America's Ports and Intermodal Transportation System

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U.S. Maritime Administration

Contents

Preface

The Maritime Administration is pleased to present "America's Ports and Intermodal Transportation System," a Report focusing on container port and terminal requirements, based on projected increases in international trade. Specifically, this document identifies key system-wide findings and challenges in the vital strategic areas of end-to-end freight shipments, water access, landside access and interstate rail and highways with port and terminals as the nexus. The Report also discusses significant institutional challenges, including governance, the role of private industry, financing the transportation system, and infrastructure development.

The overarching goal of this Report is to focus a constructive dialogue that leads to viable alternatives and opportunities to ensure that the entire Marine Transportation System develops capacity in concert with the overall National Transportation System. For example, a port that increases its capacity "inside the gate," with no corresponding improvements in the approach channels, intermodal connectors and rail, road and marine highway corridors that serve it, will realize little overall capacity improvement.

Given the complexity and size of the Nation's infrastructure requirements, the Maritime Administration believes that a coordinated development approach will help ensure that the U.S. port system can effectively and efficiently respond to the challenges of future growth in freight shipments in the coming years and support the Nation's economic and security needs.

The Report is also fully aligned with the U.S. Department of Transportation's National Strategy to Reduce Congestion on America's Transportation Network. The Department of Transportation recognizes that system-wide congestion continues to limit the effective and reliable movement of people and goods, and poses a serious threat to continued economic growth. To this end, the Report's findings and recommendations can focus the discussion on how to achieve the national objectives of reduced congestion, expanded transportation, and efficiency.

The Maritime Administration has concentrated this Report solely on container ports and the intermodal transportation system. Reports that address other types of port operations, i.e., bulk and breakbulk, and their specific challenges and opportunities, will be issued in the future.

Finally, it is important to note that this document was prepared during a time of extreme volatility in the world's economy. The current economic climate, however, does not diminish the need to act quickly on the recommendations contained in this document. The current economic slowdown should be seen as a unique opportunity to begin an infrastructure investment program that will generate immediate economic stimulus and meet the long-term freight capacity needs of the Nation's transportation system.

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I. The Way Forward

The U.S. Marine Transportation System is clearly one of our greatest national assets. It has helped ensure our continuing leadership in international trade and is an engine of economic growth at home. It has served us with distinction in times of peace and war since before the founding of the Republic.

There is growing concern, however, that our existing Marine Transportation System may not be able to meet the anticipated growth in international trade and the many challenges associated with that growth – from financing badly needed new infrastructure improvements across the different modes of transportation to dealing with environmental concerns in an emerging "green" society.

By all indications, however, it appears that our North American trading partners – Canada, Mexico, and Panama – are preparing for current trade growth estimates. Their governments have recognized that marine infrastructure improvement projects are vitally important to their economies, and have significant improvement projects underway, or under preliminary development, to accommodate these growth projections.

The most recent are Mexico's efforts to develop the Punta Colonet container port and rail line corridor to the U.S. Mexican President Felipe Calderon stated in August of last year, "The Punta Colonet container ship project will transform and revolutionize the productivity of the country." When operational, Mexico's Punta Colonet and Lazaro Cardenas port projects will provide over eight million 20-foot equivalent units or 20-foot-long cargo containers (TEUs) of capacity and accommodate the largest containerships afloat. Additionally, Canada's Asia-Pacific Gateway and Corridor Initiative will provide five to eight million TEUs of port capacity and the deepest ship channel available in North America.

These projects, combined with the Panama Canal expansion, new water routes through the Suez Canal, and the potential opening of an Arctic sea route, will provide shippers with greatly expanded alternatives for moving cargo – opportunities that extend beyond our own national port system.

Therefore, it is imperative that we acknowledge, as do our North American trading partners, that an efficient and modern Marine Transportation System is vital to our economic security. Clearly, as the volume of goods arriving at our port gateways continues to grow, so will system congestion and development costs, along with the very real possibility of cargo diversion to non-U.S. port facilities.

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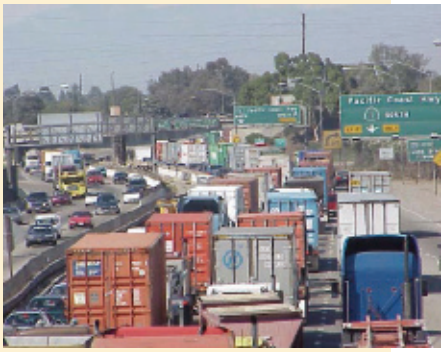
Findings

The following findings are based on our outreach and investigation of port and Marine Transportation System requirements.



America's ports and Marine Transportation System are critical to the national economy. The importance of our port system will only grow as globalization continues and the American economy becomes more integrated into the world economy.

- **America's ports and Marine Transportation System are critical to the national economy. The importance of our port system will only grow as globalization continues and the American economy becomes more integrated into the world economy.** Over 95 percent of cargo entering the United States comes by ship. Increasing world trade has resulted in record levels of cargo entering and leaving our ports. This cargo flow has become a large part of the U.S. economy. By 2006, foreign trade already accounted for nearly 22 percent of the nation's gross domestic product.

- **America's Marine Transportation System faces growing congestion challenges.** The U.S. Marine Transportation System has managed to accommodate our rising levels of international trade. Trade growth, however, has begun to strain our waterways, ports and key road and rail freight corridors. Our Nation's gateway ports, typically located in some of our most populous urban areas, face serious capacity expansion challenges – such as congestion, community, environmental, and competing land use issues.

- **The Marine Transportation System is just one part of a "system of systems" within the Nation's overall transportation network.** The current transportation system statutory and regulatory framework is largely modal-based, providing our Nation with a patchwork of rules and regulations focused on singular modal solutions to the problems associated with a multi-modal transportation system.

- **The development of America's port system has been largely driven by an amalgam of state, local, and private stakeholders.** At present, national transportation system planning activities do not uniformly consider the needs of the Marine Transportation System. Marine transportation and its supporting infrastructure have traditionally been the responsibility of state and local governments, and the private sector. Expanding and changing trade patterns require that Marine Transportation System planning be elevated to the national level with the appropriate incentives to integrate water transportation into the overall transportation system.

- **There is no dedicated Federal source of funding for our marine infrastructure.** Various agencies have funding available to support the maritime industry; however, this funding is limited in amount and scope. Presently, there is no dedicated funding for shoreside marine infrastructure, hampering any coordinated Federal response to freight capacity and flow issues.

- **Fragmented Federal agency oversight and involvement.** The Federal Government presence in marine transportation is strong – 18 Federal departments and agencies play some type of role in it, such as safety regulation, enforcement, licensing, dredging, and environmental protection. The sheer number of participants often makes decision-making unwieldy, and ultimately difficult for the both the government (Federal and state) and private industry to accommodate the rapidly changing needs of the system.

- **America's commercial ports, especially those designated as Strategic Ports, are essential to our national defense.** Accommodating military cargoes in times of

emergency is in the national interest. Military cargoes are irregular in timing and have a 'surge' component that places an inordinate demand on our designated national strategic port system – often to the detriment of the ports' regular commercial customers and stakeholders. It is vital to national security that our Strategic Ports be able to provide operational flexibility and possess sufficient redundancy to meet the needs of a wide range of missions and timelines.

- **Competing land-use issues adversely impact port expansion efforts.** A limited amount of property exists for marine development purposes in and around existing port facilities. Port expansion plans face competing development issues and environmental concerns that further limit expansion activities. Property that may be suitable for port development is subject to constant pressures for non-port uses, such as office, residential, or recreational development. When a parcel of land is designated for non-port use, it is rarely returned.

- **Small and medium sized ports have an essential role in the development of our marine highway system.** The Nation's small and medium sized ports play a vital role by serving specific market niches, communities, or regions and, in many cases, are the sole source of commodities for isolated communities. They are the key to expanding the overall efficiency of America's Marine Highways, and ultimately the entire transportation system.

- **Current environmental review and permitting processes inhibit the financing of public and private sector maritime infrastructure.** Current multi-agency and multi-regulatory financing processes drive up costs and significantly increase the time needed to obtain a permit for construction or alteration of marine facilities. It is not unusual for the permitting process to take upwards of a decade, and even then obtaining a permit is not assured. Clearly this discourages investment in an expanded marine infrastructure.

- **Inland rail and road bottlenecks impede efficient port related cargo flows.** Landside transportation chokepoints decrease the efficiency of the marine transportation system. No matter how efficient or effective port operations may be "inside the gate," that efficiency is lost if cargo is delayed due to road or rail congestion "outside the port gate."

- **The Nation lacks an overall framework to finance port and Marine Transportation System expansion.** While many port authorities already engage in successful public-private partnerships that facilitate the modernization and expansion of individual facilities, the very real need remains to create a mechanism to pursue expanded financing partnerships on a regional and even national basis.

- **Improved data on port cargo flows are needed to identify bottlenecks and changing trade patterns.** There is an abundance of anecdotal evidence suggesting where and how cargo flows can become delayed or obstructed. However, the data are usually modal specific and do not follow the movement of cargo to and from port destinations. In addition, modal data currently collected use different selection criteria for each mode making comparison and integration of the data difficult. A uniformed cross-model data collection system needs to be developed to provide adequate and timely information to make informed development and funding decisions.

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- **Technology and modified work practices increase the speed and volume of cargo moving through America's port and Marine Transportation System.** Improvements in technology and work practices expand port productivity; however, at present there is no existing uniform set of port performance measures or best practices to increase efficiency. There are also no established programs to research and promote technologies intended to improve port efficiencies.

- **Environmental concerns impact every segment of the Marine Transportation System.** Environmental sustainability is becoming more important as the maritime industry works to accommodate green transportation development and meet air and water quality standards. At present, there is no comprehensive "green" program to promote sustainability or best system development practices.

- **There is little outreach to shippers intended to encourage modal freight shifts.** Transportation managers normally adjust to bottlenecks or congestion, seeking the most efficient means to get freight to the intended destination. However, many alternative transportation options, such as the Marine Highway, are currently underutilized by the shipping community because of lack of awareness or the proper incentives to encourage alternative freight movement.

- **There is unused capacity on America's waterways that can relieve congested road and rail systems.** Road and rail congestion cost an estimated $200 billion annually – an amount only expected to grow each year. This unnecessary gridlock clogs our freight corridors, while we have thousands of miles of navigable coastal, intracoastal, river and inland waterways that have unused capacity. Ironically, water transportation, although sometimes slower, is more energy efficient, safer, and environmentally-friendly than other methods of land-based transportation. Moving cargoes to and from the port on maritime corridors can relieve congestion – especially in our urban areas and at border crossing chokepoints.

- **The Harbor Maintenance Trust Fund is not being used for dredging at many of the Nation's port facilities.** Over 90 percent of our nation's top 50 channels require immediate maintenance dredging, and nearly 30 percent of vessel calls at U.S. ports are constrained by inadequate channel depths. As such, the importance of an effective dredging program is obvious. It is essential to our national prosperity that project channel depths be maintained, or freight departing from or arriving at U.S. ports will cost more.

- **Channel deepening in our gateway ports is essential to accommodate the larger, more modern vessels currently serving the world's trades.** A new class of ocean going vessels will necessitate deeper and wider shipping channels, greater overhead clearance, and larger cranes and shore-side infrastructure to support the cargoes they carry.

- **Advanced navigation systems will increase the efficient and safe flow of vessels into and out of America's ports.** The level of international trade is growing and anticipated to further expand dramatically over the next 20 years. It is expected that the number and size of vessels will also continue to increase at a rate greater than the existing system can accommodate. Advanced navigation and safety systems can help the industry meet this increase, along with associated higher

environmental and safety standards. Examples of such systems are marking channels, charting, notifying mariners of changes, meteorological warnings, vessel traffic management, and other capabilities that sustain throughput while increasing safety and security.

- **Investment and modernization of the Nation's river lock system is needed to support the increased movement of commodities on America's Marine Highways.** Much of our lock and dam infrastructure is over 50 years old and unable to accommodate today's modern vessels. Further, the collection of the Inland Waterway Users Fee discourages the use of our inland waterways, shifting congestion to the roads and railroads. The method in which the funding is apportioned is also inefficient, in some cases adding decades and hundreds of millions of dollars in cost to essential projects. As a result, funds are being depleted, costs are soaring, and projects are delayed – creating reliability and efficiency problems that will only worsen in coming years.

- **A skilled workforce is vital to the efficiency of our Marine Transportation System.** A modernized and expanded marine infrastructure represents only one half of the Marine Transportation System improvement equation. The other equally important half is the further development of a highly-skilled workforce capable of managing a technologically improved and expanded system.

- **America's ports face competition from an expanding Canadian, Mexican, Central American, and Caribbean port system.** Canada and Mexico are investing in significant port and freight corridor improvements, threatening to ultimately divert cargo from U.S. ports to the ports of our North American trading partners. In the short term, these foreign ports and corridors could help the U.S. accommodate a projected increase in trade flows. In the long term, they will limit American job growth opportunities, negatively impact our economy, and reduce our own strategic port capacity.

For the United States to remain a leader in the global economy, it is imperative that the Federal Government, state and local authorities, and private industry support a strong national transportation system. We must start with a strong National Transportation Policy. It is clear that the Marine Transportation System is a shared enterprise. To ensure our continued prominence in international trade and the success of this and future generations, we must work together to address our fundamental transportation challenges.

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Recommendations: The Way Forward

With projected freight volumes threatening to overwhelm our transportation infrastructure, especially at our port facilities, it is imperative that the United States comprehensively address its national transportation system challenges.

The following items are recommended for further consideration:

- Develop a national freight policy to include a framework for planning, operations, and investment.
- Establish through legislation a funding mechanism to support state-driven multi-state, multimodal corridor planning and investments and organizations that focus on major transportation challenges, e.g., transportation chokepoints, intermodal corridors, and projects of national significance.
- Establish an investment fund for freight-related projects on national freight corridors. The investment fund would be used for freight system infrastructure to fix a number of problems, including bottlenecks and intermodal access to ports and distribution centers, and transportation to international gateways, i.e., ports, airports and border crossings.
- Establish Title 23 authorization as an intermodal planning mechanism for both freight and passenger infrastructure development.
- Establish criteria that prioritize the selection of projects for Federal funding based on national system needs that support international trade and our global competitiveness.
- Designate marine ports and terminals, i.e., surface intermodal transportation facilities, eligible for Title 23 funding.
- Establish the Department of Transportation (through the Maritime Administration) as the lead Federal agency for commercial port and terminal infrastructure planning and development, similar to authority granted for the ongoing Port of Anchorage Expansion Project.
- Expand freight infrastructure to accommodate trade growth through a variety of incentives, such as reduced policy and regulatory barriers, Federal funding where appropriate, and cooperative pubic-private efforts.
- Create the "surface-to-water" shipper tax credit program to reward measurable movement of cargo from the land-based freight transportation system to the marine highway.
- Fully fund surface transportation access projects with emphasis on projects of national significance specifically targeted to reduce surface freight congestion.
- Reauthorize and fully fund all freight transportation programs established in SAFETEA-LU.
- Augment freight terminal operating procedures and intermodal networks with increased use of information technology (e.g., PierPass, virtual container yard, chassis pooling) to enhance productivity.
- Revise statutes and legislation to reduce or remove constraints and barriers to multi-modal and system-wide policies and funding.
- Structure surface transportation programs and regulations to coordinate the individual modes. For example, legislation could address the entire transportation system instead of separate highway, rail, environmental and various individual maritime, freight waterway and dredging elements.
- To maximize the use of waterborne transportation alternatives and expand capacity, state and local governments and transportation planners, including Metropolitan Planning Organizations, should incorporate national transportation system strategies and priorities in state, local and regional transportation planning and investment.

With projected freight volumes threatening to overwhelm our transportation infrastructure, it is imperative that the United States comprehensively address its national transportation system challenges.

Solutions to capacity challenges will require the public and private sectors to anticipate and address overall system requirements.

- Establish Federal, state, and local "land bank" incentives, including policy development, legislation, and rulemaking, to set aside property for port capacity.
- Require ports receiving federal funds to provide zoning or land use protection at their facilities.
- Establish Federal incentives to promote regional connectivity of the Nation's freight system, through such means as the Corridor of the Future Program and Projects of National Significance that connect to international port and intermodal gateways.
- Expand the development of ports and distribution centers outside urban centers through a system of incentives.
- Incentives should be considered for nationally significant port expansion projects. One possible example is the Federal Aviation Administration. If an airport owner receives Federal funds, it is obligated to comply with FAA land use compatibility requirements around the airport. Another possibility is to tie certain Federal funding to states and Metropolitan Planning Organizations to similar obligations.
- The Department of Transportation, the U.S. Coast Guard, the National Oceanic and Atmospheric Agency and other Federal agencies should accelerate the use of technologies and systems that serve to increase safety of navigation, as well as improve the efficiency and resiliency of marine transportation through our waterways.

Authority is needed to develop the capacity of the Nation's small and medium sized port facilities.

- Balance freight flows through Federal assistance to small and medium ports that process significant strategic cargoes and directly provide congestion relief to major intermodal gateways.
- Partner with the Department of Defense to expand strategic port capacity and cost-share the development and utilization of small and medium ports to both distribute risk, and add capacity and efficiencies.
- Provide incentives to use small and medium ports as a key element of an efficient and expanded Marine Highway System.
- Assist small and medium ports to develop critical infrastructure and capacity. For example, port-specific legislation has already been enacted to designate the Maritime Administration as a "one stop" lead agency in the management and allocation of Federal, state and local resources for specific port modernization projects. This legislative authority could serve as a template for a broader authorization to manage a mix of public and private port funding sources to benefit capacity development at the Nation's smaller ports.

Streamlining the national dredging process will greatly enhance port capacity and productivity.

- Prioritize and expedite the permitting process through better Federal interagency coordination through such means as revisions to multi-agency policies, procedures, and guidelines – to reduce the time, complexity, and expense required to undertake a major infrastructure development project.
- Spend down the Harbor Maintenance Trust Fund in a coordinated and accelerated effort to maintain, modernize, and expand port productivity.
- Fully fund the restoration of the Inland Waterway infrastructure, i.e., locks, dams, navigation systems, to meet present and anticipated future capacity needs.

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- Provide incentives for the use of a broad range of investment tools, including user fees, debt financing, tax-based revenues, and public-private partnerships.
- Provide incentives to the private sector to participate in capital funding of major infrastructure projects.
- Provide a U.S. government Title XI styled Port Infrastructure Loan Program to guarantee private sector debt financing for port infrastructure and modernization of U.S. port facilities.
- Develop a tax deferred capital construction fund for port earnings (an IRA-type account) to finance port expansion and modernization projects.
- Remove Federal barriers to private investment (e.g., permitting and dredging delays, land use/availability uncertainty, etc.).
- Fully establish and quantify the public benefit of providing financial incentives to the private sector in the development of major transportation projects.
- The Department of Transportation should take a leadership role in developing systemic policies and mechanisms that facilitate and encourage public-private partnerships in road, rail, and marine highway projects.

A simplified environmental permitting process will encourage system improvements.

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- Mandate accelerated air quality improvement through incentives, i.e., tax credits.
- Explore coordinated policies and rulemaking for marine resource conservation (clean water, wildlife habitats, and reduction of invasive species).
- Expand the use of incentives to reduce fuel consumption related to transportation, including the introduction of new technologies and alternative fuel use.
- The Department of Transportation, the Environmental Protection Agency, Department of Homeland Security, the Department of Commerce, and other Federal agencies should provide leadership on improving policies impacting marine air emissions, invasive species, ballast water treatment, and other environmental issues. This includes international standard-setting through organizations such as the International Maritime Organization, as well as working with states, regions, and other environmental stakeholders to ensure national policy supports state and regional needs, and avoids vessel operators having to meet multiple, conflicting regulations as they move cargo through multiple jurisdictions.
- The Department of Transportation and the Environmental Protection Agency should lead an effort to improve collaboration between industry stakeholders, government agencies, and the concerned public on how to effectively reduce the time it takes to complete environmental reviews and issue construction permits. This should include revising policies, procedures, and guidelines to streamline the environmental review and permitting process for maintenance, modernization, and expansion projects in and near ports and waterways. The goal should be to reduce the time, complexity and expense required and to establish a stable and predictable timeline to reduce risk for private investment.

Integrate data collection will aid in the prioritization of freight planning.

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- Establish the collection of accurate freight volume data to develop a uniform system of measurement that tracks system performance.
- Mandate a single Federal agency “one-stop shop” as the lead for the collection, analysis, and dissemination of comprehensive freight data.
- Use accurate volume data to examine modal balancing in the system.
- The Federal Government, states, local authorities (including ports) and private sector stakeholders should collaborate to develop a uniform system of measure-

ment that tracks current and projected transportation system performance, and can model or predict future performance under circumstances of disruptions, emergencies, or changing trends in transportation. A single Federal entity should be designated as lead agency and provided with the resources needed to develop this capability.

Fully develop the capacity of America's Marine Highways.

- Fully implement the Short Sea Shipping Transportation Provisions mandated by the Energy Independence and Security Act of 2007.
- Fully fund the America's Marine Highway Initiative.
- Incentivize marine highway start-up companies that measurably reduce surface congestion and air pollution, which result in energy savings and reduced highway repair costs.
- Quantify the public benefits of increased waterway usage as a direct result of Marine Highway systems.
- Invest in new vessel technology to improve productivity and system efficiency.
- Remove/reduce impediments to Marine Highway systems, such as Harbor Maintenance Tax and the 24-hour rule.
- Appropriate Federal agencies, in consultation with industry, should revise Inland Waterway Users Fund legislation in order to efficiently and equitably collect funds to modernize and replace critical inland waterway infrastructure.

Information sharing across modes and intermodal networks will increase productivity.

- Fund, test, and demonstrate innovative technologies and systems to improve Marine Transportation System performance.
- Engage labor in developing a set of guidelines to establish uniform standards that measure port throughput efficiency (velocity), effectiveness and performance of infrastructure, technology and processes for enhancements as needed.
- The Federal Government should develop, in close collaboration with ports and terminal operators, a set of guidelines aimed at establishing uniform standards that measure port throughput and efficiency (velocity) to identify bottlenecks and measure the effectiveness of infrastructure, technological or procedural enhancements.
- The Department of Transportation, Department of Homeland Security, and other Federal agencies should, in close collaboration with state and local governments and private sector shippers, freight forwarders and third-party logistics providers, develop a communications and coordination network. This network should operate 24/7 to share information. Incentives, tax or fee waivers, or other appropriate mechanisms should be available, when appropriate, to reduce bottlenecks or shift freight flows to optimal modes.

Address Federal governance issues to make policy, planning, funding, and implementation more effective and efficient.

- The Department of Transportation, the Maritime Administration, the U.S. Coast Guard, U.S. Army Corps of Engineers and others, in partnership with state and local governments and private sector stakeholders, should develop a means for planning Marine Transportation System infrastructure projects with the greatest national significance to focus limited public and private resources on those projects. This must be a systemic view, linking water access, ports and terminals, intermodal near-port connectors and primary interstate rail, road and Marine Highway corridors. Planning should address future trends in transportation, including

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infrastructure and use of technology and should exploit all existing capacity, and make maximum use of public and private resources.

- The various functions provided by the Federal Government should be streamlined, including constructing, operating and maintaining the navigable channels; managing traffic on waterways; providing aids to navigation, charts and information on water and weather conditions; regulating safety and environmental compatibility of vessels; responding to accidents; helping to identify resources for projects that link ports and terminals to key corridors; and ensuring the security of the Marine Transportation System and its components. This might be done by consolidating these functions in one Federal agency.
- The Department of Defense and the Maritime Administration should lead the development of new and innovative mechanisms to give the military better access to Strategic Ports; support security training for mariners and short based maritime personnel; and, collaborate to identify and implement best practices

Encourage worker recruitment and retention.

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- The Federal Government should continue to support the system of Federal and state merchant marine academies so they can attract, train and educate America's future merchant marine officers. In addition, appropriate Federal agencies should review and revise certification and licensing requirements as necessary to ensure the knowledge, skills and abilities required of our workforce accurately reflect current industry needs.
- The private sector should improve recruitment and retention of skilled workers for our domestic and international trades to reduce seagoing and shoreside workforce shortages. In addition, the private sector should implement programs to streamline the training necessary in order to meet workforce certification and licensing standards.

These recommendations are by no means a complete list or inventory of the many actions we must take to keep America competitive and our economy growing in the 21st century; they represent a framework of actions that the public and private sector must undertake to meet the demands of tomorrow's Marine Transportation System. The primary focus is on containerized transportation, and more work must be done to address energy, liquid cargoes, dry bulk cargoes, breakbulk cargoes, and passenger trades, all essential components of the Marine Transportation System. The Maritime Administration will be studying these other elements of the system as well as issuing reports and recommendations. Further, we will be working with governmental, public, and private stakeholders to address the challenges we uncover and to take advantage of the opportunities ahead.

It should also be noted that the Report was prepared during a time of extreme volatility for the world's economy. However, the current economic climate does in no way alter the need to meet the recommendations contained in the Report. In fact, the current slowdown should be seen as an opportunity to better prepare and coordinate our response to the many challenges facing our Nation's ports and the intermodal system.

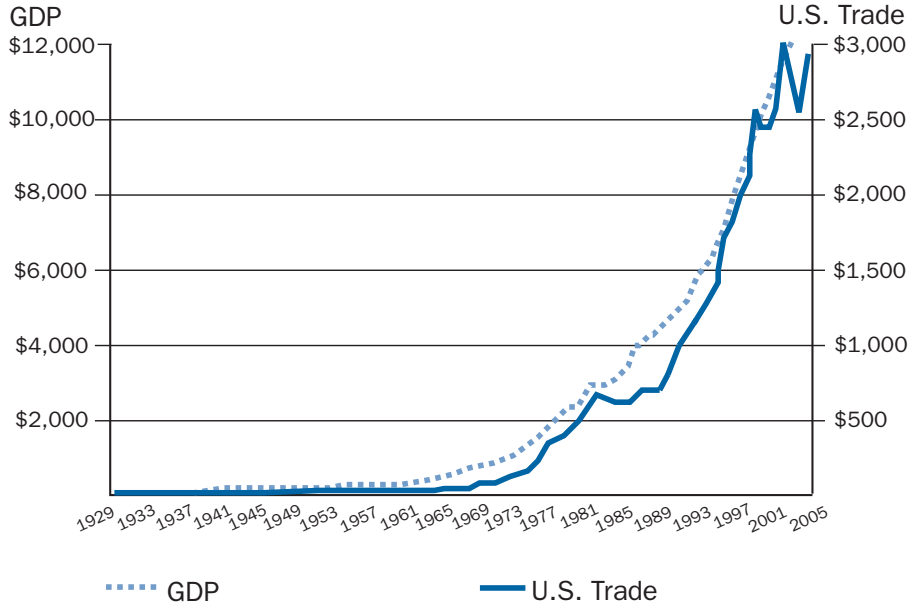
II. Introduction: Our Nation's Ports -

The Critical Link in America's Economy

The lifeblood of America's economy passes through our ports – everyday, trains, trucks, barges and ships move goods into, around, and through our ports to meet the commercial and military needs of the Nation. Ports receive shipments from farms and factories destined for markets throughout the world. Goods flow from factories in Europe, South America, and the Far East through our ports on the way to factories and stores throughout the country. Petroleum, chemicals, and raw materials move across the oceans through our ports to reach U.S. industries.

The seas and rivers, ports and terminals and their nearby transportation links, and interstate rail, road, and marine highway systems are the critical and intertwined transportation network that "delivers the goods." Containers, bulk, breakbulk, neo-bulk, project cargo, automobiles and trucks, and petroleum and other bulk liquids all flow through our transportation system that begins at our Nation's ports. Such a system requires an advanced and sophisticated network of not only ports and terminals, but fleets of trucks, rail cars, and barges to carry this cargo to the customer and to fuel our economy. It also requires highly trained personnel both ashore and afloat. And it needs support services and industries to keep the network up and running. A failure of any one of these parts prevents the efficient functioning of the rest of the system.

U.S. Trade and Gross Domestic Product
(in millions)



Source: U.S. Department of Transportation based on Department of Commerce data

The lifeblood of America's economy passes through our ports – everyday, trains, trucks, barges and ships move goods into, around, and through our ports to meet the commercial and military needs of the Nation.

As our economy has become interdependent on the global economy, the U.S. Gross Domestic Product (GDP) has grown exponentially. This global interdependence among trading nations has brought prosperity, but has also placed additional demands on our ports and the end-to-end delivery system of imports and exports that are so vital to America's economic growth and our role as the world's leading economic power.

Although foreign trade accounted for only 13 percent of U.S. GDP in 1990, it grew to nearly 22 percent by 2006. Recent projections indicate that foreign trade will be equivalent to 35 percent of GDP by 2020 and may grow to 60 percent in 2030. As foreign trade continues to grow, marine transportation will become even more important to our economy. Approximately 90 percent of America's overseas foreign trade tonnage is moved by ship. And, America's network of waterways moves more than 2.3 billion tons of domestic and foreign cargo each year.

Recent projections indicate that foreign trade will be equivalent to 35 percent of GDP by 2020 and may grow to 60 percent in 2030.

The transportation network that serves our economy also benefits our national defense. The movement of military and related traffic essential to national security relies heavily on our commercial transportation system. Ports moving commercial and consumer goods also move military equipment and supplies that enable the United States to project its power anywhere in the world. Robust intermodal connections are necessary to support the flow of global commerce and the deployment of military forces. Only focused, sustained attention to both business and military needs will allow for a truly seamless, integrated intermodal freight transportation system.

Until recently, additional capacity demands could be met because there was always a way to build another terminal or add another highway lane. That is no longer the case. Today, our Nation's ports and intermodal systems face a growing capacity crunch.

We are confronted with capacity stretched to its limits, aging and decaying infrastructure, multiple demands for land and high construction costs. And when a problem occurs in one part of the system, it can have a ripple effect throughout the entire waterborne and surface transportation network.

Today, there is an urgent need to address congestion's systemic challenges. Although ports and their intermodal connections are continually making improvements, any benefits can be quickly offset by the rapid pace of growth in shipments and the relatively slow and often daunting process of financing and constructing new infrastructure.

Clearly, there is a need to better manage the transportation process "end to end." We must improve efficiency, reliability and cost savings and provide environmentally sustainable world class service to customers. But the decisions of today and tomorrow are much more complex than they were 20 or 30 years ago.

Now, transportation decision makers in metropolitan planning organizations, cities, individual states and the Federal government must consider not only the "why" and "how" of infrastructure needs, but also their impact on the environment, local communities and quality of life of future generations.

Given the enormity and breadth of these challenges, it is imperative that the United States adopt a truly national freight transportation policy. We must ensure the efficient movement of goods in the domestic and global supply chains while promoting a productive and competitive U.S. economy and addressing national defense needs.

In order to accomplish these goals, individual stakeholders, as well as individual segments of the transportation system, must no longer stand alone but attain full integration into the overall solution. The Nation's ports should serve as the focal point for present and future efforts.

America's Ports and Intermodal Transportation System

In the past, transportation management, planning, and funding were often viewed from an individual modal perspective, such as rail, road, and marine transportation. But today's transportation decisions are far more complex and require a system-wide perspective. The benefits are clear. With a nationwide understanding of common problems and agreement on broad goals for the way forward, ports, governments and the private sector will be better able to collaborate to achieve solutions to improve our Marine Transportation System and freight movement. The Maritime Administration is committed to this effort and to working with our stakeholders to ensure the Nation's ability to move goods and people, meet military needs and support and grow our economy.

To move forward and facilitate consensus among the various interests serving the Nation's transportation system, the Maritime Administration prepared this report, "America's Ports and Intermodal Transportation System." The Report identifies key system-wide findings and challenges in the vital strategic areas of end-to-end freight shipments, water access, ports, terminals and landside access and interstate rail and highways. The Report also discusses significant institutional challenges including governance, the role of private industry, financing the transportation system and infrastructure development.

The Report's primary goal is to ensure that the entire Marine Transportation System develops capacity in concert with other transportation modes. For example, a port that increases its capacity "inside the gate," with no corresponding improvements in the approach channels, intermodal connectors and rail, road and marine highway corridors that serve it, will realize little overall system gains. The Report's findings and recommendations will help ensure that the U.S. port system can effectively and efficiently respond to the challenges of future growth in freight shipments in the coming years and support our Nation's needs.

Today's transportation decisions are far more complex and require a system-wide perspective.

The Report is also fully aligned with the U.S. Department of Transportation's National Strategy to Reduce Congestion on America's Transportation Network. The Department of Transportation recognizes that congestion across all transportation modes continues to limit the predictable, reliable, and efficient movement of people and goods, and poses a serious threat to continued economic growth. Since 2006, there have been several Department-wide efforts to address congestion at our Nation's gateways and on our highway corridors, bridges, and roads. Four of these initiatives support the Report's recommendations and are discussed throughout this analysis:

- Reduce bottlenecks at major freight gateways, including Southern California;
- Develop new interstate highway and rail capacity through a "Corridors of the Future" concept;
- Encourage states to consider enacting public-private partnership laws; and
- Implement technological and operational improvements.

