A Look at the

Business Plan

for the proposed

North Carolina International Terminal

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A Look at the Business Plan for the Proposed North Carolina International Terminal

We're all a bunch of termites trying to eat the same log
-Dilbert, by Scott Adams

The North Carolina State Ports Authority, a component of the North Carolina state government, has purchased, for $30 million, 600 acres of undeveloped land on the Cape Fear River near Southport, and plans to develop an international container terminal to facilitate the import of goods from Asia. The terminal would have an annual capacity of 3,000,000 twenty-foot equivalent units (TEU), approximately eight times the current capacity of the container terminal at the Port of Wilmington, and would be able to accommodate larger vessels than can reach that port. The new terminal would be called the North Carolina International Terminal (NCIT).

This report examines the business plan for that project, as developed by CH2M Hill, Inc., consultants to the State Ports Authority, in a report entitled *Pro Forma Business Plan*, dated March 15, 2008.

Conclusions

The site purchased by the North Carolina State Ports Authority for the proposed deepwater container terminal presents numerous difficulties, the most formidable of which is that the water is not deep.

The business plan prepared by CH2M Hill, Inc., for the proposed terminal is based on capturing, from other Southeastern terminals, container traffic six times the traditional share enjoyed by the terminal at the Port of Wilmington. Because of access and geographic factors, any such capture at all is unlikely.

The needs of the State of North Carolina for container import and export facilities would best be met by continued use of the existing container terminal at the Port of Wilmington, as it would be expanded in accordance with existing plans.

Summary of Findings

The site purchased by the State Ports Authority for the proposed container terminal presents certain challenges:

- The site is bound on two sides by a nuclear power plant and its cooling water canal.
- Immediately to the north of the site lies the largest ammunition depot in the western hemisphere.
- Immediately to the south of the site lies a tranquil residential community of historic interest.

- The site is separated from the Cape Fear River by approximately 100 acres of ecologically significant estuarine wetlands. Another 300 acres of the site have been designated as "marsh" by the Brunswick County assessor.

- The Cape Fear River at the site is approximately one foot deep. Access by vessels of 50-foot draft, for which the terminal is planned, would require dredging a new channel in the river to a depth of 54.5 feet, 600 feet wide, for four and a half miles to the mouth of the river, to connect to the existing channel. That channel would have to be deepened by ten feet and extended to deep water, about fourteen miles beyond the mouth of the river.

- The aquifer providing groundwater for eastern Brunswick County extends under the Cape Fear River. At the terminal site, the top of the aquifer is 43 feet below sea level, and would be penetrated by the dredging of such a channel.

- The Cape Fear River is not a deepwater harbor, and vessels not immediately accommodated at a berth would be obliged to stand out to sea.

- The nearest common-carrier railroad is 23 miles from the terminal site.

- The nearest interstate highway would be approximately 25 miles from the terminal site after construction of extensions currently planned.

Consultants to the State Ports Authority have developed a "pro forma" business plan for the proposed North Carolina International Terminal. The consultants' report "is intended solely as a presentation of conceptualized data or information, where certain values or concepts are hypothetical or tentative." The plan, so qualified, is based on these elements:

- continued growth of container traffic on the east and Gulf coasts at the rate experienced in the ten years before 2007;

- capacity shortages at container terminals in the Southeast; and

- capture from other terminals of market share representing approximately six times the market share of the container terminal at Wilmington.

There is no assurance that any of those things will happen. Indeed, present circumstances strongly suggest that none of those things will happen. Instead,

- container traffic has fallen to the level prior to 2005 and continues to fall; although traffic is expected to resume growing, that rate of growth would more likely adopt the lower rate of a mature market;

- other container terminals in the South Atlantic coastal region have surplus capacity, and taking into account expansion projects underway, will have surplus capacity into the foreseeable future;

- The Port of Wilmington has disadvantages of location and road and rail connections relative to competing ports, and can only maintain current market share by offering lower rates for container handling. Any container terminal located on the Cape Fear River at Southport would have further disadvantages of location; there is no conceivable means of increasing market share for such a terminal.

The consultants to the North Carolina State Ports Authority have projected growth of container movements for the proposed terminal at Southport reaching 3,000,000 TEU in 2030. But taking into account the above factors, such movements through the proposed terminal in 2030 are estimated herein to be 515,000 TEU annually, plus or minus 200,000 TEU.

Without the proposed terminal, the container terminal at the Port of Wilmington would be expected to move the same number of containers annually, 515,000 TEU in 2030, which is approximately the same as its capacity. However, should the opening of new locks in the Panama Canal result in significant use of larger vessels for east coast container traffic, container movements through Wilmington may be as much as 200,000 TEU less. Thus the incremental improvement in traffic due to the proposed container terminal at Southport, with a deeper channel, could be approximately 200,000 TEU in 2030.

Whether such container movement, primarily comprising imports, would be a benefit or a cost to the State of North Carolina is not clear. To obtain such incremental improvement in container traffic, the State and the Federal governments would bear a cost estimated at $800,000,000 to $2,200,000,000 for the dredging of a new channel and the construction of new highways. That can only be recovered indirectly by savings in transportation costs, if any. The cost of development of the terminal itself, approximately $1,600,000,000, is intended by the State Ports Authority to be provided by private investment, and recovered from revenues. Such investment would be contingent upon emergence of a viable business plan, which circumstances suggest is unlikely.

Analysis

The Container Terminal at the Port of Wilmington

The Port of Wilmington includes facilities for bulk cargoes, solid and liquid, breakbulk, and containers. The container terminal at Wilmington has a capacity of approximately 400,000 TEU. The State Ports Authority has underway an expansion program to increase that capacity to 500,000 TEU.

