

AN INVESTIGATION OF THE ECONOMIC FEASIBILITY OF
CONSTRUCTING A MULTI-PURPOSE BARGE TERMINAL ON
THE NORTH RIVER AT ST. MARYS, GEORGIA

SUBMITTED TO:

THE DEVELOPMENT AUTHORITY OF
ST. MARYS, GEORGIA

SUBMITTED BY:

Dr. E. Cameron Williams
and
Dr. Jerry W. Wilson

THE CENTER FOR MANAGEMENT DEVELOPMENT
GEORGIA SOUTHERN UNIVERSITY

February 3, 1993

Executive Summary

Given the economic uncertainty of the past several years, the small industrial base of the region, and the close proximity of other water port facilities, the proposed barge terminal on the North River at St. Marys is still a potentially viable transport alternative.

The initial market area for the terminal should include Brantley, Camden, and Charlton counties in Georgia and Nassau County in Florida. The economic base of this sub-region, while relatively small, is expected to experience significant growth in the next decade. The strongest market for the proposed terminal for the foreseeable future will be within Camden County.

A survey of area industry discovered substantial interest in the availability of water transport for a variety of bulk materials. Thirteen of sixteen responding firms indicated an interest in using such a facility. Further, most of the commodities of interest, such as bulk chemicals, wood chips, lumber, etc., would not require high capital investment for handling and/or storage.

Personal interviews with many industry professionals were conducted concerning both the physical and economic feasibility of the proposed terminal. Concerning physical characteristics, a two-barge terminal is considered very feasible. The Georgia Ports Authority and the Corps of Engineers have no objections to the concept, providing the proper applications and permitting procedures produce no obstacles. Concerning the economic aspects

AN INVESTIGATION OF THE ECONOMIC FEASIBILITY OF
CONSTRUCTING A MULTI-PURPOSE BARGE TERMINAL ON
THE NORTH RIVER AT ST. MARYS, GEORGIA

Introduction

This economic feasibility study was commissioned for a number of reasons, not the least of which was to survey the benefits of such a facility to the community and region. The most obvious benefit from the location of a small barge terminal on the North River is the stimulation of transportation revenue among and between a variety of business concerns already operating and/or serving St. Marys and Camden County. More specifically, there are at least four significant far-reaching benefits of such a facility to the region.

A proposed barge terminal on the North River at St. Marys has potential value to the city, surrounding counties, and existing industry for several reasons. First, the terminal would provide jobs for area residents (both directly at the facility and at new industrial concerns utilizing the facility) and, through revenue and payroll, channel additional funds into the local economy.

Second, the terminal could represent a new low cost transportation alternative to existing industries in the region. If such industries can be attracted to the North River barge facility, then the value of St. Marys and Camden County to such

industries is significantly enhanced. This could strengthen the industrial base of the region and result in industrial expansion among existing firms. All such activity brings increased economic health and growth along with it.

Third, a viable barge terminal could become a very valuable incentive for attracting new firms and industries to the area. The availability of low-cost water transportation could be the asset needed to overcome the advantages offered by other potential industrial sites within the region. Unlike other types of incentives used to attract industry (such as free land and/or buildings and long-term tax exemptions) the proposed facility would have the advantage of generating revenue for the economy and increasing the tax base, rather than requiring continuing subsidy in whatever form.

A fourth positive feature of the barge terminal concerns the environmental impact of industrial growth. The terminal is a potential means of greatly increasing industrial activity in the region with a negligible effect on the total environment. Few opportunities exist for expanding growth in industry without simultaneously increasing one or more types of environmental pollution. The relatively low level of environmental impact and pollution afforded by water transportation is an important point to use in promotions aimed at prospective clients of the barge terminal. Not only is water transportation very cost effective compared to other modes of transportation, it is generally much more "environmentally friendly" than other modes.

According to a recent study conducted by researchers at the University of North Florida and the Army Corps of Engineers, the future of inland water barge shipping is bright for at least the next fifteen years [Bonney 1992]. The study predicts annual growth of 2.5 percent for dry-bulk cargo and 1.5 percent for liquid-bulk during the next 25 years. The study also predicts that, under optimistic projections, a minimum of 500 new hopper and tank barges will be constructed each year through 1994. That figure is expected to rise to 1,000 per year from 1995 to 1999, and to 1,400 per year from 2000 to 2004. While these cargo and new barge estimates are for the entire nation, they do suggest that the timing for constructing a new barge terminal is right.

Thus, the proposed barge terminal has tremendous potential for revitalizing and expanding the area economy. This economic feasibility study was designed to provide a preliminary evaluation of this potential.

Purpose of the Study

The charge given by the Development Authority of St. Marys was broad enough to include ship as well as barge traffic through the proposed terminal. While the long-run view of the North River terminal could include ship traffic and certain types of shallow draft break-bulk and container ship cargo, this study concentrated only on barge traffic on the river. The existence of ocean ports at both Brunswick and Fernandina Beach (as well as Savannah and Jacksonville) makes the generation of ship traffic from and to the site unlikely, at least in the near term.

The primary focus of the research effort was on determining the types of materials and goods that could be economically moved through the terminal, the types of industries most likely to use the facility, interest among existing industries in the availability of water transportation, and the attractiveness of such a facility to new industry. A final objective was to generate a preliminary estimate of anticipated cargo flow through the proposed terminal. Rough estimates of annual revenue can then be made under varying assumptions of cargo types and levels.

During the preliminary portion of the investigation, it was felt that raw and bulk materials, agricultural commodities, and possibly some component materials, constituted the range of most likely products to flow through the proposed terminal. It was felt that there were few opportunities to generate significant traffic in either finished industrial goods (in sufficient bulk) or final consumer goods.

Due to time and cost constraints, several factors were excluded from consideration in the present study. First, the environmental impact of the barge terminal was commissioned in a separate study. Also, the process of and expense incurred in obtaining the necessary Federal and State permits was excluded from the study. The cost of land, land conversion, construction, rail and road facilities, equipment, etc., was also not included within the scope of the study.

Design of the Study

Various primary and secondary data sources were utilized to provide background information for the structure of industry within the region, to identify new industries that could be attracted to the region, and to aid in developing a forecast of potential industrial growth as a result of the availability of a new barge terminal on the North River.