As summarized here and explained further throughout this Report, a focus on three areas – Deep Water Access, Ports and Terminals, and Interstate Corridors – as well as on institutional challenges, will help to achieve national objectives to reduce congestion and improve transportation infrastructure.

III. The Marine Transportation System

Transportation is a system of systems, an integrated network, not just within the United States, but also around the world. Our domestic network must operate seamlessly in order to keep America competitive in the global transportation and logistics network. Ports have become the nexus of that system.

The Nation's port system is made up of thousands of large, medium, and small terminals and intermodal facilities in approximately 360 commercial sea and river ports. More than just facilities for loading and off-loading cargo, they are a great engine of economic growth. A recent study reported by the American Association of Port Authorities (AAPA) found that in 2006, U.S. deep-draft seaports and seaport-related businesses generated approximately 8.4 million American jobs and added nearly $2 trillion to the economy. But their success story does not end there.

Ports are not limited to working with just the maritime sector. According to the AAPA, port authorities may also have jurisdiction over airports, bridges, tunnels, commuter rail systems, inland river or shallow draft barge terminals, industrial parks, Foreign Trade Zones, world trade centers, terminal or short-line railroads, ship repair, shipyards, dredging, marinas and other public recreational facilities. Ports may also undertake community or regional economic development projects beyond those directly benefiting the port itself.

However, ocean port operations are decentralized and governed by local port authorities that may or may not own and/or operate significant portions of the port. There is also little coordination of port operation at the Federal level and, thus, ports compete for both business and government funding to maintain and improve infrastructure.[1]

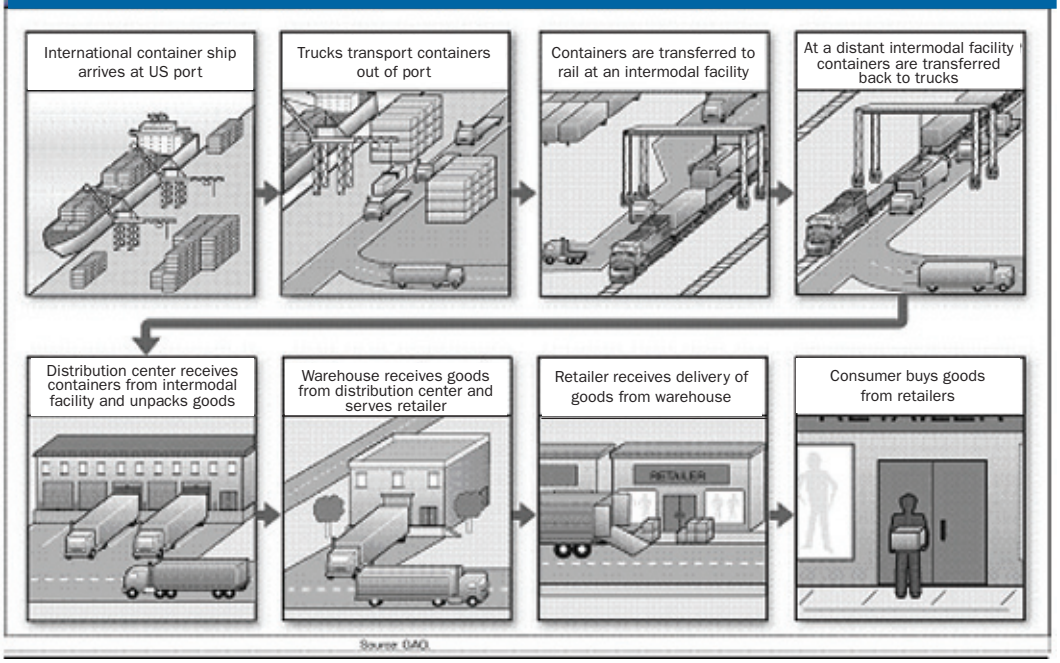
Distribution centers receive international containers (typically 20, 40, or 45 foot lengths) from ports, re-allocate the contents, and then re-pack the freight in 53 foot domestic truckloads to be moved to their ultimate destinations. Thousands of distribution centers have emerged in near-port areas and at key transportation nodes, further constraining capacity and prompting the call for new and innovative models to speed the movement of freight to and from our major container ports.

With over 85 percent of our Nation's containerized freight flowing through 10 ports, and projections for continued increases in containerized foreign trade, there is great pressure on our port and intermodal system to use capacity more efficiently. The following pages briefly describe these 10 ports. Appendix 1 also provides a listing of major U.S. port and terminal facilities.

Our domestic network must operate seamlessly in order to keep America competitive in the global transportation and logistics network. Ports have become the nexus of that system.

[1]International Trade, Transportation Networks and Port Choice: Blonigan and Wilson, May 2006.

Example of Goods Movement from Port of Entry to Customer



Top 10 Ports in the U.S.

The Port of Los Angeles

The Port of Los Angeles is located in San Pedro Bay, just 20 miles south of downtown Los Angeles, California. According to 2007 U.S. Census Bureau estimates, the Los Angeles metropolitan statistical area, with a population of 12.9 million people, ranked second in the country behind only New York. The port encompasses 7,500 acres, 43 miles of waterfront and features 27 cargo terminals, including dry and liquid bulk, container, breakbulk, automobile and Omni facilities.

In 2007, the port ranked first in terms of container volume moving nearly 5.7 million TEUs (loaded). This accounted for over 39 percent of the container traffic on the West Coast and 18.6 percent nationally. From 2002-2007, container traffic increased by 22 percent at the port.

Overall, more than 77 million metric tons of international waterborne cargo flowed through the port in 2007. While imports accounted for 79 percent of the total foreign trade by volume, they also accounted for 87 percent of the value. On average, over 212,000 tons of cargo moved through the port daily in 2007, with the top five commodities consisting of petroleum, iron and steel, heavy machinery, furniture and plastics.

The Port of Long Beach

The Port of Long Beach is also located in San Pedro Bay, California and also serves a population of 12.9 million people. The port encompasses 3,200 acres and features 10 piers, 80 berths and 71 Post-Panamax cranes. Facilities include dry and liquid bulk, container, breakbulk, and Roll-on/Roll-Off (RO/RO).

In 2007, the port ranked second in terms of container volume moving over five million TEUs (loaded). This accounted for over 34 percent of the container traffic on the West Coast and 17 percent nationally. Volumes actually increased slightly at Long Beach in 2007 (four percent). Over the last five years, container traffic has increased by nearly 61percent at the port.

Overall, more than 38 million metric tons of international waterborne cargo flowed through the port in 2007. While imports accounted for 45 percent of the total foreign trade by volume, they also accounted for 70 percent of the value. On average, over 105,000 tons of cargo moved through the port daily in 2007, with the top five commodities consisting of petroleum, wood pulp, iron and steel, plastics, and heavy machinery.

The Port of New York/New Jersey

The Port of New York/New Jersey is a bi-state port located on the East Coast of the U.S. With a population of 18.8 million people, the New York/New Jersey metropolitan area ranked as the most populated in the country. The port features seven cargo terminals, 54 container cranes and three cruise ship terminals. Facilities include dry and liquid bulk, container, breakbulk, and RO/RO.

In 2007, the port ranked third in terms of container volume moving nearly 3.9 million TEUs (loaded). This accounted for 33 percent of the container traffic on the East Coast and 13 percent nationally. Since 2003, container traffic has increased by over 30 percent at the port.

Overall, more than 80 million metric tons of international waterborne cargo flowed through the port in 2007. While imports accounted for 78 percent of the total foreign trade by volume, they also accounted for 75 percent of the value. On average, almost 220,000 tons of cargo moved through the port daily in 2007, with the top five commodities consisting of petroleum, salt and stone, wood pulp, iron and steel and beverages.

The Port of Savannah

The Port of Savannah is located in Georgia. The City of Savannah has a population of 329,000. The port encompasses 1,400 acres and includes container, breakbulk, and RO/RO facilities.

In 2007, the port ranked fourth in terms of container volume moving nearly two million TEUs (loaded). This accounted for 17 percent of the container traffic on the East Coast and seven percent nationally. Since 2003, container traffic has increased by more than 79 percent at the port.

Overall, more than 33 million metric tons of international waterborne cargo flowed through the port in 2007. Imports accounted for 60 percent of the total foreign trade by volume and 63 percent of the value. On average, almost 92,000 tons of cargo moved through the port daily in 2007, with the top five commodities consisting of petroleum, salt and stone, wood pulp, paper products, and plastics.

The Port of Hampton Roads

The Virginia Port Authority oversees four general cargo terminals: Norfolk International Terminals, Portsmouth Marine Terminal, Newport News Marine Terminal and the Virginia Inland Port in Front Royal. All of the terminals are operated by the Virginia Port Authority's

affiliate, Virginia International Terminals, Inc. The Norfolk area, with a population of approximately 1.7 million people, was ranked 34th in the country in 2007.

In 2007, Hampton Roads was ranked fifth in terms of container volume moving nearly1.6 million TEUs (loaded), accounting for 13 percent of the container traffic on the East Coast and five percent nationally. Since 2003, container traffic has increased by more than 43 percent at this port.

Overall, more than 42 million metric tons of international waterborne cargo flowed through the port in 2007. While imports accounted for 32 percent of the total foreign trade by volume, they also accounted for 60 percent of the value. On average, almost 116,000 tons of cargo moved through the port daily in 2007, with the top five commodities consisting of petroleum, grains, wood, heavy machinery and paper products.

The Port of Oakland

The Port of Oakland – ranked sixth in the country – is located on the eastern shore of San Francisco Bay in Northern California – an area that is home to 4.2 million people. The port encompasses 1,210 acres and includes 20 deepwater berths and 35 container cranes (29 of which are Post-Panamax). Additionally, the port boasts 10 container terminals and 2 intermodal rail facilities.

In 2007, the port ranked fifth in terms of container volume moving nearly 1.4 million TEUs (loaded). This accounted for 10 percent of the container traffic on the West Coast and five percent nationally. Since 2003, container traffic has increased by more than 34 percent at the port.

Overall, almost 17 million metric tons of international waterborne cargo flowed through the port in 2007. Imports accounted for 53 percent of the total foreign trade by volume but 68 percent of the value. On average, almost 46,000 tons of cargo moved through the port daily in 2007, with the top five commodities consisting of petroleum, wood pulp, iron and steel, beverages and fruit and nuts.

The Port of Charleston

The Port of Charleston is home to 630,000 people and located in South Carolina along the U.S. East Coast. Three of the port's five terminals support container traffic and boast 21 cranes (16 of which are at least Post-Panamax in size). The other two terminals support breakbulk cargoes with the capability of handling RO/RO cargo as well.

In 2007, the port ranked seventh in terms of container volume, moving almost 1.4 million TEUs (loaded). This accounted for 12 percent of the container traffic on the East Coast and five percent nationally. Since 2003, container traffic has increased by over 12 percent at the port.

Overall, more than 19 million metric tons of international waterborne cargo flowed through the port in 2007. Imports accounted for 64 percent of the total foreign trade by volume but 67 percent of the value. On average, over 53,000 tons of cargo moved through the port daily in 2007, with the top five commodities consisting of petroleum, iron and steel, salt and stone, vehicles and paper products.

The Port of Houston

The Port of Houston is centrally located on the U.S. Gulf Coast and is home to a population of 5.6 million people. The port has the benefit of being located along the Gulf Intracoastal Waterway, providing a navigable inland waterway route along the Gulf Coast. Port facilities include general cargo, containers, dry bulk, and breakbulk.

In 2007, the port ranked eighth in terms of container volume, moving almost 1.4 million TEUs (loaded). This accounted for 68 percent of the container traffic on the Gulf Coast and five percent nationally. Since 2003, container traffic has increased more than 49 percent at the port.

However, a majority of the cargo moving through the Port of Houston moves on vessels other than containerships. The port ranked first by tonnage in international cargo moved in 2007 (133 million), but only 12 percent of that cargo was carried on container vessels. Exports accounted for 65 percent of the total foreign trade by volume, but only 47 percent of the value. On average, nearly 365,000 tons of cargo moved through the port daily in 2007, with the top five commodities consisting of petroleum, organic chemicals, salt and stone, grains, and byproducts of iron and steel.

The Port of Seattle

The Port of Seattle is located in the Puget Sound area of the Pacific Northwest and is home to 3.3 million people. The port features four container terminals with 10 container berths and 25 cranes (7 Super Post-Panamax and 14 Post-Panamax). The port also includes two major rail hubs and two major Interstate Highways within five minutes of the terminals.

In 2007, the port ranked ninth in terms of container volume, moving nearly 1.3 million TEUs (loaded). This accounted for nine percent of the container traffic on the West Coast and four percent nationally. Since 2003, container traffic has increased by nearly 57 percent at the port.

Overall, nearly 21 million metric tons of international waterborne cargo flowed through the port in 2007. While imports accounted for 46 percent of the total foreign trade by volume, they also accounted for 76 percent of the value. On average, almost 56,000 tons of cargo moved through the port daily in 2007, with the top five commodities consisting of salt and stone, grains, seeds, wood and petroleum.

The Port of Tacoma

Like the Port of Seattle, the Port of Tacoma is located in the Puget Sound area of the Pacific Northwest and is home to the same 3.3 million people. The port encompasses 2,400 acres, includes two transcontinental railroads and several Interstate Highways within minutes of the terminals. In addition to container traffic, the port also supports bulk, breakbulk, and RO/RO facilities.

In 2007, the port ranked tenth in terms of container volume, moving over 1.1 million TEUs (loaded). This accounted for eight percent of the container traffic on the West Coast and four percent nationally. Since 2003, container traffic has increased by nearly 22 percent at the port.

Overall, more than 18 million metric tons of international waterborne cargo flowed through the port in 2007. While imports accounted for 35 percent of the total foreign trade by volume, they also accounted for 81 percent of the value. On average, almost 50 thousand tons of cargo moved through the port daily in 2007, with the top five commodities consisting of seeds, grains, wood, iron and steel, and salt and stone.

Small and Medium Size Ports

Not to be overlooked, our small and medium size ports play a vital role in the Nation's port system. These ports serve specific market niches and have developed special handling techniques for specific commodities, such as fresh produce, frozen meats, and building materials that are containerized and/or palletized. They can also be the sole source of commodities for isolated communities. Also, these ports provide redundancy and resiliency for emergency preparedness.

Indeed, the efficient and smaller ports that dot the U.S. coasts, Great Lakes, and inland waterways offer a range of options in the event of primary port slowdowns or stoppage due to natural or man-made events, thereby minimizing the impact on the entire transportation system. Still other ports can serve to relieve pressure and congestion when other nearby large ports approach capacity limits.

2007-2008 Overview

Due to the weakening economy, port import volumes are down compared with 2007. Ports are operating without congestion and with adequate capacity even while export volumes are booming. Rail performance measures show continued adequate performance despite delays from Midwestern flooding. Peak season volume for 2008 will be less than the corresponding months in 2007 and should help assure no disruption to port operations in the next several months. Because of the soft U.S. economy, intermodal rail import container volumes are also expected to be weak throughout 2008. While train speeds have been slower in the first half of 2008, it is expected that speeds will pick up in the second half of the year. Issues such as the expiration of the U.S. West Coast longshore labor union contract and increasing diesel fuel prices have not severely affected port throughput.

Small and medium ports also play a vital role in the local communities they serve. For example, the port of Anchorage, while not considered a major port in the global system, handles more than 90 percent of the commodities consumed and produced in the entire state of Alaska.

As noted, small and medium size ports may specialize in niche commodities upon which entire industry sectors rely. For example, the port of Southern Louisiana handles approximately 50 percent of bulk grains produced in the entire U.S. Midwest for export. Its importance to the Nation was never more apparent than when the port was closed in 2005 by Hurricane Katrina just prior to the harvest season. Fortunately, it reopened in time for the surge of operations and the season was a success.

The variety and versatility of America's ports demonstrates that the Marine Transportation System must efficiently handle all types of cargo. In recent years, attention has revolved around the growth in merchandise shipped in containers and the increasing size and number of vessels calling at ports, straining distribution centers, railroads, and highways. However, bulk, breakbulk, neobulk, project cargo, automobiles and trucks, petroleum and other bulk liquids arriving at our Nation's ports also all flow through our transportation system – whether on the water, highways, rail or through pipelines. These cargoes account for 83 percent of our waterborne freight by tonnage, and are vital to the Marine Transportation System and our economy.

National Defense

The same network that serves the U.S. economy also supports our national defense. Our Armed Forces can project power anywhere in the world through the same commercial transportation system that provides us with goods and commodities. Every day, the United States military moves assets across the Nation to the fighting front, using the seaports for deployment of equipment. When troops are deployed, the ports wear two hats as they work with both the military and commercial sector to efficiently move the goods for the economy and national defense.

Employment Opportunities

The Maritime Administration further expects that continued growth in foreign trade and domestic freight movements – along with changing technology – will create new employment opportunities in the trucking, rail, and maritime industries. In many cases, these new workers must be highly skilled and well qualified. This all translates into more high-paying jobs in our marine terminals, transportation company offices, trucking firms, railroads, shipyards and on board our ships.

Our Armed Forces can project power anywhere in the world through the same commercial transportation system that provides us with goods and commodities.

IV. Institutional Challenges

Growth in Top U.S. Port Throughput	
U.S. Port	Growth 2002-2005
Los Angeles	23%
Long Beach	48%
New York/NJ	28%
Oakland	33%
Seattle	45%
Tacoma	40%
Norfolk	38%
Charleston	24%
Savannah	43%
Houston	36%

Source: Global Insight

America's top ten U.S. container ports experienced a staggering 54 percent increase in container movements between 2001 and 2006. Many of our ports are already nearing the limits of existing capacity, and the system faces a projected doubling in cargo over the next 10 to 15 years. Port capacity, however, is not our only challenge.

Since 9/11, there has also been a significant increase of port security measures, including capital improvements, training and operating expenses. Some examples of security expenditures include the implementation of Transportation Worker Identification Credential (TWIC), enhanced cargo screening and the Port Security Grant Program. No one denies the importance of these measures for the ports. However, every dollar spent on security is one less spent on capacity improvements.

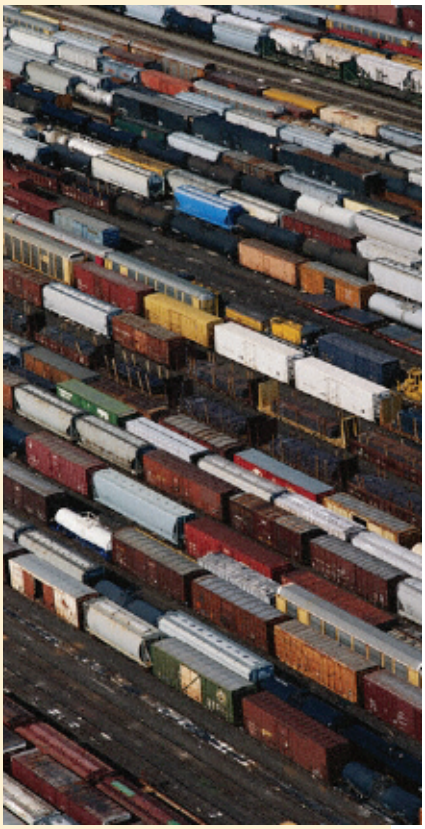
The Port Security Grant Program has helped offset some of the security improvement costs by funding security planning, perimeter and surveillance equipment, patrol craft and other necessary items. However, the grants are not available to fund the follow-on maintenance and staff required to keep the equipment operational and in service. In the long term, this may make some of the new activities difficult to sustain without a long-term commitment.

Port development has also become a costly and time consuming process. Just obtaining the necessary permits can take years; project completion can run into decades. We face similar challenges with dredging, both to maintain existing channel depths and deepening and widening channels to accommodate the newer, larger vessels.

In addition, shipping raw materials needed for U.S. manufacturing brings additional challenges as they compete with containerized freight for transportation infrastructure. Export raw materials and bulk commodities such as grain and soda must also vie for their share of the goods movement system. And where demand outpaces capacity, the system underperforms and costs increase.

Other factors also affect capacity. These include significant environmental challenges, a limited supply of land to expand, congested road and rail linkages and a shortage of labor to handle new cargo demands. The whole system is overtaxed.

Many of our ports are already nearing the limits of existing capacity, and the system faces a projected doubling in cargo over the next 10 to 15 years.



As container congestion increases, the pressure on bulk and breakbulk terminals will also increase. Often these niche terminals are crowded out by containerization. That is the bad news. The good news is that bulk and breakbulk vessels are the most adaptable to congestion challenges and can shift towards less congested routes. However, the same challenges of land and water access will limit their options in the future.

Adding rail capacity is costly and will take time. A recent study estimates that excluding the cost of land acquisition, an investment of $148 billion of infrastructure expansion over the next 28 years is required to keep pace with the projected 88 percent increase in freight rail demand.[2]

Our ability to build more roads is also severely limited. Most urban areas do not have the space to widen existing roads or build new ones. Plus, the cost of construction is prohibitive and prospective projects bring, in many cases, local opposition that can significantly delay or stop projects. In fact, the Highway Trust Fund – a key public highway funding source – is expected to be depleted by 2009.

Changing trends in transportation also bring new challenges. For example, the expansion of the Panama Canal will open new opportunities for larger container ships to call at U.S. East and Gulf Coast ports. Coupled with the expansion of marine terminal and intermodal assets at facilities, such as the Ports of Virginia and Houston, this will lead to a significant increase in container traffic calling at Gulf Coast and Eastern ports. However, with the continued growth in foreign trade this shift will do little to relieve congestion at our West Coast ports.

Taken together, declining public funding, scarcity of land, regulatory barriers, environmental concerns and other external factors clearly demonstrate that the United States must find new and innovative approaches to care for and make the best use of our current transportation infrastructure.

Adding rail capacity is costly and will take time.

An investment of $148 billion of infrastructure expansion over the next 28 years is required to keep pace with the projected 88 percent increase in freight rail demand.

Changing and Emerging Trends

The advent of the shipping container had a dramatic and profound effect on transportation and our society. It enabled the manufacturing of goods to take place thousands of miles from where they would be eventually purchased or consumed. It triggered major shifts in international trade routes, altered the gateways that handled the goods, and shifted domestic freight corridors.

However, the container revolution is but the latest in a series of tectonic shifts in transportation and their effect on how we live and work. Long before containers, the development of the railroads in the 19th century triggered a shift from waterborne transportation to land, which in turn allowed communities to develop in States and territories where it had been impractical to do so before. The Interstate Highway System had a similar influence on transportation and American society. We became a nation on the move and that mobility is now woven into our national character.

There is no doubt that transportation will continue to change at a remarkable pace. Future developments and rapidly emerging factors will not only determine how and where goods move, but will influence how we live. For example, environmental concerns – both at the global and community level – could affect the methods and cost of freight movement.

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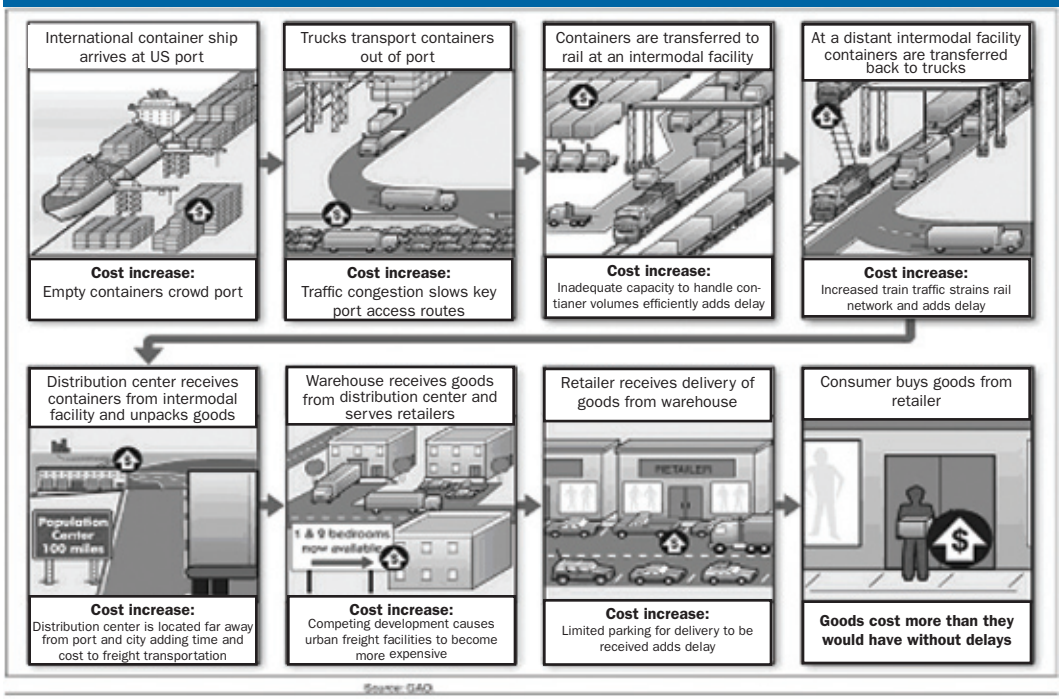
[2] National Rail Freight Infrastructure Capacity and Investment Study, Cambridge Systematics, Inc., September 2007.

Example of How Constrained Freight Mobility Increases Cost



Source: GAO

In the first half of 2008, soaring energy costs boosted the price of transportation, increasing pressure to manufacture products closer to the consumer.

In the first half of 2008, soaring energy costs – especially petroleum – boosted the price of transportation, increasing pressure to manufacture products closer to the consumer. Increased exports from the U.S. are also affecting trade flows. Even climate change presents new opportunities as new water routes open in the Arctic, which had heretofore been inaccessible. All of these factors are likely to affect the supply chain and the economy.

Developments like these can also cause shifts in the Marine Transportation System that often outpace our ability to develop the policies, infrastructure, and technologies to accommodate them. Careful planning is essential to forecast and manage change before it overwhelms the Marine Transportation System.

NYMEX Crude Oil Futures Close
(Front Month)

Environmental

Air quality compliance issues, particularly emissions on the U.S. West Coast, are of concern. Options for reducing emissions include using alternative fuels and emission reduction technologies for large vessels approaching populated areas; employing shoreside electricity (also known as “cold ironing”) for ships in port; and replacing or upgrading cargo-handling equipment in ports and the dray trucks that move freight into and out of them.

Policy implemented by state or local authorities, instead of at the Federal or international level, can negatively impact international trade and our ability to uniformly improve air quality. For instance, some jurisdictions are considering stricter air quality standards and legislating specific practices to reduce emissions. States, municipalities, and ports are also contemplating various fees to finance the cost of implementing these requirements.

As cargo volumes continue to increase, ports, industry and local, state, and Federal government agencies must determine how to best minimize these pollutants and reduce their harmful effect on the community.

However, if not properly enacted, these policies could require one costly ship configuration for one port, and another costly configuration for a different one. On the international level, global adoption of a carbon cap-and-trade policy could lead to wholesale changes in trade routes and volumes.

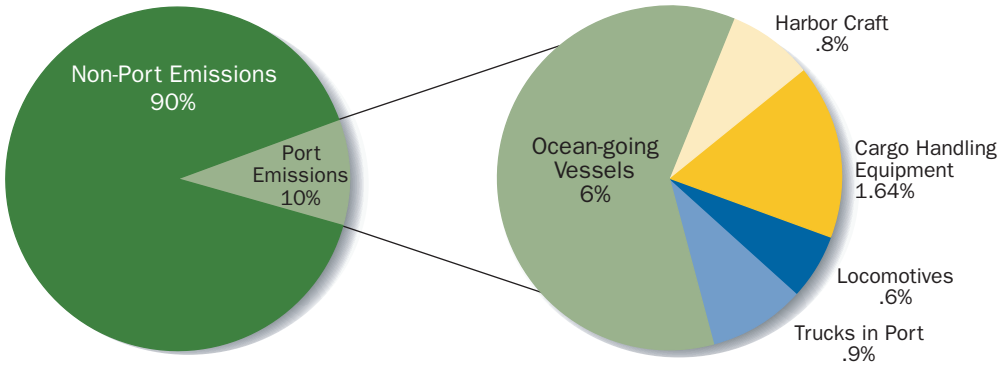
Environmental issues are not limited to just air quality. There are also efforts to limit the spread of invasive non-native aquatic species by regulating shipboard discharges of water, including ballast water, and new standards could significantly affect marine transportation.

Health Issues

The side effects of freight transportation in and near ports situated in urban, high population areas have been linked to health problems, particularly those associated with air emissions. Ships, trucks, trains, and cargo-handling equipment emit nitrogen oxide (NOx), diesel particulate matter (PM) and other pollutants. NOx is a key contributor to smog and ozone formation, while diesel PM contains unhealthy air contaminants. As cargo volumes continue to increase, ports, industry and local, state, and Federal government agencies must determine how to best minimize these pollutants and reduce their harmful effect on the community.

Some jurisdictions are already taking action. One example is the Port of Long Beach, which, combined with the Port of Los Angeles, forms the largest container port complex in the U.S. Port-related activities in Long Beach emit about 48 tons of NOx and 2.5 tons of diesel PM each day, or about ten percent of the region's pollutants. These are from a combination of sources, including ocean-going vessels, cargo handling equipment, trucks in the port, harbor craft, and locomotives.

Port-Related Emissions - Long Beach California



Source: Port of Long Beach

Recognizing the health hazards these emissions can represent, authorities have developed a Clean Air Action Plan aimed at reducing emissions for each of these sources. The plan eliminates older, less clean diesel trucks by helping to finance a new generation of clean or retrofitted vehicles and equipping all major container cargo and cruise ship terminals with shore-side electricity so that vessels at berth can shut down their diesel-powered auxiliary engines. The plan also calls for reducing ship speeds when entering

or leaving the harbor, using low-sulfur fuels, and other emission-reduction measures and technologies. Some estimates project that implementation of this plan would cut PM pollution by 47 percent, NOx emissions by more than 45 percent, and sulfur oxides by 52 percent.[3]

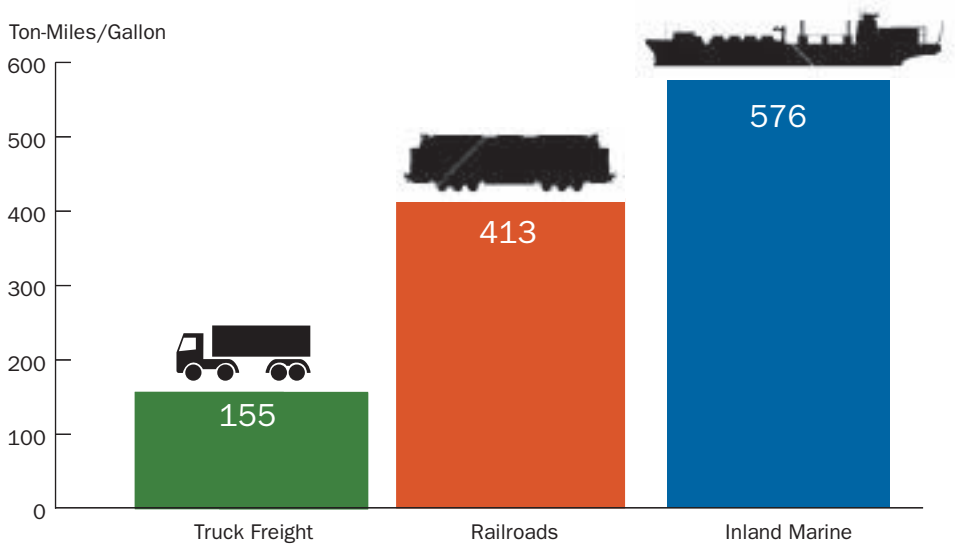
Several other communities and ports around the country, such as Seattle and Oakland, are considering variations of this plan. In addition, some states, municipalities, and ports are contemplating various fees to finance the cost of this environmental remediation.

Energy

In spite of the recent decline in price, the cost of fuel will have a profound impact on the entire Marine Transportation System, both in the short and long term. In 2000, when oil prices were $20 per barrel, it cost only $3,000 to ship a standard 40-foot container from Shanghai to the U.S. East Coast (including inland costs). By the spring of 2008, however, shipping the same container cost $8,000, and approaching $200 per barrel of oil, it cost $15,000.[4] In addition to increasing overall costs, the imbalance between the efficiencies of various methods of transportation is likely to trigger a shift of freight between modes. For example, a truck can move one ton of cargo 155 miles using a gallon of fuel. However, railroads can move the same cargo 413 miles, and inland marine towing vessels can transport it 576 miles. As the price of fuel increases, the resulting modal shift could play a significant role in shaping our future international trade routes, selecting gateway ports and determining which interstate corridors are sustainable into the future.

