

**THE PROJECTED ECONOMIC IMPACTS
FOR THE DEVELOPMENT OF A BULK TERMINAL AT
CHERRY POINT**

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The purpose of this report is to measure the potential economic impacts for the development of a new bulk terminal located in Whatcom County, Washington State at Cherry Point. The analysis is based on the projected bulk throughput tonnage potential to be moved via a new bulk marine terminal and associated upland facilities on 1,092 acres of heavy impact industrial land located at Cherry Point, WA. The projected annual bulk cargo throughput was provided to Martin Associates by SSA Marine (SSA). The contemplated terminal is assumed to begin operations in 2015, with permitting to be completed in 2012 and construction to begin in 2013. A second phase will begin construction at operational start up and is projected to be completed within the first 5-7 years after the completion of the first phase, if favorable market conditions merit the capital investment. In the first phase, the terminal is projected to handle 25 million metric tons per year. The second phase will take the terminal capacity up to 54 million metric tons per year. The bulk tonnage will be moved to the terminal via unit trains from the Midwest and Canada. The economic impact of the projected bulk cargo throughput was evaluated using the Martin Associates' economic impact model developed as part of our recent study for the Ports of Seattle and Bellingham, as well as economic relationships between bulk throughput and maritime services (terminal operational levels, longshoremen productivity, freight forwarders, steamship agents, chandlers, etc.) developed from economic impact studies conducted by Martin Associates for major bulk ports such as Lake Charles, New Orleans, and Houston.

1. IMPACT METHODOLOGY

The movement of tonnage via the new terminal will contribute to the local and regional economies by generating business revenue to local and national firms providing vessel and cargo handling services. These firms, in turn, provide employment and income to individuals, and pay taxes to state and local governments. The impact of the port operations is not reduced to a single number, but instead, the operations of the Cherry Point bulk terminal will create several impacts. These are the revenue impact, employment impact, personal income impact, and tax impact. These impacts are non-additive. For example, the income impact is a part of the revenue impact, and adding these impacts together would result in double counting.

1.1 Business Revenue Impact

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

1.2 Employment Impact

The employment impact of the current port operations and the proposed terminal consists of three levels of job impacts:

- . Direct employment impact - jobs directly generated by the movement of the bulk cargo via the terminal, as well as the current levels of business at the terminal. Direct jobs include jobs with the railroads moving cargo between inland origins and destinations and the marine terminal; members of the International Longshore and Warehouse Union (ILWU), tug assist operators; steamship agents; freight forwarders; surveyors; chandlers.
- . Induced employment impact - jobs that are created throughout the local economy because individuals directly employed by the activity at the port and proposed terminal will spend their wages locally on goods and services such as food, housing and clothing. These jobs are held by residents located throughout the region, since they are estimated based on local and regional purchases. Martin Associates has developed a Whatcom County specific induced model using data supplied by the US Bureau of Economic Analysis Regional Input-Output Modeling System (RIMS II), and US Bureau of Census data for the Bellingham Metropolitan Area.
- . Indirect jobs - jobs that are created locally due to purchases of goods and services by firms, not individuals. These jobs include jobs with local office supply firms, maintenance and repair firms, parts and equipment suppliers, etc. The local purchases likely to be made by a major bulk terminal are based on relationships developed by Martin Associates for economic impact studies for the Ports of Seattle, Tacoma, Lake Charles, Portland, Vancouver, and New Orleans.

1.3 Personal Earnings Impact

The personal earnings impact is the measure of employee wages and salaries (excluding benefits) received by individuals directly employed due to handling the marine cargo. Re-spending of these earnings throughout the regional economy for purchases of goods and services is also estimated. This, in turn, generates additional jobs -- the induced employment impact. This re-spending throughout the region is estimated using a regional personal earnings multiplier, which reflects the percentage of purchases by individuals that are made within the Whatcom County area. The direct earnings are a measure of the local impact since they are received by those directly employed by seaport activity.