This port is 26 miles up the Cape Fear River from the Atlantic Ocean. The existing channel to Wilmington, 500 feet wide and 42 feet deep, can accommodate "Panamax" vessels, that is, the largest vessels that can pass through the Panama Canal today. That channel was opened in early 2004; the prior channel, with a depth of 38 feet, could accommodate vessels of only 36-foot draft. The project to deepen the channel cost $512,000,000.

The expansion plans for the container terminal at Wilmington include cranes and berth facilities for post-Panamax vessels (vessels too large for the Panama Canal) up to 144 feet wide. Such vessels would be able to reach the terminal when loaded to less than full capacity. Container cargoes are ordinarily limited by volume rather than weight, so container ships often draw less than the design draft.

The container terminal at Wilmington is a short distance from an interstate highway, and is served by a major railroad, CSX Transportation, Inc. The Port of Wilmington offers substantially lower rates than other container terminals, and North Carolina businesses receive a tax credit for movements through the port. In its best year, 2007, the throughput of the terminal was 191,000 TEU.

Revenues do not cover capital costs, and in some years have not covered expenses. The State Ports Authority looks to the North Carolina legislature for capital infusions to cover improvements, such as cranes and handling equipment. The State Ports Authority relies on the US Army Corps of Engineers to maintain the channel, with funds appropriated by Congress and the North Carolina legislature.

The Proposed International Container Terminal

The proposed container terminal near Southport would be the largest container terminal on the east coast of the United States, except Port Elizabeth and Port Newark, New Jersey. The preliminary plans, described in the document *Pro Forma Business Plan*, dated March 15, 2008, by CH2M Hill, Inc., consultants to the North Carolina State Ports Authority, describe an automated facility to load and unload containers from the latest generation of very large container ships. Such ships, 1263 feet long, with a beam of 185 feet and draft of 50 feet, are not now able to pass through the Panama Canal, but would be after completion of the third series of locks, planned for 2015.

The 600-acre site purchased by the North Carolina State Ports Authority is approximately one mile north of the limits of the City of Southport, a residential community of historic interest with a population of approximately 2800. This and surrounding communities have attracted large colonies of retirees, and services for those retirees and tourism are the economic foundations of the city.

Immediately to the north of the site is the Military Ocean Terminal at Sunny Point, the largest ammunition transhipment depot in the western hemisphere. Adjoining the site on the west is the Brunswick Nuclear Plant with two nuclear reactors, operated by Progress Energy. The reactors draw cooling water from the Cape Fear River through canal bordering the site on the north and west sides. The site can only be reached from the south, through the City of Southport.

Wilmington Star-News

A shallow tributary of the Cape Fear River bounds the property on the east; approximately 100 acres of this side of the property is salt marsh, designated as "estuarine wetlands" by the North Carolina Department of Environment and Natural Resources.

Approximately 400 of the 600 acres have been designated as "marsh" by the Brunswick County tax assessor. Nevertheless, the entire site is zoned for industrial use.

The project would require filling the entire salt marsh and dredging a new channel in the Cape Fear River, from the terminal site and crossing to the east of the current channel, for four and a half miles to the mouth of the river. The new channel would be 600 feet wide (at the bottom) and 52.5 feet deep (plus a two-foot overdredge), cut through areas with a depth now measured in single digits. The channel would be continued over the course of the existing 500-foot wide, 42-foot deep channel four and a half miles out to sea, and would extend another nine miles to deep water. The distance from the terminal site to deep water is approximately 18 miles.

That channel and a related turning basin would be the only deep water in the Cape Fear River. There would be no harbor for vessels awaiting berth space.

The Castle Hayne aquifer, regarded as the most important source of groundwater in eastern Brunswick County, lies under the terminal site and the Cape Fear River. Test wells immediately north and south of the site place the top of that aquifer at an elevation of 43 feet below sea level. Dredging a channel to the site would penetrate that aquifer over a broad area and create a hydraulic connection between the aquifer and the Cape Fear River. The implications of this penetration on the water supply for eastern Brunswick County have not been examined.

The only road access to the site is an extension of East Moore Street from Southport. Because of the need to protect the cooling water intake canal for the Brunswick Nuclear Plant from restriction or contamination, any access road must be to the south of the terminal site, and must circle around to the west of the nuclear plant property to go north to interstate highways, a distance of approximately 25 miles. CH2M Hill, Inc., in its business plan, recommends a new four-lane highway to those interstate highway connections in the northern part of Brunswick County (this is based on completion of the I140 link to US17 at Leland for connections to the north and improvement of US74/76 to interstate standards for connections to the west.) There are not any plans for highway improvements to the south or southwest.

The site is also proximate to a railroad line, a single track of 23 miles to a connection to the CSX Transportation, Inc., railroad line at Leland. This line is currently operated by the US Army for ammunition movements to the terminal at Sunny Point. CH2M Hill, Inc., in its *Pro Forma Business Plan* for the proposed terminal, assigns one-half of the container movements to rail. The availability of this railroad for substantial container traffic has not been determined. Should it be available, CH2M Hill, Inc., recommends improvements to this line and to the CSXT routes to the north and west.

CH2M Hill, Inc., has estimated the cost of the project and related infrastructure improvements at $2.3 billion to $2.5 billion. The estimate is preliminary, not based on full engineering analysis.

According to the *Pro Forma Business Plan*, the first phase of construction would be completed for opening of the terminal in 2017. Full capacity of three million TEU would be reached in 2030.

Container Market Competition

CH2M Hill, Inc., has identified the primary competitors of the North Carolina International Terminal to be the container terminals from Virginia to north Florida, as they exist and would be expanded. Those would include the three terminals at Hampton roads, and the terminals at Charleston, Savannah, and Jacksonville. To some extent, terminals farther north and on the Gulf Coast compete for the same traffic, and even terminals on the west coast, Canada and Mexico serve eastern and Midwestern markets by rail connections. For example, the new terminal at Lazaro Cardenas in Mexico is closer by rail to Atlanta than California, and Prince Rupert in British Columbia, another new terminal, connected to the US Midwest by the Canadian National Railway, is two days sail closer to Asia than California.