Secondary Data Sources

The secondary data search began with a review of U. S. Department of Commerce data on agriculture, manufacturing, and retail goods and services trade in Southeast Georgia and Northeast Florida counties of interest. This was necessary to develop a situation analysis of the region in terms of total economic activity, the level of industrial activity, and the projected growth of trade in the region in the near future.

The search of Federal data sources then led to the U. S. Army Corps of Engineers. Data were obtained from both the Water Resources Support Center and Waterborne Commerce Statistics Center in New Orleans, Louisiana, and the Navigation Data Center located at Fort Belvoir, Virginia. The Corps references list waterborne goods movements by waterway and commodity type for domestic goods transfers.

Next, numerous Georgia and Florida state data sources were referenced for the same reasons as outlined above. Specifically, the statistical abstracts, manufacturing directory, guide to

county data, and labor and employment statistics for both Georgia and Florida were analyzed in some detail for selected counties within the outlined region. In several instances, the economic forecasts of both the Bureau of Business Research and Economic Development at Georgia Southern University and the Selig Center for Economic Growth at The University of Georgia were utilized to help define the initial market area for the terminal.

The secondary data sources were very useful for developing an economic description of the likely trade area for the North River barge terminal. These sources were also instrumental in assessing future growth potential of population and industry in the defined trade area and in determining the boundaries between the competing port operations.

Primary Data Sources

Secondary data provides the cornerstone for any forecast of economic activity. It is particularly useful for performing a situation analysis which, in turn, is the basis for determining "gaps" in the available data. These gaps, or areas where the data are missing or ill-defined, can only be alleviated by the generation of primary data, or data that are created specifically for the purpose at hand.

Numerous primary data sources were utilized for this study, requiring a great deal of planning, travel distance and time, and personal interviews. Wherever possible (in the majority of cases), both investigators jointly participated in the many interviews that took place. The number and variety of personal

and telephone interviews that were conducted contributed to the delay in finalizing the investigation and preparing the final report.

Personal and/or telephone interviews were conducted with representatives of the Georgia Ports Authority and the Army Corps of Engineers in order to determine the level of support or opposition toward the barge terminal that could be expected from these important agencies. Interviews were conducted with important transportation professionals, including the Director of the Alabama Waterways and Transportation Research Center at the University of South Alabama, an independent transportation consultant specializing in promoting barge traffic, the Director of the Georgia Tech Economic Development Laboratory and Research Institute at Brunswick, the Director of Port Operations for Crowley Maritime Corporation in Jacksonville, the President of the St. Marys Railroad Company, a marketing director with Massey Coal Company in Richmond, Virginia, barge terminal operators for GPA at both Bainbridge and Columbus, Georgia, and several tow company operators in three states.

A final important primary data source that was utilized in the study was a series of telephone interviews conducted with transportation management personnel at sixteen industrial firms within the defined market region. The data gathered concerned the type and volume of goods that are received and shipped on an annual basis, and the current transportation modes that are in use by the respondent firms. The interviewer also described the

barge terminal concept and asked the respondent to assess his/her company's potential interest in barge transportation.

It should be noted that the majority of data collected during the study is speculative in nature and does not lend itself to tests of accuracy. Regardless of the strength of a positive recommendation, without firm commitments as to the costs of making the proposed terminal operational, the economic feasibility of the concept remains questionable. It is further assumed that the planning horizon covered by this investigation is two years. Specifically, this means that in the opinion of the investigators, any delay in acting upon the results of this study that extends beyond 24 months would significantly increase the risks associated with the venture. Delay beyond this period, if necessary, should signal the need for additional economic analysis prior to commitment.

Economic Area Description

The initial market area was assumed to include counties in both Georgia and Florida within 50 miles of St. Marys and the proposed terminal location. This assumption follows a long used rule of thumb in the transportation industry. Generally, the cost of drayage to a water terminal from a distance in excess of 50 miles approaches the cost differential between using water and other transportation modes. Thus, the maximum market coverage encompassed nine Georgia counties and five Florida counties.

Counties Within 50 Mile Radius

While the list of counties included within the assumed 50-mile radius of St. Marys is impressive (see Table 1), there are additional considerations that significantly reduce the potential market area. Concerning the Florida counties within the radius, the ports at Jacksonville and Fernandina Beach are more readily accessible than the proposed terminal at St. Marys. Only Nassau County, which includes the port at Fernandina Beach, is close enough to St. Marys to make the choice feasible between the two port facilities. Therefore, only Nassau County in Florida was considered for inclusion in the barge terminal market area.

Strength of the Region In order to describe the economic patterns inherent in the southeastern portion of Georgia, selected economic data have been gathered for the nine counties listed. Notice that, in Table 2, Camden County has experienced

more rapid growth in total personal income than any other county in the region. On the down side, notice in Table 3 that only two counties in the region are ranked within the top 50 in the state in terms of total personal income as of 1990.

Table 1

Counties Within A 50-Mile Radius
of St. Marys

| <u>Georgia</u> | <u>Florida</u> |
|----------------|----------------|
| Brantley | Baker |
| Camden | Clay |
| Charlton | Duval |
| Clinch | Nassau |
| Glynn | St. Johns |
| McIntosh | |
| Pierce | |
| Ware | |
| Wayne | |

Table 2

Total Personal Income, Selected Counties
(in thousands of dollars)

| <u>County</u> | <u>1969</u> | <u>1980</u> | <u>1990</u> |
|---------------|-------------|-------------|-------------|
| Brantley | 14,765 | 50,403 | 117,748 |
| Camden | 28,544 | 107,855 | 344,046 |
| Charlton | 11,387 | 49,306 | 101,916 |
| Clinch | 13,871 | 38,406 | 66,926 |
| Glynn | 152,517 | 492,992 | 1,096,478 |
| McIntosh | 12,172 | 47,595 | 108,255 |
| Pierce | 25,257 | 71,523 | 151,934 |
| Ware | 91,896 | 266,739 | 488,086 |
| Wayne | 43,317 | 137,432 | 305,808 |