1.4 Tax Impact

Federal, state and local tax impacts are tax payments to the state and local governments by firms and by individuals whose jobs are directly dependent upon and supported by (induced jobs) activity at the bulk terminal.

2. **KEY IMPACT ASSUMPTIONS**

As part of the development of the baseline economic impact model for the Port of Seattle (2008), the Port of Bellingham (2009) and the Port of Tacoma (2005), Martin Associates interviewed 1,610 local maritime service providers, including tug operations, pilots, freight forwarders and customhouse brokers, agents, surveyors, chandlers, and railroad.¹ Based on the data gathered during those interviews, as well as an updated induced impact model and local re-spending multiplier developed for this current terminal study, Martin Associates developed the baseline economic impact model used in this analysis. To model expected employment for the ILWU, freight forwarders/customhouse brokers, chandlers, ship repair operations, surveyors, environmental support firms, bunkering firms, etc., Martin Associates developed employment, revenue and income relationships from our previous economic impact studies conducted for key bulk operations at other ports throughout the United States. SSA provided the estimated terminal employment anticipated at the two phases were provided to Martin Associates at each phase of throughput. The ILWU category includes jobs generated by the loading and offloading of vessels at the terminal, mechanics, maintenance, and labor involved in loading and off-loading rail cars at the terminal.

Job impacts with rail are based on the data provided to Martin Associates by the BNSF railroad, and include crew jobs within Whatcom County, yard employees at the terminal, and maintenance and administrative overhead factors (also provided by BNSF). Rail revenue is estimated based on the portion of the rail rate allocated to the movements within Whatcom County.

3. **POTENTIAL ECONOMIC IMPACTS OF THE PROPOSED BULK TERMINAL**

Exhibit 1 summarizes the annual economic impacts of the bulk terminal in Phase I and Phase II, which is the completion of the terminal. The throughput assumptions were provided to Martin Associates by SSA. It is estimated that with a 25 million ton throughput per year during Phase I of the terminal development, the proposed terminal would support 863 total jobs to the Whatcom County economy annually. The 294 direct job holders are projected to earn \$29.5 million of direct wages for an annual salary of about \$100,300, in 2011 dollars. A total of \$91.1 million of direct wages and salaries, local consumption expenditures, and indirect wages and salaries are estimated to be generated annually with a 25 million ton bulk throughput. Businesses (railroads, terminal operations, agents, freight forwarders, tug operators, pilots, etc.) are projected to receive \$666.6

¹ The 2007 Economic Impact of the Port of Seattle, Prepared by Martin Associates, February 10, 2009; The Economic Impact of the Port of Tacoma, Prepared by Martin Associates, May, 2005; The Economic Impact of the Port of Bellingham, Prepared by Martin Associates, October 3, 2008.

million of annual revenue, and make \$12.0 million of local purchases annually (supporting the 116 indirect jobs annually). A total of \$8.1 million of state and local taxes are projected to be generated annually with the 25 million ton terminal throughput.

Exhibit 1
Annual Economic Impact of Bulk Exports

Jobs	Phase I	Full-Build Out
Direct	294	430
Induced	453	634
Indirect	<u>116</u>	<u>165</u>
Total	863	1,229
Personal Income (millions)		
Direct	\$29.5	\$40.8
Re-Spending and Local Consumption	\$56.5	\$78.2
Indirect	<u>\$5.1</u>	<u>\$7.3</u>
Total	\$91.1	\$126.3
Business Revenue (millions)	\$666.6	\$1,437.8
Local Purchases (millions)	\$12.0	\$17.1
State and Local Taxes (millions)	\$8.1	\$11.2