CH2M Hill, Inc. does not mention the container terminal now in operation at Wilmington as a competitor. Its fate after the opening of the proposed new terminal is left unsaid.

The container terminals at Hampton Roads, Charleston, Savannah and Jacksonville have a combined capacity of approximately ten million TEU. That exceeds the current demand, which peaked at approximately 7.4 million TEU in 2007. Those ports have expansion projects underway to double capacity, to approximately 20 million TEU. Another project at Jasper County, South Carolina (near Savannah, Georgia), may add 1.5 million TEU. This is in addition to the capacity at Wilmington.

At this time, only the terminals in Hampton Roads have the channel depth to accommodate the next generation of deep-draft vessels, expected to pass through the Panama Canal after 2015. However, the ports of Charleston and Savannah have projects underway to dredge to the necessary 52 feet, which projects are planned for completion prior to 2014.

Historical Growth in Container Movements

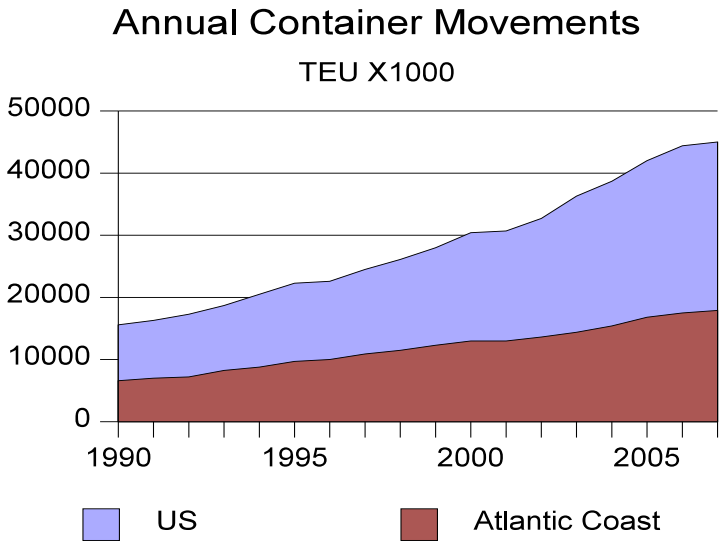
A business plan requires an estimate of the business to be done. That involves predictions of future events, an uncertain task. But the best indicator of what would happen in the future is what has happened in the past.

Until early 2008, container traffic at United States and world ports had shown substantial growth, driven first by the development of specialized container ships, terminal handling equipment and railroad equipment, and then by expanding manufacturing capacity in Asia, particularly since China joined the World Trade Organization in 2001.

This graph shows national and regional growth since 1990:

From 1990 through 2007, aggregate container traffic at US ports grew at a compound annual rate of 6.4%; for Atlantic coast ports, the rate was 6.1% From 1990 through 2000, the rate of annual growth at Atlantic coast ports was 7.1%, but the rate for the next seven years dropped to 4.6%.

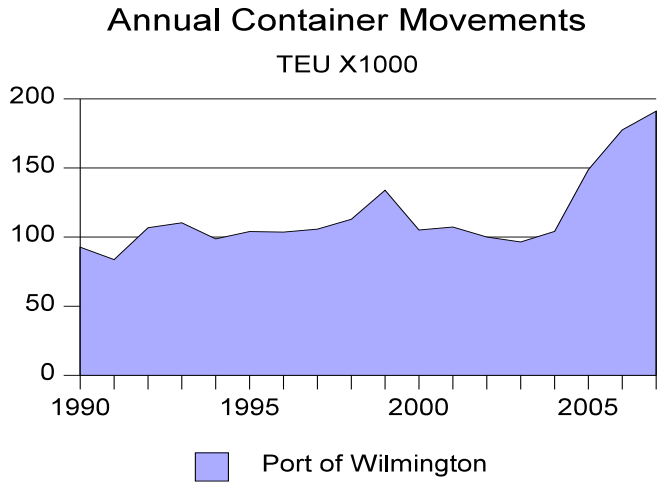
In 2008, most ports have reported reduced movements; nationally, container traffic has reverted to the level prior to 2005. Forecasters anticipate little or no growth in 2009. Perhaps it will resume in 2010.



The history of container traffic at the Port of Wilmington has greater relevance. The market to be served by the proposed North Carolina International Terminal would be the same market as that served by the container terminal at Wilmington. The new terminal would rely

on the same road and rail connections to markets beyond Wilmington, and would compete with the same terminals in other states.

This graph shows container traffic at the Port of Wilmington during the same period:



Unlike the relatively consistent annual increases exhibited by national and regional container movements, the container movements during the same period, 1990 through 2007, at the Port of Wilmington displayed a period of little growth for a long period, followed by a sudden increase beginning in 2004.

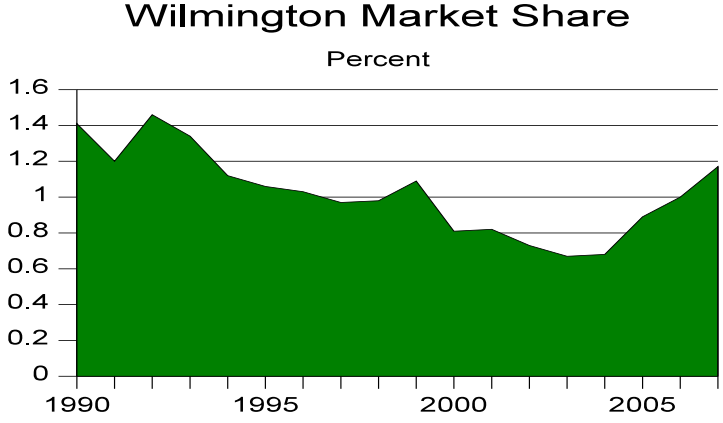
From 1990 through 2003, the container terminal at the Port of Wilmington experienced growth at a compound annual rate of less than 1%, with movements hovering around 100,000 TEU per year. Then in 2004, the trend of container movements abruptly turned up, growing at an average annual rate of 22% for the next three years. Container movements in early 2008 continued to rise, but at a lower rate, suggesting a total for 2008 of about 200,000 TEU, an increase of about 5% over 2007.

