670 ft.

The entry/exit gate has been realigned to provide a more contiguous container storage area by moving the gate out of the middle of the yard to the northeast corner of the port property.

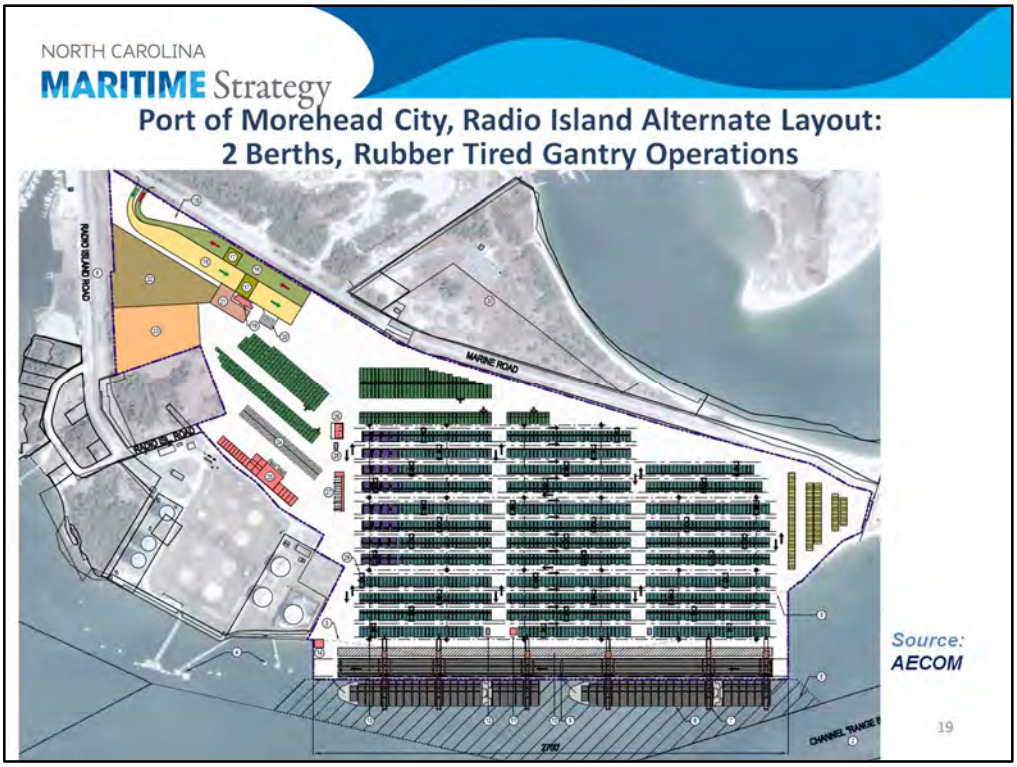
This layout continues to use Reach Stackers (RS) inside the yard for handling of all containers.

As a second alternative to increase container capacity at the Port of Wilmington, a second, more dense layout was also prepared.

This alternate container yard layout increases gross container terminal area by 37 acres as compared to the existing.

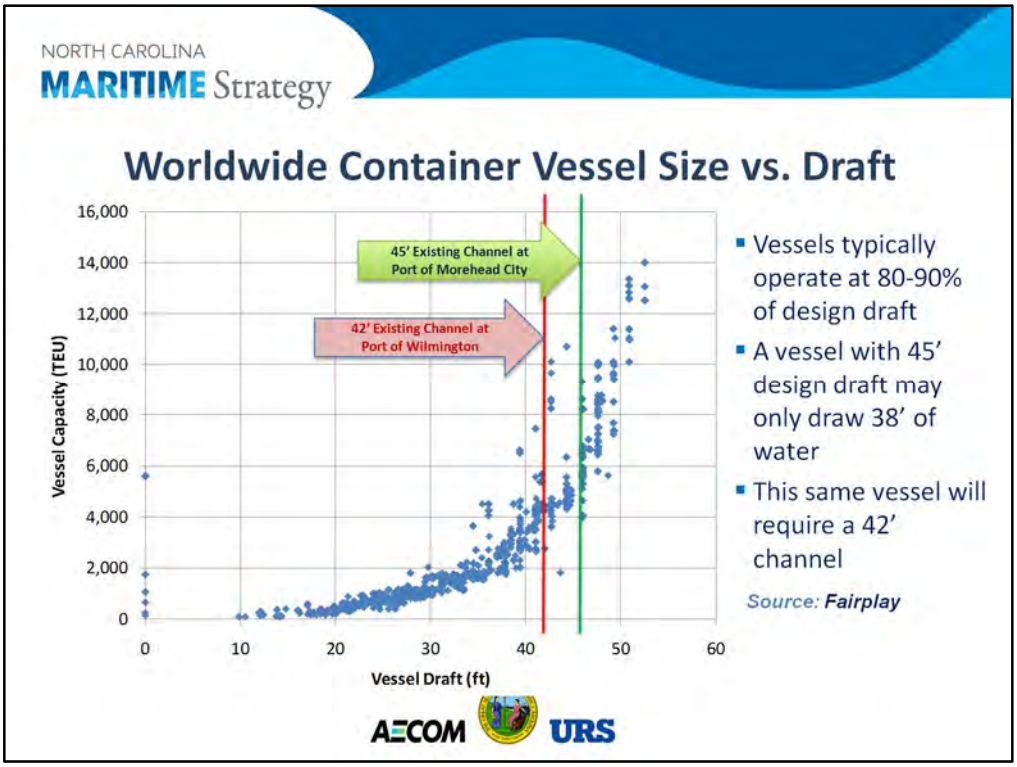
As in the previous layout, a 2nd berth with two new 100' gauge cranes is added and the entry/exit gate has been realigned.

Container movements in this denser layout would use Rubber Tired Gantry (RTG) cranes to handle containers inside the yard.



The team also examined how container operations could be incorporated into the Radio Island site at the Port of Morehead City.

The conceptual container terminal layout at Radio Island is similar in operating concept as the second alternative at Wilmington. It includes an RTG-based (rubber-tired gantry-based), two berth terminal.



An important factor in the capacity of a container terminal is the size and capacity of vessels calling on that terminal.

This chart shows the relationship between water depth and vessel capacity, in TEUs. In recent years, the size of container vessels has been increasing. Most new container ships have capacities of 8000 TEU or more. The expanded Panama Canal will allow the passage of 10,000 TEU vessels.

The existing Cape Fear channel, at 42' depth, to the Port of Wilmington can handle most 5000- to- 6000 TEU vessels without restriction.

If a container terminal were built at the Port of Morehead City, the existing channel depth of 45' would also be able to serve 5000- to 6000-TEU vessels as well as some larger containerships.

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Berth Capacity Analysis

Source: AECOM

1 Berth Existing Max 42' Channel	2 Berth Max 42' Channel	2 Berth Max 45' Channel	2 Berth Max 47' Channel	2 Berth Max 51' Channel	
5000	5000	5000 to 7000	5000 to 8000	8000	Typical Max Vessel Class Size TEUs
1,442	**1,442**	**1,648**	**1,854**	**2,060**	Container moves (Lifts) per vessel call [a]
3.0	3.5	4.0	4.0	4.5	Dock cranes assigned per vessel [b]
30.9	30.9	30.9	30.9	30.9	Productivity per dock crane (moves/hr) [c]
92.8	108.2	123.7	123.7	139.2	Vessel productivity (moves/hr) [d=b*c]
15.5	13.3	13.3	15.0	14.8	Work hours per vessel call [e=a/d]
3	3	3	3	3	Unproductive time at berth (hrs) [f]
18.5	16.3	16.3	18.0	17.8	Total vessel time at berth (hrs) [g=e+f]
20	20	20	20	20	Work hours per day [h]
1.20	1.20	1.20	1.20	1.20	Calendar hrs/ work hour [i=24/h]
22.3	19.6	19.6	21.6	21.4	Total vessel hrs at berth [j=g*i]
168	168	168	168	168	Calendar hrs per week [k]
7.55	8.58	8.58	7.78	7.86	Vessel calls per week at 100% berth utilization [l=k/j]
55%	60%	60%	60%	60%	Maximum practical peak week berth utilization [m]
4.15	5.15	5.15	4.67	4.72	Maximum practical vessel calls per week [n=l*m]
5,988.09	7,421.09	8,481.25	8,658.06	9,720.06	Peak week berth capacity (moves) [o=n*a]
1.2	1.2	1.2	1.2	1.2	Peak/mean week seasonal demand factor [p]
4,990.07	6,184.24	7,067.71	7,215.05	8,100.05	Mean week throughput capacity (moves) [q=o/p]
259,000.00	**322,000.00**	**368,000.00**	**375,000.00**	**421,000.00**	**Annual unit berth capacity (moves) [r=q*52]**
1.75	1.75	1.75	1.75	1.75	TEU per container [s]
450,000.00	**560,000.00**	**640,000.00**	**660,000.00**	**740,000.00**	**Annual unit berth capacity (TEU) [t=r*s]**
1	2	2	2	2	Number of berths (100' gauge crane) [u]
450,000.00	**1,120,000.00**	**1,280,000.00**	**1,320,000.00**	**1,480,000.00**	**Annual total berth capacity (TEU) [v=t*u]**

Berth capacity – the potential maximum throughput of containers (measured in TEUs), is a factor of both the number of berths and the channel depth. Deeper channels allow for larger ships that carry more TEUs per ship call and, therefore, offer a more efficient use of each berth.

With only one berth and 42' channel depth, the existing capacity at the Port of Wilmington is limited to 450,000 TEUs/year (Column 1). This capacity can increase to 1.12 million TEUs/year if second berth can be added with no increase in water depth (Column 2).

Channel deepening scenarios – to 45', 47', and 51' – were then selected to evaluate their effect on berth capacity. Capacities of up 1.28 million, 1.32 million, and 1.48 million TEUs could be achieved for these respective water depths (Columns 3, 4, and 5).