Table 3

| Total Personal Income Ranking Within All State Counties | | | |
|--|-------------|-------------|-------------|
| <u>County</u> | <u>1969</u> | <u>1980</u> | <u>1990</u> |
| Brantley | 130 | 125 | 120 |
| Camden | 84 | 76 | 54 |
| Charlton | 145 | 128 | 127 |
| Clinch | 136 | 138 | 146 |
| Glynn | 17 | 16 | 20 |
| McIntosh | 78 | 73 | 64 |
| Pierce | 94 | 102 | 104 |
| Ware | 26 | 32 | 43 |
| Wayne | 60 | 58 | 58 |

Table 4

| Buying Power by County (in thousands of dollars) | | | |
|---|-------------|-------------|-------------|
| <u>County</u> | <u>1990</u> | <u>1991</u> | <u>1992</u> |
| Brantley | 100,303 | 102,637 | 106,499 |
| Camden | 289,241 | 307,530 | 331,561 |
| Charlton | 85,689 | 86,304 | 88,142 |
| Clinch | 53,021 | 51,618 | 50,957 |
| Glynn | 913,806 | 940,153 | 980,825 |
| McIntosh | 91,862 | 95,581 | 100,846 |
| Pierce | 123,053 | 123,962 | 126,629 |
| Ware | 399,524 | 396,884 | 399,791 |
| Wayne | 245,821 | 249,151 | 256,067 |

Looking at growth in buying power by county, another measure of economic health, it is clear from Table 4 that Camden County is again leading the nine counties listed. Table 5 is perhaps more revealing on this point. Buying power for the state rose by 3.1 percent between 1990 and 1991, and by 4.6 percent between

1991 and 1992. While Camden is ahead of the state average, the region is growing at a slower pace than the rest of the state.

Table 5

Percentage Change In Buying Power
By County

| <u>County</u> | <u>1990-1991</u> | <u>1991-1992</u> |
|---------------|------------------|------------------|
| Brantley | 2.3 | 3.8 |
| Camden | 6.3 | 7.8 |
| Charlton | 0.7 | 2.1 |
| Clinch | -2.6 | -1.3 |
| Glynn | 2.9 | 4.3 |
| McIntosh | 4.0 | 5.5 |
| Pierce | 0.7 | 2.2 |
| Ware | -0.7 | 0.7 |
| Wayne | 1.4 | 2.8 |

Regional Leaders According to Georgia Trend magazine, and based on data provided by the Selig Center at the University of Georgia, five of the nine Georgia counties listed in Table 1 are the pace setters for the region. These five regional leaders are Brantley, Camden, Glynn, Ware, and Wayne counties. The following set of tables provides information for estimating the direction of the economy in the region within the next few years. Table 6 lists population figures for the five counties in 1986, and 1991, and estimates the 1996 figure. Table 7 includes estimates of the annual population growth rates for the counties for two five-year periods, ending in 1996. Only Camden County exceeds the growth estimates for the state during the same period.

Table 6

| Population for Selected Counties, 1986-1996 | | | |
|---|-------------|-------------|-------------|
| <u>County</u> | <u>1986</u> | <u>1991</u> | <u>1996</u> |
| Brantley | 9,900 | 11,348 | 12,804 |
| Camden | 20,000 | 32,724 | 49,153 |
| Glynn | 58,800 | 63,302 | 67,489 |
| Ware | 37,200 | 35,304 | 34,484 |
| Wayne | 21,900 | 22,523 | 23,379 |

It is important to remember, in an economic sense, that all economic activity follows population. Population, then, will not apparently contribute greatly to regional economic growth in the region of interest. The significantly higher growth rate for Camden County is the only bright spot concerning population.

Table 7

| Annual Percentage Change in Population, 1986-1996 | | |
|---|------------------|------------------|
| <u>County</u> | <u>1986-1991</u> | <u>1991-1996</u> |
| Brantley | 2.8 | 2.4 |
| Camden | 10.3 | 8.5 |
| Glynn | 1.5 | 1.3 |
| Ware | -1.0 | -0.5 |
| Wayne | 0.6 | 0.7 |

In Table 8 and Table 9, the population figures are mirrored in the expected annual growth rates in employment and in the unemployment percentages for 1990 and 1991.

Table 8

Percentage Annual Growth In Employment, 1986-1996

| <u>County</u> | <u>1986-1991</u> | <u>1991-1996</u> |
|---------------|------------------|------------------|
| Brantley | 2.4 | 2.4 |
| Camden | 7.6 | 8.5 |
| Glynn | 3.0 | 1.3 |
| Ware | 1.3 | -0.5 |
| Wayne | 4.9 | 0.7 |

Table 9

Percentage Unemployment, 1990-1991

| <u>County</u> | <u>1990</u> | <u>1991</u> |
|---------------|-------------|-------------|
| Brantley | 8.8 | 7.7 |
| Camden | 5.4 | 3.9 |
| Glynn | 4.9 | 4.3 |
| Ware | 6.0 | 5.6 |
| Wayne | 7.0 | 6.1 |

Agricultural Activity Unfortunately for the region, growth in the agricultural base cannot be counted on to fuel economic growth. In fact, in the southeastern portion of the state, the level of agricultural activity has been declining for some time. For example, the actual number of acres dedicated to farming is falling in almost every county listed in Table 1. Further, since 1978, the number of acres in farming has fallen by an almost uniform 40 percent in Brantley, Camden, and Charlton counties.

As might be expected considering the declining farm acreage, there are few crops of significant size in close proximity to St.

Marys. Also, livestock are not a large portion of revenue in the region. Some chicken farms are in operation in the region of interest, but their number has declined in recent years.

Impact on the Barge Terminal Concept

While the economy of the state is expected to continue rapidly out of recession in the next five years, the southeastern corner of the state will lag behind in all areas, with the exception of Camden County. This is merely a continuation of the trend which began with the construction of the naval base at King's Bay. In terms of the economic implications for the proposed barge terminal, the data are clear. Within the near future, the majority of customers for the terminal must come either from existing industry, or be drawn to the area by the barge terminal.

Defining the Terminal Market Area

Having developed an economic overview of the southeastern corner of the state, it is now necessary to detail the boundaries of the estimated initial market area that will be covered by the North River barge terminal at St. Marys. In the previous section, an explanation was given for excluding all Florida counties within the 50-mile radius except Nassau County. A similar exclusion process is necessary for all but three of the Georgia counties listed in Table 1.