With the completion of Phase II and full-build-out, the terminal is projected to handle 54 million tons of bulk cargo. With this throughput, it is estimated that 430 direct jobs will be supported annually, with an average salary of \$94,900. The slightly lower average income at full build out reflects the change in the distribution of direct jobs at the build out of the terminal. At full build out with a 54 million ton throughput, the share of maritime service jobs and rail jobs increase at a greater rate than jobs with the terminal employees and members of the ILWU, as productivity at the terminal improves over time. In phase II, a total of 1,229 direct, induced and indirect jobs are projected to be generated within Whatcom County on an annual basis, and total (direct, induced and indirect) annual personal wage and salary income and local consumption expenditures are projected at \$126.3 million annually. With a 54 million ton throughput, businesses providing the services to the terminal are projected to earn \$1.4 billion annually, and make \$17.1 million of local purchases within Whatcom County annually. Finally, with the 54 million ton throughput, \$11.2 million of state and local tax revenue are projected annually.

The breakdown of the direct jobs by job category, by phase, is presented in Exhibit 2. As this exhibit shows, the largest employment impact within Whatcom County is projected to be with the members of the ILWU. At full build out, jobs with maritime services such as steamship agents, freight forwarders, surveyors, and chandlers show the next largest impact.

Exhibit 2
Distribution of Projected Direct Jobs by Category

Categories	Direct Jobs/Phase I	Direct Jobs/Full Build-Out
Railroads	46	66
Terminal Operators	29	44
ILWU	170	213
Pilots/Tugs	17	36
Maritime Services	32	71
Total	294	430

In addition to the projected annual impacts generated by the throughput of the proposed terminal, SSA estimates that the Phase I construction cost of the terminal is \$536 million excluding cost of equipment. These purchases will be made in Whatcom County. Using data from the US Bureau of Economic Analysis, Regional Input-Output Modeling System for Bellingham/Whatcom County, it is estimated that the \$536 million of direct construction expenditures (excluding capital expenditures) will support 7.4 million personhours hours of direct construction employment over the period of construction. In addition, 10.1 million personhours of indirect and induced labor will also be supported over the construction period, as the result of purchases by the construction industry to local suppliers and supporting industries within Whatcom County. Associated with these direct, induced and indirect construction jobs are a payroll of \$331.0 million and an additional \$503 million of local purchases for construction supplies and support services. In addition to the jobs, income and local purchases impacts associated with the Phase I construction program, a state and local tax impact of \$74.4 million is projected. This includes the application of the sales tax on the initial construction expenditures. It is to be emphasized that the timing of the construction expenditures on an annual basis will result in varying levels of job, income, local purchases and tax impacts created annually over the construction period.

In phase II of the construction period, an additional \$121 million of construction and material expenditures will be made in Whatcom County. These additional expenditures will support 1.8 million direct personhours during the Phase II construction, and an additional 2.4 million of induced and indirect jobs in the County. The construction activity will also generate \$80 million of direct, induced and indirect wages and salaries over the Phase II construction period, along with an additional \$121 million of local purchases. Finally, the Phase II construction is projected to generate \$18.0 million of state and local taxes over the Phase II construction phase.

In total, the \$665 construction expenditures over the two phases of the project will support 21.7 million direct, induced and indirect personhours, \$411 million of direct, induced and indirect wages and salaries, and additional \$624 million of intermediate local purchases and \$92.4 million of state and local tax revenue. The timing of these impacts occur only during the construction period

and will not be ongoing as will the impacts created by the operation of the marine terminal.

These impacts are summarized in Exhibit III.