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Container Yard Capacity Analysis

RS Existing POW 100% Dwell	RS Future POW 100% Dwell	RTG Future POW 100% Dwell	RTG Future POW 80% Dwell	RTG Future POM 100% Dwell	
6,000	8,309	9,466	9,466	8,454	TGS capacity available [a]
2.5	2.5	3.0	3.0	3.0	Mean storage height (containers) [b]
15,000	20,773	28,398	28,398	25,362	TEU static capacity [c=a*b]
7.0	7.0	7.0	5.6	7.0	Mean dwell time (days) [d]
52.14	52.14	52.14	65.18	52.14	Turnovers per year per TEU static capacity [e=365/d]
782,143	1,083,138	1,480,753	1,850,941	1,322,447	TEU capacity without peaking [f=c*e]
1.20	1.20	1.20	1.20	1.20	Seasonal throughput peak factor [g]
1.20	1.20	1.15	1.15	1.15	Weekly inventory peak factor [h]
540,000	**750,000**	**1,070,000**	**1,340,000**	**960,000**	**Annual CY Capacity in TEUs [i+f/g/i]**
106	132	143	143	136	Gross terminal area (including wharf)
5,100	5,700	7,500	9,400	7,100	Annual TEUs per gross acre

Source: AECOM

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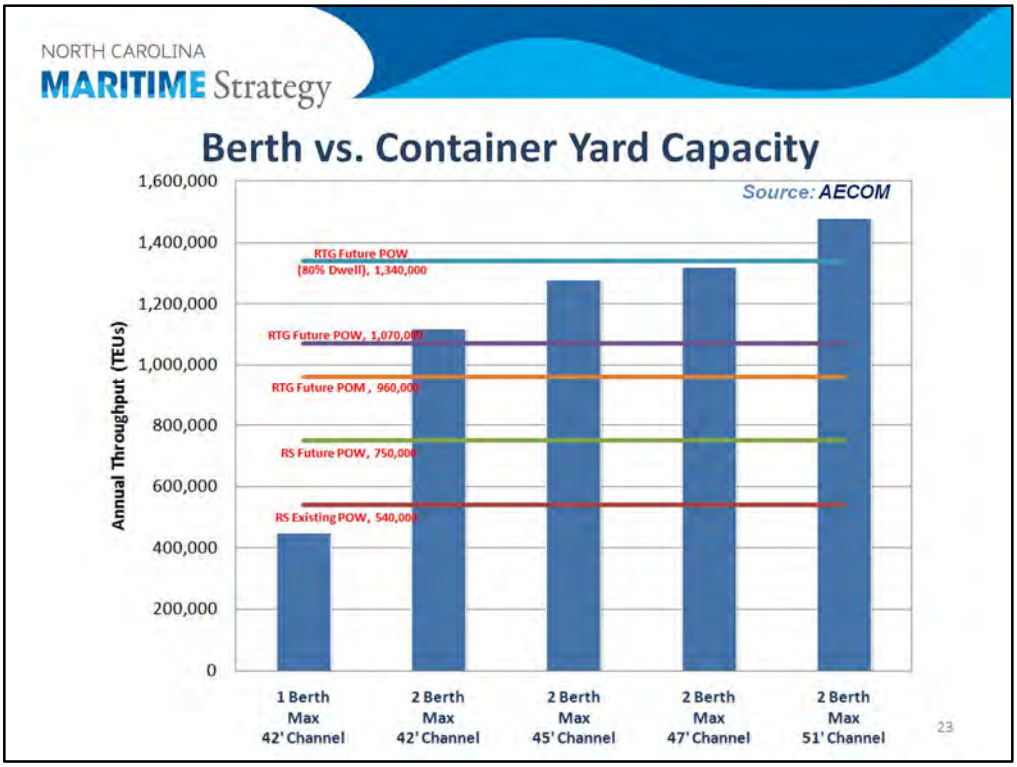
Another important factor in the capacity of a container terminal is the size and operation of the container yard. Ideally, the capacity of the berth and the container yard will be balanced.

The number of days a container sits inside the container terminal (dwell), the total number of acres available to store those containers, and the type of equipment used to handle those containers are the primary drivers of the annual container yard capacity.

This chart shows annual container yard capacity for reach stacker (RS) and rubber tired gantry (RTG) operations at the Port of Wilmington (POW) and Port of Morehead City (POM) based on the alternative layouts shown in the earlier slides. The dwell (100% or 80%) is expressed as percentage of an average 7-day dwell of containers in the yard. 7 days is typical for truck-based operations. If near-dock intermodal rail service is provided, dwell can be improved to 80% of this average (5.6 days).

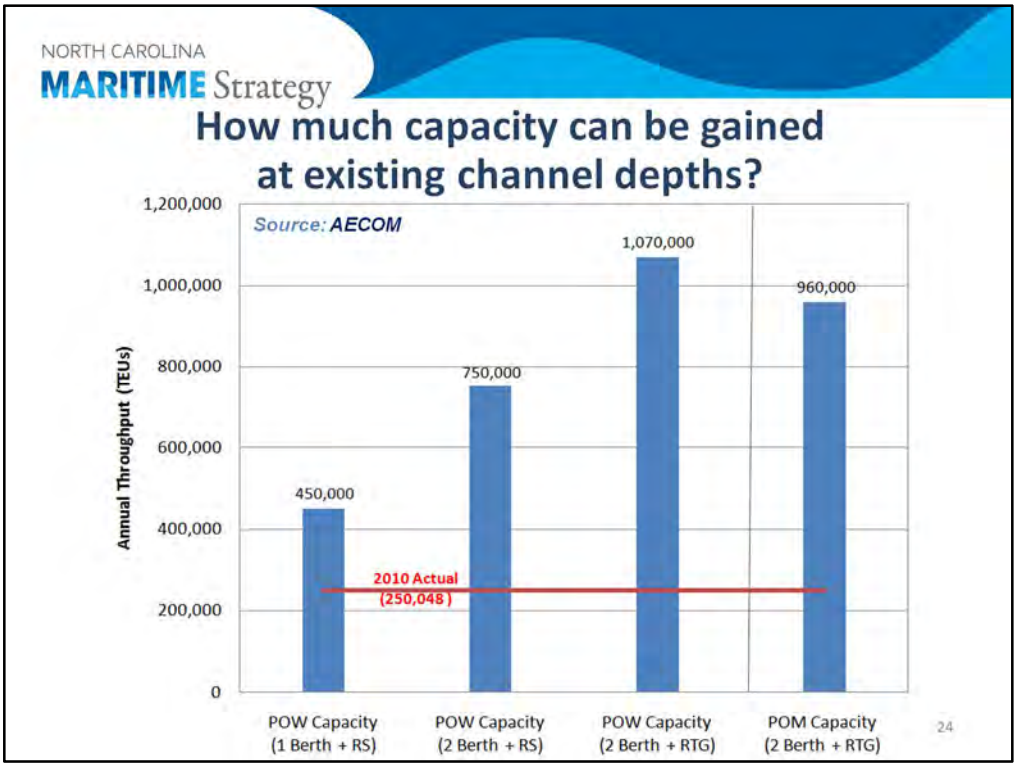
Key conclusions of this analysis:
• The current reach-stacker (RS) based operation at Port of Wilmington offers a maximum container yard capacity of 540,000.
• This can be increased to 750,000 TEU by expanding storage area and realigning the gate, but still using reach stacker (RS) operation.
• If rubber tired gantries (RTGs) are used as shown in the second POW layout alternative, total container yard capacity of 1,070,000 TEUs can be achieved.
• By adding intermodal rail service – and reducing container dwell time – the capacity of the RTG container yard alternative at POW is improved to 1.3 million TEU/year.
• The proposed RTG terminal on Radio Island at the Port of Morehead City (POM) offers a container yard capacity of 960,000 TEUs/year.



The chart shows Berth vs. Container Yard capacity, in twenty-foot equivalent units (TEUs) for all the scenarios presented earlier.

With a single berth, the current terminal at Port of Wilmington (POW) will be limited by the berth capacity of 450k TEUs/year. If a 2nd berth is constructed and current reach stacker (RS) operations are continued, the terminal will be constrained by the container yard capacity of 750k TEUs/year. This capacity could be increased to 1 million TEU if operations are converted to rubber tired gantry (RTG). After building a 2nd berth, channel deepening beyond the current 42' channel would add no overall capacity because terminal will be CY constrained -- unless average container dwell times can be reduced through the addition of intermodal rail service.

A potential container terminal on Radio Island at Port of Morehead City (POM), with 2 berths and rubber tired gantry (RTG) operations, is limited by container yard area to 960,000 TEU per year. This capacity would not be increased by dredging the channel beyond its current 45' depth.



This graph presents the projected container yard capacity under each scenario against the actual volume of containers handled at Port of Wilmington in 2010 (250,048 TEUs).

In 2010, Port of Wilmington (POW) operated at approximately 55% of it's capacity.

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Container Terminal Features at Peer Ports

	Container Berth length (ft)	# Dock cranes	CY size (acres)	Mode of operation	Railroad access
Norfolk VA	**12,295**	**29**	**760**		
Norfolk Int'l Terminals	5,570	14	250	Strad	Yes
Portsmouth Marine Terminal	3,540	9	219	Strad	Yes
APMT Virginia	3,025	6	291	ASC	Yes
Charleston SC	**8,800**	**21**	**450**		
Wando Welsh	3,800	10	242	RTG/TP	Offsite
NCT	2,500	6	130	RTG/TP	Yes
Columbus Street	2,500	5	78	RTG/TP	Yes
Savannah GA (Garden City)	**9,693**	**23**	**600**	RTG/TP	Yes
Jacksonville FL	**8,150**	**16**	**345**		
Trapac Terminal at Dames Point	2,400	6	158	RTG/TP	Yes
Blount Island	3,500	6	129	Whl/TP	Yes
Talleyrand	2,250	6	59	Whl/TP	Yes

Source: port data

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The Port of Wilmington competes for the container market with peer ports on the US east coast, including Norfolk VA, Charleston SC, Savannah GA, and to a lesser extent, Jacksonville FL.