For the period 1990-2007, the compound annual rate of growth was 4.4%.

The explanation for both the flat trend to 2004 and the sudden rise thereafter is quite likely the capacity of the channel in the Cape Fear River.

During the period shown, the average size of container vessels had been steadily growing. However, the channel in the Cape Fear River, with a depth of 38 feet, could not accommodate the largest vessels in the transpacific/Panama Canal trade until 2004. In early 2004, the channel was opened at a new depth of 42 feet, admitting the largest vessels able to pass through the Panama Canal. The deeper channel restored Wilmington's competitive position and most of the traffic that had been gradually lost to other terminals in the Southeast.

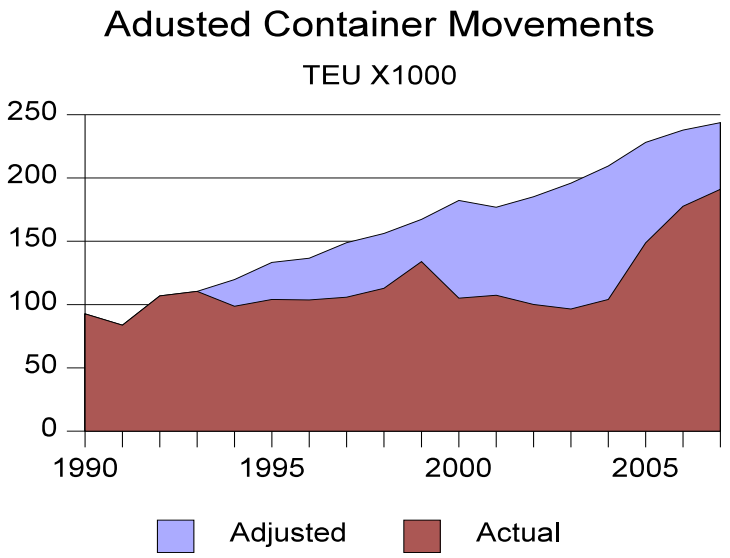
This is reinforced by a look at Wilmington's share of the Atlantic coast container traffic over the same period, shown on this graph.



Market share for the container terminal at the Port of Wilmington dropped steadily until the deeper channel was opened in 2004, and then began a rapid climb. Presumably, container movements would continue to increase until the market share prevailing at the beginning of the 1990's, approximately 1.36% of the Atlantic coast market, is again reached.

This is further suggested by the traffic in 2008, which has not suffered as much at Wilmington as at other container terminals.

We should consider what container movements would have been had they not been constrained by the channel depth. This graph shows the container movements at Wilmington adjusted for a constant market share of 1.36%, compared to actual movements.

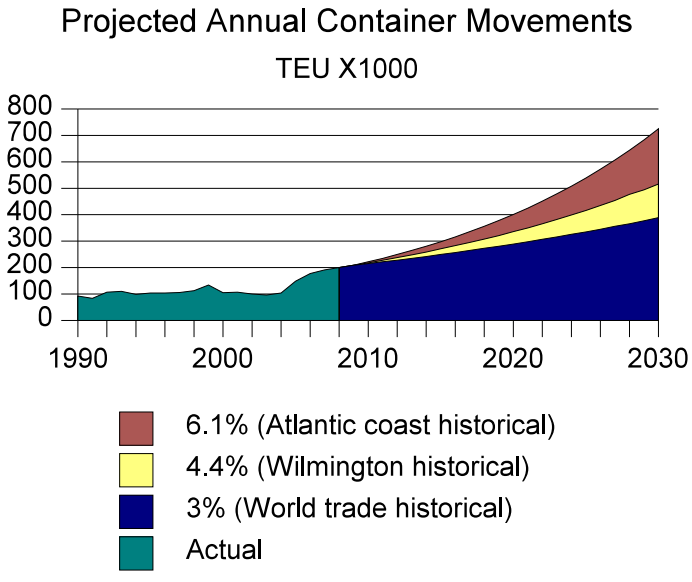


We would expect the trends of adjusted container movements and the actual movements ultimately to converge. That had not happened at the end of 2007, but there was some growth in early 2008, where regional trends were down, bringing the trend lines a bit closer. The market share of the container terminal at the Port of Wilmington appears to have reached a certain equilibrium, permitting the current level of movements to be used as the basis for projections of future movements.

Projected Demand for the Port of Wilmington

Using the actual movements at the container terminal at Wilmington as the starting point, we can project movements in the future at various rates.

We use as a "base case" projection a continuation of the historical growth at 4.4% annual rate, assuming the transient effect of the channel deepening is just that--a transient effect.



In case the container movements on the Atlantic coast resume their former vigorous growth of 6.1% annually, and container movements at the Cape Fear are carried along at the traditional market share, we use 6.1% as the "high case."

If on the other hand container movements adopt the growth rate of a mature freight medium, we use as the "low case" 3%, the annual rate of growth of all seaborne freight from 1975 to 2006, as reported by the Institute for Shipping Economics and Logistics.

The base case yields 515,000 TEU in 2030, approximately the planned capacity of the container terminal at the Port of Wilmington. The high case, about 200,000 TEU more, could also be handled at Wilmington with adoption of container handling technology now coming into use at various ports.

Thus the container terminal at the Port of Wilmington is quite adequate for the container movements reasonably anticipated for the foreseeable future.