Exhibit III
Economic Impacts to Whatcom County
of the Construction of the Marine Terminal

	Phase I	Phase II	Total
Jobs (personhours)			
Direct	7,406,880	1,782,560	9,189,440
Induced/Indirect	<u>10,096,320</u>	<u>2,429,440</u>	<u>12,525,760</u>
Total	17,503,200	4,212,000	21,715,200
Personal Income (millions)			
Direct	\$140.0	\$34.0	\$174.0
Re-spending/Indirect	<u>\$191.0</u>	<u>\$46.0</u>	<u>\$237.0</u>
Total	\$331.0	\$80.0	\$411.0
Revenue (millions)	\$536.0	\$129.0	\$665.0
Local Purchases (millions)	\$503.0	\$121.0	\$624.0
State/Local Taxes (millions)	\$74.4	\$18.0	\$92.4

KEY ASSUMPTIONS

The baseline impact model used in this analysis of a bulk terminal development at Cherry Point is based on interviews with 1,610 marine services providers, developed from Martin Associates' economic impact studies for the Port of Seattle, the Port of Tacoma and the Port of Bellingham. These interviews were used to form the basic model used in this study. The key assumptions used to calibrate the economic impact model are as follows:

- Throughput of 25 and 54 million metric tons of dry bulk cargo;
- The average ship load is 130,000 tons per vessel call;
- 2 pilots will be assigned each vessel one way transit;
- 2 tugs will be assigned each vessel one way transit;
- Terminal employment was provided by SSA for each cargo throughput level;
- Agency fees are estimated from interviews for each vessel call, as part of the Port of Seattle and Port of Tacoma impact studies;
- Charges and fees per ton for various maritime services have been derived from our Port of Seattle and Port of Tacoma impact models, which are based on the results of surveys of the 1,610 marine services providers;
- Average salary for each job category included in the model have been developed from the interviews with the marine services firms conducted as part of the Port of Seattle, Port of Tacoma, and Port of Bellingham economic impact studies. Specific salary ranges were provided for terminal employees and the ILWU by SSA;
- Rail will be used to move the bulk to the Cherry Point Terminal. Rail yard employment, crew size, average revenue per ton and rail distance traveled within Whatcom County was provided by BNSF.
- Appropriate terminal charges, rail rates, and tug and pilot charges were developed from interviews and are confidential, but included in the model analysis.

Martin Associates (John C. Martin Associates, LLC) was founded in 1986 by Dr. John Martin to provide personalized consulting services to the port and maritime industries. These services include:

- Economic Impact Analyses –seaports, airports, shipyards, waterfront real estate development;
- Economic and Financial Feasibility Analyses of Capital Intensive Projects;
- Market Analysis;
- Port Master Planning/Strategic Planning;
- Litigation Support and Expert Witness Testimony;
- Ocean Carrier Cost Analysis and Fleet Deployment Strategies;
- Commodity Flow Analyses and Forecasting;
- Surface Transportation Cost Analysis;
- Intermodal Analysis and Rail/Port Interface Planning; and
- Facilities Planning and Analyses.

Martin Associates has conducted more than 500 port planning, economic and market studies for nearly every port in the United States. Martin Associates also provides economic and planning studies for private marine terminals, ocean carriers, state and federal government agencies, and ports in Europe, Asia and the Caribbean.

Martin Associates has developed more than 300 economic impact studies for ports and port systems throughout the United States and Canada, including:

<i>Boston</i>	<i>Pittsburgh</i>	<i>Portland, OR</i>
<i>Bellingham</i>	<i>Montreal</i>	<i>Brunswick, GA</i>
<i>Baltimore</i>	<i>Providence, RI</i>	<i>Seattle</i>
<i>Philadelphia</i>	<i>Quonset Point, RI</i>	<i>Oakland</i>
<i>Virginia Port Authority</i>	<i>Houston</i>	<i>Tacoma</i>
<i>Richmond, VA</i>	<i>Beaumont/Port</i>	<i>Portland, OR</i>
<i>Wilmington, NC</i>	<i>Arthur/Orange</i>	<i>Everett, WA</i>
<i>Morehead City, NC</i>	<i>Brownsville</i>	<i>San Diego</i>
<i>Port Everglades</i>	<i>Freeport, TX</i>	<i>Vancouver, WA</i>
<i>Tampa</i>	<i>Victoria, TX</i>	<i>Vancouver, BC</i>
<i>Jacksonville</i>	<i>Los Angeles</i>	<i>Windsor, ON</i>
<i>Palm Beach</i>	<i>Long Beach</i>	<i>Thunder Bay, ON</i>
<i>New Orleans</i>	<i>San Francisco</i>	<i>Saint John, NF</i>
<i>Baton Rouge</i>	<i>Corpus Christi</i>	<i>Prince Rupert, BC</i>