The 50-mile limit assumption unfortunately does not take into consideration the proximity of major rail and highway access, as well as the location of competing port facilities. In this case, the combination of rail, highway, and alternate port access reduces the attractive radius by a large margin.

In Georgia, the ocean ports at Savannah and Brunswick (as well as the river ports at Columbus and Bainbridge), operated by the Georgia Ports Authority, represent tremendous competition for water freight. Given Savannah's size and relative importance as a freight terminal for numerous modes, the highway system favors the movement of intermodal freight to this port. The same is true of Brunswick, but to a somewhat lesser degree. For this reason, counties north of Camden are most likely to use either the port of Savannah or the port of Brunswick for shipping freight by water. Therefore, even though they are located within the 50-mile radius, the counties of Glynn, McIntosh, Pierce, and

Wayne are excluded from the prospective market area for the barge terminal on the North River.

Clinch and Ware counties are excluded from the prospective market area primarily for two reasons. First, the majority of each county lies outside of the 50-mile radius. Second, the major highway routes from the population and industrial centers in both counties favor Brunswick and Jacksonville (or even the port at Savannah) over St. Marys. However, in the future, both Clinch and Ware counties offer the most likely source of new barge terminal customers, outside of the market area defined in this report.

The remaining Georgia counties that should be included in the initial market area then, are Brantley, Camden, and Charlton. It is also suggested that, due to ease of access to St. Marys and expected growth patterns in population and income, Nassau County in Florida be included in the initial market area. This four county region includes approximately 100,000 total population at the present time. From Table 10, the pattern of growth in population and per capita retail sales since 1978 for this four county region is promising.

While the prospects for future growth and industrial development are good within the defined terminal market area, the fact remains that the strongest portion of the market area is Camden County. Therefore, the degree of initial market penetration will largely depend on how well the merchants and industries of Camden County support the barge terminal concept.

Further, existence of the terminal, along with a list of satisfied terminal customers in Camden County, will go far in speeding up market penetration in the remaining counties. The future market area of the terminal, as well as the amount of business generated within each county, is directly tied to the level of marketing effort expended in promoting the terminal and its facilities.

Table 10

| Barge Terminal Market Area Population and Sales Per Capita Percentage Change Since 1978 | | |
|---|-------------------|-------------------------|
| <u>County</u> | <u>Population</u> | <u>Sales Per Capita</u> |
| Brantley | + 12% | + 68% |
| Camden | + 35% | + 101% |
| Charlton | + 8% | + 36% |
| Nassau, FL | + 25% | + 43% |

Summary of Personal Interviews Conducted

During the exploratory research phase of the project, the investigators conducted a number of personal interviews with persons believed to possess expertise in the subject of the study. In some cases, these interviews were combined with visits to marine facilities. Brief summaries of these interviews, and findings from visits, follow.

Mr. Ed Lindsey, Area Director
Georgia Tech Economic Development Laboratory
Brunswick, Georgia

In order to avoid duplication of effort in the data gathering process, the investigators visited Mr. Lindsey, author of a preliminary study of the proposed North River site. Mr. Lindsey described the permitting process followed by the U.S. Army Corps of Engineers, and discussed in detail the environmental issues involved in the development of the site for barge traffic. He also covered the major points delineated in his report and provided us with copies of the environmental report for use in our investigation.

Mr. Robert Goethe, Assistant Executive Director
Georgia Ports Authority

Mr. Goethe informed us that a terminal for ocean-going barges would require a thirty-foot channel. Thus, the market for a terminal at the proposed St. Marys site, assuming no dredging, would seem to be confined to Atlantic Intracoastal Waterway (ICW) vessels, which draw between eight and twelve feet of water. He

also suggested that a possible approach is one which ties the proposed terminal to an incentive package for an industry, with markets and/or sources of supply along the Atlantic ICW. Such firms might be persuaded to locate in or near St. Marys.

Mr. Goethe also said that he sees no conflict between the proposed terminal at St. Marys and any efforts of the GPA. Currently, the GPA does not rely upon ICW traffic at any of its facilities.

When questioned on the subject, Mr. Goethe agreed that LASH ("lighter aboard ship") barge traffic was a possibility for the proposed terminal, and suggested that we contact Waterman Steamship Co. and Forest Lines, two LASH operators who call at the Port of Savannah. Mr. Goethe also mentioned salt (used in pulp and paper operations), chemicals, and forest products as possible cargos for the proposed facility.

Mr. Charles Chapman, President
St. Marys Railroad

Mr. Chapman described in detail for us, as background, the operations of the St. Marys Railroad, a short-line railway owned by Gilman Paper Company. Gilman Paper is, of course, the railroad's principal customer, accounting for 85 percent of its freight volume. However, the railroad does serve several other industrial shippers along its route. The two most important of these shippers are the James River paperboard coating plant in St. Marys, and the naval base at Kings Bay. The naval base

receives about 72 rail carloads of coal per year, and a varying number of missile rocket motors in special rail cars.

Mr. Chapman observed that the total potential market for the railway is about 12,000 carloads per year. The St. Marys ties into the national rail network through its interchange with the CSX railroad at Kingsland, Georgia.

Mr. Chapman told us that Gilman Paper would certainly be a potential customer for the barge terminal. When asked to estimate cargos and volumes, he first mentioned caustic soda. Gilman now gets this raw material by ocean-going barge from Texas and Louisiana ports to Jacksonville, then by rail (formerly by truck) to the plant. While this is a significant potential cargo for the terminal, the ocean-going barge presents a problem. At the present depth of the channel, the North River is far too shallow to admit ocean-going barges.

Other inbound cargos mentioned by Mr. Chapman include wood chips, pulpwood logs, chlorine, lime, and coal (for mill use, from Kentucky and West Virginia - as distinct from coal bound for the naval base). The paper mill consumes about 2,000 rail carloads of coal per year (between 160,000 and 200,000 tons).