The container traffic that would move through a new container terminal on the lower Cape Fear River would be the same. Same market, same infrastructure. The existing and proposed terminals would be only about twenty miles apart. The new terminal would take the place of the old in all respects–market served, road and rail connections. Should the State Ports Authority elect to continue operations at the container terminal at the Port of Wilmington, the new and old terminal would share the same market.

CH2M Hill, Inc., Demand Projections

The business plan prepared by CH2M Hill, Inc. for the North Carolina International Terminal is styled a "pro forma" business plan. This qualification is significant; the firm explains that their plan "is intended solely as a presentation of conceptualized data or information, where certain values or concepts are hypothetical or tentative." There is not any further elaboration of that qualification, or indication of which values or concepts are hypothetical or tentative. However, many conclusions are presented in soft language, such as "demand growth *suggests* capacity shortfall" and "the North Carolina International Terminal *could* capture market share." Such language is entirely appropriate for the nature of the forward-looking statements in the plan.

However hypothetical or tentative, the report includes estimates of container movements through the proposed container terminal at several points in the future, and those projections have then been used as the basis for conclusions as to feasibility. The projections have also been used by Martin Associates, another consultant to the North Carolina State Ports Authority, for estimates of economic impacts of the proposed terminal. Thus the estimates are capable of considerable mischief if incorrect. As the results are presented in various contexts, the hypothetical or tentative nature is often disregarded.

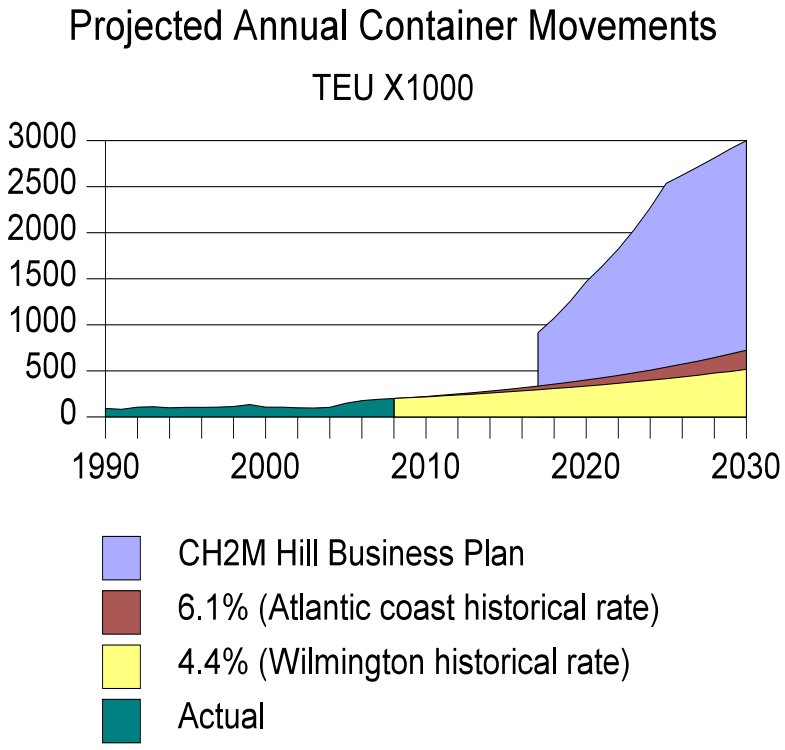
In preparing its projections of container movements through the North Carolina International Terminal in future years, CH2M Hill, Inc., did not use the history of container movements at Wilmington as the starting point and extend the historical growth. Instead, their analysis

first, projected growth of container movements for the terminals in the Southeast, and

second, estimated market share for the new container terminal.

The graph on the next page shows the CH2M Hill, Inc., projections of container movements for the North Carolina International Terminal, using this method, compared to the projections of historical trends of future container movements through the Port of Wilmington at various rates.

This graph presents the CH2M Hill, Inc., "base case" projection in its business plan, placed on the graph showing extension of historical movements at the Port of Wilmington at annual rates of growth of 6.1% and 4.4%. Those lower lines represent the same data as presented in the graph on page 8 above, but the vertical scale has been compressed to accommodate the CH2M Hill projection.



By comparison with the projections of the historical trend, the CH2M Hill, Inc., projection of container movements for the proposed North Carolina International Terminal is so high as to suggest grievous analytical error. The CH2M Hill, Inc., projection for the year 2030 is 3,000,000 TEU annually; normal growth of the Wilmington market suggests annual movements of 500,000 TEU, plus or minus 200,000 TEU. CH2M Hill, Inc., in its *Pro Forma Business Plan*, does use the word "could" to qualify its statement. But a business plan, particularly one involving public projects, should be conservative. As well as correct.

To find the reason the CH2M Hill, Inc., projection is so much higher than the historical rate of growth, we look at the two components of the CH2M Hill, Inc., projections: the rate of growth, and the market share.

CH2M Hill, Inc., projected increases in demand for container movements in the Southeast to the year 2030 at the rate experienced at East Coast and Gulf Coast ports in the ten years before 2007, approximately 6.3% compound average annual growth rate. The consultants also considered a low case of 4.3% compound annual rate, and a high case using a rate of 8.3% for the period 2014--2020 (anticipating a surge after the increase in vessel size capacity at the Panama Canal), then returning to 6.3%. The "base case" for the CH2M Hill projection, displayed in the graph above, uses a compound average annual growth rate of 6.3%. That is not substantially different from the 6.1% shown in the graph as an extension of the Wilmington history, which would produce projected container movements of approximately 725,000 TEU in the year 2030. That does not explain the discrepancy.

The second element of the CH2M Hill, Inc., projection is market share. Increasing the market share of the proposed terminal by six times the share that would result from normal growth in the Wilmington market is based on capacity limitations at other terminals and a "focused marketing strategy."

We look first at capacity.

Regional Capacity

The container terminals at Hampton Roads, Charleston, Savannah and Jacksonville handled approximately 7.2 million TEU in 2007. The terminal at Wilmington contributed another 0.2 million TEU. The current capacity of the terminals other than Wilmington is approximately 10.2 million TEU, a comfortable surplus of capacity.