Ton-miles per Gallon of Fuel

Ton-miles/gallon shows how far each mode moves a ton of cargo for every gallon of fuel consumed.



Source: Maritime Administration

[3] Port of Long Beach Clean Air Action Plan.

[4] "Will Soaring Transport Costs Reverse Globalization?" Jeff Rubin and Benjamin Tal, StrategEcon – May 27, 2008.

Exports

Several factors have combined in recent years to trigger a rapid increase in U.S. exports. A few years ago, most export containers were empty and going overseas only to be refilled with imports destined for the U.S. Today, they are being filled with grain and other produce, paper and metals for recycling, and goods manufactured in the U.S. for consumption, or use in other countries.

A factor driving this trend is the decline of the U.S. dollar which makes U.S. goods sold overseas cheaper and imports to the U.S. more expensive. There are other reasons too. For example, the rapid increase in the cost of steel and other raw materials, combined with upward construction trends in developing countries, such as China and India, have also triggered a surge in recycling. Containers are perfect to export these materials from the U.S. for re-use in a myriad of construction and manufacturing markets abroad.

Port governance in the United States varies widely and consists of both public and private entities.

Port Governance and the Role of Private Industry

Overview

According to AAPA, there are 183 U.S. commercial deep draft ports dispersed along the Atlantic, Pacific, Gulf and Great Lakes coasts. This includes seaports of Alaska, Guam, Hawaii, Puerto Rico, Saipan, and the U.S. Virgin Islands.

However, port governance in the United States varies widely and consists of both public and private entities. These organizations are found throughout all levels of government, i.e., Federal, state and local. Port authorities are usually instrumentalities of state or local governments that are established by enactments or grants of authority by the state legislature.

In contrast to other countries, the U.S. Federal Government does not control ports or port authorities during peacetime. However, port activities are subject to U.S. law and jurisdiction regarding security, safety, environmental protection, customs and immigration.

Neither the U.S. Congress nor any Federal agency has the power or right to appoint or dismiss port commissioners or staff members. However, the U.S. Constitution specifically grants Federal jurisdiction over navigable waters of the United States, including deep draft channels and harbors. Generally, this authority is delegated to the U.S. Coast Guard and the U.S. Army Corps of Engineers.

Federal Governance

The issues facing the transportation system are not going unnoticed. Across the spectrum of government and the private sector, there is growing sense of urgency that that the transportation system must be able to meet present and future economic and national security demands.

Because commercial waterborne transportation impacts every citizen's livelihood and way of life, it is essential that the Federal Government ensure the continuance of a safe, economically efficient, equitable, and environmentally-sound intermodal transportation system.

The Transportation Research Board (TRB) – one of the six major divisions of the independent National Research Council – has acknowledged that the Marine Transportation

System is a joint public-private enterprise, the same as other parts of the Nation's transportation system. Private stakeholders own and operate vessels and terminals, while the public sector provides some infrastructure and is responsible for maintaining the operation of the system in a safe, secure, and environmentally-responsible manner.

The TRB identified the Federal Government's current role in the Marine Transportation System as:

- Constructing, operating and maintaining the navigable channels;
- Managing the traffic on the waterways;
- Providing mariners with aids to navigation, charts and information on water and weather conditions;
- Regulating the safety and environmental compatibility of vessels;
- Responding to marine accidents that threaten public safety and the environment;
- Helping to finance the highways that connect marine ports and terminals to the larger transportation system; and
- Ensuring the security of the Marine Transportation System and its many components.[5]

However, the Marine Transportation System cannot be viewed in isolation. The United States has built a vast and highly productive network of transportation assets based on the strengths of the individual modes – air, marine, highway, transit, and rail. Each is important and each plays a critical role. But due to our increasing dependence on waterborne trade, the marine mode is increasingly important to meet our national economic and security objectives.

Americans require and deserve the safest and the most efficient transportation system we can provide. The Federal Government's challenge is to blend these separate transportation modes into a single, fully coordinated system – one that connects and integrates the individual modes in a manner that is at once safe, economically efficient, equitable, and environmentally sound.

Today, 18 Federal departments and agencies play a role in the Marine Transportation System, with no single entity designated as the lead agency. This presents challenges in both policy formulation and the coordination and delivery of the broad range of Federal Government services.

As the Marine Transportation System approaches capacity, stakeholders are increasingly calling for the Federal Government to play more of a leadership role in dealing with the many challenges and to improve the efficiency and quantity of the services it delivers. The Federal Government should identify projects that have national significance and serve as the broker in developing funding partnerships for them.

The different Federal agencies involved in marine transportation separately manage their individual pieces or sections of the system. Essentially, Federal management ends at each agency's organizational boundary – whether this is most effective or not, or if it makes good reason or not. Listed below are some of the non-security Federal functions related to the marine component of the U.S. transportation system and the agencies with current oversight and control.

Americans require and deserve the safest and the most efficient transportation system we can provide.

The Federal Government's challenge is to blend these separate transportation modes into a single, fully coordinated system.

[5] "TRB Special Report 279 - The Marine Transportation System and the Federal Role: Measuring Performance, Targeting Improvement", Transportation Research Board of the National Academies, Committee for a Study of the Federal Role in the Marine Transportation System, Washington, DC, 2004.

Inland waterway lock maintenance, replacement, and development – *U.S. Army Corps of Engineers (USACE)*

- Design
- Approval
- Construction Contracting
- Maintenance

Permits for channel/harbor maintenance and deepening – *USACE*

Aids to Navigation and Vessel Traffic Services – *U.S. Coast Guard (USCG)*

Ship owner's nationality verification – *USCG*

Marine safety and regulations – *USCG*

- Vessel documentation and inspection – USCG
- For new vessel construction/reconstruction
- For vessel surveys and repairs
- Development of construction and safety regulations for vessels

Mariner Training and Education – *Maritime Administration*

Mariner certification and documentation – USCG

- Mariner testing and certification
- Mariner documentation data systems

Great Lakes pilotage – *USCG and Saint Lawrence Seaway Development Corporation*

Licensing of deep water ports – *Maritime Administration and USCG*

Environmental protection (e.g., pollution prevention, ballast water management, spill cleanup) –

- National Pollution Funds Center (USCG)
- Marine safety and environmental science functions (USCG)
- Marine pollution education (USCG)
- Marine pollution prevention programs (USCG and Maritime Administration)

Charting services and weather and tide data – *National Oceanic and Atmospheric Administration (NOAA)*

Domestic and international regulations and rulemaking related to fair competition laws *– Federal Maritime Commission (FMC)*

Infrastructure and info-structure development and maintenance –

- Construction approval and inspection of waterside port facilities (USACE, Maritime Administration, USCG and NOAA)
- Bridge administration (USCG)

International marine mode representation in overseas venues – *Department of State, USCG, and Maritime Administration*

- Development of International Standards in Maritime Safety
- Development of International Standards for Marine Environmental Protection

In December 2004, the President formed the Committee on the Marine Transportation System (CMTS) to provide a coordinating body among Federal agencies. It is comprised of the 18 entities that have a role in the Marine Transportation System and brings together the authorities, resources, or capabilities of multiple Federal agencies to resolve large or complex issues.

State and Local Governance

State and local governments play an equally important role in the transportation system. All strive to provide the safest, most efficient and reliable transportation system possible within their jurisdiction, while maximizing the economic benefits for their citizens. They also collaborate to provide combined resources to address regionally significant projects and issues. State and local governments also work with the Federal Government to identify and fund projects of national significance within their jurisdiction.

This multi-jurisdictional cooperation is already showing solid results. For example, the Department of Transportation spearheaded the development of the Southern California National Freight Gateway Collaboration as a major component of the Department's initiative to reduce congestion.

Comprised of leaders representing Federal Government, State of California, local governments, ports, metropolitan planning organizations and other stakeholders, the Collaboration will address the challenge presented by the record growth in freight moving through the ports of Long Beach and Los Angeles. In fact, more than 44 percent of the Nation's imported containerized goods move through these ports to destinations throughout the country.

The Collaboration will assist the affected agencies and interests (e.g., environmental, community and business interests) to expeditiously address various concerns, issues and opportunities facing the Southern California National Freight Gateway. However, the Collaboration will not act as "super-decision-makers"; that power will be left to existing authorities.

Through this innovative approach, the Collaboration identifies and focuses on concerns, issues, or opportunities in these initiatives and assists the constituency to address them – often through public participation and stakeholder involvement with the appropriate agencies.

In some cases, the Collaboration may simply work to see that the various initiatives are better coordinated, delivered on time and functioning in an appropriate manner. In other situations, the Collaboration has begun to explore priority topics, such as the movement of freight, public health, safety, environmental and community issues and economic development and opportunities.

State, regional, and local governments play many roles in today's Marine Transportation System. States' departments of transportation and metropolitan planning organizations identify, prioritize, and allocate funding for transportation projects. While these are local decisions, they significantly affect ports, industries, or consumers in the transportation system. However, these local decisions should not be made in isolation; they should take into consideration the national system.

Many ports function as a component of city or municipal governments. Port terminals are often leased by the port authority to individual private sector tenants. As such, investment and policy decisions that have an impact on individual port capacity and efficiency are often jointly determined by local governments and their private sector tenants.

Many of the large and medium sized ports have state and local port authorities which own public terminals and related facilities. Public sector involvement has traditionally been due to the state and local economic benefits that accrue from port operations and the large capital investments necessary to build and maintain infrastructure. As noted above, while some port authorities operate terminals, many others lease terminals to private corporations. There are also many terminals in operation on the coasts and along inland water-

State and local governments play an equally important role in the transportation system. All strive to provide the safest, most efficient and reliable transportation system possible within their jurisdiction, while maximizing the economic benefits for their citizens.

ways that are privately owned and operated. All of these ports and terminals make up a network that is vital to the health of the transportation system.

State and local governments also share a problem with their Federal counterparts. The cost to replace or expand needed infrastructure continues to rise. In many cases, the cost is beyond the capability of a single entity, such as a state department of transportation, to bear. In addition, the complexity and interrelated goals and responsibilities of public and private sector freight stakeholders underscore the importance of developing new funding mechanisms for the transportation system.

Federal participation has generally not extended to "landside" projects related to port capabilities, such as building terminals or piers and purchasing cranes or other equipment to unload cargo. Some maritime stakeholders, particularly port owners and operators, have now proposed using a portion of customs duties for infrastructure improvements to the Marine Transportation System.

Funding the Transportation System

The Federal Government relies heavily on general revenues to fund the Marine Transportation System, while funding for aviation and highways relies almost exclusively on collections from users of the systems that are placed in a trust fund.

In 2002, the Government Accountability Office noted that traditionally, Federal participation in the maritime industry has been directed mainly at projects related to "waterside" issues, such as keeping navigation channels open by dredging, icebreaking, or improving the system of locks and dams; maintaining navigational aids such as lighthouses or radio systems; and monitoring the movement of ships in and out of the Nation's coastal waters.

Federal participation has generally not extended to "landside" projects related to port capabilities, such as building terminals or piers and purchasing cranes or other equipment to unload cargo. Some maritime stakeholders, particularly port owners and operators, have now proposed using a portion of customs duties for infrastructure improvements to the Marine Transportation System. They point out that the Marine Transportation System generates billions of dollars in revenue, and some of these funds should be returned to maintain and enhance the system. However, unlike transportation excise taxes, customs duties are taxes on the value of imported goods paid by importers and ultimately their consumers – not on the users of the system – and have traditionally been viewed as revenues to support the Federal Government's general activities.[6]

Public-Private Partnerships

Today, public-private partnerships are increasingly viewed as a major component of funding and developing a seamless, reliable, and cost-efficient 21st century national transportation system. In a 2004 report to Congress, the Federal Highway Administration (FHWA) found that capital-intensive highway and transit projects benefit from them. And some of these partnerships are also involved in the actual management of assets, such as ports and terminals.

Banks and private investment firms are now investing heavily in private infrastructure, including highways, bridges, and ports. States such as Texas, Virginia, Florida, and Georgia are relying more heavily on private capital to expand their highway systems. Billions of dollars are flowing into these projects.

Private investors are looking for opportunities to invest in infrastructure and know how to measure economic costs and benefits to ensure that the public interests in transportation projects are being met. Partnerships in marine terminals are seen as a wise investment that can pay off by creating more efficient terminals that compete for business while keeping local jobs and paying into the local and state tax base.

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[6] GAO-02-1090T: "Marine Transportation: Federal Financing and an Infrastructure Investment Framework."

An excellent example of a public-private partnership delivering real world benefits is the new APM Terminal in Portsmouth, Virginia. APM Terminals North America opened a new 55-foot deep-water container terminal, which is now the largest privately-owned container terminal in the United States. It is also the third-largest container terminal in the United States and is capable of handling one million TEUs annually and has the potential to expand to more than two million TEUs.

The project is the largest private investment in the history of the Hampton Roads region. APM invested $500 million to convert 600 acres into a highly automated marine terminal of 291 acres and surrounding buffer zone. The State of Virginia invested in highway improvements to access the terminal which will provide several hundred local jobs.

This new model also recently led to the development of the Heartland Corridor project connecting the Port of Virginia to intermodal distribution centers in Chicago. This project will link the existing rail network; build new lines where needed; and raise tunnel and bridge heights to accommodate double-stack trains. In total, the project will cost over $300 million, which will be paid for by multiple private users, the Federal government, and the states of Kentucky, Virginia, and West Virginia.

The Deparment of Transportation has moved both administratively and recommended to Congress to expand the use of public-private partnerships. As a result, there is now greater flexibility in financing transportation infrastructure, which includes using innovative contracting methods. In addition, recently enacted transportation legislation encourages states to explore innovative financial and contracting methods that make greater use of private sector resources.

The Administration has also recommended a number of legal changes to help promote public-private partnerships. For example, risk aversion and lack of experience with the private sector often drive public agencies to spend considerable time and resources developing systems for soliciting projects, ensuring adequate competition, and allocating the risks associated with designing, constructing and operating a large transportation facility.

These administrative procedures limit private sector flexibility and have deterred many states from exploring such partnerships. And the additional costs associated with developing a public-private partnership can also diminish the potential value these partnerships may offer. This is especially true because some of the benefits are difficult to quantify.

However, there can also be significant cost and time savings associated with public-private partnerships. The FHWA report showed that public-private partnerships can save from six to 40 percent of construction costs and significantly limit the potential for cost overruns. The reason for these savings is that the private sector often has more appropriate incentives to limit costs than the public sector. In addition, having one entity responsible for design, construction, and operation can result in efficiencies that are not possible with traditional design-bid-build methods.

Public-private partnerships can help reduce the time it takes to build a project in two ways – innovative financing and project management. Innovate financing generates the most significant time-savings and can cut many years off project delivery. Although frequently less dramatic, innovative project management also reduces the time it takes to finish a project, often saving months if not years.[7]

Clearly, the Marine Transportation System would greatly benefit from and needs greater access to these resources. But bringing an infusion of private capital to the transportation system cannot merely be a good monetary investment with a high rate of return for a

Today, public-private partnerships are increasingly viewed as a major component of funding and developing a seamless, reliable, and cost-efficient 21st century national transportation system.

[7] U.S. Department of Transportation, Federal Highway Administration, Report to Congress on Public-Private Partnerships, December 2004.

few people. Rather, investments in roads, rail, ports, and waterways must yield dividends for the Nation, including easing congestion, minimizing environmental impacts, spurring economic growth and helping to sustain America's leadership in the global marketplace.

Clearly, the Marine Transportation System would greatly benefit from and needs greater access to resources. But bringing an infusion of private capital to the transportation system cannot merely be a good monetary investment with a high rate of return for a few people.

Types of Financing Mechanisms

Revenue Bonds

Revenue bonds are issued by governments, authorities, or public benefit corporations and are secured by a pledge of the future revenues to repay the bonds over time. In a port's case, revenue bonds can be issued on a consolidated basis; that is, they would be backed by both aviation and seaport revenues, regardless of the projects being financed. This results in a stronger credit and a lower interest rate on the bonds. Although port revenue bonds are typically issued on a fixed-rate basis for a term of up to 25 years, variable rate bonds, and shorter-term notes also can be issued to diversify the port's capital structure and to reduce interest costs by appealing to a wider group of investors.

If a port is designated as a government entity, it can issue bonds for most projects on a tax-exempt basis, meaning that investors who hold the bonds pay no Federal income taxes on the interest they receive. As a result, the port would be able to pay lower interest rates than are paid on taxable bonds, which in turn, provides for significantly lower financing costs.

General Obligation Bonds

General obligation bonds are debt instruments issued by states and local governments that can be used to raise funds for ports and public works. What makes general obligation bonds, or GO bonds, unique is that they are backed by the full faith and credit of the issuing municipality. This means that the municipality commits its full resources to paying bondholders, including general taxation and the ability to raise more funds through credit. The ability to back up bond payments with tax funds is what makes GO bonds distinct from revenue bonds, which are repaid using the revenue generated by the specific project the bonds are issued to fund.

GO bonds give municipalities a tool to raise funds for projects that will not provide direct sources of revenue, such as roads, bridges, parks and equipment, and, of course, port projects. As a result, GO bonds are typically used to fund projects that will serve the entire community; revenue bonds, on the other hand, are used to fund projects that will serve specific populations, who provide revenue to repay the debt through user fees and taxes.

Taxing Authority

Ports and port authorities rely on issuing bonds – usually general obligation or revenue bonds – for operation as well as infrastructure development. Besides bonding authority, some port districts have been granted taxing authority, such as the Port of Seattle and the Port of Tacoma.

Each port authority can levy property taxes under state law for general taxing purposes. This taxing authority is subject to two limitations: (1) the total levy rate may not exceed $0.45 per thousand dollars of assessed value; and (2) annual increases for levy are restricted to the lesser of inflation or one percent.

The annual increase in the allowable levy is based on the amount of taxes that could have been levied in the previous year, even if the port did not levy the full amount. The Tax Levy is available for general port purposes, but may not be used to pay debt service

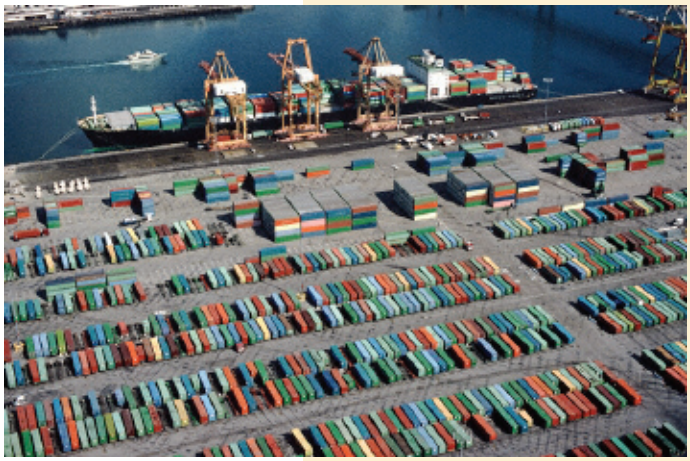
on revenue bonds. It is these ports' policy to use the levy solely for capital expenditures, environmental expenses, and community investments.

Container Fees

There is growing interest in container fees to pay for a number of environmental or congestion relief initiatives that will increase the flow of cargo through large metropolitan areas and major corridors in the United States.

Although there could be repercussions, such as the loss of business, the States of California and Washington have explored the idea of user fees to address growing transportation and environmental costs. In California, State Senator Alan Lowenthal authored SB974, which would impose a $60 per TEU fee on containers moving through the ports of Long Beach, Los Angeles, and Oakland.

The fees' proceeds – which were expected to be $400 million to $500 million annually – would have been split evenly between air quality projects related to freight movement throughout the state and to improve the goods-movement infrastructure located outside the ports.



The California Senate passed the Lowenthal bill (SB 974) in August 2008 by a vote of 22-9. This vote follows California Assembly approval of the bill in July by a vote of 45-31. But the bill was vetoed by the Governor on September 30, 2008.

Net Income

Net income for funding purposes represents the cash that could be generated from the port's business activities after payment of all expenses. It differs from the standard accounting concept of income in that it excludes non-cash items such as depreciation and amortization. It also includes non-operating items such as interest earnings. Net income can be used directly to fund capital projects (pay-as-you-go) or leveraged (borrowed against).

Alternative Financing

Alternative financing refers to off-balance-sheet funding mechanisms that do not rely on port capital or credit capacity. This includes private or third party development, conduit financing (debt secured by a private company) or project financing (debt secured solely by project revenues).

Future Workforce

Given growing throughput and rapidly changing technology, a fully staffed and well-trained workforce is critical to the safe and efficient operation of the Marine Transportation System. Deep draft, coastal and inland vessel crews are under increasing pressure to accomplish more with fewer personnel. They must operate more efficiently and comply with more and more rules, regulations, and requirements. Merchant Marine Academies, state schools, union, and non-union sponsored schools and training centers must address these new challenges and opportunities to meet the increased demand for well trained and qualified mariners.

Port personnel who load and unload vessels, move, track and account for cargos and ensure the safety and security of people and property must meet the increased demand for moving greater volumes of freight at greater speeds and adapting to new technologies and environmental protocols. Truck drivers who move the cargo to and from the ports are

There is growing interest in container fees to pay for a number of environmental or congestion relief initiatives that will increase the flow of cargo.

increasingly in short supply at a time when demand is increasing and supply chains are changing. They must also be well trained and equipped with the safest and most environmentally sound equipment.

The entire workforce, port, and employer leadership must collaborate to ensure the future workforce is positioned to meet all of these demands. They must work in concert so that the entire Marine Transportation System can function safely and effectively.

Port personnel who load and unload vessels, move, track and account for cargos and ensure the safety and security of people and property must meet the increased demand for moving greater volumes of freight at greater speeds and adapting to new technologies and environmental protocols.

Infrastructure Development

From 1946 through 2005, U.S. public port development capital expenditures totaled $30 billion which funded the construction and improvements to port facilities and related infrastructure.[8] The need for infrastructure development is only increasing. Projected cargo demands suggest that we may need the capacity of a new container terminal the size of the Ports of Seattle/Tacoma each year for the next five to ten years. Several trends are also emerging as we look at future requirements for the Nation's maritime infrastructure, including:

- Specific geographic needs will drive solutions, e.g., international gateways and trade corridors;
- The private sector is increasing its investment in port and terminal infrastructure; and
- The public sector is limited in its ability to fund future connector infrastructure needs.

There is evidence that the private sector is concerned too about the lack of investment in the Nation's logistics infrastructure. The National Chamber Foundation released a study in April 2008 entitled "The Transportation Challenge: Moving the U.S. Economy." The study concludes that there is a need for more investment in the transportation system in order to support increasing trade and population growth in the United States. According to the report, underinvestment is contributing to congestion which is costing U.S. businesses and consumers both time and money.

Historically, the acquisition and use of available land for necessary development met few objections because expansion was in the name of economic prosperity. But many port communities are now encountering competing demands for waterside land for purposes other than those related to waterborne commerce: namely, commercial, residential, and recreational uses. This issue is discussed in greater detail in Section V under "Community and Land Use Issues."

Deeper channels to accommodate larger ships also make dredging a major component of infrastructure development in the transportation system. However, many other issues also affect infrastructure development.

Infrastructure development is also not just about bricks and mortar. To achieve an enhanced integrated transportation system for the movement of international and domestic freight, new technology must be exploited. And it must be planned and built into the infrastructure and transportation network, and designed into communication and information flows right from the start.

[8] Maritime Administration, "U.S. Public Port Development Expenditure Report (FYs 2005 and 2006-2010)), Washington, DC, July 2007, page 3.

National Defense, Security and Emergency Preparedness

In partnership with the Maritime Administration and the National Port Readiness Network (NPRN), the Department of Defense (DOD) has designated 15 commercial ports as Strategic Seaports. These Strategic Ports are geographically dispersed along the Nation's coasts. Each has individual capabilities that provide DOD with the facilities and services the military requires to perform its mission. Recent history has shown that these same capabilities can also be applied to domestic emergency relief activities after a natural disaster.

Military deployments require the large-scale use of RO/RO ships, which are capable of carrying a combination of aircraft, wheeled and tracked vehicles, oversize equipment, and containers. As demonstrated during Operation Iraqi Freedom, loading of combat units requires substantial staging areas for vehicles and aircraft, adequate port rail infrastructure and port labor that is skilled in handling non-containerized military equipment.

The effectiveness of military cargo port operations is tied to the mobility planning process and the availability of staging areas and rail infrastructure for sequencing arriving equipment. As noted, U.S. ports will continue to expand their operations to meet the forecasted growth in commercial containerized freight. However, if these ports reduce the area available for non-containerized cargo, there will be fewer facilities to support military cargo handling. This, in turn, may reduce the ability of U.S. ports to facilitate military unit deployments.

Indeed, the deployment of U.S. forces and materiel from "fort to foxhole" depends on the commercial intermodal freight transportation system. This vital military cargo shares a transportation system that is already stressed by carrying commercial freight with demanding delivery schedules.

With the exception of ammunition and other specialized or dangerous cargoes, virtually all CONUS-based military contingency cargoes are deployed through U.S. commercial seaports. Commercial cargo and peacetime military cargo are primarily containerized, whereas military surge cargo is based on moving an entire military unit's needs (force package), which contains wheeled vehicles, tanks and other equipment. Military surge and sustainment freight also differ in volume and needed configuration in comparison with normal commercial port operations. This surge deployment of cargo puts unique pressure on staging areas and requires the use of other labor skills to load the cargo.

Military freight mobilization also moves under compressed timeframes, with a requirement to maintain real-time communications between public and private transportation entities and DOD command and control. If not properly planned, coordinated, and executed, military operations can disrupt commercial transportation operations both immediately and over the longer-term. For example, U.S.-based forts may load and dispatch six trains per day to ports, while the receiving port may only have the capability of handling and unloading one to two trains per day.

Military deployments, which must preserve unit integrity, may also require that a port receive materials and supplies from more than a dozen different U.S. military installations in a short timeframe. Trains and trucks may be dispatched from bases and arrive at the terminal gates with little advance warning. DOD logistics planners have adopted successful commercial methods of handling freight and will re-direct cargo at the last moment to accomplish a just-in-time delivery. But again, these changes occur with little or no warning to the receiving port.

The deployment of U.S. forces and materiel from "fort to foxhole" depends on the commercial intermodal freight transportation system.

The ability to meet these many requirements is raising alarms at the highest levels. The "Department of Defense Report to Congress on Projected Requirements for Military Throughput at Strategic Seaports," states that "commercial cargo volume growth has generated increasing concern about the future adequacy of Strategic Seaport infrastructure to meet national security requirements and readiness."[9]

Clearly, as the volume of trade continues to increase, we must ensure that the U.S. transportation system maintains the ability to fully accommodate defense mobilization requirements. It is important to note, however, that in today's modern world, sealift and emergency planning cannot be successfully accomplished in isolation. They must be integrated into the much larger planning process for the entire U.S. transportation system so as to serve both economic and national defense needs.

The Maritime Administration and other parts of the Department of Transportation are also working with other Federal agencies in outreach and coordination activities designed to assist the maritime industry in emergency preparedness, response and recovery efforts related to maritime transportation security incidents and natural disasters. This includes interaction with key industry associations and Marine Transportation System stakeholders in planning and training forums, conferences, workshops, exercises, real world response and recovery efforts and establishing a communications link between the broader business community and Federal leadership regarding private sector concerns that may arise during emergencies.

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Homeland Security

The President approved the National Strategy for Maritime Security in October 2005, which is an overarching document of eight supporting plans that cover the spectrum of preparedness, protection, response, and recovery for all hazards, both man-made and natural.

The Maritime Administration coordinates with other government entities, as well as state and local security providers, in order to facilitate the movement of commerce in a secure environment. Transparency, accountability, and interoperability are essential elements of a secure and efficient transportation system, which is why security and safety are inextricably linked to the movement of commerce. For example, knowing where vessels are located, their next and last port of call and the cargo being carried, is used to both coordinate movement through the supply chain and analyze the security risk. The latter is based on threat, vulnerability, and consequence.

The U.S. Coast Guard and U.S. Customs and Border Patrol have the responsibility and authority to ensure the security of vessels and cargoes entering ports. Security measures to identify risks at the earliest opportunity are part of an in-depth, layered security program. The Maritime Administration acts as a catalyst between Federal, state, and local entities that provide security, and the Marine Transportation System private sector.

[9] U.S. Department of Defense, "Department of Defense Report to Congress on Projected Requirements for Military Throughput at Strategic Seaports".

Commercial Strategic Ports with Port Planning Order Agreements

Source: Maritime Administration

Maritime Domain Awareness (MDA) is the foundation for preparing, protecting, and responding to a transportation incident. The Maritime Administration is the MDA Executive Agent for the Department of Transportation, as is the U.S. Coast Guard for the Department of Homeland Security and the Navy for the Department of Defense. In a collaborative effort, the knowledge that each Executive Agent possesses is shared in order to provide clarity and actionable information to identify threats. The Federal Government also administers port security grants to harden the security of our Nation's portS. The Maritime Administration, U.S. Coast Guard, and the Transportation Security Administration are included in the review of grant applications and make policy recommendations about the grant program to the Secretary of the Department of Homeland Security.

Port security is a "must have" from both a homeland security perspective and a business perspective. As with safety, security is based on customer demands and expectations. In order to facilitate commerce and enhance security simultaneously, the private sector, state, and local entities must be considered to effect solutions commensurate with the security threat. The physical security at the port and the economic security of our homeland are inextricably linked.

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V. Deep Water Access

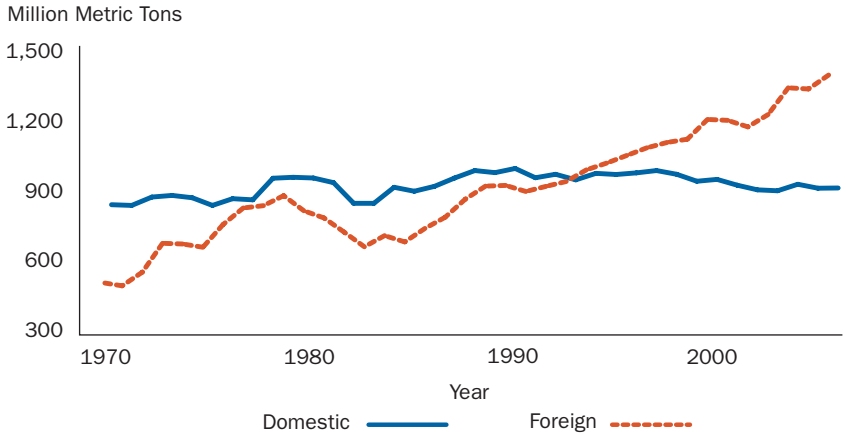
In 2006, U.S. waterborne trade amounted to 2.3 billion metric tons. Foreign trade accounted for 60 percent of the total, up from 56 percent five years earlier. In the mid-1990s, domestic and foreign trade was about one billion metric tons each. By 2006, foreign trade had increased to about 1.4 billion metric tons while domestic trade had fallen to about 0.9 billion metric tons. The growth in foreign waterborne trade has been spurred largely by the container trades.

Container Trades

From 2002 to 2006, U.S. foreign container trades increased by 40 percent or about four times as fast as overall waterborne trade. In 2006, about 80 percent of these trades (metric tons) were time-sensitive, food and manufactured products. These products are carried in regularly scheduled, fixed-day services.

To service the rapid growth in container trades, carriers have deployed post-Panamax (5,000+ TEU, 24+ knot) containerships in end-to-end services; increased call frequencies; and reduced transit times.[10] Over the last five years, containership calls at U.S. ports increased by 16 percent while the average vessel size (measured in TEUs) per-call

U.S. Waterborne Commerce, Domestic and Foreign, 1970-2006



Source: Maritime Administration

[10] Panamax refers to the maximum dimensions of a vessel that can pass through the locks of the Panama Canal: length – 965 feet, beam – 106 feet, and draft – 39.5 feet. Post-Panamax containerships exceed one or more of these dimensions. In the past, containerships that could transit the canal were deployed in tri-continental services, such as Europe/U.S./Far East. Now, most containerships operate in end-to-end services (transit one ocean).