Existing berth lengths, dock cranes, container yard size, mode of operation and railroad access for each of these ports' container terminals are summarized here. Each terminal offers a minimum two berths, with significant container storage area behind the wharf as well as on-port or near-port access to Class 1 railroads (Norfolk Southern and/or CSX). Most peer ports' container yards operate using combined rubber-tired gantry (RTG) and top-pick (TP) container moving equipment. Norfolk uses straddle carriers (Strad) at its older terminals and has a fully automated, high-density operation (ASC) at its APMT Virginia terminal.

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Container Capacity at Peer Ports

(at existing depth)

Source: AECOM

Port terminal (existing)	Annual berth capacity (TEU)	Annual CY capacity (TEU)	Annual terminal capacity (TEU)	2010 Throughput (TEU)
Norfolk VA	**5,570,000**	**5,030,000**	**3,360,000**	**1,895,018**
Norfolk Int'l Terminals	2,510,000	1,130,000	1,130,000	
Portsmouth Marine Terminal	1,550,000	990,000	990,000	
APMT Virginia	1,510,000	2,910,000	1,510,000	
Charleston SC	**3,870,000**	**3,380,000**	**3,230,000**	**1,280,000**
Wando Welsh	1,670,000	1,820,000	1,670,000	
NCT	1,100,000	970,000	970,000	
Columbus Street	1,100,000	590,000	590,000	
Savannah GA (Garden City)	**5,000,000**	**4,500,000**	**4,500,000**	**2,825,178**
Jacksonville FL	**3,310,000**	**1,850,000**	**1,600,000**	**826,580**
Trapac Terminal at Dames Point	940,000	1,190,000	940,000	
Blount Island	1,490,000	450,000	450,000	
Talleyrand	880,000	210,000	210,000	
Total Peer Ports Capacity	**17,750,000**	**14,760,000**	**12,960,000**	**6,826,776**

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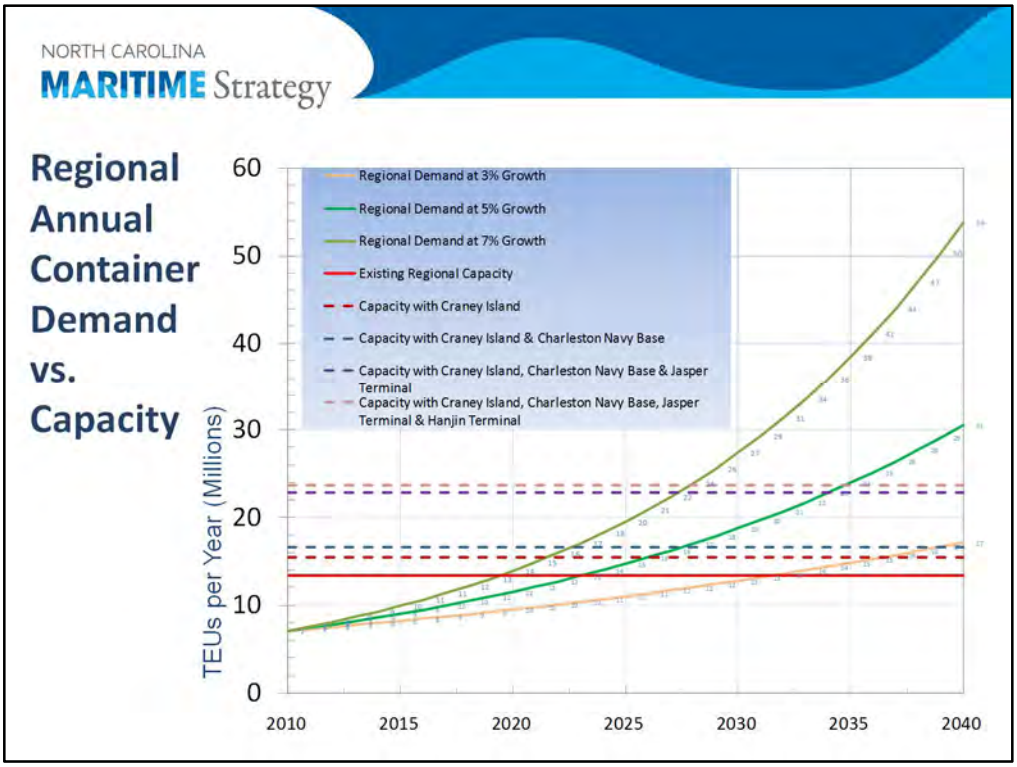
Combined, all peer ports handled approximately 6.8M TEUs in 2010 against their operating capacity of approximately 13M TEUs/year. All Ports and entire region is currently operating at approximately 53% of their capacity.



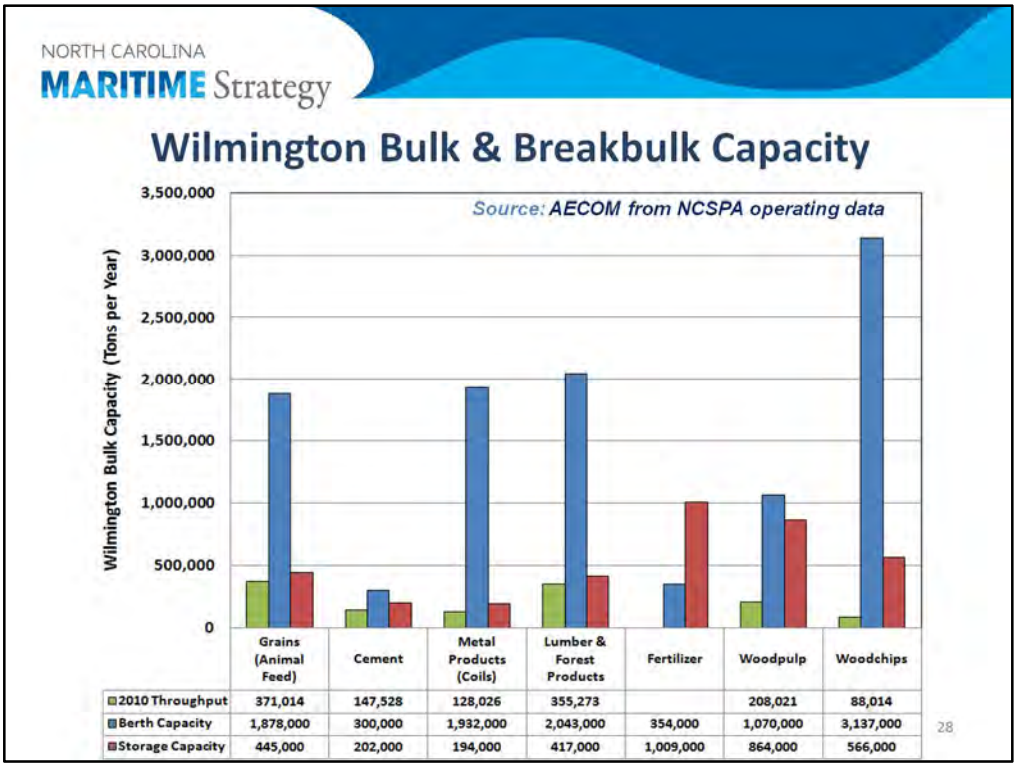
It is important to consider container capacity in relation to overall regional demand. This graph shows current capacity with existing facilities (horizontal solid red line) and how it would be increased due to incremental addition of four proposed container terminal developments: Craney Island at Norfolk; Charleston Navy Base; Jasper Terminal, the proposed partnership between the states of Georgia and South Carolina; and the Hanjin Terminal at Jacksonville. Existing Port of Wilmington capacity is included in the baseline figure.

The largest proposed capacity addition to the region is the Jasper Terminal.

Existing and potential regional capacity are compared to three growth scenarios: 3%, 5%, and 7% growth.

<u>With existing facilities</u>
At 7% growth, need new capacity in 2020
At 5% growth, need new capacity in 2024
At 3% growth, need new capacity in 2032

<u>With all four planned facilities</u>
At 7% growth, need new capacity in 2028
At 5% growth, need new capacity in 2035
At 3% growth, need new capacity beyond 2040

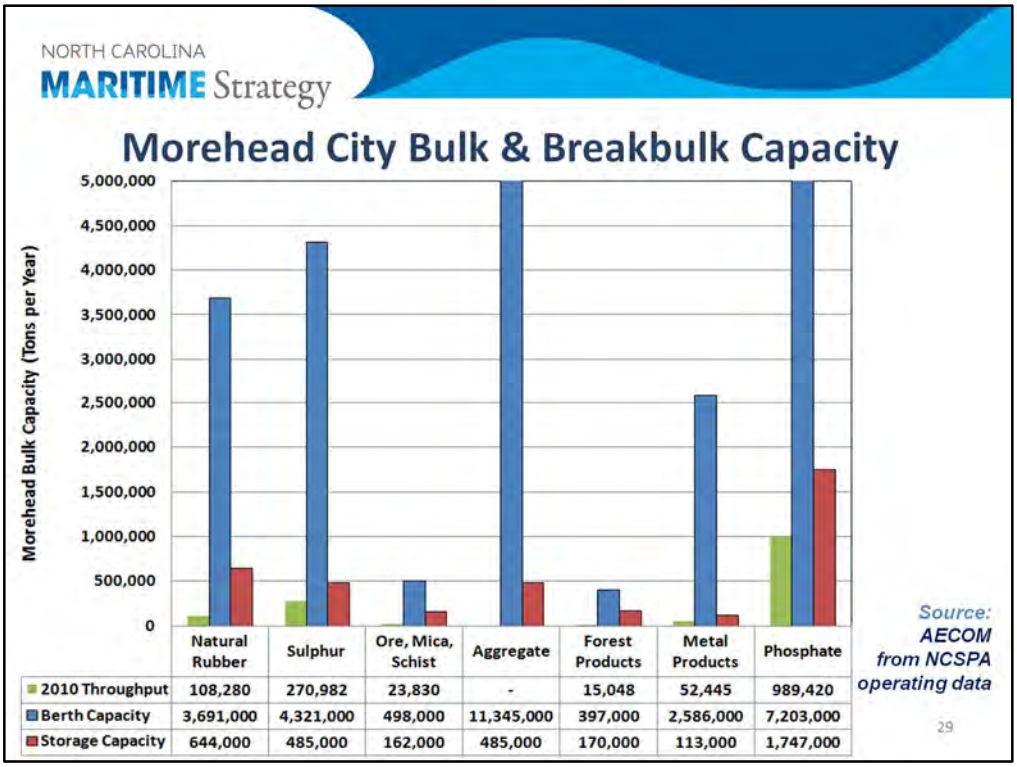


	Grains (Animal Feed)	Cement	Metal Products (Coils)	Lumber & Forest Products	Fertilizer	Woodpulp	Woodchips
2010 Throughput	371,014	147,528	128,026	355,273		208,021	88,014
Berth Capacity	1,878,000	300,000	1,932,000	2,043,000	354,000	1,070,000	3,137,000
Storage Capacity	445,000	202,000	194,000	417,000	1,009,000	864,000	566,000

In addition to container capacity, the team examined bulk and breakbulk capacity at each of the Ports of Wilmington and Morehead City.
Bulk and breakbulk commodities often use designated facilities within the terminal. Some bulk products, like grain, require specialized handling equipment.