These port impact studies have become integral as planning tools, in addition to the traditional public relations use of impact studies. The major reason that these impact models have become planning tools is the fact that the underlying analysis is based on a detailed assessment of each port's operations, and no macro port impact models are used. Each port is unique and our models reflect the uniqueness of each port. Hence, the results of the models are highly defensible and the direct economic impacts estimated can be traced to the individual firm level of detail.

The following examples highlight how the Martin Associates economic impact models have been used for port planning and the justification of capital development projects:

- ***Assess the impact of new marine facilities construction*** - The Port of Seattle impact model was used to justify the purchase of additional land to expand American President Lines' Terminal, and to further estimate the future economic impacts that will be generated by this state-of-the-art marine terminal. The Port of Seattle model was also used to assess the impact of future breakbulk and container tonnage forecasts and the associated need for new breakbulk warehouse space at Seattle. For the Maryland Port Administration, we used the impact model to assess the impacts of a new state-of-the-art automobile terminal -- the Masonville Terminal. For the Port of Houston, we completed the economic impact analysis of the Bayport Container Terminal for use by the Corps of Engineers in assessing the economic benefits and costs of that project.
- ***Measure the economic impacts of channel dredging*** - The Port of Oakland Economic Impact Model was used to assess the impacts of dredging the Inner Harbor area of the San Francisco Bay. For the US Army Corps of Engineers, Martin Associates used our Port of Richmond (VA) economic impact model to measure the economic impact of widening and deepening the James River. For the Maryland Port Administration we identified the potential lost cargoes if maintenance dredging is not continued, and using our Port of Baltimore Economic Impact Model, we translated the potential "at risk" cargo and ocean carriers into potential economic impact losses to the region. The potential negative impacts of not continuing the maintenance dredging were then allocated to state legislative districts to be used in lobbying efforts by the Maryland Port Administration.
- ***Assess the impact of intermodal facilities development*** - The Martin Associates' Port of Philadelphia's impact model was used to measure the impact of increased use of rail at the Port's new intermodal rail yard for container moves to and from the port. The Martin Associates' Port of Oakland model was recently used to assess the potential impact of the loss of intermodal traffic and transload traffic.
- ***Allocate port investments*** - For the Port of Portland (OR), Martin Associates developed separate impact models for each of the Port's lines of business: seaport, airport, shipyard and real estate development. The impact models are then used to assess the impact of alternative capital investment in airport vs. seaport vs. shipyard vs. real estate development. The Port of Portland is now using the impact models to identify the jobs, income and revenue impacts associated with each Port investment. The results are used in the Port's annual report to describe the economic importance of the investments made by the Port over the fiscal year.

A similar set of models of seaport and airport operations and real estate development on port-owned land was developed by Martin Associates for the Port of Seattle and the Port of Oakland. These models are used on a continual basis to assess the relative economic impacts of various types of seaport, airport and real estate projects all competing for limited port funds. The Port of Seattle has incorporated the use of the impact models in its overall planning process, and will, as part of their long-term business plan, use the models to evaluate the economic benefits of each proposed capital project.