Potential outbound cargos from Gilman include a portion of the mill's output of about 1,200 tons per day of roll paper, or about 6,000 rail carloads per year at maximum production capacity. The mill produces kraft paper, pulpboard for cartons, card stock (for products such as playing cards, etc.), and envelope-grade paper. A significant portion of the mill's output

is exported, but Mr. Chapman was unable to specify exact export tonnages since some product is exported through export brokers who arrange overseas shipment. Thus, Gilman's records reflect only a U.S. destination.

One very plausible reason for Gilman's use of the barge terminal came out of a discussion of the requirements of some export shippers who prefer that the product (roll paper) be containerized (shipped in ISO-standard steel shipping containers). A sea container has a weight limit that significantly exceeds bridge and highway weight limits in all states, including Georgia and Florida. Since kraft paper in roll form is a relatively dense cargo, filling a container with it exceeds highway weight limits. Thus, when containers of export paper are trucked from the plant (usually to the port at Jacksonville), the capacity of the containers is not fully utilized, resulting in higher ocean freight cost per roll of paper.

If loaded export containers could be moved by all-water means to shipside, for example by barge from the North River terminal (adjacent to Gilman) to the ports of Jacksonville, Fernandina Beach, Brunswick, or Savannah, their maximum capacity could be utilized. This would allow loading 55,000 pounds of product in each container, versus 45,000 pounds if containers must be kept highway-legal. Roughly five highway-legal container loads of paper could be loaded into only four containers for water-only transport. The savings per container in ocean freight

rates could be as much as \$1,000, depending upon the overseas destination. If the cost of the barge operation is less than this ocean freight savings plus the highway transportation to the port of lading (which would be highly likely), then the use of the proposed barge terminal appears to be both economically viable and highly advantageous to Gilman Paper and its foreign customers.

The only special equipment required, aside from a crane with a lifting capacity of about 30 tons or more (which is essential to any general-purpose barge terminal in any case), would be a standard container spreader-bar attachment to connect the crane hoist to the container. It appears highly likely that standard ICW dry-cargo barges could be used to transport sea containers over the short hauls contemplated with little or no adaptation.

Another potential high-volume outbound cargo for the terminal is the sludge which must be periodically removed from the mill waste-water settling ponds. This waste by-product is currently trucked to a disposal site in an adjacent county and has received some attention by the local and area media. When this site is full, or closed for other reasons, another must be found. One located on or near the Atlantic Intracoastal Waterway would allow the sludge to be barged, greatly reducing the cost of transportation.

Mr. Homer Hirt, Marketing and Transportation Consultant, and
Mr. Brian Webb, Terminal Manager, Port of Bainbridge, GPA

The investigators visited GPA's barge terminal and facilities at Bainbridge, Georgia and interviewed Mr. Hirt and Mr. Webb. Mr. Hirt is an independent marketing and transportation consultant employed by Georgia Ports Authority to build traffic through the inland ports at Bainbridge and Columbus. Mr. Webb is the terminal manager of the Bainbridge facility and very familiar with the operating characteristics of the port. The visit provided the investigation team with valuable background information on barge terminal operations and cargos. The terminal at Bainbridge is much more extensive and capital-intensive than the proposed facility at St. Marys.

An important point stressed by Mr. Hirt during the tour and discussions during the day is the need for an aggressive, proactive marketing strategy, especially for a new terminal. Mr. Hirt feels that this is a key success factor. He believes, based on many years of experience in the industry, that a passive stance of waiting for shippers to discover the terminal and its benefits is a course doomed to failure.

Mr. David Homan, Director of Operations
Crowley Maritime Corporation
Jacksonville, Florida

Mr. Homan provided the investigative team with an exhaustive tour of Crowley's Jacksonville, Florida marine terminal. The terminal is a dual-purpose one, serving both ocean going

combination roll-on/roll-off (RORO) vessels, and the RORO barges principally employed in the Puerto Rican trade.

The purpose of the visit was to explore the possibility of barge service to Puerto Rico from the St. Marys site. As mentioned earlier in this section, however, we quickly learned that ocean-going barges draw nearly as much water as self-propelled sea-going vessels - in excess of twenty feet. Without dredging, there is no possibility of berthing sea-going barges at the North River site. Another point which was brought home is the large amount of trailer marshalling area required for the roll-on/roll-off service. This is conservatively estimated to be in excess of ten acres per barge berth. The North River site at St. Marys does not seem to lend itself to either sea barge or RORO service.

Captain Phil Thomas, State River Pilot

Captain Thomas, an experienced master mariner and licensed pilot (state and federal) for the approaches, entrance, and harbors of St. Marys and Kings Bay, spent most of one entire day with the investigative team and discussed in detail the characteristics of the proposed site from the point of view of vessel handling and safety. In his professional opinion, ICW tugs and tows can easily negotiate the channel of the North River as far as the proposed site. In the case of multi-barge tows, one bend in the river may require pilots to "stage" tows. Staging would require anchoring or mooring the tow below the bend in the river and ferrying one barge at a time to the site. While

time consuming, this is a routine maneuver in towing and presents no special problems.

It should be noted, however, that the proposed site has enough riverfront for only one barge to be berthed alongside. The channel width is such that no more than one additional barge could be moored outboard of the one alongside, so the site itself sets a practical limit of two barges per tow actually at the terminal. As mentioned, however, larger tows could be staged.

During this visit to St. Marys, the team procured, and studied with Captain Thomas, National Ocean Service chart number 11503 (Fernandina Harbor to Kings Bay), the largest scale nautical chart available which covers the proposed site. This chart is updated to 15 December 1990, and shows minimum depths of 8 feet at Mean Lower Low Water (the average of only the lower of two daily low tides) [Maloney 1985]. That is, depths of somewhat less than 8 feet at low tide could be expected approximately one-half of the time.

Assuming no initial dredging, the channel depth presents something of a constraint on terminal operations, since ICW barges fully laden to a draft of 8-12 feet would generally be unable to transit the North River at low water. This would cause delays in arrival and departure of tows at least some of the time. In summary, the site is navigationally feasible for ICW tugs and tows, with the caveats outlined above.