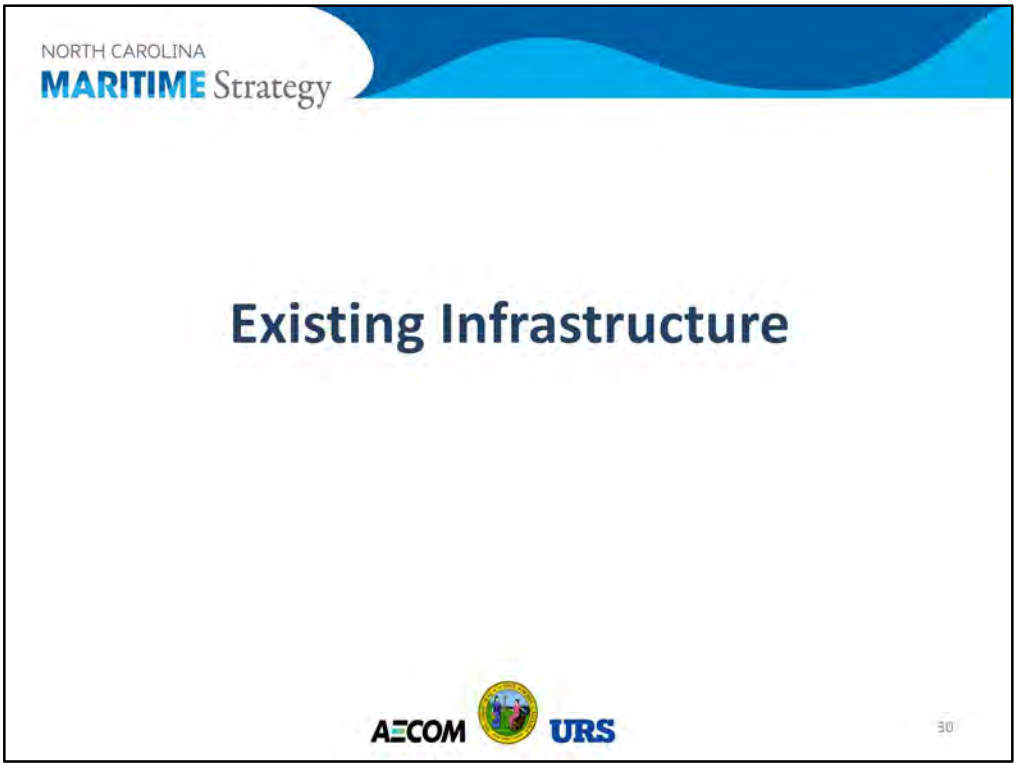
This chart shows 2010 throughput against berth capacity and storage capacity for various commodities at the Port of Wilmington (POW).

Growth of most of the bulk and breakbulk commodities at POW will be limited by their storage capacity. POW has a plenty of berth capacity overall.

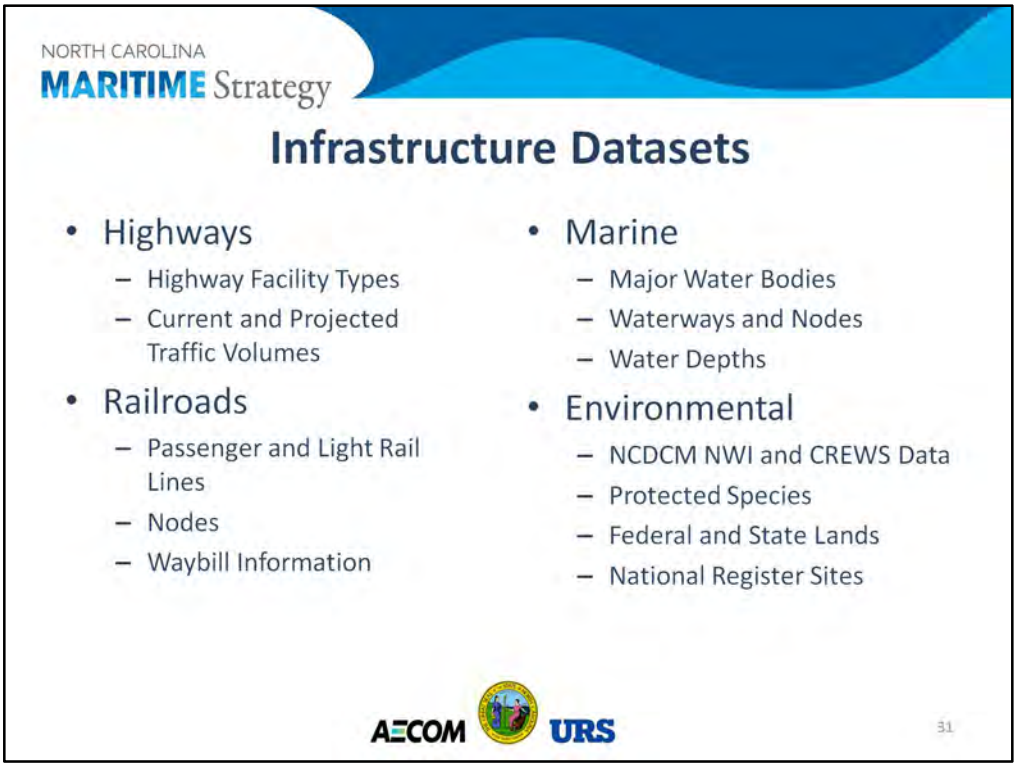


This chart shows 2010 throughput, berth capacity and storage capacity for various commodities at the Port of Morehead City (POM).

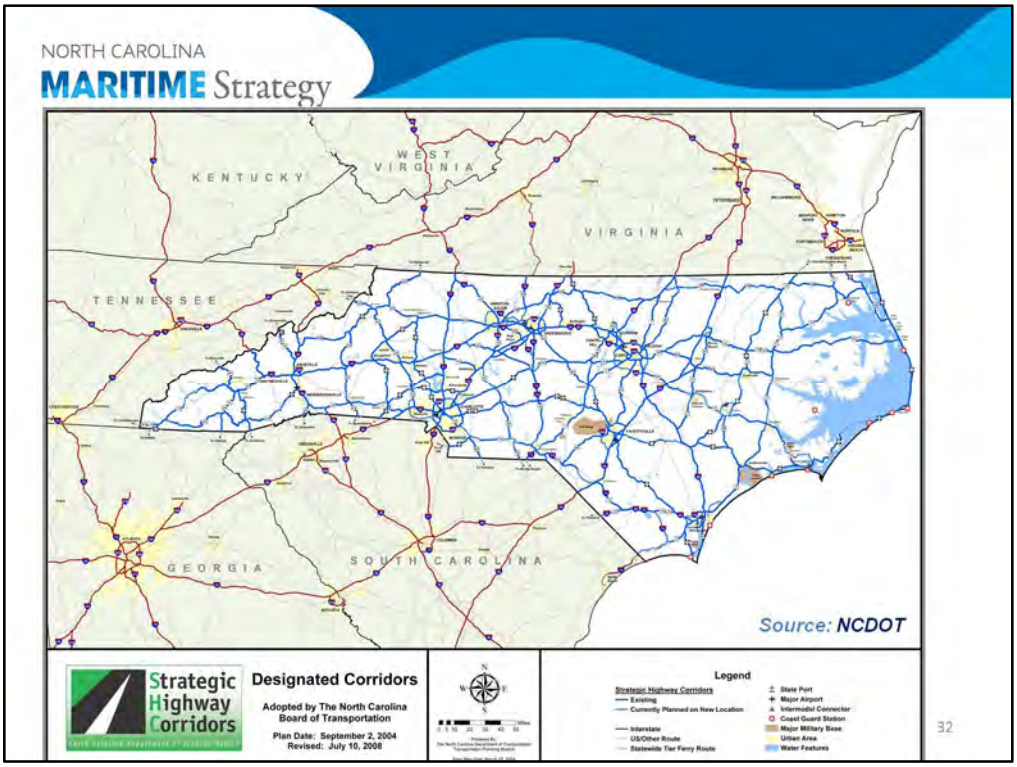
Growth of most of the bulk and breakbulk commodities at POM will be limited by their storage capacity. POM has a plenty of berth capacity overall. Berths are often used for multiple bulk and breakbulk commodities.



The study team has also been advancing definition of existing infrastructure within and around North Carolina.