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U.S. Waterborne Trades, 2002-2006
(Million Metric Tons)

Trade	2002	2003	2004	2005	2006	% Change 2001-2006
Foreign	1,196.9	1,250.2	1,365.2	1,359.6	1,419.6	18.6
Container	154.2	166.1	187.3	205.3	216.6	40.5
Imports	848.2	911.5	988.0	995.1	1,025.9	21.0
Container	91.9	98.1	112.9	123.6	132.7	44.4
Exports	348.7	338.7	377.2	364.5	393.6	12.9
Container	62.3	68.0	74.4	81.7	83.9	34.7
Domestic	926.3	921.9	949.9	933.4	928.6	0.1
Coastwise	196.3	202.8	200.1	193.8	183.2	-6.7
Container	15.7	17.8	18.3	18.6	19.6	24.8
Inland	551.6	553.0	568.1	566.1	569.3	3.2
Lakes	92.1	81.5	93.9	87.3	87.9	-4.6
Other	86.3	84.6	87.8	86.2	88.2	2.2
Total	2,123.2	2,172.1	2315.1	2,293.0	2,348.2	10.6

Source: U.S. Army Corps of Engineers, PIERS for foreign container trades.

increased by 17 percent. Calls by containerships of 5,000 TEU or greater, which are largely post-Panamax class (too large to transit the Panama Canal), increased by 251 percent. In 2007, post-Panamax containerships accounted for 20 percent of the containership calls at U.S. ports up from seven percent five years earlier and a nearly three-fold increase in five years.

In response to rising vessel operating costs, many ocean carriers continue to buy ever larger vessels to move growing freight volumes, so that they can achieve greater economies of scale by spreading costs over more units of freight moved per ship. But larger ships require deeper shipping channels and berths. For example, today's largest containerships require channel and berth drafts of 45 to 50 feet. However, after 2015, post-Panamax ("Panamax II") and "Suez-max" vessels may eventually require drafts of 60 feet or more.

These larger ships accounted for 32 percent of the global fleet (measured in TEUs) in 2007, up from 20 percent in 2002 (Clarkson's Register), and new containership capacity on order amounted to about 61 percent of the existing fleet capacity. Vessels of 5,000 TEUs or greater accounted for about 64 percent of capacity on order. Therefore, it is reasonable to expect that the post-Panamax fleet will expand to nearly 44 percent of the global fleet capacity by 2010.

Over the past decade (1996 to 2006), America's top 10 port complexes experienced a staggering 116 percent increase in container movements. What is most interesting, however, is that the Canadian port complex of Vancouver and Fraser River had a faster average annual growth rate (near 14 percent annually) than any of these top 10 U.S. container facilities even though on a volume basis these ports have a much lower throughput.

Very few U.S. ports on the Pacific, Atlantic, and Gulf coasts have shipping channels of at least 50 feet. Many ports plan to dredge deeper to accommodate the needs of larger vessels already in service. Some must also compete with new and expanding foreign ports in the Bahamas, Mexico, and Canada (e.g., Freeport, Lazaro Cardenas and possibly Punta Colonet, and Halifax, Prince Rupert, and Vancouver, respectively) that hope to move growing quantities of U.S. trade.

In 2007, containerships of all sizes called at 45 U.S. ports. The top ten ports accounted for 83 percent of the calls. By comparison, post-Panamax containerships called at only 18 U.S. ports, and the top five ports accounted for 97 percent of the calls.

Other General Cargo Vessels

In addition to containerships, RO/RO vessels and general cargo ships are involved in U.S. time-sensitive trades. RO/RO vessels include vehicle carriers, which are used largely in the car trades, and traditional RO/RO vessels which carry trailers and other oversized products such as construction equipment, mobile homes, etc. General cargo vessels include specialized reefer (refrigerated) vessels which carry perishable food products; others carry containerized and non-containerized manufactured products. These vessels are generally equipped with cranes (geared) and/or RO/RO ramps.

Over the past decade, America's top 10 port complexes experienced a staggering 116 percent increase in container movements.

Containership Calls at U.S. Ports by Size, 2002-2007

Vessel Size, TEUs	2002	2003	2004	2005	2006	2007	% Change 2001-2007
Calls							
<1,000	566	626	443	394	332	372	-34.3
1,000-1,999	4,097	3,492	3,463	3,600	3,814	3,532	-13.8
2,000-2,999	4,032	4,032	4,541	4,410	3,986	4,048	0.4
3,000-3,999	4,129	4,050	3,888	3,624	3,333	2,917	-29.4
4,000-4,999	3,186	3,945	4,210	4,226	4,782	5,033	58.0
>4,999	1,128	1,142	1,734	2,288	3,344	3,961	251.2
Total Call	17,138	17,287	18,279	18,542	19,591	19,863	16.9
TEUs/Call	3,020	3,144	3,234	3,313	3,497	3,601	19.2

Source: Maritime Administration, Vessel Calls at U.S. Ports

Calls at U.S. Ports by Vessel Type, 2002-2007

Vessel Size, TEUs	2002	2003	2004	2005	2006	2007	% Change 2001-2007
Container	17,138	17,287	18,279	18,542	19,863	19,863	15.9
<4,999	1,128	1,142	1,734	2,288	3,961	3,961	251.2
Other	16,010	16,145	16,545	16,254	15,902	15,902	-0.7
RO/RO	5,632	5,191	5,317	5,663	6,077	6,077	7.9
Vehicle	3,605	3,113	3,065	3,652	4.084	4,084	13.3
Other	2,027	2,078	2,252	2,011	1,993	1,993	-1.7
General	3,894	3,915	3,967	3,935	3,948	3,948	1.4
Reefer	989	1,073	978	980	889	889	-10.1
Other	2,905	2,842	2,989	2,955	3,059	3,059	5.3
Total	26,664	26,393	27,563	28,140	29,888	29,888	12.1

Source: Maritime Administration, Vessel Calls at U.S. Ports

Top Ten General Container Ports, 2002 & 2007 (Calls)

Port	2002	2007	% Change 2002-07
LA/Long Beach	2,779	3,058	10
New York	2,121	2,549	20.2
San Francisco	1,917	2.046	6.7
Virginia Ports	1,529	1,940	26.9
Savannah	1,085	1,807	66.5
Charleston	1,393	1,589	14.1
Houston	1,310	1,287	-1.8
Port Everglades	772	818	6.0
Seattle/Tacoma	222	739	232.9
Miami	750	563	-24.9
Total, Top 10	13,878	16,396	18.1
Total, All Ports	17,138	19,863	15.9

Source: Maritime Administration, Vessel Calls at U.S. Ports

Top Ten RO/RO Ports, 2002 & 2007 (Calls)

Port	2002	2007	% Change 2002-07
Baltimore (13)	694	755	8.8
Jacksonville (16)	556	609	9.5
New York	640	586	-8.4
LA/Long Beach	342	365	6.7
San Francisco	102	310	203.9
Miami	250	304	21.6
Seattle/Tacoma	373	294	-21.2
Columbia River (18)	276	292	5.8
Brunswick	66	242	266.7
San Diego (24)	167	234	40.1
Total, Top 10	3,446	3,991	15.8
Total, All Ports	5,632	6,077	7.9

Source: Maritime Administration, Vessel Calls at U.S. Ports

Over the last five years, some of the smaller U.S. container ports have attracted calls by RO/RO and general cargo vessels in trades that did not justify large investment in container infrastructure. For example, in 2007, Columbia River ports ranked eighth among U.S. ports in RO/RO calls, fourth in general cargo calls, but eighteenth in container calls. New Orleans, the third largest port-of-call for general cargo vessels in 2007, ranked fifteenth in container calls. For the non-major container ports, the five-year growth in general cargo calls was 10.4 percent compared to 1.4 percent for all U.S. ports, suggesting that their gains were offset by declines at other U.S. ports, including some major container ports. The RO/RO trades showed a similar pattern.

U.S. container ports will need to make significant investments in infrastructure to accommodate the expanding post-Panamax fleets and nearly ten-percent annual growth in container trades. In addition, the smaller container ports will have to invest in assets to accommodate the changing pattern of U.S. non-container general cargo trades.

Against this backdrop of continuing and projected increases in waterborne freight, the safety of people, property, and the environment are placed at greater risk. To address these concerns and future needs, we must proactively invest in waterway maintenance and development. All Marine Transportation System stakeholders must continue to support ongoing efforts of the U.S. Coast Guard to monitor vessels and maintain our aids to navigation.

Dredging

Almost every one of the Nation's top 50 ports handling foreign commerce requires regular maintenance dredging. Together, these ports move nearly 99 percent of U.S. overseas trade by weight and 61 percent by value.[11] Without routine dredging, sections of the navigation channels can quickly become shallow, reducing the draft and size of vessels accessing these ports. In addition, as the size of ships continues to grow, approach and alongside depths in several key ports must be increased to as much as 45 to 50 feet. If we do nothing more than merely maintain existing channels at project depth, the Nation's competitive edge ultimately will erode. The Nation has to do more than maintain, it must deepen channel depths to accommodate the largest vessel sizes. But meeting this challenge requires a significant investment by both the Federal government and private industry.

The Army Corps of Engineers is responsible for maintaining 300 commercial harbors and more than 600 smaller ones. Each port area is made up of a number of different channels all of which have different depths and their own set of dredging needs. For example, there are 31 different channels alone that make up the Baltimore port area, with depths ranging from 22 to 50 feet. A recent Army Corps of Engineers Study reports that almost 30 percent of vessel calls at U.S. ports are constrained due to inadequate channel depths. If ignored, America's waterways will be unable to support future growth in trade.

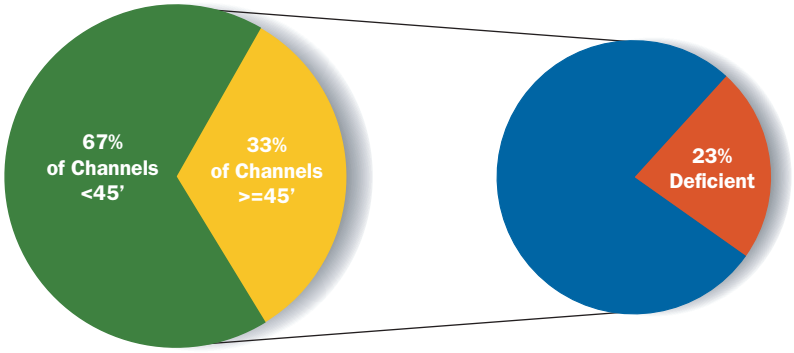
[11] TRB News 235, The Marine Transportation System and the Federal Role, November-December 2004.

The following key facts illustrate the challenges of moving forward with dredging:

- Eleven percent of the Nation's channels, handling more than 10 million tons of commerce, are shallower than their authorized depths;
- Of those channels handling more than 10 million tons of commerce, 33 percent are authorized for depths of at least 45 feet and 23 percent of these are currently considered to be deficient;
- Of those channels handling more than 10 million tons of commerce, 14 percent are authorized for depths of at least 50 feet and 40 percent of these are currently considered to be deficient.

Unfortunately, in spite of a growing Federal fund specifically intended to finance dredging, appropriated funding for waterways maintenance has not kept pace with the Marine Transportation System's needs. [12]

Dredging Projects with >10 Million Tons of Commerce



Source: Maritime Administration

Top Ten General Cargo Ports, 2002 & 2007
(Calls)

Port	2002	2007	% Change 2002-07
Philadelphia (11)	370	420	13.5
Houston	321	399	24.3
New Orleans (15)	324	338	4.3
Columbia River (18)	130	253	94.6
LA/Long Beach	248	239	-3.6
San Juan (12)	260	181	-30.4
San Francisco	162	180	11.1
Mobile (26)	159	176	10.7
Savannah	199	122	-38.7
Port Hueneme (37)	104	118	13.5
Total, Top 10	2,277	2,426	6.5
Total, All Ports	3,894	3,948	1.4

Source: Maritime Administration, Vessel Calls at U.S. Ports

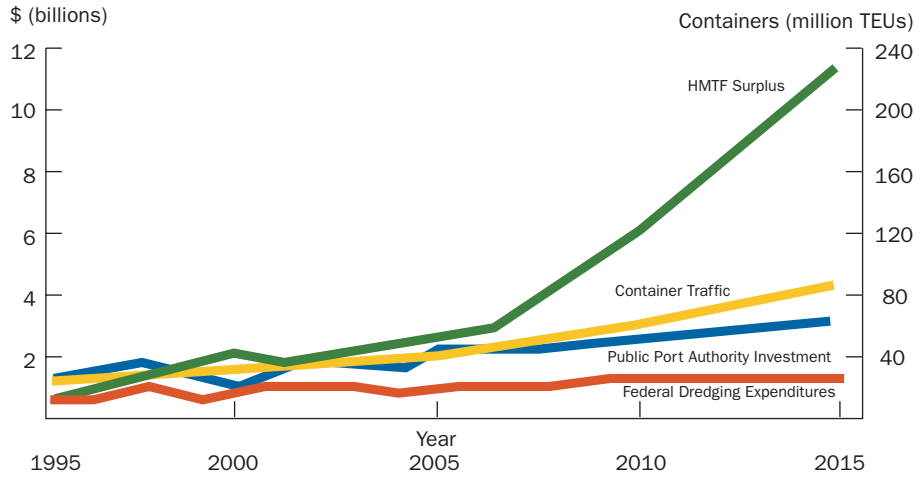
Dredging projects are primarily funded through the Harbor Maintenance Tax (HMT), which with some exceptions, is an ad valorem fee on the value of commercial cargo loaded or unloaded on vessels using federally maintained harbors. The tax is generally imposed against most imports (not exports), domestic shipments, foreign trade zone cargo, and non-ferry passengers. HMT revenues collected by U.S. Customs and Border Protection are deposited in the Harbor Maintenance Trust Fund (HMTF) and subsequently transferred to the Department of the Treasury in accordance with Congressional appropriations.

The HMTF is authorized to be used to recover 100 percent of the U.S. Army Corps of Engineers' expenditures for commercial navigation and other related costs. According to the Department of the Treasury, as of September 30, 2007, the HMTF balance was $3.812 billion and growing. This balance, however, is used to help offset the U.S. deficit rather than being used for its stated purpose – to maintain Federal harbors. A summary of operations for 2002-2007 is shown on the next page.

[12] In a February 2008 report titled "Substantive Reviews Needed to Align Port-Related Fees with the Programs They Support," the GAO stated; "… the difference between HMF collections and funds appropriated for harbor maintenance has resulted in a large and growing surplus in the Harbor Maintenance Trust Fund. Although both Corps officials and port stakeholders say many federally managed harbors and channels are undermaintained, the Corps has not yet completed cost estimates or time frames for addressing the backlog…"

In spite of a growing Federal fund specifically intended to finance dredging, **appropriated funding for waterways maintenance has not kept pace with the Marine Transportation System's needs.**

Federal Investment Lagging – Trust Fund Surplus Skyrocketing



Sources: AAPA, Budgets of the United States, Energy and Water Development Appropriations Acts, MARAD and the U.S. Corps of Engineers.

As this table indicates, the HMTF balance is steadily increasing each year. HMT revenues and interest earnings exceed spending by an increasing margin. Amounts transferred from the HMTF depend upon the amounts appropriated by Congress for authorized activities, irrespective of any surplus in the HMTF. However, it has become harder to get Federal contributions towards maintenance dredging costs from the HMTF – in spite of the growing balance.

Harbor Maintenance Trust Fund, Summary of Operations
(in millions of dollars)

	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	Average
Initial Balance	1,819	1,873	2,092	2,366	2,783	3,306	2,373
Revenues (HMT & Accrused Interest)	711	805	922	1,123	1,321	1,416	1,050
Total Available	2,530	2,678	3,014	3,489	4,104	4,722	3,423
Transfers (Expenditures)	2,530	586	648	706	798	910	717
Closing Balance	656	2,092	2,366	2,783	3,306	3,812	2,705

Source: U.S. Army Corps of Engineers

Nevertheless, Congress has been supportive of an active harbor improvement program to meet future needs. The illustration below shows harbor improvement projects funded for FY 2008. These projects include both study and construction activities addressing needs at 48 harbors across the Nation and include 27 major harbor improvement projects underway in FY 2008 (shown in red) totaling over $216 million in current year construction expenditures. These projects represent a planned long-term investment of over $4 billion. See Appendix 2 for a list of current U.S. Army Corps of Engineers' deep draft and shallow draft navigation projects for ports with greater than 10 million tons of commerce.

In addition to the considerable reserves in the HMTF, a cost-sharing formula has been established that further leverages funds for harbor and channel deepening. The cost-share is as follows:

- Construction of channels with depths greater than 45 feet – locals pay a 60 percent cost share;
- Construction of channels with depths less than or equal to 45 feet – locals pay a 35 percent cost share;
- Maintenance of channels greater than 45 feet – locals pay 50 percent of cost for increments of increased costs over 45 feet; and
- Maintenance of channels less than or equal to 45 feet – locals pay zero percent of cost. All costs are covered by funds generated by the Federal Harbor Maintenance Tax.

Today, there is a significant backlog of dredging projects, prompting several port authorities to call for an acceleration of HMTF spending. Stakeholders have also expressed concern over the growing balance in the HMTF, particularly when it is available, but not being used for its intended purpose. Channel users who pay the HMT express frustration when shoaling channels increase costs and erode safety while incrementally reducing their ability to compete as vessels sail on restricted schedules and partially loaded. The GAO recently addressed the issue of the HMTF. It recommended that Congress review the link between the HMTF and expenditures and establish a HMTF stakeholder advisory body. [13]

Key Harbor Improvement Projects Funded in FY 08

Source: U.S. Army Corps of Engineers

[13] Ibid.

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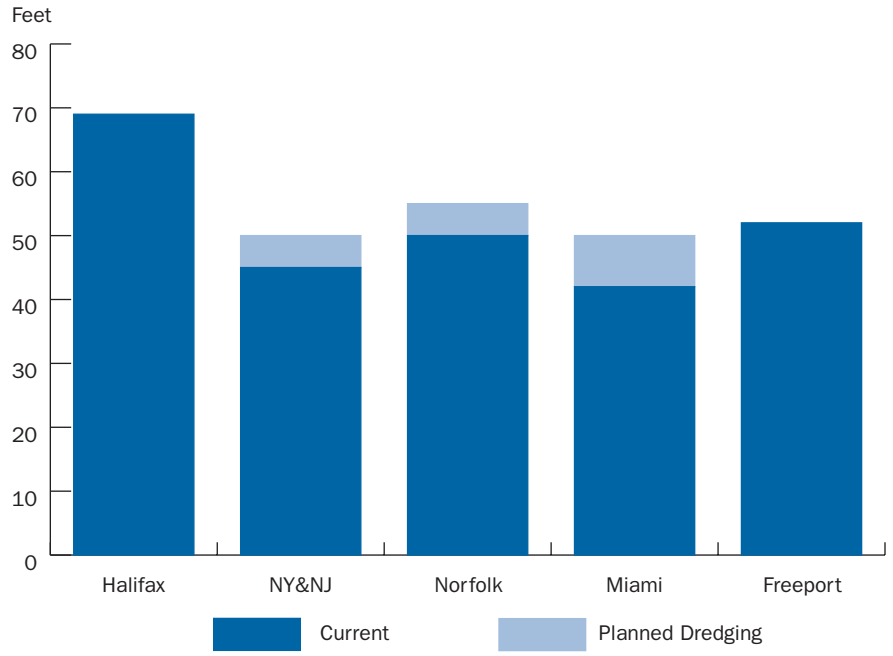
The Institute for Water Resources also completed an analysis that shows the "tons per inch immersion" (TPI) for various vessel designs. In other words, the loss of every inch of immersion because of shallow water means a vessel loads less cargo and is less efficient. For example, an S-class container vessel would have to leave behind 320 tons of cargo. For a Panamax tanker, the lost cargo weight is 172 tons. A Panamax bulk carrier would leave behind 179 tons of cargo for every lost inch of draft. And according to James H.I. Weakley, President of the Lake Carriers' Association, the Great Lakes 730-foot long ocean-bound "salties" that carry 27,000 tons when fully loaded, have a TPI of 115 tons. This loss is cumulative among ship types and vessel calls throughout the period of time during the year when full depth is not available.

In addition to funding, ports face a number of challenges when it comes to dredging, including increased review and complexity when dealing with environmental, wetland, endangered species, and other habitat issues. This makes it increasingly difficult for U.S. ports to get environmental approvals for dredging projects.

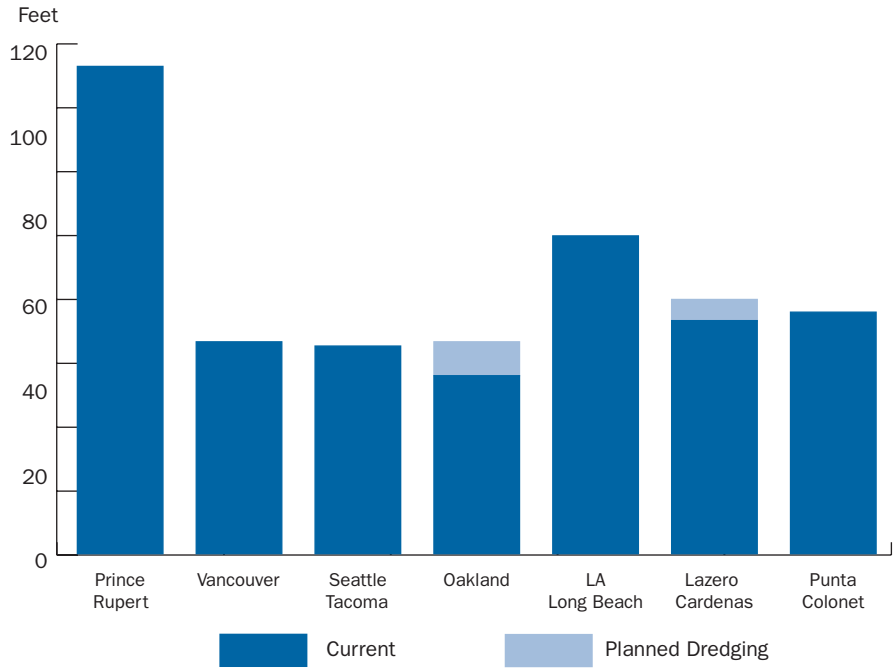
The Environmental Protection Agency (EPA) is responsible for developing the environmental criteria used by the Army Corps of Engineers to evaluate proposed discharges of dredged material and environmental oversight. The potential for dredging to harm aquatic life or for dredging material to contain contaminants requires careful analysis, but can also involve extensive delays and costly disposal methods that may paralyze port infrastructure investment and development.

Major Atlantic and Gulf Container Ports with Panamax II (50+') Channels



Source: Maritime Administration

Major Pacific Container Ports with Panamax II (50+') Channels



Source: Maritime Administration

Where channel bottom material is contaminated, disturbing the sediment can further degrade the environment by distributing or releasing these contaminants. Although preventing contamination in the first place is the overarching goal, the key environmental issue when considering waterborne commerce usually is the disturbance of contaminated sediments when dredging occurs and then finding proper disposal sites.

Restrictions on in-water disposal of contaminated sediments have significantly reduced disposal options. The challenges with locating and permitting upland or contained disposal sites are also substantial. Waterfront development has restricted the options for near-project disposal capacity, which in turn, has increased the cost of disposal.

Likewise, although substantial efforts have been made to identify and implement alternative uses for dredged material, many of these options have substantial costs. Public opposition to disposal sites and lengthy environmental processes hamper the establishment of new sites as well as alternative uses for dredged material.

Without a significant change in the way we manage dredging, the lack of adequate water access to U.S. ports will almost certainly lead to the eventual loss of our competitive edge in the global marketplace and will serve as a growing disincentive to private investment in "downstream" infrastructure.

In addition to funding, ports face a number of challenges when it comes to dredging, including increased review and complexity when dealing with environmental, wetland, endangered species, and other habitat issues.

Lock and Dam Construction and Maintenance

Besides dredging, the U.S. Army Corps of Engineers is also charged with the construction and maintenance of the nation's inland waterway lock and dam system. The Federal Government is 50 percent responsible for the construction and major rehabilitation of inland waterway projects. Funding to pay for these projects comes from two sources: revenue from a fuel tax imposed on vessels engaged in commercial waterway transportation on designated waterways and Federal general revenue. The funds raised by the user fuel tax are deposited into the "Inland Waterways Trust Fund" (IWTF). The fund was originally authorized under the Inland Waterways Revenue Act of 1978 (P.L. 95-502). As currently authorized in §1404 of WRDA 1986, the tax is 20 cents per gallon and is collected by the Internal Revenue Service. WRDA 1986 also established the Inland Waterways Users Board, comprised of industry members including shippers and carriers. The Board is tasked with making recommendations to Congress and the U.S. Army Corps of Engineers concerning the prioritization of inland navigation projects. The cost-share for inland navigation projects is as follows:

Much of our lock and dam infrastructure has surpassed its intended lifespan. As a result, this infrastructure is becoming increasingly unreliable and costly to maintain.

Cost-Share for Inland Waterway Projects: Construction, Operation and Maintenance

Inland Waterway Projects	Construction	Operations and Maintenance
Federal General Revenue	50%	100%
IWTF	50%	0%

Source: U.S. Army Corps of Engineers

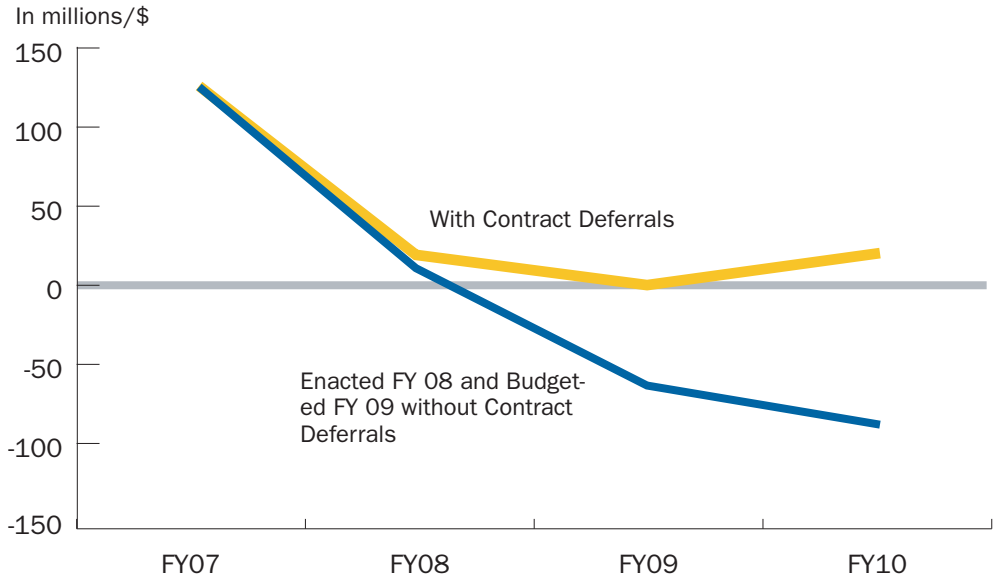
Much of our lock and dam infrastructure has surpassed its intended lifespan. As a result, this infrastructure is becoming increasingly unreliable and costly to maintain. The Inland Waterways Trust Fund has been declining since 2002 and is estimated to be depleted at the end of the 2008 calendar year. Clearly the Fund cannot sufficiently keep pace with current or projected Federal capital investments in inland and intracoastal navigation projects. The diesel fuel tax currently generates approximately $90 million annually, while the cost of navigation projects in FY 2008 was $216 million.

In addition to the overall availability of sufficient funding for inland waterway projects, these multiyear construction projects often suffer from significant delays in receiving sufficient funding to complete the projects in a timely manner. This triggers considerable cost overruns. For example, one lock and dam project that was authorized in 1988 at an original estimate of $775 million with a seven year construction timeline, still has an estimated seven years remaining and the total cost is now estimated at $1.53 billion.

A surprisingly large grain harvest placed additional strain on the system in the fall of 2008. The U.S. Department of Agriculture predicts farmers will produce the second largest corn crop and fourth largest soybean crop in history. These grains are typically shipped aboard modern-sized barge tows (1,100 feet long), but must pass through locks roughly half that length. As a result, these barge tows must split in two to get through, adding 50 hours of travel time along the upper Mississippi, all the while burning fuel and paying workers.[14]

[14] Christopher Leonard and Catherine Tsai, AP Business Writers, *US Grain Exports Snagged by Infrastructure Delays*, August, 2008.

IWTF Year-End Balance with Current Fuel Tax



Source: Department of Transportation

Aids to Navigation

Advances in aids to navigation have proven beneficial not only to safety, but as a means to provide efficient, effective and environmentally-friendly transportation. An excellent example is the International Maritime Organization decision to require all vessels over 300 gross tons to transmit a VHF signal to improve safety. Similar to the information that an aircraft transponder broadcasts, the signal includes the vessel's name, position, speed and other pertinent information to avoid a safety incident.

The Automatic Information System (AIS) also enhances the performance of the transportation system as cargo is moved from mode to mode and conveyance assets are coordinated based on the near real-time information of the ship's movement. Trains and trucks may also be more efficiently used with such up-to-date vessel position and arrival information, allowing the transportation provider to make adjustments earlier in the planning phase to expedite cargo movement and minimize delays. However, the use of AIS does not alleviate the need to have up-to-date navigation charts.

The threat of congestion may be mitigated through the use of AIS and other 21st century solutions that monitor the condition and performance of the Marine Transportation System. An information-sharing environment between the private sector and the Federal Government for AIS sharing is necessary and should continue to be pursued to benefit the Marine Transportation System for our global economic security, as well as the physical security of the United States.

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Environmental Conditions

Port access and system efficiency are also significantly impacted by environmental regulations and programs aimed at protecting endangered species and marine sanctuaries and reducing harmful air emissions. While it is important to meet these objectives, such restrictions can significantly limit the flow of trade.

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For example, in September 2008, the National Oceanic and Atmospheric Administration (NOAA) proposed to lower vessel speeds to reduce the threat of ship collisions with North Atlantic Right Whales. The proposed rulemaking imposes a mandatory 10 knot speed limit for all vessels (excluding Federal vessels) greater than or equal to 65 feet operating within certain "Seasonal Management Areas" (SMAs) and "Dynamic Management Areas" (DMAs).

SMAs are areas where Right Whales are assumed to face the highest risk of ship strikes resulting in injury or mortality. The rulemaking imposes a 10-knot speed limit in the SMAs, which extend to 20 nautical miles offshore from various points on the U.S. East Coast encompassing over 10,000 square nautical miles and most major ports between Boston and Southeastern Florida. DMAs are areas where three or more Right Whales have been sighted; the speed restriction for them is voluntary in the current proposal.

Based on 2005 data, the speed limits would affect well over 28,000 vessels that call on U.S. East Coast ports and transit through the described areas each year. While estimates vary, the economic impact of slowing ships, some of which travel at more than twice the proposed speed limit and carry millions of tons of commercial cargo and passengers, would be significant.

In addition, routing measures, which consist of a set of routes, are designed to minimize collisions between Right Whales and ship traffic in the same waters. While use of these routes is voluntary, mandatory speed restrictions would apply in the portions of the routes located within an active SMA. NOAA's National Marine Fisheries Service would monitor these routes and consider making them mandatory if use is low, imposing further restrictions on commerce.

Marine sanctuaries are also established by NOAA to help conserve, protect, and enhance the biodiversity, ecological integrity, and cultural legacy. In some cases, the sanctuaries are protected as "areas to be avoided" by vessels of certain sizes or carrying particular cargoes. There are currently 14 marine sanctuaries and "areas to be avoided" offshore of the U.S. in the Pacific Islands, Washington state, California, Florida Keys, Mid-Atlantic states and New England coastal waters.

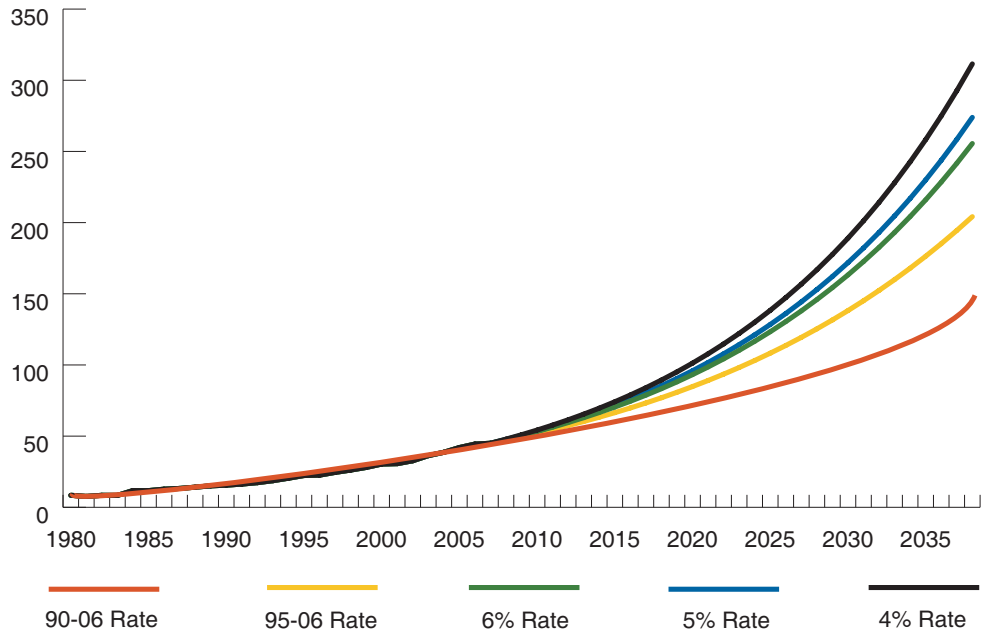
Moreover, on the U.S West Coast, ports in southern California have requested vessels to reduce speed to 12 knots within 20 nautical miles in an effort to reduce air emissions. In 2001, the ports of Long Beach and Los Angeles requested voluntary compliance with this speed reduction. While scheduling has been affected, most vessels have complied with the request and it is estimated that 90 percent of ships serving these ports are reducing speed 20 nautical miles out. The Port of Los Angeles has estimated that the speed reduction has resulted in vessel emission reduction of 30 percent to 50 percent for NOx, SOx, Diesel Particulate Matter and CO2 (estimated values for 2006).