All of those terminals have expansion plans underway to increase capacity. The table below shows the future capacity, as determined by CH2M Hill, Inc., and by Martin Associates, another consultant to the ports industry:

Southeastern Terminal Capacity (TEU X1000)

	Current Capacity (CH2M Hill)	Future Capacity (CH2M Hill)	Potential Capacity (Martin Associates)
Charleston	2.0	3.8	8.9
Hampton Roads	4.9	7.9	9.0
Jacksonville	0.9	1.7	2.3
Savannah	2.4	6.5	6.6
Total	10.2	19.9	26.8

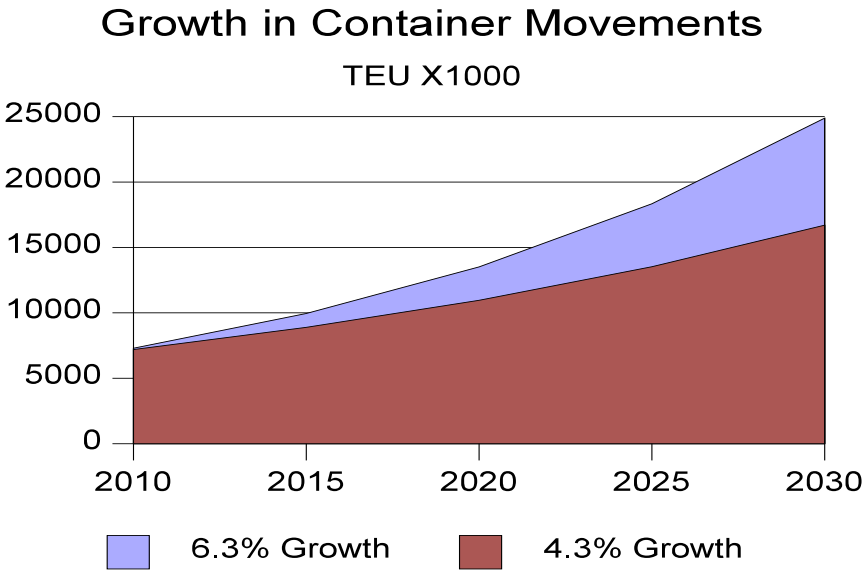
This does not include the 500,000 TEU capacity at Wilmington or 1.5 million TEU that would be added at Jasper County, South Carolina, in a project in the planning stages.

The CH2M Hill, Inc. estimates of future capacity are based on projects now underway, and do not take into account productivity improvements. The Martin Associates estimates represent the potential capacity using productivity improvements that would increase the rate of lifts in the existing space. Such improvements, which are being implemented in Europe and Asia, include increased density of storage and techniques to increase velocity of movements, that is, to reduce the time containers are stored. Martin Associates has reported that with such improvements "Atlantic Coast ports will not likely become capacity constrained in the long-term."

CH2M Hill, Inc., in its *Pro Forma Business Plan* for the North Carolina International Terminal, uses a compound annual growth rate of 6.3% for its "base case," and 4.3% for the "low case." The base case rate represents the average annual rate of growth in container traffic in Gulf Coast and East Coast ports for the ten-year period 1997-2006; the firm supports this by reference to "an industry rule of thumb" of container growth rates of twice the rate of growth of gross domestic product for the period, 3.12%.

The CH2M Hill, Inc., "low case" rate of 4.3% represents the historical average annual rate of growth of movements at regional terminals. This is consistent with the rate of growth at Atlantic coast terminals for the period 2000-2007, 4.6%, and the rate of growth at Wilmington, 4.4%. An important difference between the base case and the low case is that the base case assumes significant diversion of movements into the Midwest from West Coast ports.

The graph below shows the growth in container movements at south Atlantic terminals at the 6.3% rate and the 4.3% rate:



This table shows the dates at which various measures of capacity of south Atlantic container terminals would be reached at various rates of growth:

	Current Capacity (CH2M Hill)	Future Capacity (CH2M Hill)	Potential Capacity (Martin Associates)
At 6.3% annual growth	2016	2027	2032
At 4.3% annual growth	2017	2034	2041

Addition of capacity at Jasper County would extend each date another year.

In these circumstances, the prudent approach to a business plan would be to assume that container terminal capacity in the South Atlantic region, existing and expected, is sufficient to meet demand for the foreseeable future, and that any traffic going through the North Carolina International Terminal in excess of the normal Wilmington share must be captured from other terminals in the region by factors other than capacity limitations.

The Potential for Market Capture

With capacity adequate at competitive terminals for the foreseeable future, there would have to be some other reason other terminals would be vulnerable to capture of additional market share by a terminal on the Cape Fear River.

That would not be channel depth. Hampton Roads is now at depth sufficient for 50-foot draft vessels. Charleston Harbor has a depth of 45 feet in channels to the container terminals, and has a project underway to increase that to 50 feet. Savannah also has plans in place and approved for increasing depth of the channel to accommodate 50-foot draft vessels.

As for distance from traffic origination points at foreign ports, CH2M Hill, Inc., in its *Pro Forma Business Plan* for the North Carolina International Terminal, examined the relative distances by ship to the terminal and to its south Atlantic competitors. These are the findings:

- Compared to the terminals at Hampton Roads in Virginia, the proposed North Carolina International Terminal would offer an advantage of about eight hours in sailing time from the Panama Canal, and would be at a 12-hour disadvantage in sailing time from Europe and the Suez Canal.

- Compared to the terminals to the south, Charleston, Savannah, and Jacksonville, the North Carolina International Terminal would have a few hours sailing time disadvantage with respect to the Panama Canal, but would be closer to Europe and the Suez Canal by about eight hours, more or less.