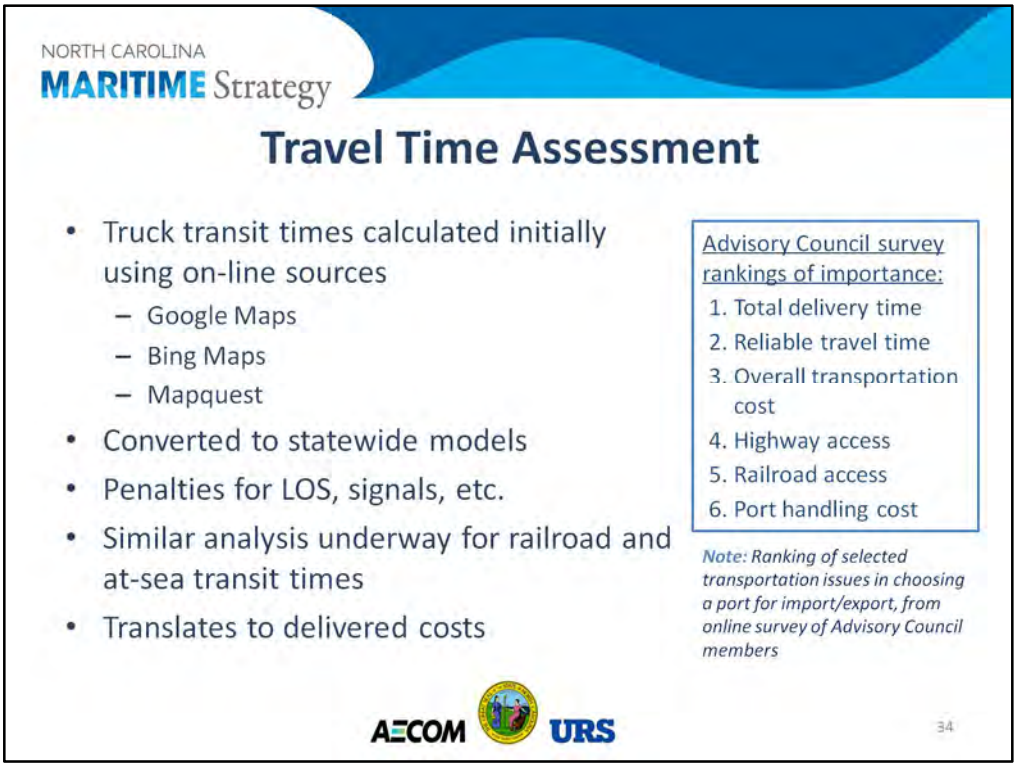


A comprehensive GIS database has been assembled to define capacity and operations of the regional highway and railroad network. Water access and environmental considerations are also included. Readily available datasources, such as the NC OneMap, are being supplemented by key information on transportation system features, constraints, and performance – a few of which are listed here.



As an example, our team has incorporated NCDOT information regarding Strategic Highway Corridors.

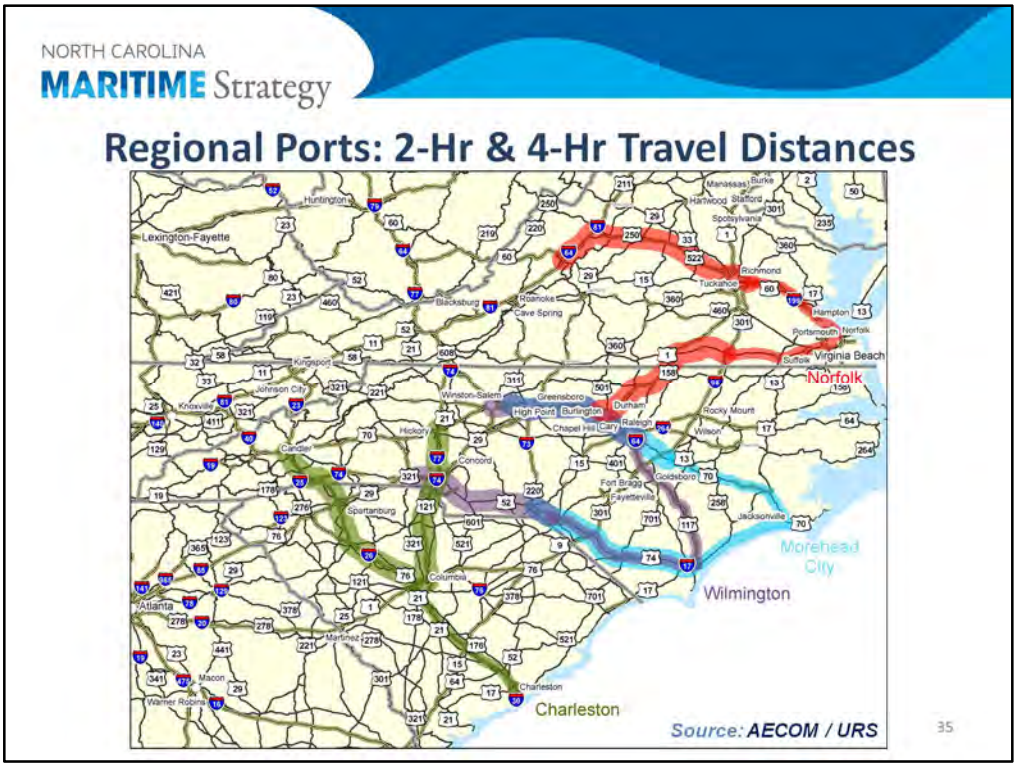
Strategic Highway Corridor Vision Plan is also incorporated for consideration in defining future infrastructure needs as part of the Maritime Strategy.



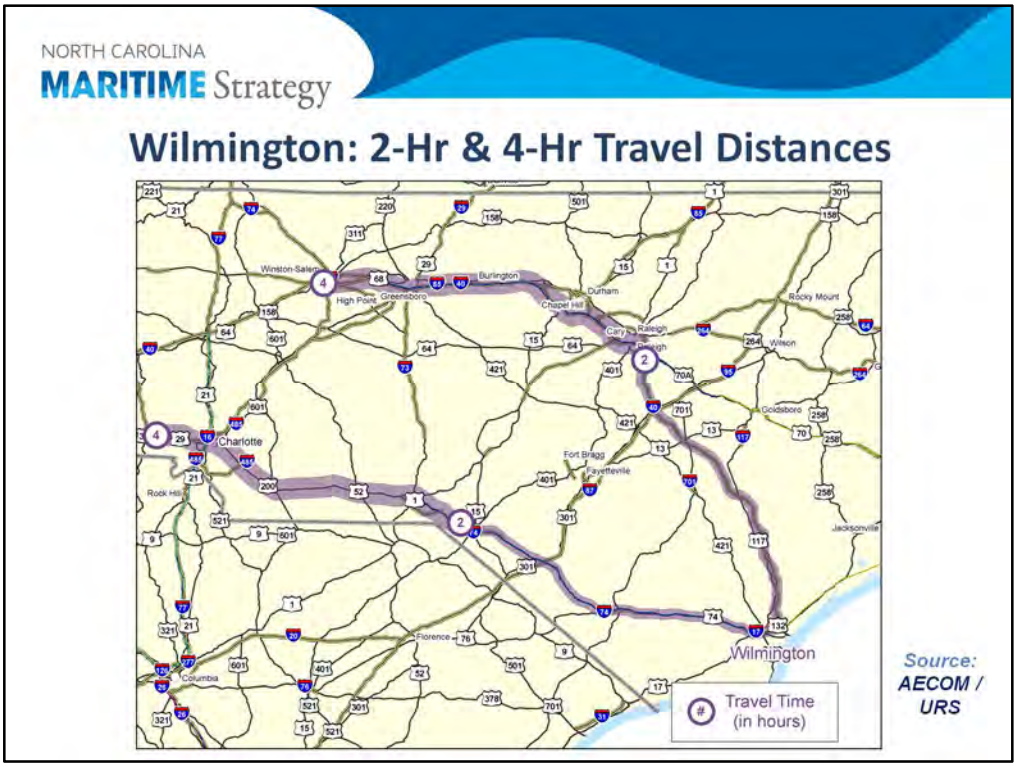
GIS will be an important tool in assessing travel time to and from existing or proposed port facilities. The team has initially calculated truck transit times using online sources such as Google Maps, Bing, and Mapquest. This will be converted to the use of GIS-based statewide models for neighboring states and will include time penalties for roadway level of service, signals, and other constraints. A similar analysis will also be performed for railroad and at-sea transit times.

In the online survey conducted of Advisory Council members, total delivery time was identified as the most important factor in choosing a port for import or export. This was followed by reliable travel time and overall transportation cost. In fact, there is a close relationship between total delivery time and the total delivered cost of goods to market.

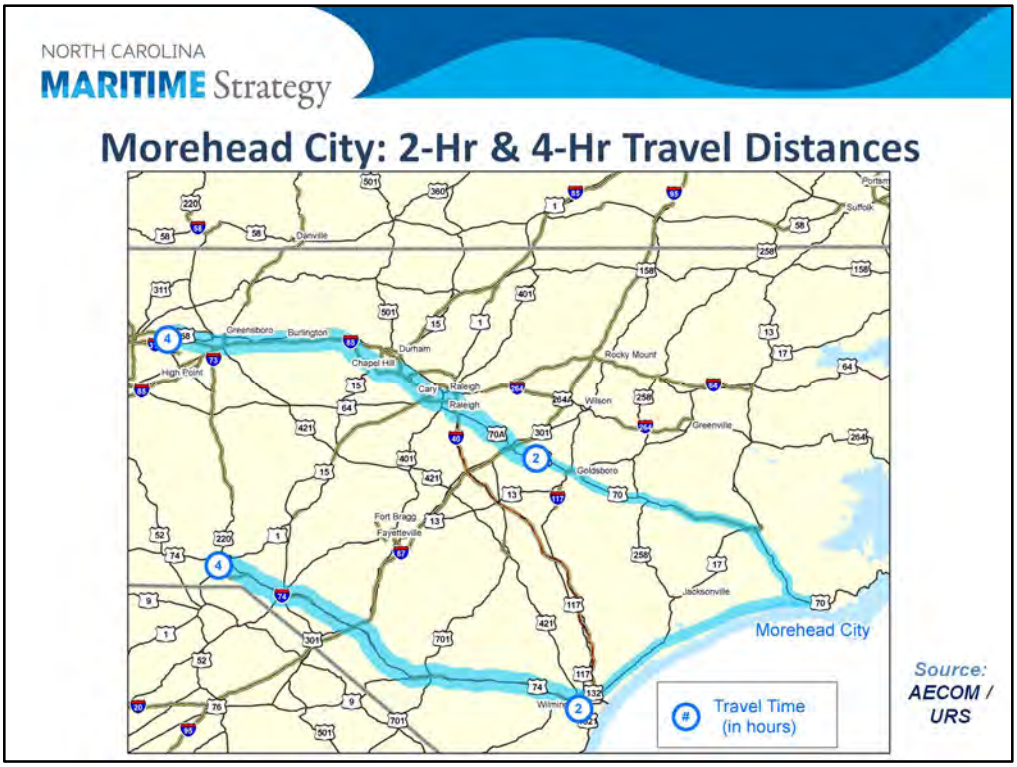
Our team will use GIS-based analysis to support the development of a delivered cost model that will define the likely market area for North Carolina ports and that will be used to evaluate the travel time benefits that could be realized from targeted infrastructure improvements.