VI. Ports, Terminals and Landside Access

In order to maintain and improve the United States leadership position in the global marketplace, our Nation must have the transportation systems and supporting infrastructure to meet anticipated increases in trade. However, dramatic increases in freight flows continue to create capacity constraints and congestion at key gateways in major U.S. trading corridors – imposing added costs on shippers and consumers, and placing additional pressures on the environment.

Projected growth in the U.S. economy and historical trends at U.S. ports suggest that port container traffic will double by 2020 and triple by 2030. This may occur even if the average annual rate of growth in container traffic falls from the 1995-2006 average of 6.4 percent (or the 2000-2006 rate of 6.5 percent, or 1990-2006 rate of 6.8 percent) to five percent, as shown in the accompanying chart. Even if the growth rate falls to four percent, container traffic could still more than double by 2030.

U.S. Port Container Traffic Projected to 2037



Source: Maritime Administration

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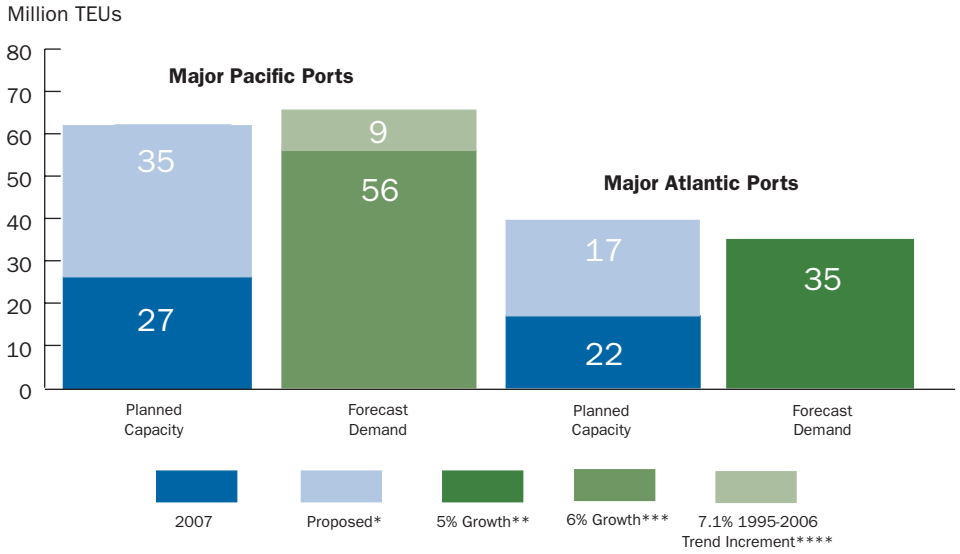
In coming years, however, the market for transportation services nationwide and worldwide will be driven by the need to contain rising costs. Although fuel prices have temporarily declined, there is still a growing U.S. and international chorus to switch to low-sulfur and cleaner burning distillate fuels to reduce air pollution from ships, terminal facilities, and truck and rail connectors in and near highly populated port regions. Such a change could lead to yet another doubling or tripling of fuel costs.

Capacity and Demand by 2020 by Major Ports



Source: Maritime Administration

Expanding and improving the efficiency of port terminal facilities and their hours of operation and upgrading connections to regional and national road and rail networks will also add new costs. The costs for expanding capacity at many ports and relieving chokepoints in the landside transportation network will be passed on to shippers and eventually consumers.

The high price of congestion rears its ugly head in other ways, too. For example, without new national policies and improved public-private investment coordination to increase capacity and offer alternatives to current primary ports, such as Los Angeles/Long Beach (LA/LB) and New York/New Jersey (NY/NJ), congestion will only grow worse, reducing freight transportation reliability and increase costs for all freight classes.

In addition, more trade will be diverted to ports in Canada and Mexico. In fact, cargo diversion from Southern California to other regions may have already begun, such as through the Port of Prince Rupert, Canada. Developments in Mexico are also increasing the potential for cargo diversion to ports such as Puerto Lazaro Cardenas and the planned facility at Punta Colonet.

In 2005, the Canadian government established their Pacific Gateway Strategy to address Canada's West Coast port issues and marine transportation as a complete intermodal system, including the gateway ports and key trade corridors. It takes on numerous intermodal infrastructure projects across the country toward which the Canadian federal government has committed $1 billion and will be augmented with private investment, as well.

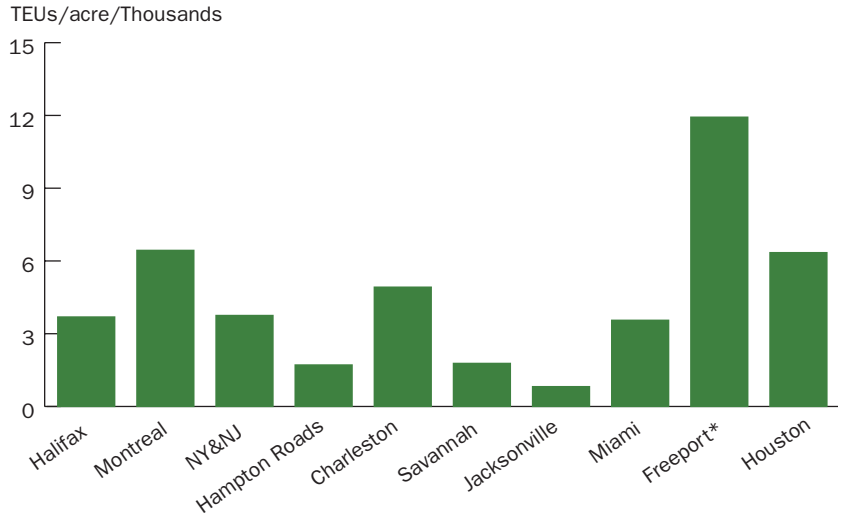
This well publicized initiative points out that Canadian West Coast ports offer a two-day sailing advantage over other Western Hemisphere ports, and is specifically aimed at attracting additional Asian cargo. When completed, this national policy framework on strategic gateways and trade corridors intends to shift international trade from U.S. ports and corridors to Canada.

In the face of such competition, the busiest container ports are seeking to improve their terminal productivity. To increase container handling efficiency, however, improvements in port operations and technological innovations must be implemented through public-private partnerships. These collaborative efforts can develop guidelines for port operational improvements that address areas including: harbor trucking, extended operating hours, chassis pool management improvements, free time management, truck appointment systems, and disbursed vessel sailings and arrivals.

A mix of grants and tax credits to encourage efficiency improvements may be needed. Ports need to be more responsive to changes that can improve efficiency. For example, extending gate hours can reduce bottlenecks by spreading traffic over longer periods of time. However, doing so requires Federal inspectors, including Customs and Border Protection, to adjust their operations to the new schedules.

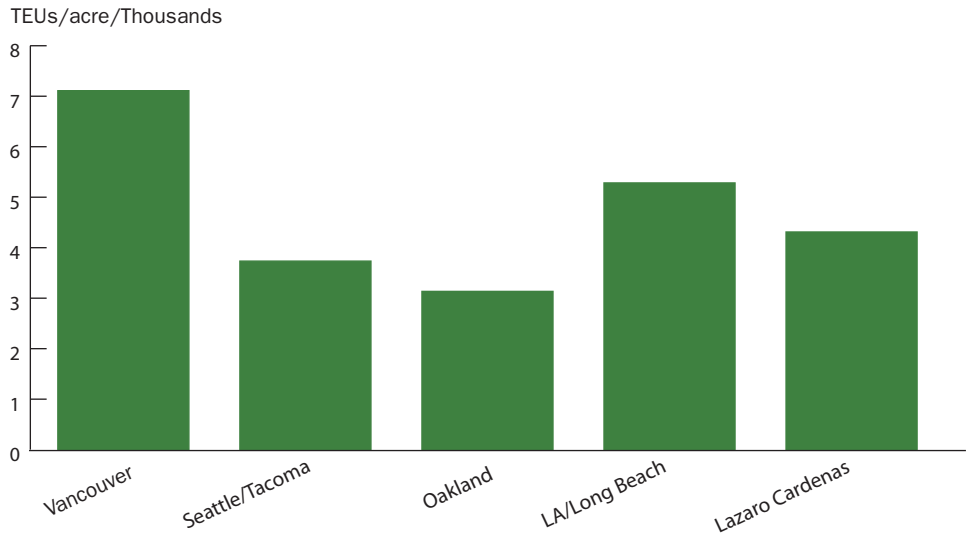
Rapid growth in container traffic at ports also strains the capacity of road and rail connections. Even if ports and terminals can accommodate an increased cargo load, shoreside transportation capacity is already at a premium because the majority of ports are located in or near large metropolitan areas. The traveling public and a multitude of industrial users also share the same transportation infrastructure – leading to routine gridlock at chokepoints and increased air pollution.

Productivity of Major Atlantic and Gulf Container Ports 2006 Throughput Density



Source: Maritime Administration

Productivity of Major Pacific Container Ports 2006 Throughput Density



Source: Maritime Administration

Outside port gates, connector roads and rail projects must also be expedited. Bottlenecks in the Marine Transportation System often occur at gateway ports which are located at the end of major trade corridors.

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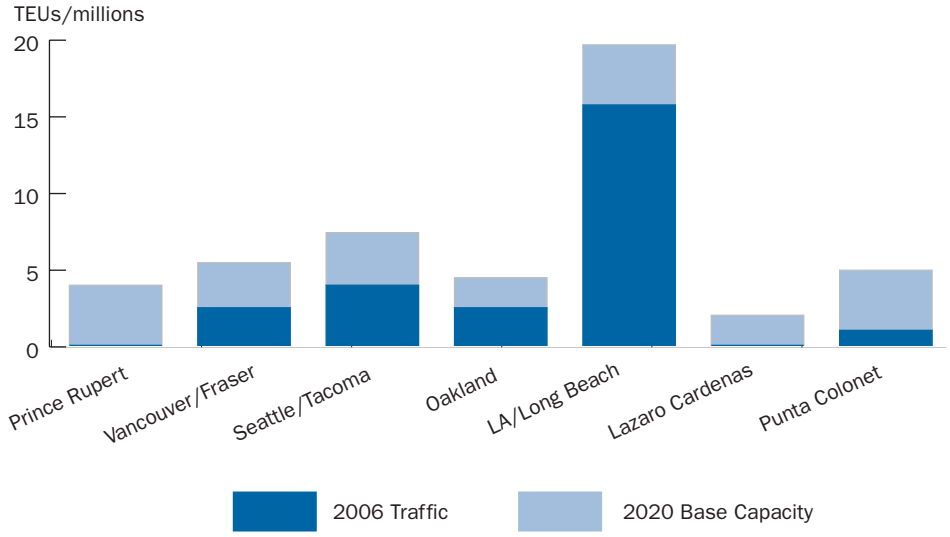
Future Capacity of Major Pacific Countainer Ports With 2006 Productivity on More Land



Source: Maritime Administration

Investing in Ports

Today, port authorities and marine terminal operators are spending substantial sums to build, improve, and expand terminals to handle the current and anticipated increases in cargo. Billions of dollars have been and are being expended to improve terminals to accept and process cargo. During fiscal years 2006-2010 alone, $8.6 billion is projected to be invested: over $3 billion in U.S. Southern Pacific Coast ports, $2 billion in the South Atlantic, and over $1 billion each in the North Atlantic and the Gulf regions.[15]

Improvements to gate systems, technology, cranes, equipment, management processes and information technology all come at a cost. They do not alleviate all issues associated with cargo movement, but they can improve port viability, distribution of benefits and costs, environmental quality and the overall the effectiveness, and efficiency of the national transportation system.

And many outside of the marine transportation community are taking notice. Over the past few years, equity firms and other investors have been on a buying spree, purchasing terminals, leases, or other marine related assets. Some recent examples include:

- The Ontario Teachers' Pension Plan purchased four terminals, two in the U.S., and two in Canada, from Hong Kong's Orient Overseas (International) Ltd. for $2.4 billion.
- A Deutsche Bank subsidiary purchased Maher Terminals, which has terminals in two ports, the Port of New York and New Jersey and the Port of Prince Rupert, Canada. Maher Terminal is the largest container volume terminal and privately-held operator of port terminal facilities in both ports.
- Goldman Sachs Infrastructure Partners made an equity investment in Carrix, the parent company of SSA Marine and Tideworks Technology. SSA Marine is the largest U.S. owned and privately-held marine terminal operator in the world, with over 120 marine and rail operations worldwide, including 11 container terminals in LA/Long Beach, Oakland, Seattle, Panama, Mexico, and Chile.
- Marine Terminals Corporation (MTC), an American-owned stevedoring company, sold its 50 percent share in Total Terminals Corporation (TTI) to Hanjin American. Hanjin America sold 40 percent of TTI to Macquarie Fund, a special purpose corporation established in Korea.

Today, port authorities and marine terminal operators are spending substantial sums to build, improve, and expand terminals to handle the current and anticipated increases in cargo.

Community and Land Use Issues

Historically, ports have been constructed in areas geographically favorable to the surrounding population's immediate needs and convenience and ease of transferring goods. Typically, an active waterside community emerged and thrived as trade flourished. The use of available land for necessary development met few objections as expansion was in the name of economic prosperity and there was plenty of available land. Everyone benefited.

However, the 21st century has brought new obstacles to port expansion, such as regulatory changes, shifting public attitudes, and increasing land value and use. For example, landside facilities capable of accommodating large containerships require long berth lengths, large cranes, and railway or highway access. In most cases, meeting these needs requires the acquisition and development of adjacent land. However, many ports have

[15]Maritime Adminstration, U.S. Public Port Development Expenditure Report (FYs 2005 and 2006-2010), Washington, DC, July 2007, Page 8.

encountered competing demands and disagreement over how waterside land is used and developed. Because of these land use issues, local port authorities are now having more difficulty making their operations competitive and viable. This makes it harder to attract clients and coordinate the distribution of imports and exports through their regions.

Port authorities are increasingly aware that there must be renewed emphasis on state and local zoning and land use regulations so as to reflect the importance of port expansion and land use decisions to accommodate trade growth.

Container port development now raises major, and perhaps unprecedented, issues for terminal operators, port authorities, and the public and other stakeholders.

Taking a page from aviation, there are specific regulations that govern features and functions at, or near airports. A similar approach could be explored for developing land around seaports. However, it should be noted that the regulation of land near airports is a Federal responsibility, in contrast to seaports, which are the responsibility of the state and municipality.

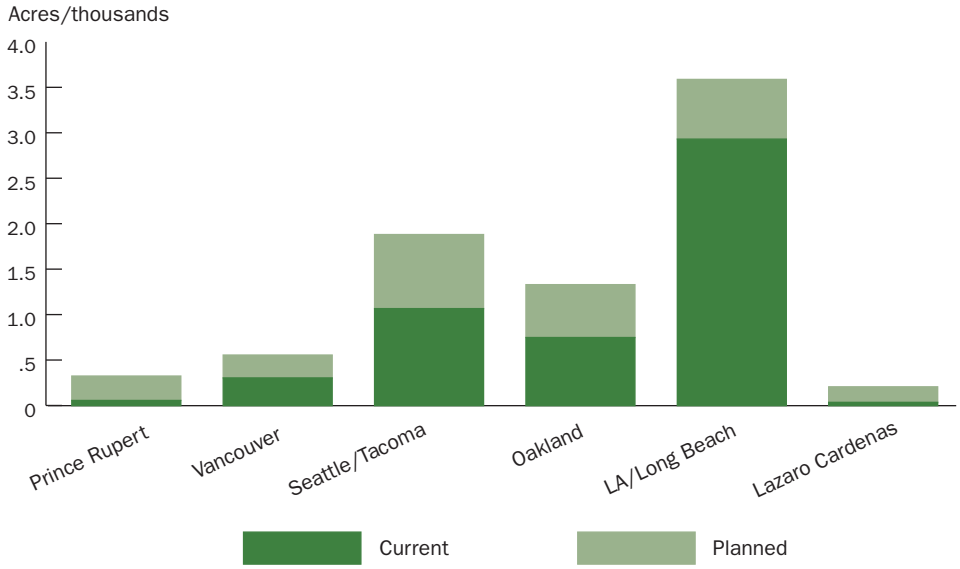
Increased environmental awareness has also significantly influenced port planning and operations. As previously noted the dredging or deepening of channels to maintain their navigability involves removing sediment, rock, and debris from the channel bottom.

Indeed, container port development now raises major, and perhaps unprecedented, issues for terminal operators, port authorities, and the public and other stakeholders. They include the amount of land required for terminal development, alternative uses for land, residential concerns, taxes, along with a host of other possible problems.

Today, with the increased concern about ports and their surroundings, it will typically take 10 years to get a new marine terminal from the planning board to operation. A host of factors affect port feasibility, distribution of costs and benefits, environmental quality and the efficiency and effectiveness of our national transportation system. They include:

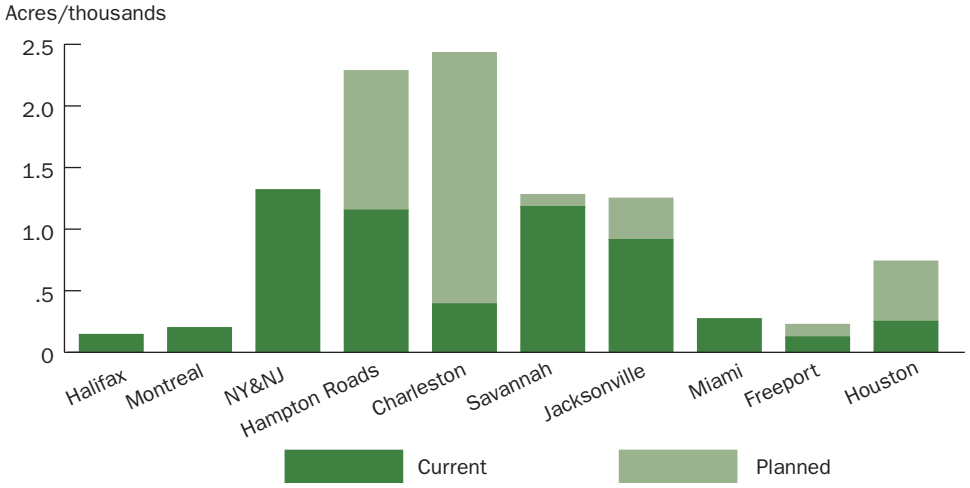
- emerging and changing trade patterns;

Major Pacific Container Ports Terminal Land Availability



Source: Maritime Administration

Major Atlantic and Gulf Container Ports Terminal Land Availability



Source: Maritime Administration

- technological and structural changes in shipping and ports;
- the economic feasibility of individual port development plans;
- evaluation of environmental issues and their resolution;
- a state's versus an operator's (or railroad's) role in the financing of port development;
- potential conflicts between national and state objectives; and
- issues of strategic behavior and rent seeking by different parties.

In light of the high stakes and uncertainties involved with port development, there is a need for objective, analytical studies of container port development that can contribute to public discussion of land use policy. Such examinations should include the potential of zoning regulations for port and maritime activity and development. To be most useful, such studies should be cross-cutting and integrate key financial, economic, environmental, and strategic factors within a unified and consistent analytical framework.

Clearly, Federal, state, and local policy makers and planners must work together to enhance the capacity of the major freight gateways within the transportation system. In addition, state and local zoning and land use regulations must be revised to reflect the importance of port expansion and land use decisions needed to accommodate trade growth.

Dockside Infrastructure

All urban areas where major ports are located are currently managing existing demand. But there are shared issues that will affect ports when demand for import and export cargo picks up. For example, physical, operational, and institutional issues are placing increasing pressure on the ports from the standpoint of expansion and continued operations.

Additionally, certain regions of the country face population and employment growth that increase this pressure. The regions with the greatest population growth face an even more difficult problem of how to move more freight when capacity is constrained by environmental, social, and financial issues.

Today, major chokepoints are developing both in north/south directions along major highway and rail corridors and along east/west directions, which have been traditional cargo

Clearly, Federal, state, and local policy makers and planners must work together to enhance the capacity of the major freight gateways within the transportation system.

movement corridors. These bottlenecks affect system reliability, trade movement, and port efficiency.

This underscores the importance of not viewing ports in isolation. Problem resolution must be viewed and occur on a regional and corridor basis. Continued cargo growth will require the development of solutions that meet physical, environmental, and funding needs for our entire system of ports, regions, and corridors.

Institutional challenges faced by the entire transportation system are both far reaching and diverse and there is no one silver bullet to answer them all. A number of solutions to improve the expeditious movement of goods within the terminal and to address congestion and corresponding environmental problems outside the terminal are necessary for both the fiscal and physical health of the Nation.

There is no lack of problems, but there is also an abundance of solutions – some of which are understandably not the most popular. However, various forms of fees, taxes, and tariffs must be examined as ways for the United States to maintain its economic leadership in the world. A strong national commitment to improving and maintaining the infrastructure within ports, harbors, and waterways is essential to the economic and environmental well-being of this Nation.

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And while the Federal Government has paid for much of the transportation infrastructure of the United States, highways, airports, ports and marine terminals have historically been financed by local taxes or private sector investment. As many container ports in the U.S. continue to develop new terminals and implement projects to reduce port congestion and accommodate bigger ships, not all ports and terminal operators are able to do so. A recent report by the American Society of Civil Engineers states that "Although U.S. ports are currently comparable to foreign ports in terms of overall port infrastructure, more effort needs to take place in terms of dockside infrastructure, i.e., larger and more substantial berths, newer and larger cranes, and improved intermodal access to inland transfer areas."

As current events have shown, it is now being recognized that private sector investment in infrastructure may provide benefits where the public sector can no longer act. It is necessary to understand the complex nature of the activities at the core of the business. Although ports are engines of economic growth for their local communities, they face competing demands, particularly environmental and land use issues.

Yet despite such challenges, many ports are rising to the occasion. Recently opened (Maersk Terminal in Portsmouth, Virginia) and planned terminals (Yusen Terminal, Tacoma, Washington; Coos Bay, Oregon; Dames Point, Jacksonville, Florida; Maersk/CMA CGM Terminal, Mobile, Alabama; North Carolina International Terminal and the Craney Island Expansion Project, Norfolk, Virginia) are taking into consideration the need for expanded berths, newer and larger cranes, and improved intermodal capabilities. These terminals will add approximately 12 million TEUs of capacity to the national port system within the next few years.

Technology

To achieve an enhanced integrated transportation system for the movement of international and domestic freight, technology must be built into the infrastructure right from the start (including ports and terminals), and designed into the transportation network and communication and information flows. Initiatives to create such a transportation system should be based on a system-level approach to freight transportation from origin to destination. This allows for the development of a framework where segments of technologically-advanced transportation networks are developed in concert and relation to total system requirements.

Key to this concept are advances in water and surface transportation technologies and infrastructure requirements, including intermodal transfer points and sub-systems. On the waterside, this will require advances in terminal design and operating systems that complement advances in ship design and operations. Surface transportation networks will require advances in high-speed freight rail networks, truck/container transport and handling systems, truck-airport and rail-truck-water interface systems. All of these efforts come at a potentially enormous cost.

However, new technology and strategic thinking are already delivering the goods at the Ports of Los Angeles and Long Beach – the largest container complex in North America. The ports share a breakwater, connecting rail and highway facilities, freight consolidation yards and intermodal facilities. Southern California is a major consumer market, and port congestion is created by both domestic and international freight movement to and from the North American heartland. The ports introduced the use of "hoot owl" gate operations several years ago in an effort to encourage off-peak use of port facilities, but the success of this effort was hampered by the lack of 24-hour warehouse and distribution center operations.

Because of the uneven arrival rates of inbound vessels and the lack of 24-hour port operations, freight stakeholders continue to search for operating strategies to increase overall port capacity by smoothing peak demand. Building upon the success of the Alameda Corridor, which uses a container-based fee structure, marine terminal operators have instituted a new operations strategy designed to promote off-peak operations by using financial incentives.

PierPASS Inc. is a not-for-profit organization created by marine terminal operators to reduce congestion and improve air quality in and around the Ports of Los Angeles and Long Beach. In May 2005, PierPASS Inc. initiated OffPeak, a port-wide program to reduce port congestion. OffPeak provides an incentive for cargo operations on nights and weekends, aiming to reduce daytime truck trips and improve air quality by reducing idle times of trucks in and around the ports.

Following an initiation program of several months, OffPeak was institutionalized in the form of a Traffic Mitigation Fee, required for most cargo movement through the ports during peak daylight hours. Registration is required to participate in the program and fees are used to support financial and gate systems during night and weekend hours. PierPASS assesses a "Traffic Mitigation Fee" on all loaded containers entering or exiting marine terminal gates by road during peak daytime hours (weekdays 3:00 am to 6:00 pm). The fee is $40 per TEU, or $80 for a 40-foot container. In effect, the fee is a congestion pricing mechanism.

To achieve an enhanced integrated transportation system for the movement of international and domestic freight, technology must be built into the infrastructure right from the start (including ports and terminals), and designed into the transportation network and communication and information flows.

PierPASS does not assess a fee for empty containers and chassis, domestic containers, or transshipment to other ports. Nor does it assess a fee for intermodal containers that depart or arrive via the Alameda Corridor for import or export and that already pay an Alameda Corridor Transportation Authority (ACTA) fee. The cargo owners (shippers, consignees, or their agents) are responsible for payment of the fee; not the trucking community and water carriers.

Since PierPASS was made operational July 23, 2005, nearly 30 percent of the normal daytime container traffic passing through the ports has moved off-peak, either at night or during the weekend. This has resulted in a noticeable reduction in congestion on the freeways leading to and from the ports during peak traffic times. Turn times for trucks once inside the gates are now 35-40 minutes for both peak and off-peak, down from more than 45 minutes, creating further flexibility, agility and the ability to maximize time.

VII. Interstate Road, Rail and Marine Highway Links

As shown in the accompanying map, the U.S is linked to the global economy by a system of ocean transport routes. Cargo from China and the Far East, increasingly in the form of containers, arrives primarily at our West Coast ports. India utilizes a mix of water routes, transiting the Pacific to reach our West Coast ports, or the Suez Canal to reach our East Coast ports. Our European and South American trading partners deliver their goods to Gulf and East Coast ports.

Increasingly, U.S. exports are following the reverse routes, serving many of the same international trading partners. However, the existing freight infrastructure has been designed primarily to accommodate Asian imports to the U.S. Import containers are unloaded far from key U.S. agricultural and industrial export load points. The opposite is also true. Delivery points in Asia for U.S. produce, scrap metal, chemicals and other export shipments are often far from Asian contract manufacturers who subsequently export goods to the U.S. As a result, there are significant logistics problems and costs associated with "ill-positioned" empty containers.

After water access and ports and terminals, the third and equally essential component of the Marine Transportation System is the series of domestic transportation corridors that move freight and passengers to and from the ports. These are the interstate roads, railroads, and marine highways, and as freight volumes increase on international trade

U.S. Container Export Trade Routes: Top Ten Partners

Source: Maritime Administration

After water access and ports and terminals, the third and equally essential component of the marine transportation system is the series of domestic surface transportation corridors that move freight and passengers to and from the ports.

Container Ports of Major U.S. Gateways and Their Distribution Hubs

	Ports	Regional Distribution*	Distribution Hub
1.	Los Angeles/ Long Beach	33%	Chicago
2.	New York/ New Jersey	80%	New York
3.	Savannah & Charleston	20%	Atllanta
4.	Hampton Roads	18%	Chicago
5.	Oakland	20%	Chicago
6.	Houston	70%	Chicago
7.	Seattle/ Tacoma	30%	Chicago

Source: Maritime Administration

*Regional distribution indicates the percentage of cargo handled by a port that remains in that port's local geographic region.

routes and in ports, so do the volumes on these domestic corridors. Repeatedly, we see congestion, bottlenecks, or disruptions anywhere along these corridors, even many hundreds of miles from the ports they serve. This can result in backups at the ports or serious interruptions at inland destinations or points of origin.

As freight and passenger demand outpaces new capacity, the frequency and severity of these disruptions will have an increasingly negative impact on the entire Marine Transportation System. This chapter examines the current state and future needs of each of these three surface transportation corridors as individual components of a larger single system.

The table and chart on this page identify the top U.S. container gateway ports, the primary hubs they serve, and the percentage of cargo that remains in the port region.

Highways

Construction of the U.S. Interstate Highway System was a crowning achievement of the 20th century. Consisting of about 46,000 miles of roads across the country, it sparked a period of freedom, mobility, and opportunity for the Nation. But when it was being planned in the 1950s, the system was designed for projected 1980's traffic volumes. Considering that total vehicle miles traveled in the U.S. have increased almost 90 percent in the 20 years since 1983, congestion should come as no surprise. However, no one could have imagined the explosive growth in trade – and traffic – the 21st century would bring. Our highway corridors face serious capacity challenges, both today and in the future. Every year, Americans lose 3.7 billion hours and 2.3 billion gallons of fuel sitting in traffic jams, costing an estimated $200 billion, and that figure continues to grow. This congestion is also having an increasingly negative effect upon freight movement, which in turn can cause gridlock at the ports themselves. In 2005, America's highways carried 77 percent of America's freight by ton and 92 percent by value. No matter how efficiently a port and its near-port connectors operate, a traffic jam outside the gate can bring the entire operation to a halt. The chart below shows where truck bottlenecks occur on America's highways. Not surprisingly, many of these are at or near our major gateway ports, or along the interstate corridors they serve.

Improvements come at a price and the recent tripling of diesel prices contributed to an erosion of states' construction purchasing power by as much as 40 percent in the three years prior to May 2007; and prices have since risen even higher.[16] In 2007 the estimated cost to improve highways to add adequate capacity was $155 billion. The cost is most certainly higher today.

There are, however, tangible opportunities to mitigate roadside congestion. The American Association of State Highway and Transportation Officials reports that much of the Nation's congestion occurs at bottlenecks on the Interstate Highway System, mainly at outdated and over-capacity interchanges. By looking at the Interstate Highway corridors that serve

[16] American Association of State Highway and Transportation Officials (AASHTO) "America's Freight Challenge," May 2007.

Gridlock: Truck Bottlenecks in U.S. HIghways

Source: Federal Highway Administration

our ports as a system, we can help identify those projects that have a national significance and focus limited resources and funds on eliminating the bottlenecks that have an impact on the overall system, sometimes thousands of miles away.

We can also seek a better balance of capacity and demand across the three transportation modes – highways, rail, and marine highways. Congestion on one mode can be mitigated by shifting to another, when both serve the same corridor and capacity is available.

Removal of bottlenecks along key Interstate Highway corridors that serve gateway ports could improve the efficient flow of cargo throughout the system. The Department of Transportation has begun to address this issue and has selected six interstate routes for the Department's "Corridors of the Future" program. However, more work needs to be done.

The overall Marine Transportation System and the Nation as a whole would be better served by a system-wide assessment – as suggested by the "Corridors of the Future Program" – that would focus on those projects that best serve the key interstate corridors. These six select corridors carry 22.7 percent of the Nation's daily interstate travel. They are I-95 from Florida to the Canadian border; I-70 in Missouri, Illinois, Indiana, and Ohio; I-15 in Arizona, Utah, Nevada, and California; I-5 in California, Oregon, and Washington; I-10 from California to Florida; and I-69 from Texas to Michigan.

These are the first to participate in a Federal initiative to develop multi-state corridors to help reduce congestion along some of the Nation's busiest corridors. This comprehensive approach to fighting congestion represents the beginnings of innovative national and regional approaches to reduce congestion and improve the efficiency of freight delivery.