Survey of Towing and LASH Operators

Towing firms operating in the area as common carriers were identified with the assistance of Mr. Alan Garrett, with the Savannah office of the U.S. Army Corps of Engineers. A survey of the towing operators was conducted by telephone. Firms which do not routinely tow past St. Marys or nearby were eliminated from the survey. Those firms which do routinely operate in the area were questioned concerning types of cargo handled as well as the volume of cargo necessary to induce port calls. Also included in the survey were the only two firms currently providing LASH (lighter aboard ship) service between Savannah and Jacksonville. The results of the survey are summarized in this section.

Stevens Towing Company Port Royal, South Carolina

Mr. Benjamin B. Smith, Operations Manager at Stevens Towing, told our interviewer that his firm handles LASH barges and "spot" cargo. A major component of the spot trade is made up of import steel that moves between Savannah and Jacksonville. Since Stevens routinely tows past St. Marys, Smith indicated that they would willingly call the terminal for any reasonable amount of any type of offered cargos.

Thunderbolt Marine Thunderbolt, Georgia

Mr. Wayne Varner, Towing and Dredging Manager at Thunderbolt Marine, reported that his firm is a contract carrier and does not offer scheduled service. However, he indicated a willingness to

negotiate terminal calls "on inducement", meaning given that there is sufficient cargo to warrant a stop.

Dixie Towing Corporation
Jacksonville, Florida

Mr. Robert Gibbs, Operations Manager for Dixie Towing, said that his firm handles such cargos as construction materials and equipment (e.g., prestressed concrete, bridge pilings, construction cranes). The firm routinely tows on the St. Marys River. According to Mr. Gibbs, Dixie could be induced to call at the proposed terminal for minimum lot sizes of 1,000 tons, depending upon the nature of the cargo and destination.

Willis Towing Company
Jacksonville, Florida

Mr. Paven, a senior manager with Willis, told us that his firm is a common carrier, offering regular service between Savannah and Green Cove Springs, Florida and intermediate points. Willis would provide service for sufficient inducement, which Mr. Paven described as at least one barge load of cargo, or approximately 1,400 tons. The firm would be particularly interested in forest products, which Mr. Paven indicated was the most likely cargo, in his opinion. He did, however, express doubts that sufficient traffic exists to support such a terminal given the proximity of other water terminals. In his opinion, based upon his firm's experience operating private-sector barge terminals, 200,000 tons per year is the minimum volume necessary to sustain such a facility.

Cross-State Towing Company, Incorporated
Jacksonville, Florida

Mr. Lane (no title given) informed our interviewer that his firm's vessels already routinely call at the site of the proposed terminal. Cross-State tows an oil barge to Gilman's fuel dock at regular intervals. He said that the amount of cargo to induce a call at the proposed new terminal would depend upon the cargo destination, but gave as an example a minimum of 1,500 tons (about one barge load) for a tow to Savannah.

Savannah Marine Services, Incorporated
Savannah, GA; Jacksonville, FL; and Norfolk, VA

A manager with Savannah Marine Services stated that their operations do not include common carriage on the ICW. Their present operations are limited to towing LASH barges for Forest Lines (see discussion below), under contract, as directed by the line.

Palmetto Shipping, Incorporated
Savannah, Georgia
Agents for Waterman Steamship Company (LASH Operator)

Waterman Steamship Company operates LASH service between U.S. ports and Red Sea/Indian Ocean ports. Having already ascertained Gilman's interest in LASH barge service to the proposed site, we contacted Waterman's agents in Savannah about such service. A manager at Palmetto reported that Waterman's LASH motherships call at New Orleans, Houston, and Savannah, and have engaged contract towing services to provide feeder service between these three ports and outports. From the information

provided, it appears that very little export cargo originates locally for this type service at the present time. The manager was not able to provide the interviewer with minimum volumes necessary to attract LASH service. It was indicated, however, that Waterman would be interested in providing LASH barge service at St. Marys, as cargo volumes warrant.

Forest Lines
New York, New York

Forest Lines is also a LASH operator. Mr. Jack Mandleur, a marketing representative in Forest's New York office, stated that service to the proposed site at St. Marys was feasible, given adequate volumes of either import or export cargo. As the name implies, Forest Lines specializes in handling forest products, but does not restrict its operation to only those cargos. Mr. Mandleur stated that six LASH barges make up an ICW tow, but that a minimum of only three barges would be required for an outport call. The typical LASH barge has a capacity of 19,600 cubic feet, or 410 short tons (820,000 pounds). For wood chips in bulk, a LASH barge cubes out at about 270 short tons. The LASH barge is smaller than the standard ICW or river open barge and would fit the tight space restrictions at the North River site extremely well.

Conclusions: Availability of Barge Service

It seems clear that there is ample towing capacity available on the Atlantic ICW to support the proposed barge terminal, given adequate cargo volumes. Domestic bulk and break-bulk service,

both common carrier and contract carrier, is available. In addition, international intermodal service, in the form of LASH barge operations, is also an available alternative.

It should also be noted that, once the barge terminal is in operation, the operators on the ICW will develop a great deal more interest in providing service. Further, agents for both domestic and international water carriers would promote the use of the terminal to their customers, when doing so would help secure business.

Survey of Area Industry

In order to estimate the level of potential interest in the barge terminal concept among area industries, a telephone survey was conducted. A total of sixteen area firms were included in the survey. The interviewer was instructed to ask to speak to the person in charge of transportation, traffic, procurement, or some similar logistics-related job title. The interviewer was required to keep a record of the names of the respondents, as well as their job titles and duties. In all cases, the persons responding to the set of questions were knowledgeable in the areas of questioning. The set of questions comprising the survey instrument are as follows:

1. Does your company ship or receive large quantities of bulk and/or raw materials?
2. If yes, what kinds of materials/products and in what volumes?
3. What modes of transportation are currently being used to obtain/deliver these materials?
4. To what specific locations are you currently shipping materials/products?
5. From what specific locations are you currently receiving materials/products?
6. Would a barge terminal located at St. Marys be of interest to your firm for either shipping or receiving materials/products?
7. If yes, estimate the potential volume and types of materials/products that would move through the proposed barge terminal.
8. In your opinion, would the existence of a barge terminal at St. Marys open up new markets for your firm?

The size of the sample, while including almost every industry in the region, was just too small to estimate statistical accuracy and draw probabilistic conclusions. Therefore, the required interpretation of the data is qualitative in nature, rather than quantitative.