Our initial analysis of travel time focused on primary routes serving North Carolina from ports at Wilmington, Morehead City, Norfolk and Charleston. These routes – including two-hour distances with narrower line and four-hour distances with a wider line – indicate that North Carolina ports are competitive with Norfolk in providing access to the state's hinterlands. The western reaches of NC, however, can be reached faster from Charleston than from Wilmington or Morehead City.

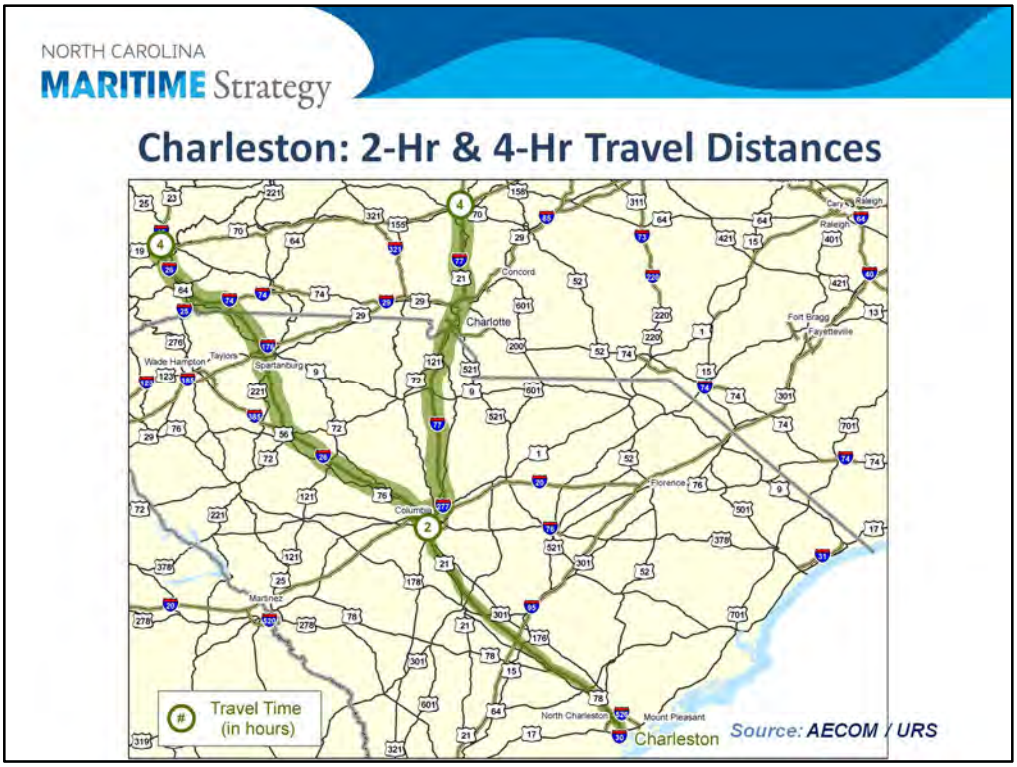


From the Port of Wilmington, travel time to the Raleigh/Durham area is about two hours. A truck can reach Charlotte, Winston-Salem, and Greensboro in four hours or less.



From Morehead City, truck travel time to Raleigh is over two hours, which is also the travel time to Wilmington. Travel time to Greensboro and High Point is under four hours.

Trucks originating at port terminals in Norfolk can reach the Raleigh / Durham area in under four hours.



From the Port of Charleston, truck transit time to Columbia NC is just about two hours. It takes less than four hours to reach Charlotte. Much of the western portions of NC may also be reached in four hours.

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Focused Discussion

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Suggested Discussion Topics

- Exports
- Attracting Shippers to NC Ports
- Infrastructure Needs

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Stakeholder Coordination and Industry Workshops

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Stakeholder & Industry Workshops

- To be conducted July through October
- Obtain input from targeted industry groups with interest or specialized expertise in NC maritime development or goods transport
- Support from Advisory Council to identify proposed workshop participants and support productive discussions

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Stakeholder Groups

- Focused meetings
  - NoPort Southport
  - Save the Cape
  - US Army Corps / NC Dept of Coastal Resources
  - Progress Energy / NRC
  - NC Tourism
- Industry workshops
  - Trucking and railroads
  - Shippers
  - Agriculture
  - Military
  - Non-Ag manufacturing
  - Special zones
  - Shipping lines

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Focused Meetings Held to Date

- No Port Southport and Save the Cape

  Concerns focused on proposed NCIT and Cape Fear inlet:
  - Economic and market need
  - Safety and security
  - Environmental impacts to aquifer and channel
  - Health impacts of port operations
  - Landside infrastructure and impacts
- US Army Corps of Engineers
  - Limited funding for dredging
  - Priorities based on port volumes, channel distance, military needs
  - Feasibility study at Cape Fear will examine shoaling at Bald Head Island, S Turn at Battery Island, and enlarged turning basin

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Public Comment

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Conclusions and Close

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APPENDIX

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Employment Densities in NC by Selected North American Industry Classifications

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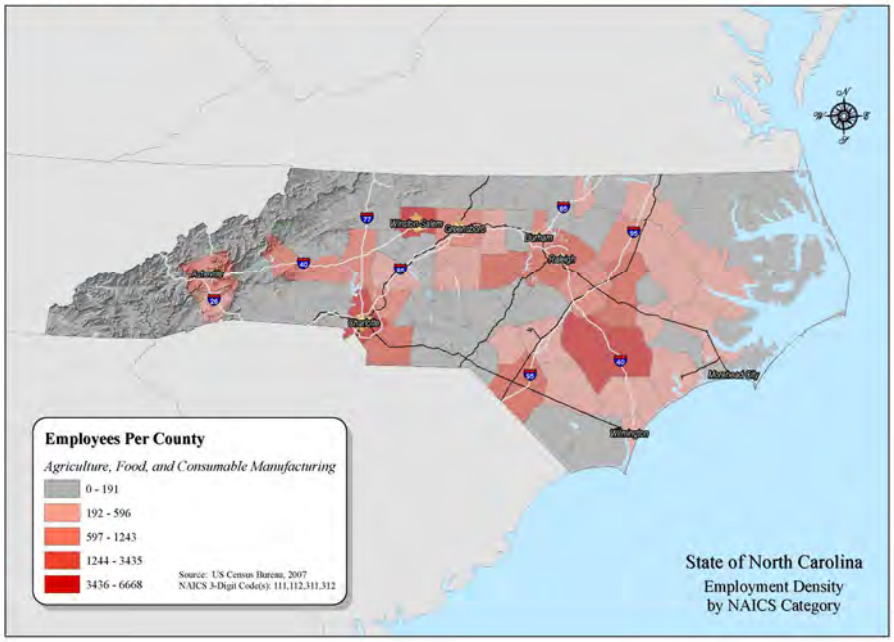

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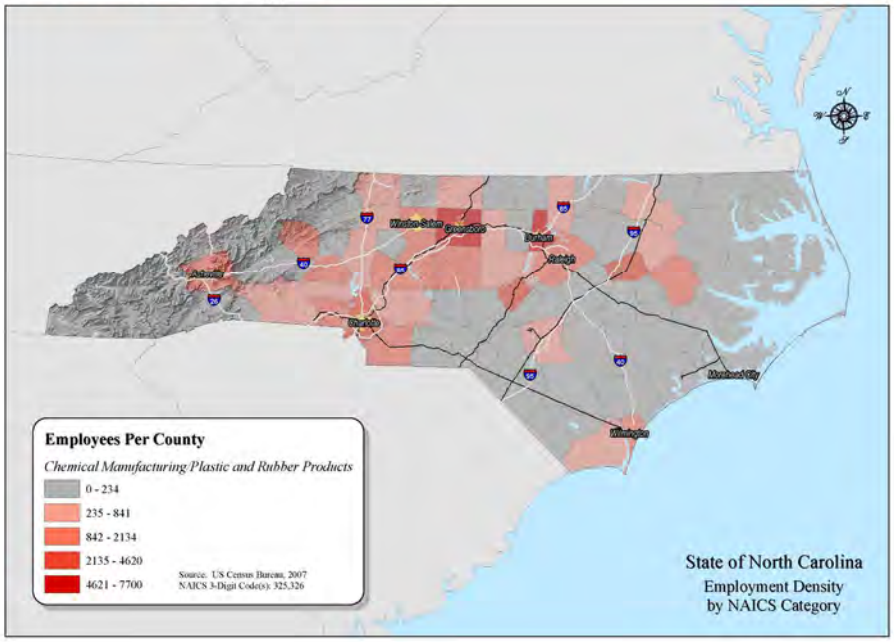