- ***Rank facilities investment plans*** - The Port of Philadelphia impact model was used in Martin Associates' Marine Facilities Development Strategy Study for the Commonwealth of Pennsylvania. The model was used to rank recommended facilities investment projects in terms of job and income generation. A similar approach was used to assess each recommended master plan strategy and investment in our Port Everglades Master Plan Study, the North Carolina State Ports Authority Capital Development Master Plan and our completed Master Plan for the Port of Baltimore.
- ***Assess alternative waterfront land development*** - The Martin Associates' real estate and maritime models are being used by the Port of Portland (OR), the Port of Vancouver (WA), the Port of Seattle, the Port of Oakland, the Port of San Francisco, and the Port of Longview to assess alternative development of waterfront land. For example, the models are used to assess the impact of future marine terminal development vs. industrial or commercial development of the waterfront land. In Oakland, the impact model was used to assess the impact of developing a resort hotel vs. reserving the land for future maritime uses. In Seattle, the impact models have been used to assess the impact of developing a parcel of land as a container facility or a ship repair yard, as well as the development of the Central City Waterfront, including a museum, hotel, restaurant, world trade center and condominium development.

We completed an analysis of riverboat gambling for the Port of Philadelphia, and the impact models were used to assess the relative economic benefits of marine terminal operations vs. riverboat gaming and hotel development.

- ***Justify investments in cruise terminal development*** - The Martin Associates' cruise service impact methodology was used at the Port of Baltimore to evaluate the economic impacts of cruise service on the local and regional economies. Impacts of passengers and crew in the local and regional tourism industry were also estimated, as part of this study. We also developed a detailed cruise industry model for Port Everglades which is used with our seaport impact model for Port Everglades to assess the relative economic benefits of cruise operations vs. cargo operations. This is of critical importance to Port Everglades since the Port is both land and berth constrained. We also developed a cruise impact model as part of our overall impact study for the Port of Houston Authority, as well as for the Port of Seattle, Port of San Francisco, Port of Los Angeles, and the Port of Philadelphia.

- ***Evaluate alternative marine terminal designs*** - The Martin Associates' seaport impact models are also used to assess alternative designs of marine terminals. We develop the economic impacts of a terminal based on dedicated uses of the terminal. For example, for a given terminal we can compare the jobs, income and port revenue that would be created under full-utilization if the terminal were used for a mixed use terminal (containers, breakbulk, RO/RO), or a dedicated auto terminal or bulk terminal or cruise terminal. Given the fact that the demand exists for each of the terminal uses, it is possible to use the impact models to assess the economic development benefits of each terminal alternative and to further lobby for port development financing.
- ***Measure the economic impacts of shipbuilding and ship repair activity*** - Martin Associates has developed detailed ship building and repair economic impact models that are used to measure the jobs, revenue, income and tax impacts of shipyard activity, by type of activity – new building, ship and barge repair, modular construction, military versus cargo versus passenger ships, etc. These models have been developed for shipyards at the Port of Portland, Port of Seattle, Port of San Francisco, Port of Erie and the Port of Philadelphia. We have used the shipyard model to estimate the economic impacts of the opening of a new shipyard (Meyer Werft Yard) in Philadelphia, as well as to monitor the ongoing dry-docking activities at the Port of San Francisco owned shipyards.
- ***Assess the impacts of a work shutdown at West Coast Ports*** - For the Pacific Maritime Association (PMA), Martin Associates conducted an assessment of the economic impact of containerized cargo at West Coast Ports. The models developed for Seattle, Tacoma, Portland, Oakland, Los Angeles, and Long Beach were then used in a detailed analysis of the potential impacts of a work slowdown or strike (in July of 1999) by the International Longshore and Warehouse Union (ILWU). The results of the analysis were used by the Governor of California, the Council of Economic Advisors and the White House to evaluate the impact on the national economy of the possible strikes, and to formulate a plan to resume normal working practices.
- ***Assess the economic impacts of the Marine Transportation System*** - Martin Associates recently completed an evaluation of the economic impacts created by the nation's coastal ports, inland waterways, cruise industry, commercial fishing, passenger ferry service, and recreational boating. The report, which was prepared as an issue paper on behalf of the National Advisory Council, Marine Transportation System, was submitted to Vice President Richard Cheney. The issue paper sets out the economic benefits of the Marine Transportation System, and further identifies key investment needs of both coastal ports as well as inland river ports that will be needed over the presidential term. This report served as the basis for the Secretary of Transportation's address to the AAPA Spring Conference on March 20, 2001.
- ***Impact of Section 201 Steel Import Quota*** - Martin Associates completed the economic impact assessment of steel import restrictions as part of the maritime industry's response to the Section 201 steel import hearings. The results of the study were presented before the International Trade Commission and the report served as the key document describing the importance of the steel

imports on the US Maritime Transportation System. The report was presented to the Council of Economic Advisors and President Bush.