Of the total of sixteen respondents in the survey, thirteen expressed interest in the availability of a barge terminal at St. Marys. Seven of these are wood and lumber processing plants, four are in rock/stone and/or cement industries, and the remaining two are in metal processing related industries. Of the three firms that did not express interest in the concept, two are paper and/or chipboard processors, and the third is a producer of paper and paper board.

Six of the respondent firms either export finished product to or import materials from foreign countries. They currently use the ports of Jacksonville and Fernandina Beach on the Atlantic and Mobile on the Gulf of Mexico. One additional firm uses the port at Brunswick. Trialumina Hydrate is received from an Ohio supplier by barge and then trucked to the processing plant. All of these firms that are currently utilizing water transportation could be potential future customers for the barge terminal.

The types and quantities of bulk materials shipped and/or received by all of the firms participating in the survey are quite promising. The potential volume of traffic for each identified commodity is significant, especially to a small barge facility.

The following is a composite list of the materials and products represented in the survey.

- bulk cement
- corn grit
- crossties
- crushed rock
- gypsum
- hardwood logs
- liquid asphalt
- lumber (various kinds/grades)
- other chemicals
- paper rolls
- pine logs
- pine mulch
- plywood
- polyethylene pellets
- rolled chipboard
- steel plates/plating
- steel tubing
- stone
- treated poles
- trialumina hydrate
- wood chips

Another important finding from the survey that holds promise for the proposed barge terminal concerns current transportation modes being used to move the listed commodities. In excess of 90 percent of these materials/products move inbound, outbound, or both by truck at the present. Given the availability of the barge terminal at St. Marys and the cost differential between the average truck and barge freight movement, the opportunity would appear to be great to convert much of this traffic from highway to water. Even more important to note here is that this is existing freight traffic, not new traffic that would have to be created for movement by water.

Several of the respondents were actually excited about the prospect of being able to reach new markets via the barge facility. Two firms expressed interest in shipping treated lumber by barge to Mexico. The availability of water transport would, in their opinion, open such a market by allowing them to price more competitively. Another respondent was interested in shipping rolled paper in ocean containers to various potential markets throughout the world. It appears that, by avoiding the truck weight limit, more paper could be shipped per container and result in significantly lower total freight cost. The lower freight cost would again allow more competitive pricing in the world market.

A final caveat is necessary concerning the very positive nature of the survey results. Again, the sample is too small to estimate statistical accuracy. It should also be kept in mind that the respondents were given no information concerning the cost to use the proposed barge terminal. Accurate estimates of potential demand for barge transportation through the terminal would require in-depth personal interviews with the survey respondents, during which accurate cost estimates would have to be presented. Regardless of these limitations, the survey results provide significant evidence of the economic feasibility of the barge terminal.

Summary of Potential Market Segments

The investigators identified the following types of freight that are currently moving into and out of the service area of the proposed barge terminal. It is expected that many of the cargoes listed here could be diverted from their current transportation mode to barge.

Inbound Cargos

Lumber, Wood Products. In this category are, for example, utility poles and untreated crossties, both shipped in for creosote application. Raw logs, both pine and hardwood, are shipped in for further processing into lumber for building materials, or dimensioned lumber of assorted grades.

Paper Industry Raw Materials and Products. This category includes wood chips, coal, fuel oil, various chemicals in bulk and roll paper.

Construction Materials Other Than Lumber. Bulk cement, crushed stone, gypsum, and liquid asphalt are all materials currently imported into the area in bulk, via road and rail.

Chemicals, Industrial Raw Materials. Stone slabs, trialumina hydrate, polyethylene pellets, and various chemicals in bulk are currently shipped in to area industry utilizing road and rail.

Outbound Cargos

Paper Industry. Area paper mills ship rolls of various paper products, including liner board, kraft paper, and card

stock, to destinations all over the world. In addition, a by-product of paper making, the sludge which accumulates in the bottom of the settling ponds, must be periodically removed from the ponds and disposed of at some other site. Currently trucked to a nearby county, this sludge could be diverted to barge if future disposal sites are located on or near the Intracoastal Waterway system.

Forest Products, Other Than Paper. At the present time, wooden utility poles and railroad crossties are treated by at least one area firm and shipped to various destinations in North America, including Mexico, via road and rail. At least some of this freight could be diverted to barge. In addition, pine logs, hardwood logs, plywood, rolled stock chipboard, and lumber are all shipped from the locality to various destinations via road and rail.

Miscellaneous Products. Corn grit, steel plating, and steel tubing are shipped in significant quantities from the locality to various U.S. destinations. At least some of the cargo in this category could be economically diverted to barge.

Summary Listing

For convenience, an alphabetical summary listing of the various cargos mentioned above follows, divided into inbound and outbound categories.

Inbound

coal in bulk
crossties

Outbound

corn grit
crossties (treated)

| | |
|-------------------------|-------------------------|
| crushed stone | hardwood logs |
| fuel oil | lumber (various grades) |
| gypsum | paper rolls |
| liquid asphalt | pine logs |
| logs, pine and hardwood | plywood |
| paper rolls | rolled stock chipboard |
| polyethylene pellets | paper mill sludge |
| steel plates/plating | utility poles (treated) |
| steel tubing | |
| stone slabs | |

Facilities Requirements

Although physical facilities planning and design is beyond the scope of this study, the investigative team has assumed a general description of the proposed facility. This was necessary in order to be able to estimate potential customers, market segments, and cargo volumes for the terminal. This description takes into account the inherent constraints imposed by the site, as shown and described to the investigators by Mr. Don Hanner of the Development Authority and Mr. Chapman of Gilman and the St. Marys Railroad.

The facilities are assumed to provide berthing alongside a dock or wharf oriented parallel to the channel, of sufficient length to accommodate two ICW barges (one alongside the dock and one moored outboard), or two LASH barges moored end to end. A general-purpose crane with a minimum lifting capacity of 30 long tons, along with a variety of lifting/grappling devices, will be necessary. These devices may include, for example, a grab bucket for bulk cargos such as coal, an electromagnetic hoist for scrap iron, and/or a spreader-bar assembly for standard ISO containers.