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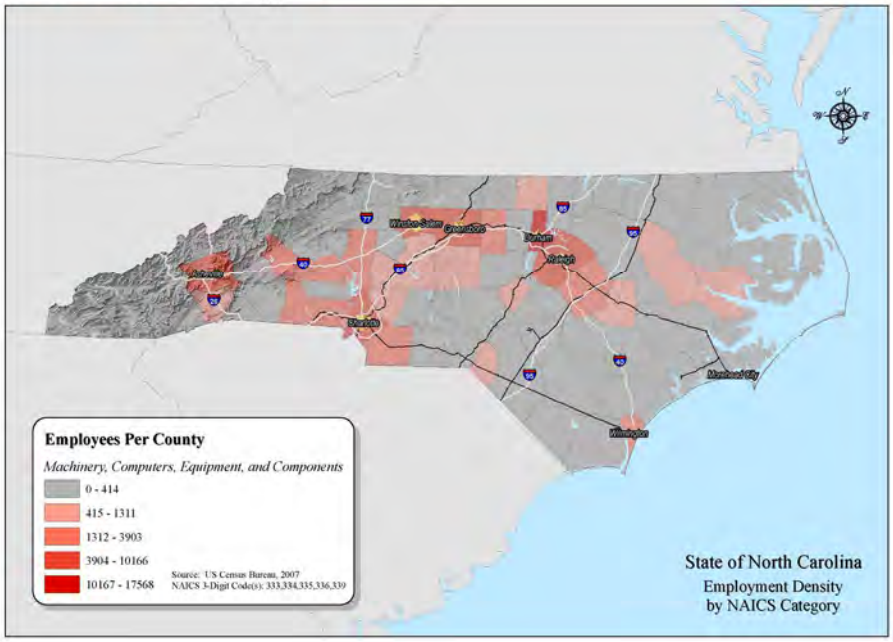

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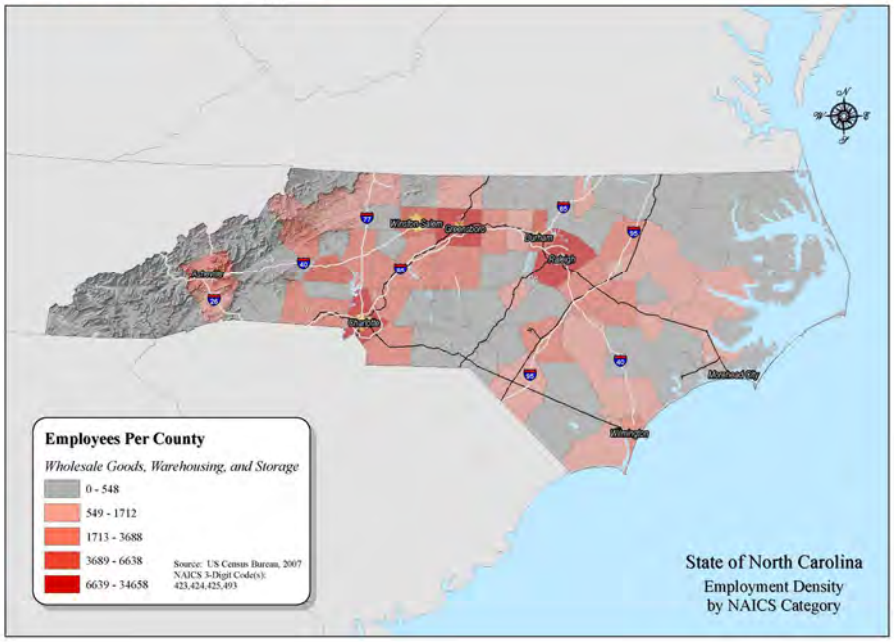

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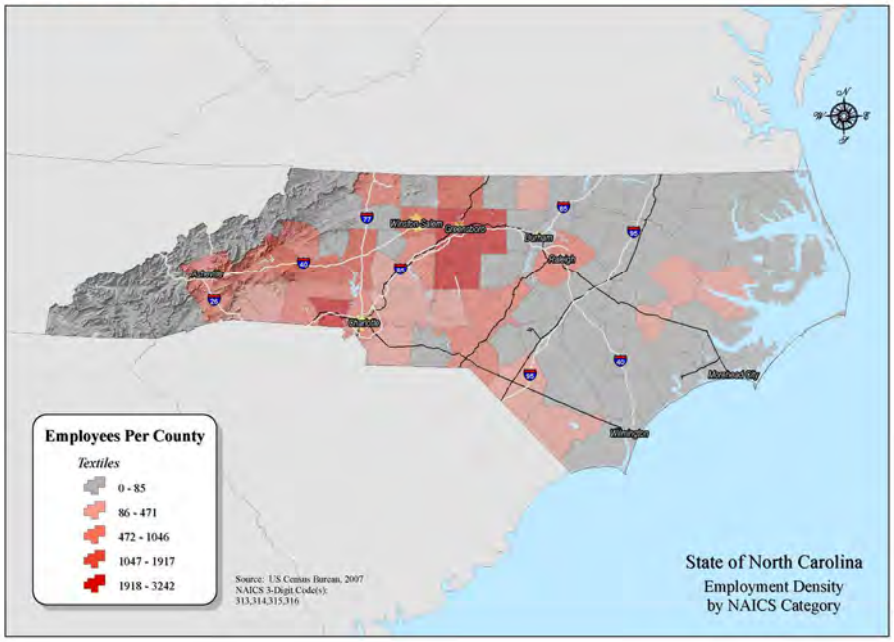

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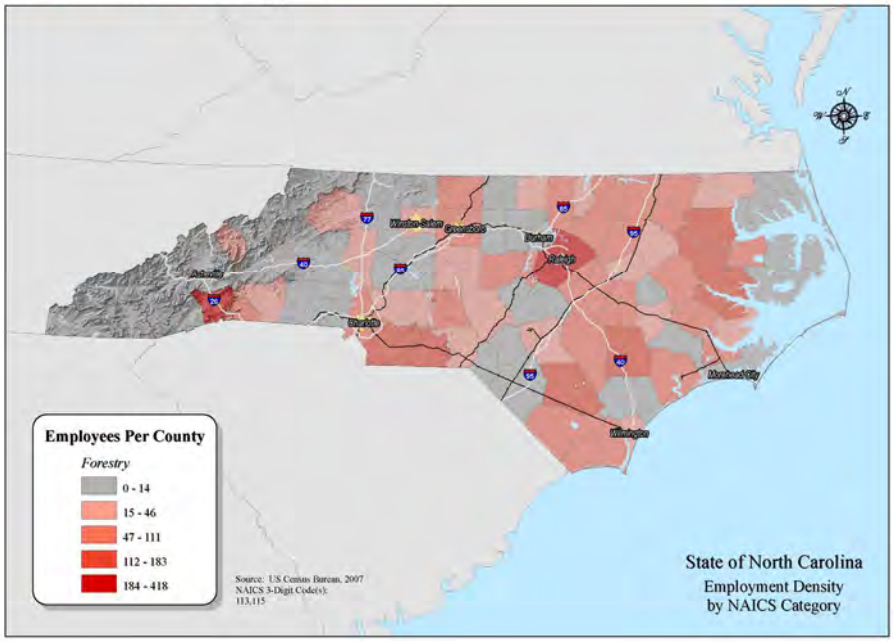

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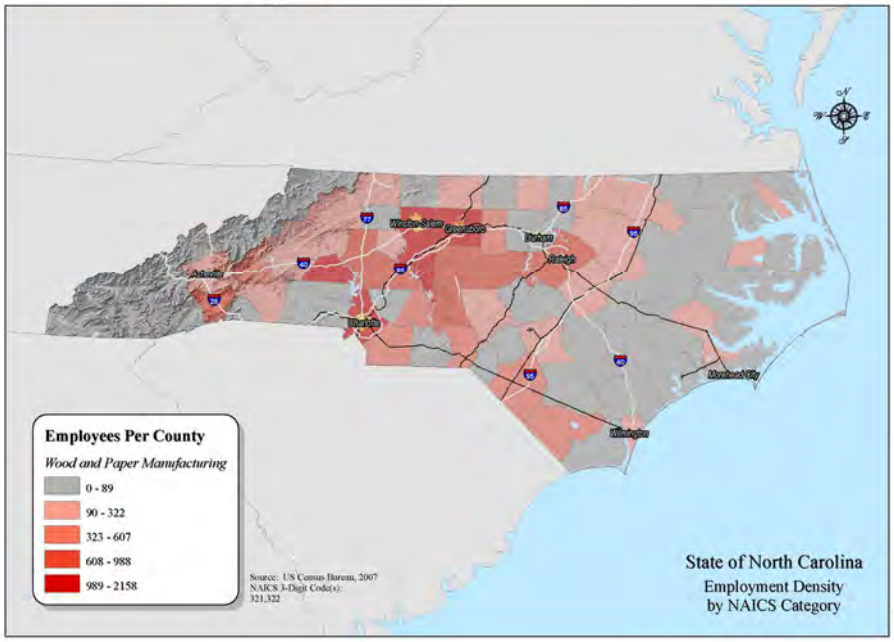

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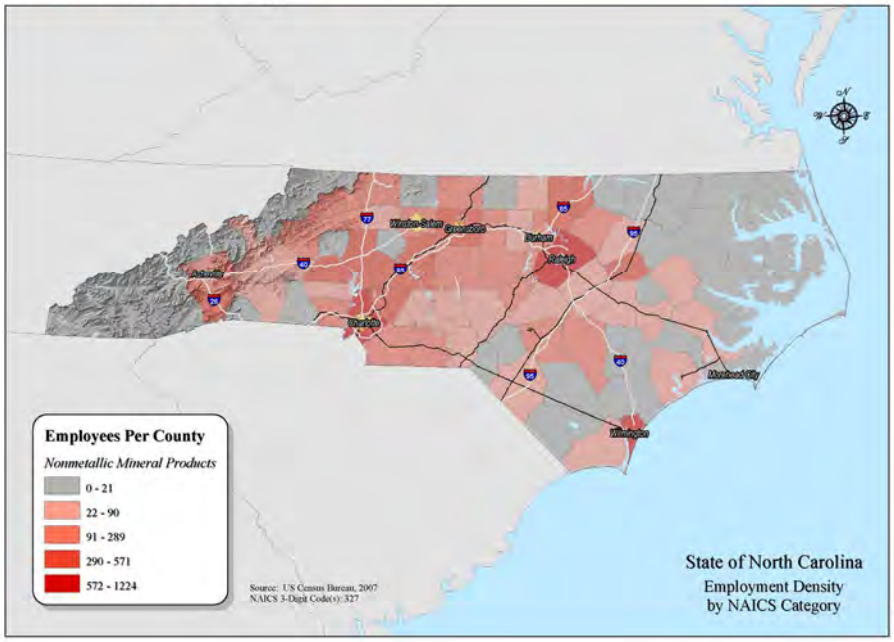