- ***Impact of 2002 West Coast Port Shutdown*** - Our impact analysis of the West Coast port shutdown in September, 2002 was a key input into the decision by the President to enact the Taft Hartley Act. As part of this process, Martin Associate's impact models and methodology was reviewed by the Council of Economic Advisors and the Board of Governors of the Federal Reserve. Currently, Martin Associates is measuring the actual economic impacts of the recent port closure on all aspects of the logistics supply chain of the port closure.
- ***Impact of Port Systems*** - With respect to the impact of port systems, Martin Associates has developed the Great Lakes Economic Model of the St. Lawrence Seaway Development Corporation. This model, last updated in 2002, consists of 13 individual port impact models. Using these models, it is possible to assess the comparative economic impact of specific investments and changes in operational characteristics at each port as well as at the port system level.

Martin Associates developed a similar set of port system models for the Canadian Ports Corporation, which was used by Ports Canada to assess and compare investments at each of the ports within the Canada Ports Corporation System.

- ***Pacific Maritime Association*** - Martin Associates has developed container terminal-specific models to assess the economic impacts of the West Coast container operations. These models, being terminal specific, allow the PMA to assess future ILWU labor demands based on forecasts developed by Martin Associates for each terminal, to assess the impacts of grounded vs. stacked operations at each terminal, and to assess the impacts of work slowdowns and port shutdowns.
- ***Port of New Orleans*** - Martin Associates completed the economic impact analysis of the Port two days before the Port was devastated by Hurricane Katrina. The resulting impact model was used to demonstrate the economic importance of New Orleans and the Lower Mississippi River Ports to the nation's economy, and was instrumental in securing the initial FEMA funding to assist the Port's recovery.
- ***Economic Impact of the US Ports Industry, 2006-2007*** – For the American Association of Port Authorities, Martin Associates prepared an economic impact analysis of international cargo activity at the US ports. This study has provided the foundation for the AAPA for responses to specific policy issues.
- ***Economic Impact of the Containerized Shipping Industry, 2007*** - For the World Shipping Council, Martin Associates has just completed an economic impact analysis of containerized cargo activity handled at US ports in calendar year 2007. This report will form the basis for the WSC responses to policy issues impacting international container shipping.

With respect to **cruise impact analysis**, Martin Associates has developed cruise impact models for the Ports of Los Angeles, San Francisco, Seattle, Port Everglades, Jacksonville, Tampa, Baltimore, Norfolk and Philadelphia. These models are used to show the impact of current cruise service operations, as well as to provide a tool by which changes in vessel deployment, vessel size and market demographics can be measured. The cruise models are also used with the cargo models to evaluate alternative uses of waterfront land for cargo or cruise terminal development. Such an analysis was recently conducted by Martin Associates at the Port of Jacksonville to assist the Commissioners in making strategic decisions as to the development of a cruise terminal that could impact both containerized cargo and auto operations.

We also use a derivation of this model to assess the impacts of ferry operations, including the Washington State Ferry operations, as well as San Francisco Bay ferry operations and the impact of potential ferry operations on the Great Lakes.

Martin Associates has developed a detailed model of **commercial fishing activity** at the Port of Seattle's Fishermen's Terminal and Elliott Bay, and a similar commercial fishing and fish processing economic impact model for the Port of San Francisco and the Port of Los Angeles. The models are used to assess the impacts of changes in the composition of the commercial fishing fleet. We have also measured the economic impacts of commercial fishing activity at the Port of Boston, the Port of Victoria, TX and the Port of Port Lavaca, TX.