Other materials-handling equipment, such as forklifts, may also be required, depending upon the types of cargo handled. In addition, if coal in large volumes is anticipated (as tentatively proposed by a representative of Massey Coal Company in Virginia - in the neighborhood of 300,000 tons per year, and arriving by unit train), specialized equipment for handling bulk coal will also be required.

A major physical constraint at the site is the availability of land for cargo staging, and for covered and uncovered storage of cargo in transit. For maximum marketing flexibility, there should be at least two transit sheds, each with a minimum of 10,000 square feet of cargo storage area (or one shed of 20,000 square feet capable of being divided so as to absolutely separate two different materials in bulk), plus two to three acres of paved, lighted, and fenced outdoor cargo storage area, in addition to a minimum of one-half acre of transit apron, contiguous with the river frontage and dock. This obviously strains or exceeds the available current acreage at the proposed North River site. However, it was suggested that the acquisition of adjacent property is possible in the future.

Revenue and Cost Considerations

The following brief discussion of revenue and cost considerations is necessarily preliminary and tentative, given the lack, at this point, of a precise physical description of the proposed facility with specified throughput capabilities. See also, in this regard, the limitations discussed in the final paragraph in the previous section of the report summarizing the survey of area industry. Information on costs and revenues of comparable facilities was sought from a variety of sources. Every operator of a private-sector barge terminal contacted, without exception, declined to share any type of financial data for competitive reasons. Georgia Ports Authority, however, was willing to provide aggregate revenue figures for both the terminals at Bainbridge and Columbus.

Revenue

On average, the ports at Bainbridge and Columbus earn revenues of approximately \$3.00 per ton of cargo handled. This figure includes all revenue obtained from docking fees and demurrage, cargo loading and unloading, and transit storage. Since the GPA barge terminals are generally similar to the proposed North River terminal in terms of facilities (with the exception of overall size of terminal), it is reasonable to assume that the revenue estimate should be comparable between the two.

In terms of tonnage throughput, an industry rule of thumb seems to be (mentioned by more than one industry professional during the investigation) that, to be economically feasible, a small barge terminal would require a minimum of 200,000 tons of cargo movement through the facility per year. It is the considered opinion of the investigators that this figure is attainable at the proposed site and, in fact, is at the lower end of the range of estimates for the facility's potential.

This minimum volume would generate, using the \$3.00 per ton estimate, annual total revenue of \$600,000. Note that this estimate is for revenue from all sources. This annual revenue would have to cover all operating costs as well as any debt service on loans/bonds, etc.

Cost

Cost figures are somewhat more difficult to even estimate in general. GPA cost figures are not at all directly comparable and/or applicable to the proposed terminal for a variety of reasons. First, GPA barge terminal facilities are significantly depreciated. Second, GPA's overhead cost structure is vastly different from the fixed cost component of the proposed terminal. Third, GPA is an arm of state government, and not subject to profit and loss pressure at an individual facility that is rendering sufficient service to area residents and industry. Further, any cost estimates are directly tied to cargo mix, labor costs, and cargo tonnage handled, all of which are unknown for the proposed terminal.

However, it is safe to say that the proposed North River terminal will have relatively high costs of development, funded through whatever sources. Normal operating expenses, coupled with loan/debt service, will result in high fixed costs and relatively low variable costs. This, in turn, means that as tonnage increases through the terminal, the average cost per ton will fall rather rapidly. The result is that, at low levels of utilization (such as the 200,000 ton minimum figure) total cost is very likely going to exceed total revenue.

In order to obtain more detailed estimates of the relationship between cost and revenue, it will be necessary to estimate the total cost of developing the land and securing the minimum equipment for operating purposes. This was beyond the scope of the present study.

Feasibility of the Proposed Terminal

It is the opinion of the investigators that, based upon the findings reported here, a barge terminal on the North River site in St. Marys is feasible. The rather conservative estimate of the market potential, based upon secondary data and the survey of area industry, is from 200,000 to 500,000 tons per year. While the variety of potential commodities that would flow through the terminal is not extremely broad, the volumes of a number of the products discussed in the report should be sufficient to attain the minimum necessary to cover operating costs.

Barge service, by both common and contract carrier, is readily available locally, as several potential carriers already routinely pass within a few miles of the proposed site in the course of their present operations. In terms of marine safety and navigation, expert sources agree that the proposed site is both feasible and properly suited to the anticipated barge traffic. However, certain critical conditions must hold in order to be able to realize the full potential of the terminal at the site under consideration.

First, the full cooperation of Gilman Paper Company, the present owner of the site and next-door neighbor, is obviously essential. The developer and operator of the terminal (whether the Development Authority or some other entity) must have constructive long-term possession of the site in question. In addition, a significant proportion of the projected initial cargo flows are Gilman Paper shipments that will be diverted from other

modes. It should also be kept in mind that both the railroad and street extensions necessary to allow rail and truck access to the terminal site will require cooperation from Gilman.

Second, the necessary permits for construction and operation of the terminal at the North River site must be obtained from all cognizant federal, state, and local agencies. Part of the issue here is that all significant environmental and ecological concerns can be satisfactorily addressed by the applicants for the permits. Failure to successfully negotiate this obstacle means failure of the concept, regardless of the feasibility on other factors.

Third, further hydrographic surveys of the North River may be necessary, as well as some local dredging to provide and maintain adequate depths alongside the wharf at the site. Note that the assumption was made, for the purposes of this study, that no major dredging of the channel would be necessary for the passage of ICW tows.

Fourth, it was also assumed by the investigative team, that the site is suitable for a construction project of the magnitude described. Soil composition and compaction testing and other civil engineering evaluations of the site will be necessary before the actual facility design can be completed.

Finally, but crucially important to the overall success of the concept, an appropriate marketing strategy must be developed for the proposed terminal and aggressively implemented. Qualified people must be engaged, either on a contractual basis

or as full-time employees of the facility, in order to accomplish this task. The barge terminal will not sell itself nor will adequate cargo throughput and revenues be realized without a well-planned and energetic marketing strategy.

Based upon the available data and the findings outlined in this report, the investigators recommend that the Development Authority proceed with permitting and preliminary planning for the barge terminal on the North River at the Gilman Paper Company site. Initial steps should address all of the issues raised in the preceding section.