CH2M Hill, Inc., also examined the distances from the various terminals to markets by road and by rail. These are the findings:

- Compared to the other terminals, the distance by road from the North Carolina International Terminal is shorter to Raleigh, but other terminals are closer by road to other northern, southern, and Midwestern destinations. Even Winston-Salem is closer by road to Hampton Roads in Virginia. The terminal at Charleston is closer to Charlotte, Charleston and Savannah are closer to Atlanta, and Hampton Roads is closer to the markets in the Midwest.

- Compared to the other terminals, the distance by rail from the North Carolina International Terminal is shorter to North Carolina destinations, but other terminals are closer to other northern, southern, and Midwestern destinations. Rail distances usually are considered relevant only for movements more than 400 miles.

Not noted by CH2M Hill, Inc., in their report is the lack of service to the North Carolina International Terminal by Norfolk Southern Railway Company, the competitor of CSX Transportation, Inc., in the East. Both railroads have extensive networks throughout the East and Midwest, and connections to the western roads. The rail connection from the North Carolina Terminal would be to CSXT at Leland. All other terminals in the Southeast are served by both CSXT and Norfolk Southern. Although interchange of traffic from CSXT to Norfolk Southern is possible, the element of competition to assure the best rates and service for the North Carolina International Terminal would be missing.

The incremental cost of a ton-mile by ship is less than that for rail, and the incremental cost for rail is less than that for truck. Thus the lowest cost route would have the shortest road or rail distance, even if the voyage is slightly longer.

Putting these elements together, the only market in which the North Carolina International Terminal would offer reductions in transportation costs, relative to out-of-state terminals, is eastern North Carolina, the traditional market served by the Port of Wilmington. Even the market share of Wilmington may not be achieved. Distances to all markets from the proposed container terminal would be about 20 miles longer over land than from the existing terminal at Wilmington.

The only other competitive advantage open to the North Carolina International Terminal would be lower rates. However, the CH2M Hill, Inc., *Pro Forma Business Plan*

advises that the rates per container lift at the Port of Wilmington are now substantially lower than at other ports in the region, $150 per container at Wilmington versus $220 per container at Charleston and Hampton Roads. The firm further advises that achieving the rate of return necessary to induce investment in the proposed terminal would require raising the rates to the same level as the other terminals. CH2M Hill, Inc., does not explain how raising prices would increase market share.

Thus the North Carolina International Terminal would not have any advantages in location, access, or pricing over the terminal at the Port of Wilmington, and cannot be expected to achieve any greater market penetration.

A Growth Assessment

The above examination of competitive position of the proposed North Carolina International Terminal suggests that the only prudent method of estimating container movements in the future would be extension of the historical trends for the Port of Wilmington.

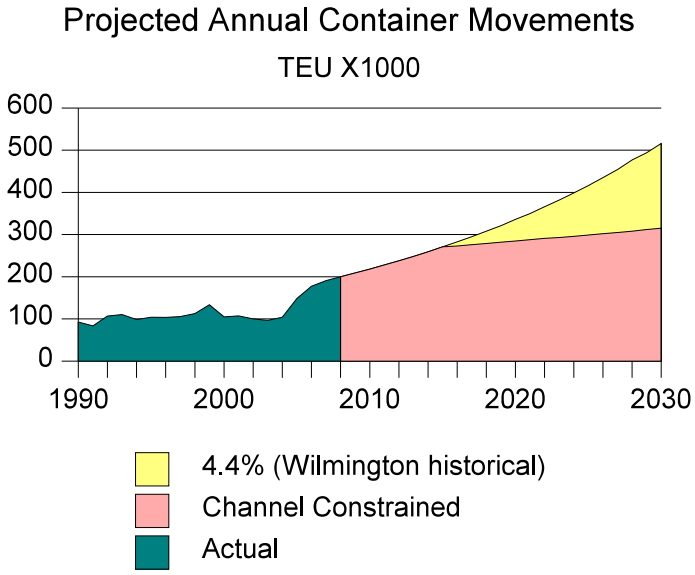
That is shown above, in the section headed *Projected Demand for the Port of Wilmington*. The result is an estimate of 515,000 TEU container movements in 2030, whether at the container terminal at the Port of Wilmington or at the proposed container terminal downstream at Southport. Of course, that may be more or less; the likely range is plus or minus 200,000 TEU.

Although market factors and geography suggest that container movements at the proposed North Carolina International Terminal would be approximately the same as at an expanded container terminal at Wilmington, there is one factor in favor of the proposed new terminal--channel depth.

The container terminal at the Port of Wilmington had lost market share in the period before 2004 because the channel in the Cape Fear River could not accommodate the largest vessels able to transit the Panama Canal. That was remedied in 2004. After completion of the third locks in the Panama Canal (scheduled for 2015), even larger vessels will be able to move through the Canal. If the container vessel fleet serving the Asia/Atlantic coast trade acquires a significant proportion of deep draft, post-Panamax vessels, the Port of Wilmington may again be at a disadvantage because of the 42-foot channel depth in the Cape Fear River. The plans for the new terminal include a deeper channel that would accommodate vessels of 50-foot draft. Competitive terminals also will have such deepwater channels.

The graph on the next page shows what may happen.

The graph shows the historical growth of container movements through the Port of Wilmington to 2008. Container movements are projected thereafter at the same average annual rate of growth, 4.4%. That is the upper line; it reaches 515,000 TEU in the years 2030.



From 2015 onward, another line, nearly horizontal, shows growth at an annual rate of 1%. That line represents the rate of growth of container movements at the Port of Wilmington if the limitations of channel depth at 42 feet had the same effect as the limitations of channel depth at 38 feet had during the period before 2004. That reaches 315,000 TEU in 2030.

The difference between the two trend lines after 2015 represents the additional container movements that would be expected at the proposed North Carolina International Terminal with a channel able to accommodate post-Panamax vessels of 50-foot draft. This assumes substantial use of post-Panamax vessels in the Atlantic coast trade; the actual extent of construction of such vessels and assignment to Atlantic coast service is unknown. The lower the proportion of such vessels in the fleet, the lower the effect of the deeper channel.