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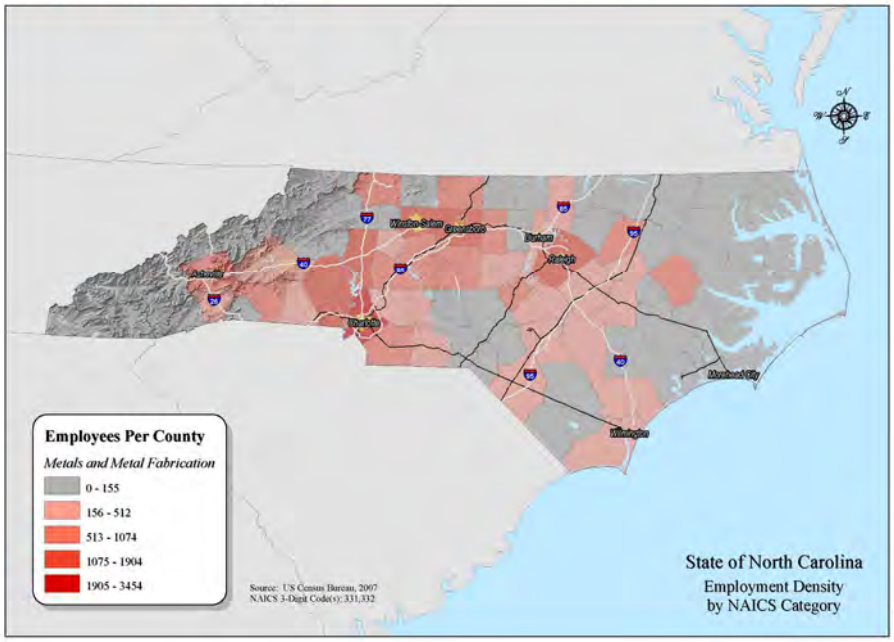

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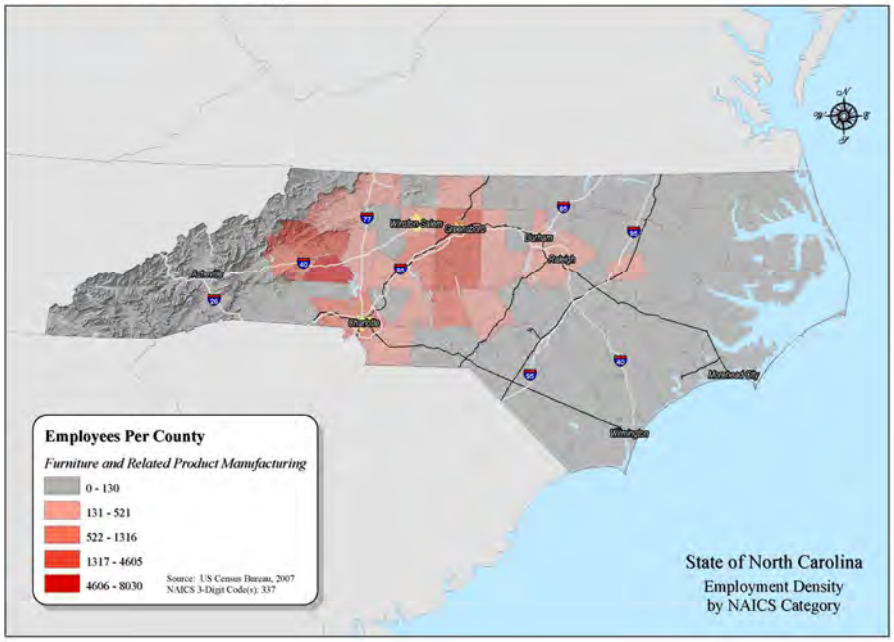

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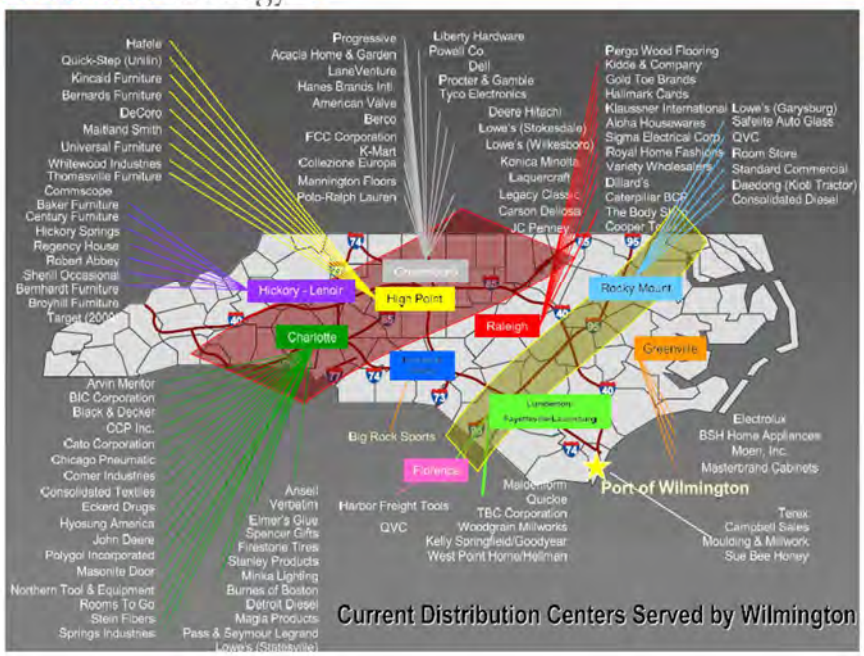

Source: ***NCSPA***

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MARITIME Strategy

NCSPA Land Use

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MARITIME Strategy

Port of Wilmington Land Use Plan

Source: AECOM from NCSPA GIS

Wilmington	Chemicals	Grains (Animal Feed)	Cement	Metal Products (Coils)	Machinery	Gen Merch / Misc	Lumber & Forest Products	Fertilizer	Woodpulp	Woodchips
T-End Pier	X									
Berth 1				X						X
Berth 2				X						X
Berth 3		X			X					
Berth 4			X			X	X	X		
Berth 5						X	X	X		
Berth 6						X	X	X	X	
Berth 7									X	

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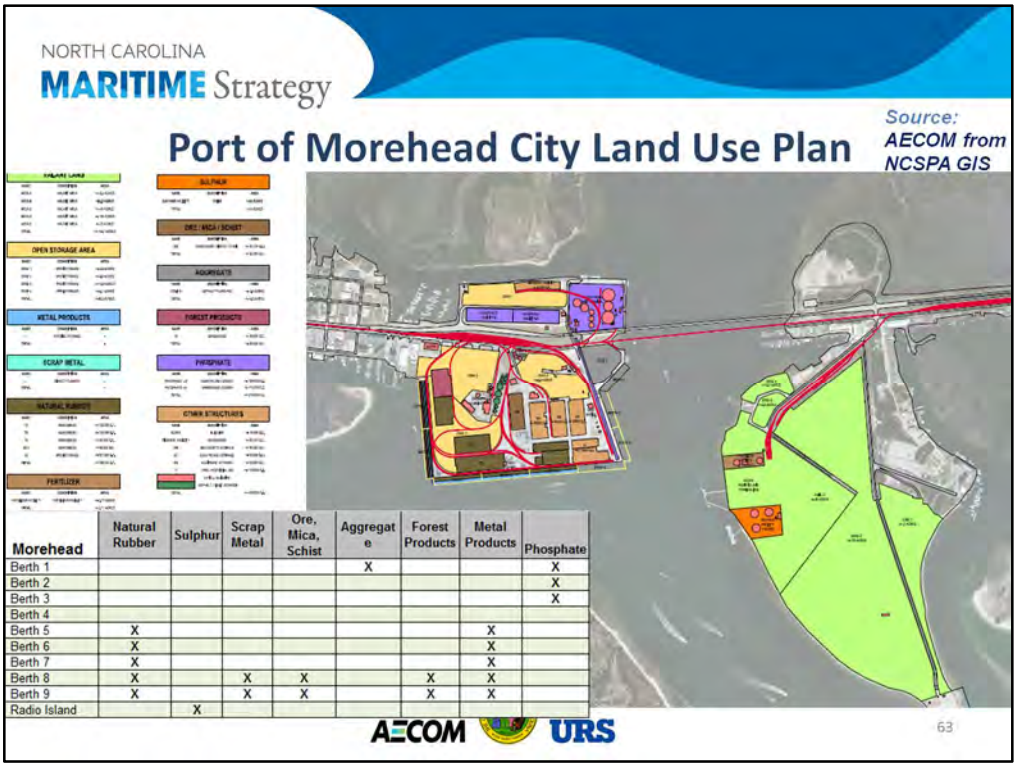
Do we need this? Can we put into an appendix for reference during focused dicussions?



Morehead	Natural Rubber	Sulphur	Scrap Metal	Ore, Mica, Schist	Aggregate	Forest Products	Metal Products	Phosphate
Berth 1					X			X
Berth 2								X
Berth 3								X
Berth 4								
Berth 5	X						X	
Berth 6	X						X	
Berth 7	X						X	
Berth 8	X		X	X		X	X	
Berth 9	X		X	X		X	X	
Radio Island		X						

Do we need this? Can we include in appendix for reference?