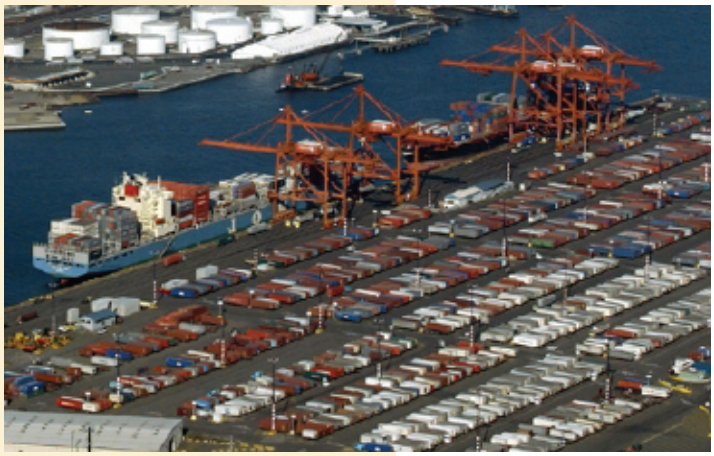
Infrastructure gaps are not the only challenge facing the trucking industry. Rising fuel costs, air quality issues, community concerns, and driver shortages combine to complicate the fast, clean, and efficient delivery of freight by road.

Our highway corridors face serious capacity challenges, both today and in the future.

Every year, Americans lose 3.7 billion hours and 2.3 billion gallons of fuel sitting in traffic jams, costing an estimated $200 billion, and that figure continues to grow.

Corridors

By 2020, even at moderate rates of economic growth, the total domestic tonnage of freight carried by U.S. freight systems will increase by 100 percent in the West; by 89 percent in the Midwest and Southern states, and by 79 percent in the Northeast, according to the Federal HIghway Administraton's Freight Analysis Framework. In this same timeframe, every major U.S. container port is expected to at least double in volume, with select East Coast ports tripling their volume and some West Coast ports quadrupling (U.S. Chamber of Commerce Foundation, 2003, Report on Trade and Transportation). While this increase in growth may be seen as a U.S. problem, West Coast ports in both Canada and Mexico are being expanded to take advantage of the situation and divert U.S. cargo through those nations' ports.



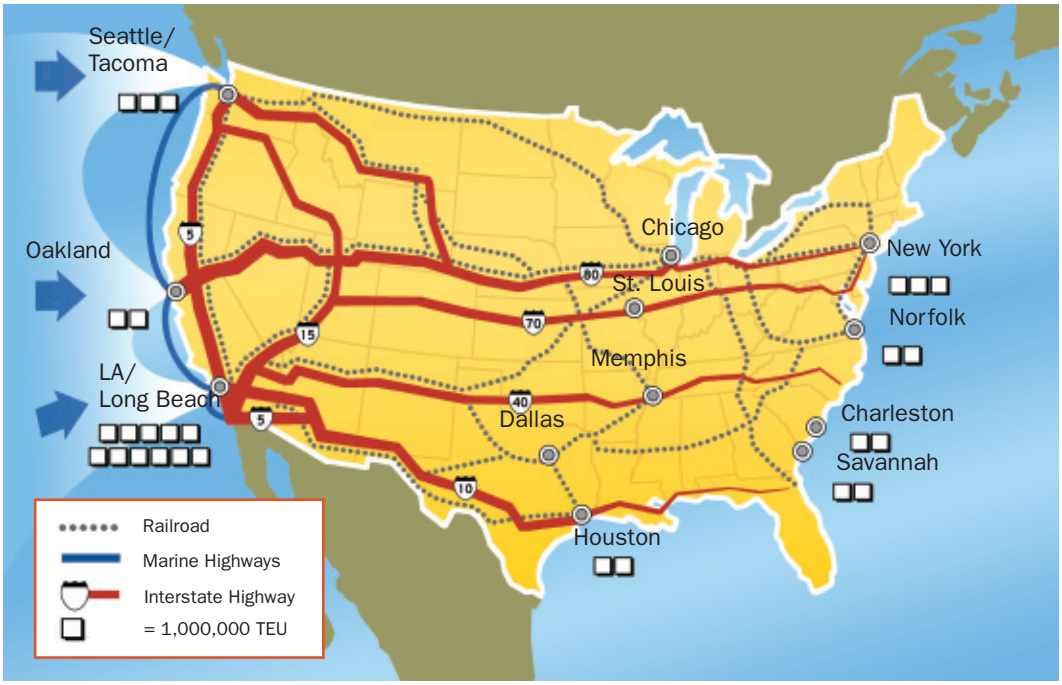
The Canadian Government has sponsored its own Gateway Initiative to attract U.S.-bound cargoes to its ports. A primary focus is Prince Rupert in British Columbia, Canada, which links Asia to North America at a strategic entry point. Situated 436 miles/36 hours sailing time closer to Shanghai than Vancouver, British Columbia and over 1,000 miles/68 hours closer than Los Angeles, the Prince Rupert terminal provides fast transit times between Asian and North American markets. The Port has direct connection to CN Rail with direct access to all of North America via Chicago. Prince Rupert also has a deep harbor ranging between 138 and 144 feet and when completely built out will have a throughput of 2 million TEUs per year. The Canadian Government is investing in making improvements in infrastructure to make their Gateway Initiative work.

By 2020, even at moderate rates of economic growth, the total domestic tonnage of freight carried by U.S. freight systems will increase by 100 percent in the West, by 89 percent in the Midwest and Southern states, and by 79 percent in the Northeast.

New York Gateways & Corridors

Source: Maritime Administration

U.S. West Coast Gateways & Corridors



Source: Maritime Administration

As previously discussed, Mexican ports are also positioning themselves to accommodate goods heading to the U.S. For example, Lazaro Cardenas is 532 miles closer to Houston by rail than the route from Long Beach to Houston. Lazaro Cardenas has a naturally deep harbor, direct dockside rail access, room to grow and relatively cheap labor. When fully built out, the port will be able to handle one million TEUs.

Another project currently under development is Punta Colonet on the Baja Peninsula. The plan is to create a deep-water container port able to accommodate the largest modern ships. It is scheduled to have 10 to 20 berths with a 300-kilometre double-track rail connection to the U.S. border. The project will develop both port and rail services and will have an initial annual capacity of one million TEUs with the potential to grow to six million TEUs by 2025. The Port of Manzanillo also plans to develop Phase II of its container terminal. When completed, this will bring total container throughput to one million TEUs annually.

Conceptual Corridor

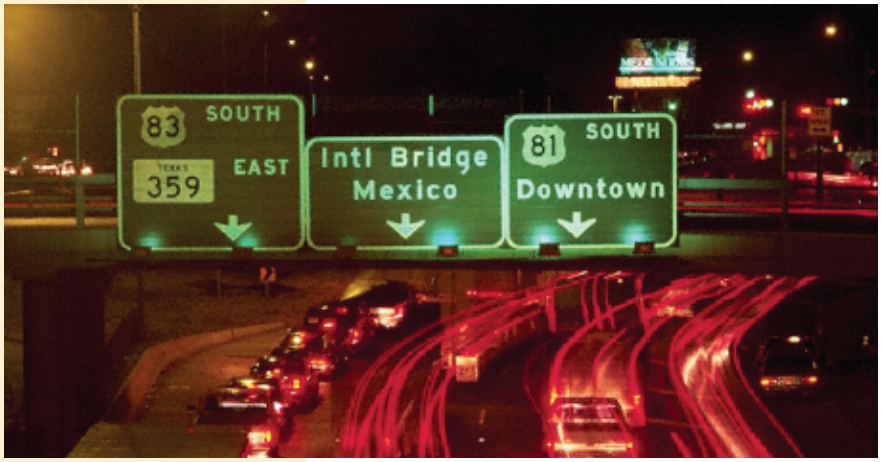
The concept for the Trans-Texas Corridor, shown here, calls for separate lanes for cars and trucks; rail with separate lines for passenger, high-speed freight, and commuter traffic; and a utility zone.
Source: Texas Dept. of Transportation

In this same timeframe, every major U.S. container port is expected to at least double in volume, with select East Coast ports tripling their volume and some West Coast ports quadrupling.

To help meet increasing demand for goods and to ensure timely delivery, a new network of transportation corridors is being proposed around the United States. These routes are expected to help speed freight from marine ports and terminals to their final destinations.

Norfolk Gateways & Corridors

Source: Maritime Administration



To help meet increasing demand for goods and to ensure timely delivery, a new network of transportation corridors is being proposed around the United States. These routes are expected to help speed freight from marine ports and terminals to their final destinations. They not only assist in the movement of freight, but passengers as well. In some instances, the corridors incorporate separate lanes for passenger vehicles and trucks, rail lines for high-speed passenger and freight rail, and a dedicated utility zone.

A number of corridors are proposed with each one consisting of a number of components that may incorporate existing and new highways, railways, and utility rights-of-way where practical. Some states are already taking action. For example, Texas transportation officials are planning to use public-private partnerships to finance much of the development of several corridors in the state, which are estimated to cost $145.2 billion to $183.5 billion.

The concept for the Trans-Texas Corridor, shown on the previous page, calls for separate lanes for cars and trucks; rail with separate lines for passenger, high-speed freight, and commuter traffic; and a utility zone.

Clearly, current demand on our Nation's transportation system is stretching infrastructure to, and in many cases, beyond capacity. This includes all major railroads and many of our Interstate Highways which cross into Canada and Mexico. These same railroads and highways also serve many coastal and Great Lakes ports. To improve competitiveness, it is essential that we have system-wide efficiency and intermodal connectivity to link suppliers, manufacturers, distributors and retailers regionally, nationally and globally through these port and highway corridors.

Key drivers to improve our corridors include the better application of technology, adequate funding and sharing resources, information and ideas. This process will require a multi-state, multi-jurisdictional partnership of public and private sector stakeholders to carry out specific goals, action plans, and projects. Appendix 3 provides a list of gateway (including near-port) and corridor projects having national significance because they play a key role in the operation of the U.S. Marine Transportation System.

Key drivers to improve our corridors include the better application of technology, adequate funding and sharing resources, information and ideas.

Charleston/Savannah Gateways & Corridors

Source: Maritime Administration

According to 2020 estimates from FHWA's Freight Analysis Framework data, cargo volumes are also growing at a pace which will exceed capacity limits at other high-volume hubs and corridors, and funding of future freight capacity needs is not being adequately addressed.

Freight Rail

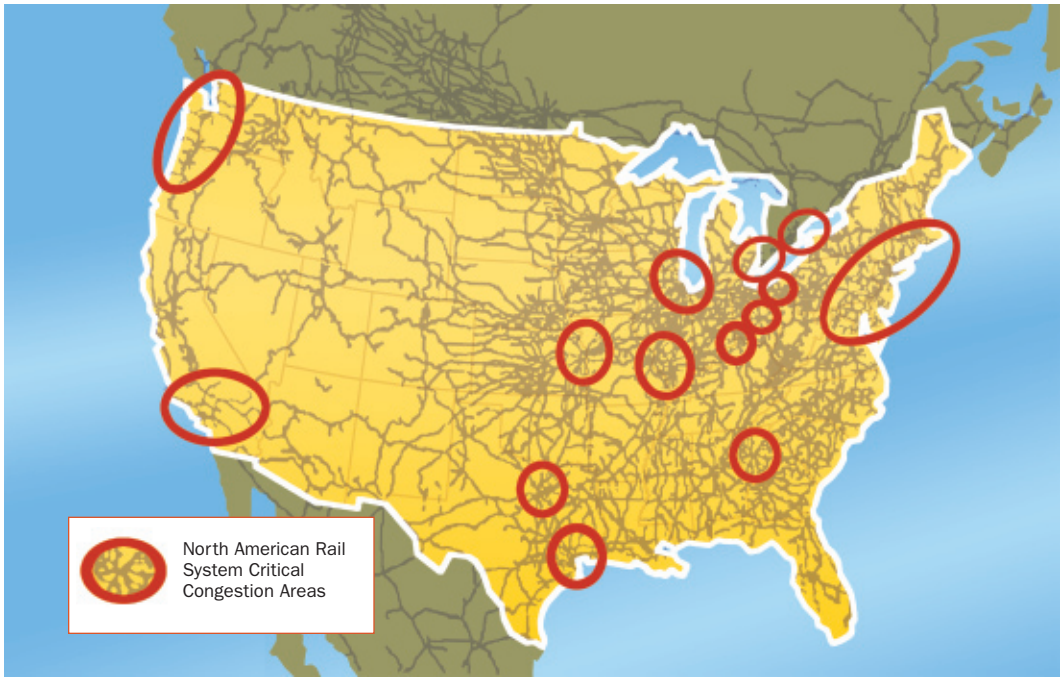
Today, there is concern that freight railroads are at or beyond capacity at certain high-volume hubs and corridors. According to 2020 estimates from FHWA's Freight Analysis Framework data, cargo volumes are also growing at a pace which will exceed capacity limits at other high-volume hubs and corridors, and funding of future freight capacity needs is not being adequately addressed. The need for additional rail capacity and other freight transportation options, such as short-haul corridors are being analyzed as we face these capacity challenges.

Rail options continue to be attractive for a number of reasons. These include: increasing freight volumes; freight delivery schedules demanding higher levels of reliability; many urban highways at or beyond designed capacity levels; increasingly expensive highway life cycle costs; and the ability of intermodal trains to take a significant number of trucks off the highway while being very fuel efficient.

Traditionally, railroads have viewed their freight intermodal market to be in corridors of about 700 miles or longer. There are many reasons why railroads have focused on long-haul freight including, cheap long-haul trucking rates, high local dray costs and good long-haul financial returns for the railroads.

Nevertheless, there is a major opportunity where short-haul freight intermodal service is available for railroads to help alleviate traffic congestion, reduce infrastructure wear and tear, and address environmental problems. However, in order for railroads to implement an intermodal service to alleviate congestion, traditional pricing and market factors may need to be supplemented by incentives which address public benefits, such as improved travel times, safety and air quality enhancement.

North American Rail Network Bottlenecks and Congestion Areas



Source: Federal Railway Administration

Rail Snapshot

According to the Association of American Railroads, total U.S. and Canadian rail traffic decreased from a year ago. U.S. rail carloads are up just 0.6 percent while intermodal loadings are down 4.8 percent compared with a year ago. The industry average U.S. Class I railroad train speed was down slightly from a year ago. Only the two Canadian Class I railroads, Canadian Pacific Railway (CPR) and Canadian National (CN), had train speeds that increased in June 2008. It is expected that train speeds will slowly recover through the remainder of 2008 from the Midwestern flooding. The 2008 flooding in the Midwest heavily disrupted rail service to and from the area, affected all major rail lines with operations in the region.

To assist railroads in meeting requirements, the Railroad Rehabilitation and Improvement Financing (RRIF) program was established to provide direct federal loans and loan guarantees to finance development of railroad infrastructure. The RRIF program was established by the Transportation Equity Act for the 21st Century (TEA-21) and amended by the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU).

The funding may be used to acquire, improve or rehabilitate intermodal or rail equipment or facilities, including track, components of track, bridges, yards, buildings, and shops; refinance outstanding debt incurred for the purposes listed above; and develop or establish new intermodal or railroad facilities. Direct loans can fund up to 100 percent of a railroad project with repayment periods of up to 25 years and interest rates equal to the cost of borrowing to the government. Eligible borrowers include railroads, state and local governments, government-sponsored authorities and corporations, joint ventures that include at least one railroad and freight shippers that intend to construct a new rail connection.

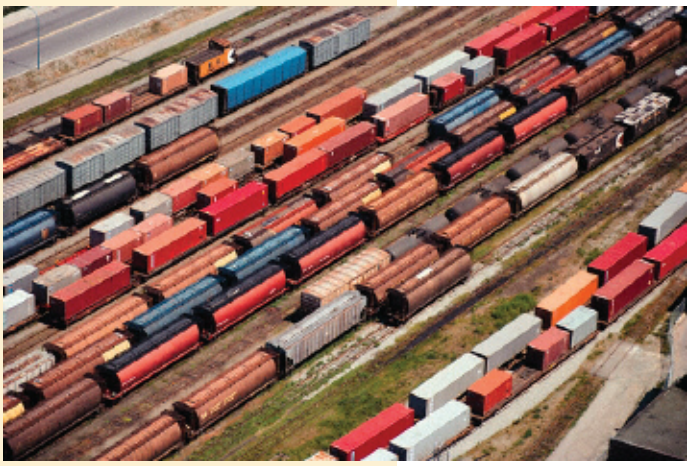
Driven by international trade, coal demand, highway congestion, agricultural trade, and environmental issues, America's railroads have embarked on a new era of growth and are undertaking new projects to add track and facilities. But we still see an imbalance between rail supply and demand which requires more investment in infrastructure to keep pace with the strong economic trends.

The recent economic slowdown may assist in this needed development by providing the railroads with an opportunity to continue to increase average intermodal train speed, which went from 28.40 miles per hour in the second quarter of 2007 to 29.75 miles per hour in May 2008, and allow more time for completion of expansion projects. In addition to highways, freight railroads serve as another vital series of interstate freight corridors. The Nation's freight rail networks consist of more than 140,810 route miles and move more than 2.2 billion tons of freight annually. Over 90 percent of these networks are privately owned. The majority of this freight is carried by the seven large Class I railroads, accounting for about 68 percent of total route miles. About 52,340 route miles are considered by the Class I railroads to be in primary corridors.

The Nation's freight rail network is less congested than our highways. According to a recent report by the National Surface Transportation Policy and Revenue Study Commission, 88 percent of today's primary freight rail corridor mileage is operating below capacity. About 12 percent is near or at practical capacity, and less than one percent is operating above capacity.[17] However, it should be noted that railroads may also have capacity and congestion issues similar to those that occur on highways. For example, in heavily traveled corridors there may be limited capacity on specific line segments and in certain yards. This limited capacity will affect the number of trains that can move through the corridor over a period of time.

Driven by international trade, coal demand, highway congestion, agricultural trade, and environmental issues, America's railroads have embarked on a new era of growth and are undertaking new projects to add track and facilities. But we still see an imbalance between rail supply and demand which requires more investment in infrastructure to keep pace with the strong economic trends.

[17] National Surface Transportation Policy and Revenue Study Commission, "Transportation for Tomorrow: Report of the National Surface Transportation Policy and Revenue Study Commission, Washington, DC, January 15, 2008.



Additionally, the demand for freight rail services is projected to increase 84 percent in ton-miles by 2035, while actually declining as a percentage of all shipments from 14 to 13 percent of all freight tonnage.[18] Over the next three decades, it is expected that increases in demand will lead to a significant deterioration in the level of service on the freight rail network.[19] This coincides with the projected increase in traffic.

Moreover, a 2007 report concluded that $148 billion (in 2007 dollars) in investment is needed for infrastructure expansion over the next 28 years to keep pace with economic growth.[18] And this estimate does not include acquisition of land, locomotives, and freight cars or the cost of replacing and updating existing track, facilities, locomotives, and freight cars. The study concludes that there is a clear need for more investment in rail freight infrastructure and a national strategy to support rail capacity expansion and investment.

Over the next three decades, it is expected that increases in demand will lead to a significant deterioration in service on the freight rail network.This coincides with the projected increase in traffic.

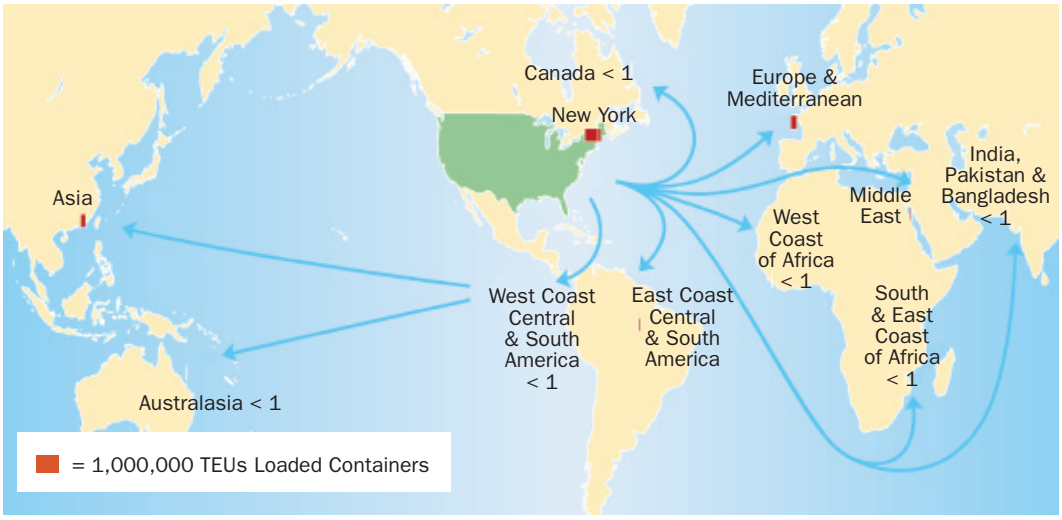
Freight railroads and the Federal Railroad Administration have made progress toward reducing congestion and bottlenecks through public-private partnerships. The $2.43 billion Alameda Corridor in Southern California has enabled the continued expansion of the ports of Los Angeles and Long Beach (LA/LB) and the smoother flow of freight from these ports by separating streets from a heavily-used rail line.

The Union Pacific Railroad and Burlington Northern Santa Fe Railway are also increasing the capacity of their respective corridors to Chicago from LA/LB and are implementing operation strategies for more efficient throughput. The Heartland Corridor project involved several states, Federal and private investment, which when completed, will improve and shorten the transit between the Mid-Atlantic seaboard and the Midwest, shaving several hundred miles off the distance and allowing greater volumes per transit. Other examples include a project currently in progress called CREATE that will lead to more efficient and safer movement of freight through the Chicago area; Norfolk Southern's improvements to the Meridian Speedway and its Crescent corridor to increase capacity and the flow of traffic; and CSX's "National Gateway Project" that will improve its southeast corridor.

[18] Report of the National Surface Transportation Policy and Revenue Study Commissioner, Transportation for Tomorrow, December 2007, p. 3-15.

[19] "National Rail Freight Infrastructure Capacity and Investment Study", Cambridge Systemics prepared for the Association of American Railroads, September 2007.

U.S. Container Export Trade Routes: New York



Source: Maritime Administration

Surge in Exports

The growth in foreign waterborne commerce has been spurred largely by growth in container trade movements. Over the last five years, container trades increased at an average annual rate of 7.4 percent or nearly three times the growth of non-container trades. In 2007, 80 percent of the container trades (metric tons) were time-sensitive, food and manufactured products which were carried by vessels in scheduled services.

The non-container trades, which include oil, ores, coal, grains and other crude materials, are moved in unscheduled services. Because these commodities are stockpiled, there can be significant year-to-year fluctuations in the trades as commodity prices change (draw-downs when prices are expected to fall and vice versa), and the long-term growth of these trades is generally below U.S. economic growth.

Over the first three quarters of 2008, the slowdown in U.S. economic growth has dampened growth of waterborne trade. U.S. import trades were down significantly reflecting a decline in the value of the dollar (higher dollar prices for imports). The decline in imports was offset to some extent by a surge in U.S. exports.

U.S. Container Export Trade Routes: LA/Long Beach

Source: Maritime Administration

The growth in foreign waterborne commerce has been spurred largely by growth in container trade movements.

Over the last five years, container trades increased at an average annual rate of 7.4 percent or nearly three times the growth of non-container trades.

America's Marine Highway, consisting of more than 25,000 miles of inland, intracoastal, and coastal waterways, already transports about one billion tons of domestic cargo annually, and has considerable room to grow.

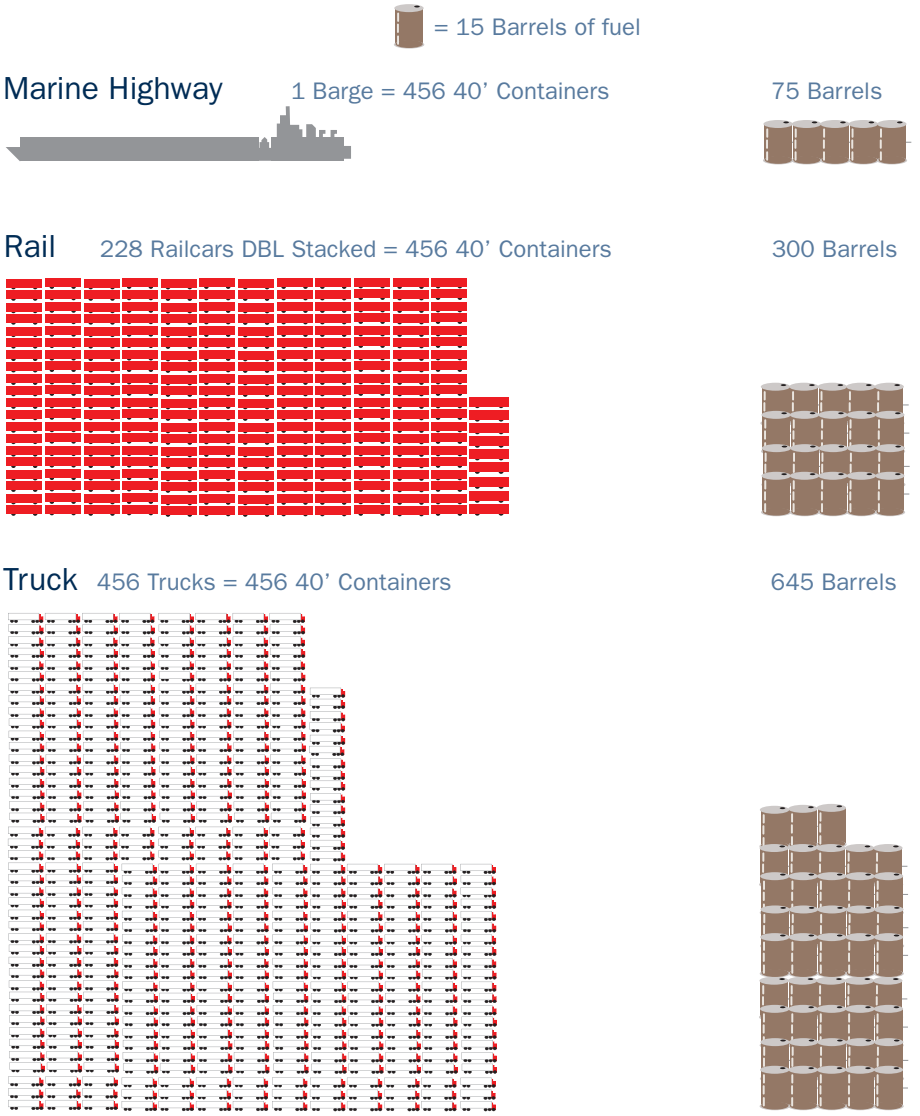
Marine Highway

America's Marine Highway, consisting of more than 25,000 miles of inland, intracoastal, and coastal waterways, already transports about one billion tons of domestic cargo annually, and has considerable room to grow. In many cases, marine highways run parallel to some of the most congested highway corridors in the country, several of which have been designated by DOT as "Corridors of the Future."

For example, on the East Coast, I-95 is a well-known, critical, but congested north-south corridor that runs from Maine to Florida. The Marine Highway provides a near-parallel alternative corridor. Similar opportunities exist on other congested major road and rail corridors, including I-5 on the West Coast, I-10 along the Gulf Coast, and I-65 that runs north and south between Chicago and New Orleans/Mobile AL.

Expanded use of America's Marine Highway is an effective and desirable way to help relieve landside rail and highway congestion as waterborne transportation in general is underutilized. Increasing its use is cost effective, requires very little new infrastructure,

Congestion and Savings



Source: Maritime Administration

represents significant fuel savings, and offers a resilient and redundant means of transportation following natural or man-made emergencies.

One current operation highlights the considerable benefits derived from using the Marine Highway. The accompanying illustration is based on an existing East Coast container-on-barge operation that runs between Baltimore, MD and Norfolk, VA. Each barge load of containers takes nearly 500 trucks off the road. Every week, they take almost 2,000 trucks off the I-95 and I-64 corridors. That is equal to three lanes of bumper-to-bumper trucks eight miles long. And they do it for less than 1/8 the amount of fuel that trucks would consume.

Several impediments, however, discourage expanded use of the Marine Highway. Shippers moving cargoes by water are subject to the Harbor Maintenance Tax on many cargoes, while surface transportation modes are not subject to this tax. In the case of imported cargo, a single container is subjected to this tax two times – first when it arrives aboard a large ship, then again when it is moved via a marine highway service. A container moving through a terminal to a marine highway vessel is subjected to additional handling charges, whereas trucks and railroads normally pay for only one lift. Carriers of waterborne cargoes coming into the U.S. are also required to provide 24 hour advance notice of arrival, which is not required of trucks or rail. In addition, the public benefits, including air quality and congestion relief, are not fully recognized.

There are opportunities to overcome these impediments and expand the use of the Marine Highway. The Energy Independence and Security Act of 2007 requires that the Department of Transportation establish a "short sea transportation program" and designate specific projects to mitigate landside congestion. Although it does not appropriate any funding for the program, the Act does require that Department of Transportation support designated corridors and projects, identify potential short-term incentives that could help stimulate the use of the Marine Highway, and propose solutions to overcome impediments to the expanded utilization of waterborne freight movements.

As previously discussed in an earlier chapter, another barrier to maximizing the Marine Highway is the aging inland waterway infrastructure, including locks and dams. Problems include insufficient funding, delay and cost overruns.

The fact that freight projects have difficulty in competing for surface transportation funds was identified as an issue of concern in the 1994 report of the National Commission on Intermodal Transportation and reaffirmed in the recent Federal Highway Administration Report to Congress on the National Highway System (NHS) Intermodal Connectors.

The report concluded that freight mobility projects cannot fairly compete under the current programs. The Metropolitan Planning Organizations are responsible for transportation planning at the local level, and tend to allocate resources to those projects with the most local impact. In many cases, primary interstate freight corridors and the intermodal connectors that are essential components of a national system, receive little attention – and funding – at the local level.

There are opportunities to overcome these impediments and expand the use of the Marine Highway.

The Energy Independence and Security Act of 2007 requires that the Department of Transportation establish a "short sea transportation program" and designate specific projects to mitigate landside congestion.

Appendix 1:

Port Terminal Intermodal Information

CA - Long Beach
Address:
TEU: 5779852 Tonnage: 69195350

Container Facility Information

Facility Name	Number of Berth	Container Freight Station Sq ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Terminal	Railway Connection
California United Term. E-24-E26	3		57.9	14400	5000			5	3	Yes	Two connecting surface tracks on apron join additional terminal trackage, connect with Southern Pacific; Union Pacific and Atchison, Topeka and Santa Fe Railroads.
International Transportation Service	11	70,000	86.4	12800	4000			16		Yes	Two tracks at shed, and 6-track intermodal yard with capacity for 43 five unit articulated double-stack cars; connect with Southern Pacific; Union Pacific and Atchison, Topeka and Santa Fe Railroads..
Long Beach Cont. Terminal	5		73.8	10000	7200		7			Yes	4-track intermodal yard with capacity for 24 five unit articulated doublestack cars; connects with Southern Pacific; Union Pacific and Atchison, Topeka and Santa Fe Railroads.
Pacific Container Terminals Pier J, Berths J243-247. 266, 270	5		192.4	12376	6002			16		Yes	Two tracks on apron, and 6-track intermodal yard with capacity for 36 five unit articulated double-stack cars; connect with Southern Pacific; Union Pacific and Atchison, Topeka and Santa Fe Railroads.
SSA, Pier A, Berths A90-A94	3		90	24000						Yes	
SSA, Pier C, Bertha C60-C62	3		56.9	4000	2768			3		Yes	
Total Terminals International	9		237	18000				14		Yes	

Dry Bulk Facility Information

Facility Name	Number of Berth	Silo Storage/Bushels	Ship Loader on Wharf	Rail on Terminal
Forest Terminals Berths D-50-54	4			
Fremont Forest Group, T-122	1			
GP Gypsum Corp.	1			
Koch Carbon Co. Berth 211	1			Yes
MCC Lucky Cement Co. B-F208	1			No
Metropolitan Stevedore, G212-215	2			
Morton Salt, Berth F-210	1			Yes
National Gypsum Co., Berth 82	1			
Pacific Coast Cement (CEMEX)	1			
Pacific Coast Recycling, Pier T	1			
Weyerhauser Co. (T115/116) T 22	1			

General Cargo Facility Information

Facility Name	Number of Berth	Covered Storage Sq/Ft	Open Storage Acres	Refrigerated Storage SqFt	RO/RO Ramp	Rail on Terminal				
Cooper T Smith, F-204, F205	2	180,000								
Crescent Terminals/SSA	2	190,000			Yes	Yes				
CUT, Berths D-28.29.30-31	2				Yes	Yes				
CUT, Berths D-33 & D-34	1	66,715			No	No				
CUT, Berths E-12, E-13	2	180,000			Yes	Yes				
CUT, Berths E-20, 21, 22	2					Yes				
Toyota Logistic Services	1	4,830,000	40,000		Yes	Yes				

Port Terminal Intermodal Information

Liquid Bulk Facility Information

Facility Name	Number of Berth	Storage Tanks/Gallons	Pipeline Access	Rail on Terminal
Baker Commodities, Berth C30-31	1	6.700,000	Yes	
BP Pipeline of NA B-76-79	4	61,316,000	Yes	
BP Pipeline of NA, Berth T-121	1	Ref 45	Yes	
Chemoil Terminals Corp. F-209	1	17,850,000	Yes	Yes
Dow Chemical USA, Berth S-101		15,000,000	Yes	Yes
Petro-Diamond, Berths B82-B83	2	17,220,000	Yes	
Texaco Refining MKT B 84-86	3	256,578,000	Yes	
World Oil Co. Berth C-73	1	21,000,000	Yes	No

Auto Facility Information

Facility Name	Number of Berth	Terminal Area Acres	Open Storage Acres	RORO Ramp	Rail on Terminal	Parking Spaces
CUT, Berths E-17-E18	2	9.7		Yes	Yes	

CA - Los Angeles

Address:

TEU: 7321440 Tonnage: 513272289

Passenger Facility Information

Facility Name	Number of Berth	Passenger Terminal SqFt	Parking Spaces	Passengers	Passenger Vehicles Allowed
World Cruise Ctr. Berth 91-93	3		2,560		

Container Facility Information

Facility Name	Number of Berth	Container Freight Station Sq ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Terminal	Railway Connection
American President Lines B-302-305	4	180,000						12 (SPP)		Yes	Harbor Belt Line Railroad surface track on apron.
APM Terminals Pier 400	6			46,000	8000			14 (SPP)		Yes	
Marine Terminals Corp. ECT B-226-236	3		150	8,000				8		Yes	Harbor Belt Line Railroad was not in use at time of survey.
Matson Terminals B-206-B209	2	Yes	85	6,900			4		Yes	Yes	Harbor Belt Line Railroad: Two platform-level tracks serving container freight were not in use at time of survey.
Transpacific Cont. Serv. B-135-139	5		88	25,000	3,300			11		Yes	Harbor Belt Line Railroad: one surface track on apron.
West Basin Container Ter. B-121-131	4	122,000	129	7,228			3	5		Yes	None
West Basin Container Ter. Berth 100	1							4 (SPP)		Yes	
Yusan Terminals, Berths 212-225	5		171		1,200			4			Harbor Belt Line Railroad: Two surface tracks on apron at Berths 222-224 join one track on apron at Berth 225, and 2 platform-level tracks along rear of transit shed.