Any difference in annual traffic, 200,000 TEU or less, would be attributable entirely to the new channel. Whether that would justify the expense of dredging the channel, estimated at $531 million to $2 billion, and the development cost of the new terminal and associated highway improvements, would be the subject of other analyses.

In that regard, it would be necessary to consider that container movements through the Port of Wilmington are now subsidized by the State of North Carolina by a tax credit and infusions of funds for capital improvements, and that the same markets, in state or out, could be served by container terminals in neighboring states, which have abundant capacity (and also subsidize operations). Any economic impact, such as jobs in distribution facilities, would be related to the markets, not the point of entry, and would be felt with or without expanding port facilities in North Carolina.

There is also the issue of whether the import of goods from Asia, the purpose of the container terminal, results in economic benefit from logistics jobs, or economic damage from loss of manufacturing jobs.

Financing

CH2M Hill, Inc., in preparing the *Pro Forma Business Plan* for the North Carolina International Terminal for the NC State Ports Authority, estimated these costs for the proposed terminal and directly related facilities:

Terminal construction	$1,383,400,000 to $1,582,600,000
Environmental and Permitting	60,000,000
Channel	531,600,000
Highway improvements	181,500,000
Railroad improvements	127,400,000
	$2,483,100,000

Regarding the estimate for channel dredging, $531.6 million, it is worth noting that the US Army Corps of Engineers is now completing the project to deepen of the channel in the Cape Fear River from 36 feet to 42 feet, at a cost, as of September 2007, of $512 million. That project involved removal of approximately 13 million cubic yards of material. A new channel for the proposed North Carolina International Terminal would require the removal of approximately 50 million cubic yards of material, including a considerable amount of rock at the lower depths. This suggests the cost of the new channel would be closer to $2 billion, and the aggregate cost of the project would be approximately $4 billion, approximately $1.5 billion more than the CH2M Hill, Inc., estimate.

The consultants treat the channel dredging and the highway improvements as costs to be met by the federal government and the State of North Carolina, not to be recovered out of terminal revenues. Costs of maintenance of the channel and highway, and associated costs of enforcement and emergency services, would also be for the account of government agencies. The $60,000,000 cost of environmental and permit work would be for the account of the North Carolina State Ports Authority, preliminary to actual development and construction. The $30,000,000 spent for the terminal site is not mentioned.

The railroad improvements would be for the account of the carrier connecting to the terminal, CSX Transportation, Inc. Presumably the railroad would expect to recover that in freight charges.

CH2M Hill, Inc., examined financing alternatives in the *Pro Forma Business Plan* to cover the cost of terminal construction. These alternatives were presented:

- Operation by the North Carolina State Ports Authority, with financing from state funds and a bond issue.
- Granting a long-term concession to a private operator, which would finance the cost of construction and pay a fee to the State Ports Authority.
- Joint venture, a combination of the above.

The consultants selected the long-term concession to a private operator for analysis. The operator would be expected to provide financing for the $1.4 billion to $1.6 billion construction costs of the terminal itself. The consultants suggested a combination of one-third equity and two-thirds debt. The revenues from the terminal would be the source of equity return and debt service.

Development costs ($60,000), channel dredging ($2,000,000,000), and highway construction ($181,000,000) would be provided by state and federal sources. Such costs would not be recovered from revenues, but would have to be justified by public benefits, if any.

The consultants presented economic models showing rates of return for various permutations of the private operator alternative, with coverage for operating costs and debt service. All depend on (a) the demand forecasts coming true, and (b) the proposed terminal achieving the market share forecast.

The author of this report respectfully suggests that the public debt markets would not welcome a debt offering based on such forecasts. A successful offering would depend on investment-grade ratings from the statistical rating agencies, Standard & Poor's, Moody's and Fitch, and despite some bad press related to mortgage-backed securities, or perhaps because of that, those agencies can be expected to look upon such an offering with cold and fishy eyes.

A similar attitude would greet an attempt by the North Carolina State Ports Authority to offer bonds based on revenue from the proposed terminal. The Authority's debt would only be an obligation of the Authority itself, not the State of North Carolina. Without an assurance of revenues, the bond market is unlikely to accept the bonds.

The uncertainty of the revenues to support debt can be overcome by debt financing, public or private, supported by the credit of a large terminal company with other operations, or backed by the full faith and credit of the State of North Carolina. One wonders if any terminal company would be that brave, or if the State would be that foolish.

Glossary

CH2M Hill, Inc. An engineering and consulting firm, experienced in port construction, engaged by the North Carolina State Ports Authority.

China. The People's Republic of China.

Intermodal. Spanning more than one mode of transport. Intermodal containers can be carried on vessels, trucks, and rail cars, and commonly move on all three modes in a single trip from origin to destination.

Martin Associates. An economic consulting firm, experienced in port matters, engaged by the North Carolina State Ports Authority.

North Carolina State Ports Authority. A semi-autonomous component of the State of North Carolina. The NCSPA is not part of the administrative branch of government; it is governed by a board of directors appointed by the legislature and the governor.

Panamax. Largest vessel able to pass through the Panama Canal today. The Canal limits size to 40-foot draft and 108 feet in width.

Post-Panamax. Vessel larger than Panamax. Vessels of draft of 50 feet or less and width of 185 feet or less are sometimes called "new Panamax," because the expansion of the Panama Canal scheduled for completion in 2015 would accommodate that size.

TEU. Twenty-foot equivalent unit. Containers used for international shipments come in various sizes, but the shortest size in common use is 20X8X8.5 feet. Most containers are 40 feet long, or two TEU. TEU is used to measure vessel capacity. When used with reference to a terminal size or capacity, the term means TEU per year.

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