As part of our economic impact study of the Marine Transportation System conducted for the National Advisory Council of the Marine Transportation System (MARAD) (which was presented to the Bush Administration in 2000), Martin Associates developed a more refined model to measure **the impacts of recreational boating**. The model not only addresses the local employment at marinas and support services at the marinas, but also the impact of local purchases to support the recreational boating operations. These include repairs and supplies, retail purchases as well as storage. We used a similar model of recreational boating on our economic impact studies for the Port of San Francisco marinas, as well as for the Port of Los Angeles marinas, the Port of Tacoma marinas, the Port of Seattle marinas and the Port of Everett marinas.

With respect to channel **deepening and the justification of continued maintenance dredging**, Martin Associates has developed the economic benefits analysis of maintenance dredging of the Texas City Ship Channel, the maintenance dredging benefits of Port Freeport, the economic benefits of channel widening for an LNG facility at the Port of Freeport, and the economic benefits of maintaining the Houston Ship Channel. We also developed the economic benefits analysis of the Matagorda Ship Channel at Port Lavaca, as well as an economic impact study of the cargo activities at Port Lavaca –Point Comfort. For the Port of Brownsville, we recently conducted an economic impact study of the Port as well as an economic benefits analysis of maintaining the shipping channel and deepening the channel to accommodate not only Panamax size vessels for steel slab, but also to accommodate large oil rigs that are maintained and repaired by one of the Ports tenants. With respect to other economic studies evaluating the economic benefits of channel maintenance dredging, we have recently developed the economic benefits of maintaining the C&D Canal at its

current depth and developed a similar economic benefit cost analysis of maintaining the Port of Baltimore's main shipping channel at 50 ft.

Martin Associates has also developed a similar methodology to evaluate the economic impacts associated with *industrial and commercial real estate development*. This methodology has recently been used to measure the economic impacts of industrial and economic development at numerous seaports throughout the United States. The real estate impact methodology has been used to quantify the economic impacts of real estate development by the Ports of Portland, Seattle, Los Angeles, San Diego, Tampa and San Francisco. The resulting real estate impact model developed for these Ports allows for the estimation of the potential economic impacts of alternative waterfront and non-waterfront land developments and compares these developments with cargo and passenger uses.

Martin Associates has developed a similar approach to measure the economic *impacts of shipyard activity*. The methodology measures the jobs, income, revenue and tax impacts generated by new construction and repair work at shipyards. The impacts are estimated by industry segment (i.e., tankers, cargo ships, barges, Navy/Coast Guard, MARAD, oil modules, etc.) and by type of work (i.e., new construction, repair, dry dock, topside, etc.). The model allows the direct comparison of shipyard activity with the impacts of seaport, airport and other industrial activity. The shipyard model has been used to assess the economic impacts of shipyard activity in Seattle, Portland (Oregon), and Port Angeles, to assess the potential for locating a barge and tug construction yard in Pittsburgh, and to assess the economic impacts of a proposed shipyard (by Meyer Werft) specializing in cruise ship construction at the site of the Philadelphia Naval Yard. Within the last year, we have recently used this analysis to estimate the economic impacts of ship repair and new construction activity at the shipyards in Tampa and Mobile.

Finally, Martin Associates provides similar economic impact services to the majority of the *nation's airports*, including the Van Nuys Airport (current), San Francisco International Airport, Oakland International Airport, Sacramento International Airport, San Jose International Airport, Sea-Tac International Airport, Portland International Airport, Miami International Airport, Washington-Dulles and Washington Reagan National Airport, Baltimore-Washington International Airport, Hartsfield-Atlanta International Airport, Minneapolis-St. Paul International Airport, and the Milwaukee International Airport.