Dry Bulk Facility Information

Facility Name	Number of Berth	Silo Storage/Bushels	Ship Loader on Wharf	Rail on Terminal
Coos Head Lumber Co. B-200G&H	1			Yes
Hugo Neu-Proler Co. B-210 & 211	2			Yes
Kaiser International Corp. B-49-50	1			Yes
LAXT Export Terminal Berth 301	1			Yes
Paktank Corp.	1			No
U.S. Borax Berths 165-166	1		100tph	Yes

Port Terminal Intermodal Information

General Cargo Facility Information						
Facility Name	Number of Berth	Covered Storage SqFt	Open Storage Acres	Refriger-ated Storage SqFt	RORO Ramp	Rail on Terminal
Catalina Freight Line B 184-185	3	22,600				No
Port of Los Angeles Berths 153-155	2	217,374				Yes
Rio Doce Pasha Term B142-146	3	200,000				Yes
Rio Doce Pasha Term. B174-181	3	235,000				Yes
Stevedoring Services of A.B-54-55	2	211,290				Yes

Liquid Bulk Facility Information				
Facility Name	Number of Berth	Storage Tanks/Gallons	Pipeline Access	Rail on Terminal
Amerigas Berth 120	1	103,950,000		No
ConocoPhillips (Unicol) B-148-151	2	34,650,000	Yes	No
GATX Terminals Corp. B-70-71	1	24,906,000		Yes
GATX Terminals Corp. B-171-173	2	42,000,000	Yes	No
GATX Terminals Corp. B-45-47	3	Pipeline	Yes	No
Kinder Morgan Berths 118-119	2	32,508,000	Yes	No
Mobil Oil Corp. Berths 238-240 A&B	2	97,146,000	Yes	No
Shell Oil Products, Berths 167-169	2	24,360,000	Yes	No
Vopak Berths 187-191	4	100,800,000	Yes	Yes
Wickland Oil & Ultramar B-163-164	4	64,932,000		No

Auto Facility Information						
Facility Name	Number of Berth	Terminal Area Acrs	Open Storage Acres	RO/RO Ramp	Rail on Terminal	Parking Spaces
Auto Warehousing Co. B erth 200A	1	19.68		Yes	Yes	
Pasha Properties, Berths 87, 88, 89	1				No	
WWL Vehicle Serv. Berths 195-99	5	127.9		Yes	Yes	8,000

CA - Oakland
Address:
TEU: 2043122 Tonnage: 12627486

Container Facility Information											
Facility Name	Number of Berth	Container Freight Sta-tion Sq/ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Termi-nal	Railway Connection
APL Terminal Berth 60-63	4	48,000		6,500			5			NDT	
APM Terminals Berth 24	1			2,152	3,388			3		Yes	
APM Terminals Berths 20-22	2	112,030		3,900			3			Yes	
APM Terminal Berths 23	1			3,200				2		Yes	
B.E. Nutter Cont. Term. B 35, 37	3			4,500			5			No	
Charles P. Howard CT B 67-68	2			3,000					Yes	Yes	Surface track behind apron connects with Oakland Terminal Railway.
Hanjin Terminal Berth 55-56	2		90	23,107	1,860			4		No	
Oakland Int. Container Terminal 57-59	3							6	Yes	NDT	

Port Terminal Intermodal Information

Container Facility Information, continued											
Facility Name	Number of Berth	Container Freight Station Sq/ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Terminal	Railway Connection
Outer Harbor Cont. Term. B 32-34	3			5,500			3		Yes	Yes	Surface track at rear of storage area connects with Oakland Terminal Railway, Union Pacific Railroad, and Burlington Northern Santa Fe Railway (Berth 25 only).
Trans Pacific Cont. Serv. B-30	1			2,000			3			Yes	Surface track on apron connects with Oakland Terminal Railway, Union Pacific Railroad, and Burlington Northern Santa Fe Railway.
Transbay Container Term. 25-26	2			3,200			2			Yes	Surface track at rear of storage area connects with Oakland Terminal Railway, Union Pacific Railroad, and Burlington Northern Santa Fe Railway (Berth 25 only).

Dry Bulk Facility Information				
Facility Name	Number of Berth	Silo Storage/Bushels	Ship Loader on Wharf	Rail on Terminal
Hanson Aggregates Mid Pacific	1			

GA - Savannah
Address:
TEU: 1662021 Tonnage: 23368591

Container Facility Information											
Facility Name	Number of Berth	Container Freight Station Sq/ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Terminal	Railway Connection
Garden City Terminal	11	191,216	482.9	27,088	10,646			15		Yes	
Ocean Terminals	11		66			3			Yes	Yes	One surface track on apron, connects with tracks of Norfolk Southern Corporation.

Dry Bulk Facility Information				
Facility Name	Number of Berth	Silo Storage/Bushels	Ship Loader on Wharf	Rail on Terminal
Atlantic Cement	1			Yes
Atlantic Wood Industries Wharf	1			Yes
Colonial Terminals Plant 2 Dk2	3	84,000,000		Yes
Georgia Kaolin Terminals	1		1,200 tph	
GP Gypsum Corp.	1			Yes
Marcona Ocean Industries	1			
Savannah Electric & Power Co.	1	1,260,000		Yes
Savannah River Wharf Co.	1		1,100 tph	
Savannah Sugar Refinery Wharf	2	3,660,000		
Southern Bulk Industries	2		500 tph	Yes

General Cargo Facility Information						
Facility Name	Number of Berth	Covered Storage SqFt	Open Storage Acres	Refrigerated Storage SqFt	RORO Ramp	Rail on Terminal
East Coast Terminals, Berth 3-7		359,900				Yes
Georgia Steamship Co. Savannah Wharf	1	230,000				Yes

Port Terminal Intermodal Information

Liquid Bulk Facility Information				
Facility Name	Number of Berth	Storage Tanks/Gallons	Pipeline Access	Rail on Terminal
76 Lubricants Co. Savannah	1	6,300,000	Yes	Yes
Amoco Oil/Pan Ocean	1			
Belcher Oil/Union Oil	2			
Citgo Asphalt Refinery Wharf	1	46,326,000	Yes	Yes
Koch Materials Co.	2	10,290,000	Yes	No
Southern LNG Inc.	1			
ST Services Savannah Terminal	2	36,246,000	Yes	Yes
Vopak	2	36,246,000	Yes	Yes

NJ - New Jersey/New York
Address:
TEU: 4478480 Tonnage: 145889166

Passenger Facility Information					
Facility Name	Number of Berth	Passenger Terminal/SqFt	Parking Spaces	Passengers	Passenger Vehicles Allowed
Brooklyn Cruise Terminal		190,000			
Manhattan Cruise Terminal					

Container Facility Information											
Facility Name	Number of Berth	Container Freight Sta-tion Sq/ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RO/RO Ramp	Rail on Termi-nal	Railway Connection
APM Terminals	8						6	5		No	Two platform-level tracks servce west side of container freight station; connect with Consolidated Rail Corp.
Global Marine Terminal	2		78	4,000	6,0-00		2	4			Port Jersey Railroad: 2 platform level tracks serving north side of Shed A, and 2 surface tracks serving open container storage area connect with Consolidated Rail Corp.
Howland Hook Terminal	4	348,000									None
Maher Consolidated Terminal	10						6	7		Yes	None
Port Newark Container Terminal	5						3	4			None
Red Hook Terminal	7	345,000	54			4			1	Yes	None

Dry Bulk Facility Information				
Facility Name	Number of Berth	Silo Storage/Bushels	Ship Loader on Wharf	Rail on Terminal
25 Street Pier	1			
Continental Terminals	1			
Domino Sugar Corp. Sugar Wharf	1			
Refined Sugars, Yonker Wharfs	1			

General Cargo Facility Information						
Facility Name	Number of Berth	Covered Storage SqFt	Open Storage Acres	Refriger-ated Storage SqFt	RORO Ramp	Rail on Terminal
Brooklyn Marine Terminal	4		29.5			
South Brooklyn Marine Terminal	8	600,000	76.3			

Port Terminal Intermodal Information

Liquid Bulk Facility Information				
Facility Name	Number of Berth	Storage Tanks/Gallons	Pipeline Access	Rail on Terminal
Bayonne Taker Berth	1			
Bayway Terminal	1			
Bowline Pt. Terminal	1			
BP Terminal, Dock 19, 21	2			
Castle Astoria Terminal	2			
Chevron Terminal, Perth Amboy	1			
Cibro Terminal	1			
Co ED North Terminal	1			
Coastal Terminal Bayonne Berth	1			
Coastal Terminal Newburg Berth	1			
Con ED Hudson Ave. Terminal	1			
Constable Terminal	1			
Crode Storage Inc.	1			
Eastern Terminal	1			
GATX Carteret, Dock 3 & 2	2			
GATX, S.I.	2			
Gordons Terminal	1			
Hess South P Reading	1			
Hudson River Terminal	1			
Hudson Terminal, Newark Tanker B	1			
IMTT Bayonne Terminal	4			
Linder City Terminal	1			
Niagara Mohawk Terminal	1			
North P Reading	1			
Oceana Cinl	1			
Port Mobil Terminal, 1 ship Berth	1			
Port Mobil Terminal	1			
Roseton	1			
S.I. Tremley PCI	1			
Sears Rensselear Terminal	1			
Shell Terminal Sewaren	2			
StarEnterprises Terminal	1			
State St. Perth Amboy	1			
Stolt Outerbridge	1			
Stratus Petroleum Terminal	1			
Tosco, OII Dock 1 & Oil Gas dock 2	2			
Tremley Pt. Staten, Bert B	1			
Trumbull Terminal	1			
Vico Terminal	1			

Auto Facility Information						
Facility Name	Number of Berth	Terminal Area Acrs	Open Storage Acres	RO/RO Ramp	Rail on Terminal	Parking Spaces
Auto Facilities Port Newark	6	314				
Auto Marine Terminal	2	130				

Port Terminal Intermodal Information

PR - San Juan
Address:
TEU: Tonnage:

Passenger Facility Information

Facility Name	Number of Berth	Passenger Terminal/SqFt	Parking Spaces	Passengers	Passenger Vehicles Allowed
Muelle "Frontier Base"	2				
Muelle #3 (Pier 3)					
Muelle #4 (Pier 4)	1				
Muelle #6 (Pier 6)	1				
Muelle #1 (Pier 1)	1				
Muelle Panamericano, East & West	2				

Container Facility Information

Facility Name	Number of Berth	Container Freight Station Sq/ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Terminal	Railway Connection
Army Terminal Pier	3										
Berth C	1										
Berth D	1	100,000									
Berths A & B	2										
Berths N & D	2										

Dry Bulk Facility Information

Facility Name	Number of Berth	Silo Storage/Bushels	Ship Loader on Wharf	Rail on Terminal
Bulk Grain Handling Facilities	1			

General Cargo Facility Information

Facility Name	Number of Berth	Covered Storage SqFt	Open Storage Acres	Refrigerated Storage SqFt	RORO Ramp	Rail on Terminal
Isla Cabras Pier 15 & 16						
Isla Grande Terminal	2	9,450				
Muelle #10 (Pier 10)	1					
Muelle #8 (Pier 8)	3	170,900				
Muelle #9 (Pier 9)	3	133,680				
Muelle #11 (Pier 11)	1	99,960				
Muelle #13 (Pier 13)	1	27,976				
Muelle #14 (Pier 14)	1	39,984				
Muelle #12 (Pier 12)	1	15,000				

Liquid Bulk Facility Information

Facility Name	Number of Berth	Storage Tanks/Gallons	Pipeline Access	Rail on Terminal
CAPECO Berth	1			
Caribbean Oil Pier	1			
Caraño Pier Oil Dock	1			
Cluster Berth	1			
Navy Oil Pier	1			
Refinery Pile	1			

Auto Facility Information

Facility Name	Number of Berth	Terminal Area Acrs	Open Storage Acres	RORO Ramp	Rail on Terminal	Parking Spaces
Berths J & K	2			Yes		

Port Terminal Intermodal Information

SC - Charleston
Address:
TEU: 1863917 Tonnage: 25198899

Passenger Facility Information

Facility Name	Number of Berth	Passenger Terminal/SqFt	Parking Spaces	Passengers	Passenger Vehicles Allowed
Cruise Terminal	1	18,000	Yes		

Container Facility Information

Facility Name	Number of Berth	Container Freight Station Sq/ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Terminal	Railway Connection
Columbus Street Terminal (CST)	2	457,500	78				1	4	Yes	Yes	South Carolina Public Railways: One surface track extending diagonally across upper portion, join with tracks on apron of Ref. No. 14.
North Charleston Terminal (NCT)	3	219,500	123				2	4		Yes	South Carolina Public Railways: One platform-level track at rear of container freight station connects with additional terminal trackage in rear.
Union Pier Terminal	4	698,049							LASH		South Carolina Public Railways: Two platform-level tracks inside each transit shed; one platform level track along upper side of upper transit shed, and two surface tracks service over storage area.
Wando Welch Terminal (WWT)	4	200,000	194				2	8		No	None

Dry Bulk Facility Information

Facility Name	Number of Berth	Silo Storage/Bushels	Ship Loader on Wharf	Rail on Terminal
NCT Grain Elevator	1			Yes
Shipyard River Terminal	1		2,500 tph	Yes

General Cargo Facility Information

Facility Name	Number of Berth	Covered Storage SqFt	Open Storage Acres	Refrigerated Storage SqFt	RORO Ramp	Rail on Terminal
Veterans Terminal	4		110			

Liquid Bulk Facility Information

Facility Name	Number of Berth	Storage Tanks/Gallons	Pipeline Access	Rail on Terminal
BP/Amoco Terminal	1			
Hess Terminal	1			
Kinder Morgan (Ex-Allied)	3	52,920,000		

VA - Hampton Roads
Address:
TEU: 1808933 Tonnage: 41452718

Container Facility Information

Facility Name	Number of Berth	Container Freight Station Sq/ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Terminal	Railway Connection
APM Terminals, Portsmouth Wharf	1			2,250	2,214		2			No	One surface track in rear; connects with Norfolk and Portsmouth Belt Line Railroad Co. and CSX Transportation, Inc.
APM Terminals, Virginia								6			One surface track in rear; connects with Norfolk with Norfolk and Portsmouth Belt Line Railroad Co. and CSX Transportation, Inc.

Port Terminal Intermodal Information

Lambert's Point Dock Pier P	3		7.5	2,500		2				Yes	Two surface tracks each on north and south aprons, total length 4,300 feet, and 2 carfloor-level tracks inside transit shed, total length 2,020 feet; connect with Norfolk Southern Railway Co.

Container Facility Information, continued

Facility Name	Number of Berth	Container Freight Station Sq/ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Terminal	Railway Connection
Newport News Marine Terminal	6		43	10,000	2,500		2		3	Yes	CSX Rail Transport: 2 platform level tracks inside center of transit shed, total length 1,100 feet; one 840-foot surface track on upper apron; one 600-foot surface track on lower apron.
Norfolk International Terminals	19		98	8,555	702			11	Yes	Yes	None
Portsmouth Marine Terminal	3		46.3	11,262	2,000	1	6	3		Ys	Two surface tracks on apron, total length 2,200 ft. and door-level tracks at warehouse at rear; connect with Norfolk Southern Railway, Inc. Eastern Shore Railroad, and CSX Transportation.
The Port of Richmond Terminal	3		37							Yes	

Dry Bulk Facility Information

Facility Name	Number of Berth	Silo Storage/Bushels	Ship Loader on Wharf	Rail on Terminal
Dominion Terminal Associates P 11	2			Yes
Elizabeth River Terminals P 1 & 2	3	5,497,700		Yes
Giant Cement of Virginia, Paradise Pt.	1			Yes
ITI Chesapeake West Terminal Dock	1	28,700,000		Yes
Kinder Morgan Blk Terminals, P-9	2		8,000 tph	Yes
Lafarge NA Cement Norfolk TP	2			Yes
Mid Atlantic Terminals, Chesapeake Wharf	1			Yes
Norfolk Southern Rail, Coal Pier 6	1		8,000 tph	Yes
Old Dominion, Port Richmond Elev.	2			Yes
Perdue Farms Chesapeake Grain Elevator Ship & Barge	1	9,480,319	1,500 tph	Yes
Roanoke Cement Chesapeake Plant	3			Yes
Roanoke Cement Chesapeake Plant	1			Yes
Roanoke Cement, Ohio St. Wharf	1			Yes
Southern State Cooperatives Chesapeake Wharf	1			Yes
Tidewater Quarries, Richmond Quarry Wharf	1	2,478,000		No
U.S. Gypsum Co. Norfolk Wharf	1			Yes
Vulcan Materials, Richmond Lower Yard	1			Yes
Vulcan Materials Co. Port Norfolk	1			No
Vulcan Materials Co. Sunset Creek	1			No
Vulcan Materials, Richmond Quarry	1			No

General Cargo Facility Information

Facility Name	Number of Berth	Covered Storage SqFt	Open Storage Acres	Refrigerated Storage SqFt	RO/RO Ramp	Rail on Terminal
Jerry O. Talton Piers 14, 15	4	19,000				Yes
Lambert Pt. Dock, Sewell's Pt. Div., Piers A & B	2	232,848				Yes
Lambert's Point Dock Pier N	3	97,537			2	Yes

Port Terminal Intermodal Information

Liquid Bulk Facility Information				
Facility Name	Number of Berth	Storage Tanks/Gallons	Pipeline Access	Rail on Terminal
Allied Terminals, Chesapeake Marine Terminal	1	54,096,000		No
Amoco Elizabeth River Terminal	1	27,510,000		
Atlantic Energy Wharf	1	20,160,000		Yes
Crown Central Petroleum, Chesapeake Barge Dock	1	9,000,600		No
Dominion Generation Chesterfield Slip	2	11,256,000		Yes
Dominion Generation, Chesapeake E Ctr	1	1,890,000		Yes
Equalon Chesapeake	1			
ExxonMobil Refining & Supply Co. Terminal, Tanker & Barge	3	64,136,940	Yes	No
Flint Hills Resources, Richmond Terminal	1	2,751,000		No
Giant Industries, Torktown Refinery	5	226,380,000		Yes
Hess Corp., Money Pt. Barge Dock	1	19,992,000		No
Hess Corp., Money Pt. Tanker Dock	1	22,684,200		No
Honeywell Int. Hopewell Plant Pier	2	11,400,000		Yes
IMTT Chesapeake Terminal Wharf	1	203,490,000		No
IMTT Richmond Terminal Wharf	1	23,226,000		No
Kinder Morgan Energy, Richmond TD	1	6,384,000		No
Koch Materials N. News Tanker W	2	18,270,000		
Marine Oil Service, Berkley Mooring North & South Pier	4	148,260		No
Miller Oil	3	2,478,000		
Norfolk Oil Transit Inc. Lamberts Point Dock Pier L	1			Yes
Nova Chemicals, Chesapeake Wharf	1	5,040,000		Yes
Regional Enterprises, Hopewell Wharf	1	5,208,000		Yes
Triport Terminal Wharf	1	19,319,300		Yes

WA - Seattle
Address:
TEU: 1775858 Tonnage: 19448157

Passenger Facility Information					
Facility Name	Number of Berth	Passenger Terminal/SqFt	Parking Spaces	Passengers	Passenger Vehicles Allowed
Bell Street Cruise Terminal	2	56,000	1,700		
Cruise Facility Terminal 30	2	95,000	700		

Container Facility Information											
Facility Name	Number of Berth	Container Freight Station Sq ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Terminal	Railway Connection
Eagle Marine Services, Berth 5	3	180,000	130	2,470	2,308			6		Yes	On-dock intermodal yard with capacity of 54 five-platform doublestack rail cars with adjacent storage facility of equal size, connects with Burlington Northern Santa Fe Railway and Union Pacific Railroad.
SSA Terminal 18 Berths 2-6 & 7	7	97,000					1	10		Yes	On dock intermodal yard with loading capacity for 58 five-platform doublestack rail cars and adjacent storage of a similar number of cars; connect with Burlington Northern Santa Fe Railway.

Port Terminal Intermodal Information

Container Facility Information, continued											
Facility Name	Number of Berth	Container Freight Station Sq ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Terminal	Railway Connection
SSA Terminal Wharf 25	1						3			No	None.
Transfpacific Cont. Serv. Wharf 30	2									Yes	One surface track on apron; connects with joint tracks of Burlington Northern Santa Fe Railway and Union Pacific Railroad.
TTI Terminal Wharf #46	3						1	5		No	None

Dry Bulk Facility Information				
Facility Name	Number of Berth	Silo Storage/Bushels	Ship Loader on Wharf	Rail on Terminal
Ash Grove Cement, South Pier	1			Yes
Ash Grove Cement, North Wharf	1			Yes
Glacier Northwest, West Terminal				
James Hardie Gypsum	1			
Lafarge Corp. Cement Wharf	1			Yes
Lafarge Corp. Raw Materials Wharf	1			Yes
Pacific Terminals Ltd. Wharves	2			Yes
Pendleton Flour Mills, Seattle	2			Yes
Terminal #86, Grain, L. Dreyfus	1		Yes	Yes

General Cargo Facility Information						
Facility Name	Number of Berth	Covered Storage Sq/Ft	Open Storage Acres	Refrigerated Storage SqFt	RORO Ramp	Rail on Terminal
Birmingham Streel, Ter. 105, B #1	1					
Seattle Term. 91, Pier 90 & 91	19			1,900,000	Yes	Yes
SSA Terminal Wharf #37	2	12,000				
Terminal 115, International Term.	2				Yes	Yes

Liquid Bulk Facility Information				
Facility Name	Number of Berth	Storage Tanks/Gallons	Pipeline Access	Rail on Terminal
BP Oil, Seattle Terminal, Pier #11		25,914,000		Yes
Chevron USA Pt. Wells	2	36,372,000	Yes	Yes
SSA Terminal Wharf #37	2	24,570,000	Yes	No
Terminal 115, International Term.	3	10,164,000	Yes	Yes

WA - Tacoma & Olympia
Address:
TEU: 1797560 Tonnage: 22965750

Container Facility Information											
Facility Name	Number of Berth	Container Freight Station Sq ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Terminal	Railway Connection
Maersk Pacific, APM Terminals, Tacoma Wharf	2						1	4			Adjacent South Intermodeal Yard consists of four ramp tracks totaling 8,645 feet and seven interchange tracks totaling 10,582 feet; connect with Tacoma Municipal Belt Line Railway.
Olympic Container Terminal	1					1	3				
Pierce County Terminal	2							7			

Port Terminal Intermodal Information

Container Facility Information, continued

Facility Name	Number of Berth	Container Freight Station Sq/ft	Container Storage Acres	Grounded TEU Slots	Mounted TEU Slots	Gantry Cranes	Panamax Cranes	Post Panamax	RORO Ramp	Rail on Terminal	Railway Connection
Port of Olympia, Terminal Wharf	3										One platform-level track serves Shed A and open stoarage area in rear; connects with Union Pacific Railroad and Burlington Northern Santa Fe Railway.
Port of Tacoma, Husky Terminal	1							4			
Port of Tacoma, Terminal 7D, Husky Terminal Stevedoring	1		33								Eight 3,200-foot surface tracks located at rear of terminal with capacity for 88 double-stack container railcars or 264 conventional railcars; connect with Tacoma Municipal Belt Line Railway.
Washington United Terminal	2							4			

Dry Bulk Facility Information

Facility Name	Number of Berth	Silo Storage/Bushels	Ship Loader on Wharf	Rail on Terminal
Atofina Chemicals, Tacoma Plant Wharf	3	80,757,600		
Cargill (TEMCO), Tacoma Elevator Wharf	1			
City of Tacoma, Stearn Plane Coal Dock	1			
Commencement Bay Mill Co. Lob Lift	1			
Continental Lime Wharf	2	385,000		
Dunlap Towing Co. Olympia Wood Chip Dock	2			
Georgia-Pacific Gypsum, Tacoma Plant Wharf	2			
Lone Star Northwest Stellacoom Plant North Dock	2			
Lone Star Northwest Stellacoom Plant South Dock	2			
Louisiana Pacific Corp. Tacoma Log Lift	1			
Manke Lumber Co. Dock	1			
Pioneer Americas, Tacoma Dock No. 1 & 2	3	1,600,000		
Port of Tacoma, Terminal 7, Berth C	1			
Schnitzer Steel of Tacoma Wharf	2			
Simpson - Tacoma Kraft Co., Barge Unloading Dock	2	2.047,500		

Dry Bulk Facility Information, continued

Weyerhauser Co., Tacoma Export Yard Dock	1			
Weyerhauser Wood Chip Terminal	2			

General Cargo Facility Information

Facility Name	Number of Berth	Covered Storage SqFt	Open Storage Acres	Refrigerated Storage SqFt	RORO Ramp	Rail on Terminal
Port of Tacoma, Blair Waterway Terminal Wharf	2					
Port of Tacoma, Pierce County Terminal, Berths A & B	2	24,000				
Port of Tacoma, Terminal 4, Marine Terminals Corp. Evergreen	2					
Port of Tacoma,Terminal 7, Berths A & B	2	180,000			Yes	

Port Terminal Intermodal Information

Liquid Bulk Facility Information				
Facility Name	Number of Berth	Storage Tanks/Gallons	Pipeline Access	Rail on Terminal
Buckeye Pipeline Co., Tacoma Dock	2	378,000		
Sound Refining, Tacoma Terminal Dock	2	29,400,000		
Superior Oil Terminal Co. Dock	3	21,000,000		
U.S. Oil & Refining Co., Tacoma Terminal Dock #1	2	89,287,800		
U.S. Oil & Refining Co., Tacoma Terminal Dock #2	1	89,287,800		
UNOCAL Corp., Tacoma Marine Terminal Wharf	2	5,901,000		

Auto Facility Information						
Facility Name	Number of Berth	Terminal Area Acrs	Open Storage Acres	RORO Ramp	Rail on Terminal	Parking Spaces
Totem Ocean Trailer Express Tacoma Terminal Wharf	2	47		Yes		

Appendix 2:
U.S. Army Corps of Engineers Major Navigation Projects

U.S. Army Corps of Engineers Deep Draft and Shallow Draft
Navigation Projects with Greater than Ten Million Tons of Commerce

Project - Civil Works Identification System Number	Type Project		Depth (ft)	Authorized Width (ft)	Length (ft)	Acreage (ac)	Depth (ft)	Constructed Width (ft)	Length (ft)	Acreage (ac)	District
	Deep Draft	Shallow Draft									
1 Anacortes Harbor-067300	1										Seattle
Barge Channel Sta 2+00 to Sta 7+41	1		18	150		0	18	150		0	
Barge Channel Sta 7+41 to Sta. 9+12	1		18	150		0	18	150		0	
Barge channel Sta. 9+12 to Sta. 56+85	1		18	150		0	18	150		0	
Cap Sante		1				0				0	
2 Ashtabula Harbor=000650 (Main)	1		16, 18, 27, 28,29	100-1,500	15,400	149	16, 18, 27, 28, 29	100–1,500	15.400	149	Buffalo
Ashtabula Harbor-000650 (Leading to Slips)			22, 27, 28	350-1,200	5,250	96	22, 27, 28	350-1,200	5,250	96	
3 Baltimore Harbor and Channels-074955	1		50	800-1,000	445, 967	8,570	20	700-1,000	438,047	7,422	Baltimore
Cape Henry Channel			50	1,000	15,840	364	50	1,000	15,840	364	
York Spit Channel			50	1,000	97,152	2,230	50	800	97,152	1,784	
Rappahannock Shoal Channel			50	1,000	54,384	1,248	50	800	54,384	999	
Craighill Channel			50	800	19,008	349	50	700	19,008	305	
Craighill Angle			50	800-1,800	9,504	292	50	700-1,830	9,504	276	
Craighill Upper Range			50	800	12.672	233	50	700	12,672	204	
Cutoff Angle			50	800-1,700	9,504	273	50	700-1,650	5,808	157	
Brewerton Angle			50	800	17,952	330	50	700	17,952	288	
Fort McHenry Channel			50	800	22,176	407	50	700	22,176	356	
Fort McHenry Channel			50	800	22.176	407	50	700	22,176	356	
Northwest Branch East Channel			49	600	6,864	95	49	600	6,864	95	
Northwest Branck West Channel			40	600	6,864	95	40	600	6,864	95	
Curtis Bay Channel			50	600	11,616	160	50	600	11,616	160	
Curtis Creek Channel, 35-Foot			35	800		0	35	800		0	
Curtis Creek Channel, 22-Foot			22	800		0	22	800		0	
Ferry Bar Channel			42	600	7,339	101	42	600	7,339	101	
Brewerton Channel Eastern Extension			35	600	33,370	460	35	600	33,370	460	
Tolchester Channel			35	600	38,016	524	35	600	38,016	524	
Swan Point Channel			35	600	14,995	207	35	600	14,995	207	
Dundalk Marine Terminal East Channel			42	400	6,494	60	42	400	6,494	60	
Dundalk Marine Terminal West Channel			42	500	7,709	88	42	500	7,709	88	
Dundalk Marine Terminal Connecting Channel			36, 38	500	2,482	28	36, 38	500	2,482	28	
Dundalk-Seagirt Marine Terminal Connecting Channel			42	500	2,482	28	42	500	2,482	28	
Seagirt Marine Terminal Channel			42	500	6,178	71	42	500	6,178	71	
South Locust Point Marine Terminal Channel			36	400	7,181	66	36	400	7,181	66	
Fort McHenry Anchorage			35	400	3,485	32	35	400	3,485	32	
Anchorage No. 3A			42	2,200	2,200	111	42	2,200	2,200	111	
Anchorage No. 3B			42	1,800	1,800	74	42	1,800	1,800	74	
Anchorage No. 3C			35	1,500	500	17	35	1,500	500	17	
Anchorage No. 4			35	1,800	1,800	74	35	1,800	1,800	74	
4 Big Sandy Harbor-010222		1				0				0	Huntington
5 Boston Harbor, MA-001960	1										New England
Presidents Roads Anchorage			40	3,109	5,874	18	40	3,109	5,874	18	
35' Anchorage			35	803	3,679	68	35	803	3,679	68	

U.S. Army Corps of Engineers Deep Draft and Shallow Draft
Navigation Projects with Greater than Ten Million Tons of Commerce

Project - Civil Works Identification System Number	Type Project		Depth (ft)	Authorized Width (ft)	Length (ft)	Acreage (ac)	Depth (ft)	Constructed Width (ft)	Length (ft)	Acreage (ac)	District
	Deep Draft	Shallow Draft									
Entrance Channel North Channel (35' Broad Sound)			35	600	10.300	143	35	600	10.360	143	
Entrance Channel North Channel (40' Broad Sound)			40	800-1,100	13,137	289	40	900-1,100	13,137	289	
Entrance Channel South Channel			30	1,200	12,060	332	30	1,200	12,060	332	
Reserve Channel			35 & 40	430	5,428	48	35 & 40	430	5,428	48	
Reserve Channel Turning Area (Notch)			40	600	1.387	20	40	600	1,387	20	
40' Main Channel (to Castle Island)			40	600-1,200	17,177	407	40	600-1,200	17,177	407	
40' Main Channel (to Inner Confluence)			40	600-1,200	23,199	376	40	600-1,200	23,119	376	
35' Channel North			40	600	6,415	88	35	600	6,415	88	
35' Channel South			35	600	8,442	116	35	600	8,442	116	
Boston Waterfront			35	600	5,007	69	35	600	5,008	69	
Inner Harbor Confluence			40	978	2,636	35	40	978	2,636	35	
Charles River Entrance Channel			35	210, 685, 1,010	2,905	39	35	21-685-1,010	2,905	39	
Chelsea River			38	225-430	10.514	70	38	225-430	10,514	70	
Mystic River Channel			40	263-1,042	6,616	124	40	263-1,042	6,616	124	
6 Buttermilk Channel-041015	1					0					New York
7 C and Lw Rivers Below Vancouver WA and Portland OR-003630	1		40, 43	600	546.480	7,527	40, 43	600	546,480	7,527	Portland
8 Calc River and Pass-002440	2		42,40,35	800,400,250	380, 767	4,982	42, 40, 35	800,400,250	380,767	4,982	New Orleans
9 Calumet Harbor and Riv. -002410 Lake Calumet Chan.	1		28, 27	varies			28, 27	varies			Chicago
Appoach Channel	1		29	3,200	10,000	735	29	3,200	10,000	735	
Harbor Channel	1		28	3,000	10,000	689	28	3,000	10,000	689	
River Channel	1		27	200	37,000	170	27	200	37,000	170	
Lake Calument Channel	1		27	1,000	3,000	69	27	1,000	3,000	69	
10 Channel to Newport News, Virginia-073783	1		55	800	31,680	582	50	800	31,680	582	Norfolk
11 Channel in Lake St. Clair Michigan-002940	1		28	800	76,560	1,406	28	800	76,560	1,406	Detroit
12 Channel in Straits of Mackinac Michigan-074201	1		30	1,250	3,500	100	30	1,250	3,500	100	Detroit
13 Charleston Harbor SC-002980	1										Charleston
Charleston Harbor SC-002980-Bar Channel 47 Feet			47			0	47			0	
Charleston Harbor SC-002980-Lower Reaches 45 Feet			45			0	45			0	
Charleston Harbor SC-002980-Wando Channe 45 Feet			45			0	45			0	
Charleston Harbor SC-002980-Upper Reaches 45 Feet			45			0	45			0	
14 Chesapeake and Delaware Canal - 008160	1					0				0	Philadelphia
15 Cleveland Harbor-003430	1		23,25,28,29	150-300 1,600-2,400	64.500	1,506	23,25,28,29	150-300 1,600-2,400	64,500	1,506	Buffalo
Cleveland Harbor-003430 (Outer Harbor West)			28, 29	325-1,600	7,600	195	28, 29	325-1,600	7,600	195	
Cleveland Harbor-003430 (Outer Harbor East)			25, 27	500,2,000	23,466	443	25, 27	500-2,000	23,466	443	
Cleveland Harbor-003430 (East-River Main)			23, 27	150,250	38, 124	206	23, 27	140-250	38, 124	206	
16 Columbia River at Mouth, and WA-003600	1		48, 55	2,640	31,680	1,920	48, 55	2,640	31,680	1,920	Portland
17 Corpus Christi Ship Channel-014340	1				184, 272	2,130			184,272	2,130	Galveston
Sea Bar Channel			47	650	14,731	220	49	650	14,731	220	

U.S. Army Corps of Engineers Deep Draft and Shallow Draft
Navigation Projects with Greater than Ten Million Tons of Commerce

Project - Civil Works Identification System Number	Type Project		Depth (ft)	Authorized Width (ft)	Length (ft)	Acreage (ac)	Depth (ft)	Constructed Width (ft)	Length (ft)	Acreage (ac)	District
	Deep Draft	Shallow Draft									
Jetty Channel			47-45	600	6,758	93	49-47	600	6,758	93	
Inner Basin at Harbor Island			45	1,080	3,326	82	47	1,080	3,326	82	
Inner Basin Main Channel			45	600	3,326	46	47	600	3,326	46	
Humble Basin to Junction at La Quinta Channel			45	600	52,800	727	47	600	52,800	727	
La Quinta Channel Juntion to Bcn. 82			45	400	51,005	468	47	400	51,005	468	
Bcn. 82 to Main Turning Basin			45	350	4,805	39	47	350	4,805	39	
Main Turning Basin			45	550	6.389	81	47	550	6,389	81	
Industrial Canal			45	400	3,115	29	47	400	3,115	29	
Avery Point Turning Basin			45	688	2,482	39	47	688	2,482	39	
Tule Lake Channel			45	300	20,011	138	47	300	20,011	138	
Viola Channel			45	800	2,534	47	47	800	2,534	47	
Viola Turning Basin			45	800	1,584	29	47	800	1,584	29	
18 Detroit River Michigan-004710	1		21-29.5	300-8,000	438, 100	31,400	21-29.5	300-8,000	438, 100	31,400	Detroit
19 Duluth-Superior Harbor Minnesota-005050	1		27-32	200-3,700	134, 900	2,483	27-32	200-3,700	134, 900	2,483	Detroit
20 East River-041062	1					0				0	New York
21 Freeport Harbor-006170	1				47, 774	453			14, 774	453	Galveston
Outer Bar Channel			47	400	23,021	211	49	400	23,021	211	
Jetty Channel			45	400	7,022	64	47	400	7,022	64	
Lower Turning Basin			45	750	1,003	17	47	750	1,003	17	
Channel to Brazosport Turning Basin			45	500	2,482	28	47	500	2,482	28	
Brazos Harbor Approach Channel			36	425	2,798	27	38	425	2,798	27	
Brazos Harbor Turning Basin			36	750	581	10	38	750	581	10	
22 Galveston Habor and Channel-006340	1				110,035	2,62			110,035	2,462	
Entrance Channel			45	800	45,408	834	47	800	45,408	834	
Outer Bar Channel			45	800	8,976	165	47	800	8,976	165	
Inner Bar Channel			45	800	17,424	320	47	800	17,424	320	
Anchorage Basin			34	3,100	4,752	338	36	3,100	4,752	338	
Bolivar Roads Channel			45	900	10,032	207	47	900	10,032	207	
Bolivar Roads to Exxon Oil Dock			40	1,125	8,659	224	42	1,125	8,659	224	
Exxon Oil Dock to Todds Shipyards			40	1,125	7,920	205	42	1,125	7,920	205	
Todds Shipyards to Pier B (43rd Rd St)			40	1,075	6,864	169	42	1,075	6,864	169	
23 Grays Reef Michigan-074160			25	3,000	9,500	654	25	3.000	9,500	654	Detroit
24 Honolulu Harbor, Oahu, HI-007600	1										Honolulu
Entrance Channel	1		45	500	3,100	36	45	500	3,100	36	
Main Basin	1		40	1,350	4,300	133	40	4,300	1,350	133	
Kapalama Channel			40	400	2,500	23	40	400	2,500	23	
Kapalama Basin			34	1,100	2,500	63	34-40	1,100	2,485	63	
25 Houston Ship channel-007780	1				281,371	3,181			281,371	3,181	Galveston
Bolivar Roads to Red Fish Light 1			45	530	58,344	710	47	530	58,344	710	
Red Fish Light 1 to Beacon 76 (Turn)			45	530	43.824	533	47	530	43,824	533	
Beacon 76 to Lower End Morgans Point Cut			45	530	40,022	487	47	530	40,022	487	
Lower End Morgans Point Cut to Exxon Oil Co. Slip			45	530	25,344	308	47	530	25,344	308	

U.S. Army Corps of Engineers Deep Draft and Shallow Draft
Navigation Projects with Greater than Ten Million Tons of Commerce

Project - Civil Works Identification System Number	Type Project		Depth (ft)	Authorized Width (ft)	Length (ft)	Acreage (ac)	Depth (ft)	Constructed Width (ft)	Length (ft)	Acreage (ac)	District
	Deep Draft	Shallow Draft									
Exxon Oil Co. Slip to Carpenter Bayou			45	530	29,568	360	47	530	29,568	360	
Carpenter Bayou to Greens Bayou			40-45	53	28,512	347	42-47	530	28,512	347	
Greens Bayou to Hunting Bayou (Upper End)			40	300	11,616	80	42	300	11,616	80	
Turning Point at Hunting Bayou			40	600	1,056	15	42	600	1,056	15	
Hunting Bayou at Southern Pacific Slip			40	300	18,480	127	42	300	18,480	127	
Turning Point at Clinton Island			40	700	1,584	25	42	700	1,584	25	
Southern Pacific Slip to Turning Basin Wharf			36	300	16,368	113	38	300	16,368	113	
Turning Point at Brady Island			36	422	1,056	10	38	422	1,056	10	
Turning Basin			36	625	4,224	61	38	625	4,224	61	
Upper Turning Basin			36	150	1,373	5	38	150	1,371	5	
26 Hudson River Channel-007800	1					0				0	New York
27 Hudson River NY (Maint)-007810	1					0				0	New York
28 Indiana Harbor-018120	1		28, 27, 22	varies			28, 27, 22	varies			Chicago
Entrance Channel	2		29	800	4,000	74	29	800	4,000	74	
Harbor Channel	2		28	800	4,000	74	28	800	4,000	74	
Maneuvering Basin	2		28	1,000	1,600	37	28	1,000	1,600	37	
Canal Entrance	2		27	280	3,700	24	27	280	3,700	24	
Canal	2		22	210	13,500	65	22	210	13,500	65	
29 Jacksonville Harbor FL-008410	1		30-42	630	153,146	2,216	30-42	630	153,146	2,216	Jacksonville
St. Johns Bar Cut Range East Section			42	800	19,863	365	42	800	19,863	365	
St. Johns Bar Cut Range West Section			40	800	10,137	186	40	800	10,137	186	
Pilot Town Cut Range			40	971	4.133	92	40	971	4.133	92	
Mayport Cut Range			40	1,063	3,263	80	40	1,063	3,258	80	
Sherman Cut Range			40	650	2.466	37	40	650	2.466	377	
Mile Point Lower Range and Turn			40	650	5,321	79	40	650	5,321	79	
Training Wall Reach			40	500	4,762	55	40	500	4.762	55	
Short Cut Turn			40	600	4,349	60	40	600	4,349	60	
White Shells Cut Range			40	180	3,658	49	40	580	3,658	49	
St. Johns Bluff Reach			40	1,210	4,979	138	40	1,210	4,979	138	
Dames Pt.-Fulton Cutoff Range			40	500	15,916	183	40	500	15,916	183	
Dames Pt. Turn			40	1,200	2,157	59	40	1,200	2,157	59	
Quarantine Island Upper Range			40	650	4,932	74	40	650	4,532	74	
Brills Cut Range			40	508	6,057	71	40	508	6,057	71	
Broward Pt. Turn			40	643	4,935	73	40	643	4,935	73	
Drummond Creek Range (Lower)			40	400	653	6	40	400	653	6	
Drummond Creek Range (Upper)			40	400	7,578	70	38	400	7,578	70	
Trout River Cut Range			40	423	5,470	53	38	425	5,470	53	
Chaseville Turn			40	624	2,911	42	38	624	2,911	42	
Long Branch Range			40	900	4,011	83	38	900	4,011	83	
Terminal Channel (Lower)			40	575	6,500	86	38	575	6,500	86	

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Navigation Projects with Greater than Ten Million Tons of Commerce

Project - Civil Works Identification System Number	Type Project		Depth (ft)	Authorized Width (ft)	Length (ft)	Acreage (ac)	Depth (ft)	Constructed Width (ft)	Length (ft)	Acreage (ac)	District
	Deep Draft	Shallow Draft									
Terminal Channel (Upper)			34	575	12,121	160	34	575	12,121	160	
Old River (Blount Island East Channel)			30	300	5,300	37	30	300	5,310	37	
Old River (Blount Island West Channel)			38	300	11,669	80	38	300	11,669	80	
30 Los Angeles-Long Beach Harbors-074719	1		78, 76, 72, 45, 35, 20	1,000	92,600	2,126	81,76, 72, 60, 45, 20	1,000	92,600	2,126	Los Angeles
La Approach Channel			81	1,200-3,300	5,500		81				
La Entrance Channel			81	1,000-1,200	4,000		81				
La South Channel			75	800	4,020		67				
La South Turning Basin			75	1,320	1,740		67				
La Pier 300 Turning Basin			81		1,800 dia		81				
La North Channel			45	750	3,235		53				
La Main Channel			53	685-2,000	15,220		53				
La Inner Turning Basin			53	varies	1,500		45				
La Cerritos Channel			53	230-400	2,800		45				
La East Basin Channel			53	400-950	2,000		45				
La East Turning Basin			53				45				
La West Basin Channel			53	350-1,350	3,800		53				
La West Turning Basin			53	varies	varies		53				
Lb Approach Channel			76				76				
Lb Main Channel			76				76				
Turning Basin			35	600-1,200	2,100		55				
Southwest Pass			45	750	105,600	1,818	45	750	105,600	1,818	New Orleans
Deep Draft Crossings			9, 45	500	485,760	5,576	9, 45	500	485,700	5,576	New Orleans
33 Mobile Harbor-011670	1				257,513	3,238			257,513	2,618	Mobile
Mobile Harbor-011670 Bay Channel 47 Foot			57	700	42,949	690	47	600	42,949	592	
Mobile Harbor-011670 Bay Channel 45 Foot			55	550	151,544	1,913	45	400	151,544	1,392	
Mobile Harbor-011670 River Channel 40 Foot			40	500	24,466	281	40	500	24,466	281	
Mobile Harbor-011670 Theodore Channel 40 Foot			40	400	38,554	354	40	400	38,554	354	
34 New Haven Harbor Ct-012380	2		35	500		0	35	500		0	New England
Entrance Channel			35	500	6,490	75	35	500	6,490	75	
Lighthouse Point Reach			35	620, 400, 500	17,657	172	35	620, 400, 500	17,657	172	
New Haven Reach			35	500, 800, 500	5,715	99	35	500,800,500	5,715	99	
Turning Basin			35	400	830	8	35	400	830	8	
35 New York Harbor-012490	1				0					0	New York
36 Newark Bay (Hackensack and Passaic Rivers) NJ-012550	1				0					0	New York
37Norfolk Habor, VA-012801	2										Norfolk
Atlantic Ocean Channel			60	1,300	58,608	1,749	52	1,300	58,608	1,749	
Thimble Shoal Channel			55	1,000	111,936	2,570	50	1,000	111,936	2,570	
Channel to Newport News			55	800	31,680	582	50	800	31,680	582	
Channel Harbor 50 Ft.			55	800-1,500	34,848	996	50	800-1,250	34,848	996	
Norfolk Harbor 40 Ft.			45	375-750	33,264	458	40	375-750	33,264	458	
Southern Branch 35 Ft.			40	250-500	19,536	178	35	250-500	19,536	178	

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Navigation Projects with Greater than Ten Million Tons of Commerce

Project - Civil Works Identification System Number	Type Project		Depth (ft)	Authorized Width (ft)	Length (ft)	Acreage (ac)	Depth (ft)	Constructed Width (ft)	Length (ft)	Acreage (ac)	District
	Deep Draft	Shallow Draft									
Anchorage F			55	3,000	3,000	207	50	3,000	3,000	207	
Sewells Point East Anchorage			45	2,400	2,400	132	45	2,400	2,400	132	
Sewells Point West Anchorage			45	2,400	2,400	132	40	2,400	2,400	132	
Newport News East Anchorage			45	2,400	2,400	132	40	2,400	2,400	132	
Newport News West Anchorage			45	2,400	2,400	132	40	2,400	2.400	132	
38 NY-NJ Channels (Arthurkill-Killankuhl)			1			0				0	New York
39 Oakland Harbor-012990	1		50	900	55,000	1,136	46	900	55,000	1,136	San Francisco
40 Pascagoula Harbor-013680	1				122,414	1,169			122,414	1,076	Mobile
Bar Channel 44 Feet			44	550	40,328	509	44	450	40,328	417	
Lower Sound and Casotte 42 Feet			42	350	46,972	377	42	350	46,972	377	
Upper Sound 38 Feet			42	350	24,427	196	38	350	24,427	196	
River Channel 38 Feet			38	350	10,687	86	38	350	10,687	86	
41 Philadelphia to the Sea	1		40	400-1,000			40	400-1,000			Philadelphia
42 Port Everglades Harbor-076031	1										Jacksonville
Main Channel 45 Feet			45	50-950	5,280			500-950	5,280		
Main Channel 42 Feet			42	450-1,010	5,280			450-1,010	5,280		
Main Turning Basin 42 Feet			42	1,025	2,640	62		1,025	2,640	62	
North Turning Basin 31 Feet			31	1,110	845	22		1,110	845	22	
South Channel 36 Feet			36	400	5,808	53		400	5,808	53	
43 Portland Harbor-00367	1					0					New England
45' Channel			45	1,000		0	45	1,000		0	
35' channel			35	1,650		0	35	1,650		0	
Entrance Channel			45	810-1,000-1,651	8,753	203	45	810-1,000-1651	8,753	203	
Channel to Portland Bridge			35	varies 205-1,50-1,651	10,334	251	35	varies 205-1,500-1,651	10,334	251	
Portland Bridge to End			35	190-300-400-645	8,030	872	35	190-300-400-645	8,030	872	
House Island Anchorage			45	2,995	3,285	229		2,995-3,285		229	
44 Richmond Harbor-015280	1		45, 40	900	42,000	868	45, 38	600	42,000	579	San Francisco
45 Rouge River Michigan-015590	1		17, 25	100-1,000	24,000	96	17, 25	100-1,000	24,000	96	Detroit
46 Sabine-Neches Waterway-0115780	1				513,638	5,948			513,638	5,948	Galveston
Sabine Bank Channel			42	800	75,715	1,391	44	800	75,515	1,391	
Outer Bar Channel			42	800	18,005	331	44	800	18,005	331	
Jetty Channel			40	650	21,400	321	42	650	21,490	321	
Pass Channel			40	500	29,621	340	42	500	29,621	340	
Anchorage Basin			40	1,500	8,184	282	42	1,500	8,184	282	
Port Arthur Canal			40	500	28,987	333	42	500	28,987	333	
Junction-Port Arthur Canal and Sabine-Neches Canal			40	800	32,630	599	42	800	32,630	599	
Entrance to Port Arthur Turning Basin			40	509	2,218	26	42	509	2,218	26	
Port Arthur East Turning Basin			40	459	1,742	18	42	459	1,742	18	
Port Arthur West Turning Basin			40	543	1,320	16	42	543	1,320	16	

U.S. Army Corps of Engineers Deep Draft and Shallow Draft
Navigation Projects with Greater than Ten Million Tons of Commerce

Project - Civil Works Identification System Number	Type Project		Depth (ft)	Authorized Width (ft)	Length (ft)	Acreage (ac)	Depth (ft)	Constructed Width (ft)	Length (ft)	Acreage (ac)	District
	Deep Draft	Shallow Draft									
Port Arthur West Turning Basin to Taylors Bayou Turning Basin			40	275	3,010	19	42	275	3.010	19	
Taylors Bayou Turning Basin			40	662	3,485	53	42	662	3,485	53	
Junction with Port Arthur Canal to Neches River			40	400	55,387	509	42	400	55,387	509	
Neches River to Savine River (Section B)			30	200	23,021	106	32	200	23,021	106	
Mouth to Smith Bluff Cut-Off			40	400	50,477	464	42	400	50,477	464	
Turning Basin at Deer Bayou			40	700	1,584	25	42	700	1,584	25	
Turning Basin at Smith Bluff			40	900	1,267	26	42	900	1,267	26	
Smith Bluff Cut-Off to Beaumont Turning Basin			40	400	47,309	434	42	400	47,309	434	
Turning Basin at Mile 40.3			40	853	1.478	29	42	853	1,478	29	
Channel Extension C			36	350	6,019	48	38	350	6,019	48	
Maneuvering Area at Beaumont Turning Basin			40	1,065	2,798	68	42	1,065	2,798	68	
Beaumont Turning Basin			34	468	1,78	16	36	468	1,478	16	
Beaumont Turning Basin Extension			34	300	2,006	14	36	300	2,006	14	
Beaumont Turning Basin Extension to Vicinity of Bethlehem Shipyards			30	200	5,966	27	32	200	5,966	27	
Mouth to Orange Municipal Slip			30	200	58,978	271	32	200	58,978	271	
Orange Turning Basin			30	800	4,013	74	32	800	4,013	74	
Orange Municipal Slip			30	175	3,010	12	12	175	3,010	12	
Orange Municipal Slip to Old U.S. Highway 90 Bridge Site			30	200	10,930	50	32	200	10,930	50	
Channel Around Orange Harbor Island			25	175	11,510	46	27	175	11,510	46	
47 San Juan Harbor, PR-016190	1										Jacksonville
Main Channel 56 Feet Cut 1			56	800	898	16	56	800	898	16	
Main Channel 51 Feet Cut 2			51	800	2,112	39	51	800	2,112	39	
Main Channel 49 Feet Cut 3			49	800-928	634		49	800-928	64		
Main Channel 46 FeetI Cut 4 & 5			46	928-950	1,162		46	928-950	1,162		
Main Channel 40 Feet Remain Anagordo & Army Term.			40	950	8,184	178	40	950	8,184	178	
Main Channel 40 Feet Army Term. Tb.			40	350	5,280	42	40	350	5,280	42	
Main Channel 39 Feet Puerto Nuevo Ch. & TB			39	350	6,336	51	39	350	6,336	51	
Main Channel 36 Feet Graving Dock Channel			36	350-915	6,864		36	350-915	6,864		
Graving Dock TB 30 Feet			30	0-1,300	2,640		30	0-1,300	2,640		
San Antonio Approach Channel 35 Feet			35	500-900	3,168		35	500-900	3,168		
San Antonio Channel 30 Feet			30	0-1,600	7,920		30	0-1,600	7,920		
48 San Pablo Bay and Mare Island Strait-016230	1		45	600	55,000	758	35	600	55,000	758	San Francisco
49 Savannah Harbor-067318	1										Savannah
Entrance Channel						0				0	
Inner Harbor 42 Foot Channel						0				0	
50 Seattle Harbor-067318	1										Seattle
East Waterway (If 34)	1		34	400-600			34	400-600			
East Waterway (if 51)	1		34	400-600			34	400-600			
West Waterway	1		34	600		0	34	600	0		

U.S. Army Corps of Engineers Deep Draft and Shallow Draft
Navigation Projects with Greater than Ten Million Tons of Commerce

Project - Civil Works Identification System Number	Type Project		Depth (ft)	Authorized Width (ft)	Length (ft)	Acreage (ac)	Depth (ft)	Constructed Width (ft)	Length (ft)	Acreage (ac)	District
	Deep Draft	Shallow Draft									
Duwamish Waterway	1									0	
0+00 to 127+09.74	1		30	200	0	30	200			0	
127+09.74 to 219+50.08	1		30	200	0	30	200			0	
219+50.08 to 275+56	1		15	150-250			15	150-250			
51 St. Clair River Michigan-017300	1		27.1-30	700-1,000	195,360	4,390	27.1-30	700-1,000	195,300	4,390	Detroit
52 St. Marys River Michigan-017380	5		21-30	300-2,000	344,000	5,528	27.1-30	300-2,000	344,000	5,528	Detroit
53 Tacoma Harbor-07902	1										Seattle
Hylebos Waterway	1		30	200-300			30	200-3001			
Blair Waterway (if 51)	1									0	
Blair Waterway (if 35)	1		35	300-600		35	300-600			0	
City Waterway	1										
Sta. 0+00 to 35+00	1		29	500		0	29	500		0	
Sta. 35+00 to 49+00	1		22	500		0	22	500		0	
Sta. 49+00 to 78+00	1		19	250-500			19	250-500			
54 Tampa Harbor FL-017960	1										Jacksonvill
Main Channel 45 Feet			45	700-1,000	5,280		45	700-1,000	5,280		
Main Channel 43 Feet			43	500-700	63,360		43	500-700			
Port Tampa 34 Feet			34	400-750	16,368		34	40-750	16,368		
Hillsborough Bay 41 Feet			41	400-600	5,808		41	400-600	5,808		
Hillsborough Bay 34 Feet			34	00-970	8,448		34	00-970	8,448		
55 Texas City Channel-018130	1				49,104	493			49,104	493	Galveston
Bolivar Roads to Turning Basin			40	400	35,904	330	42	400	35,904	330	
Texas City Turning Basin			40	1,200	3,168	87	42	1,200	3,168	87	
Industrial Canal			40	250	8,96	52	42	250	8,976	52	
Industrial Turning Basin			40	1,000	1,056	24	42	1,000	1,056	24	
56 Thimble Shoal Channel, VA-073800	1		55	1,000	111,936	2,570	50	1,000	111,936	2,570	Norfolk
57 Tolchester Channel, MD-008289	1		35	600		0	35	600		0	Baltimore
58 Toledo Harbor-018280	1		25 27, 28	200,400, 500	132,000	1,418	24, 27, 28	200,400,500	132,000	1,418	Buffalo
Toledo Harbor-018280 (Lake)			28	500	95,040	1,091	28	500	95,040	1,091	
Toledo Harbor-01820 (River)			25, 27	200-400	36,900	327	25, 27	200, 400	36,960	327	
59 Two Harbors Harbor Minnestoa-018700	1		28-30	900	1,510	8	28-30	900	1,510	8	Detroit
Inland River Info- Not Presently Applicable to Exercise											
McClellan-Kerr Arkansas River Navigation System-510		1	9	250			9	250			Tulsa
Miss River (Mi 599 - Mi. 320)		1									Vicksburg

Appendix 3: Project Areas

Project Areas

The following Gateway (including near-port) and Corridor projects have a national significance because they play a key role in the entire U.S. Marine Transportation System. Projects are divided into key east/west rail exchanges and corridors that support the seven groups of Gateway Ports as described in the Strategy.

I. New York/New Jersey

Gateway and Near-Port Projects: *

1. Increase NY/NJ water depth to 50 feet (Completion due 2009)
2. Add new container terminal capacity in NJ area, including brownfield development and access
3. Construct on-dock/near-dock rail infrastructure at Port of New York/New Jersey.
4. Complete North Avenue Corridor Improvement Project (connector ramp and grade separations)
5. Build/improve truck-only highway connectors between NJ turnpike (including exits 12, 14, 14A and 15) and marine terminals, and on I-78 and north of port area in NJ
6. Construct new Passaic River road crossing
7. Increase vertical clearance of the 75 year old Bayonne Bridge to accommodate modern ships

Corridor Projects: *

1. Fund and complete four long-term rail route improvements – the River and Chemical Coast Lines to the north (double and triple-track and grade crossings), the Lehigh Line to the west (triple-track) and West Trenton Line to the south.

II. Hampton Roads

Gateway and Near-Port Projects:

1. Develop the Craney Island Marine Terminal and Rail Corridor
2. Construct Hampton Roads Third Crossing Tunnel
3. Complete State Road 164 Rail Corridor Relocation Project (in progress)
4. Conduct Elizabeth River Southern Branch Navigation Channel Deepening

Corridor Projects:

1. Expedite completion of the Heartland rail corridor connecting the Port of Virginia to the Midwest. This will allow high speed, high capacity freight movements and shorten the distance traveled between the rapidly growing port and western destinations.
2. Fund and develop the I-81 Crescent rail corridor, which includes plans for new terminals in Pennsylvania, Western Maryland and Alabama and upgrades to Roanoke, VA and Memphis, TN intermodal yards.

III. Charleston/Savannah

Gateway and Near-Port Projects:

1. Expand the port in the former Charleston Navy Base (including road connectors and 280 acre container terminal, scheduled for completion in 2013)
2. Deepen Savannah Harbor and approach channel from 42 to 48 feet
3. Complete turning basin component of Charleston Harbor Deepening Project (to 45 feet)

Corridor Projects:

1. Widen State Road 17 (Savannah Highway) southward to link with I-95.

IV. Houston

Gateway and Near-Port Projects:

1. Develop Port of Houston Bayport Terminal
2. Improve connections between port and State Highway 146 and I-69
3. Improve State Highway 146

4. Improve rail connections between terminals and Class I rail lines at Pasadena, Strang, and Deer Park Yards and double track main line across Buffalo Bayou
5. Develop Grand Parkway loop around central business district (State Highway 99 to I-45)
6. Develop Pelican Island Terminal (long term project) to increase future container capacity

Corridor Projects:

1. Develop I-69 (Designated as a DOT Corridor of the Future) to improve north/south freight movements to Canada and Detroit
2. Improve I-10 between Houston and San Antonio to facilitate freight movements westward. This includes widening a key section from 4 to 10 lanes each direction

V. Seattle/Tacoma

Gateway and Near-Port Projects:

1. Develop additional container terminals along the Blair waterway in Tacoma.
2. Develop Pacific Northwest regional intermodal yard support capacity.
3. Complete Lower Columbia River Navigation Channel and improve Tacoma Harbor Channels
4. Resume maintenance of Snake River Navigation Channel
5. Build Stevedore Services of America (SSA) Terminal in Tacoma
6. Build Tacoma-Olympia South Sound Logistics Center
7. Improve Columbia/Snake River Locks.
8. Extend SR 167 and State Road 509/99 in Tacoma and Seattle, respectively
9. Reconfigure/improve Seattle Terminal 30

Corridor Projects: *

1. Add grade separations and track additions for rail service between Seattle and Tacoma, creating unobstructed urban corridor access while improving safety
2. Upgrade Stampede Pass tunnel to accommodate double stack trains
3. Reopen rail line between Ellensburg, WA and Lind, WA
4. Eliminate single-track between Portland and Troutdale
5. Construct additional track between Seattle and Tacoma
6. Double-track between Seattle and Everett, WA

VI. Oakland

Gateway and Near-Port Projects: *

1. Increase Oakland navigation channel to 50-foot depth
2. Develop Outer Harbor Terminal in Oakland
3. Improve access to the Port of Oakland and Union Pacific rail facility
4. Rehabilitate the Oakland – Martinez line to provide a third mainline into Oakland
5. Re-align Maritime Street in Oakland
6. Improve 7th St. grade separation and roadway to relieve road and rail congestion at the port

Corridor Projects: *

1. Upgrade Donner Pass rail tunnels to accommodate double stack containers and double track the line from Reno to Salt Lake City
2. Double track San Joaquin Valley to eliminate freight/passenger competition for the single track
3. Improve the Tehachapi Trade Corridor Rail line augment rail connections between northern and southern California

VII. Los Angeles/Long Beach

Gateway and Near-Port Projects: *

1. Replace Gerald Desmond Bridge in Long Beach (to allow larger ships and increase lane capacity for truck traffic).
2. Expand TraPac Marine Terminal
3. Construct Port of Los Angeles/BNSF Southern CA International Gateway Intermodal Rail Yard
4. Build SR-47 Expressway project
5. Expand capacity of I-710 between Long Beach and I-10.
6. Expand UP ICTF rail yard in Wilmington
7. Improve/construct on-dock rail at LA/LB
8. Increase Los Angeles Harbor navigation channel to 55 feet.
9. Develop Pier B Rail Yard in Long Beach
10. Develop West basin Rail Yard in LA

Corridor Projects: *

1. Increase mainline rail capacity (triple track) through Cajon Pass
2. Complete grade separations along "Alameda Corridor East" to establish the Los Angeles – Colton corridor
3. Build Colton Crossing grade separation project
4. Double track between Colton, CA and El Paso, TX
5. Upgrade Rail connector between Port Hueneme and main line

Major projects approved by the California Transportation Commission include:

- Gerald Desmond Bridge replacement at the Port of Long Beach – $250 million
- SR 47 Expressway and Schuler Heim Bridge Replacement in Los Angeles-Long Beach ports – $158 million
- Los Angeles-Long Beach ports rail improvements – $175.1 million
- San Gabriel Valley Grade Separations, Alameda Corridor East – $336.6 million
- U.S. 101-Rice Avenue Interchange near Port of Hueneme – $30.4 million
- I-15 widening and Devore Interchange reconstruction – $118.0 million
- Port of Oakland 7th Street Grade Separation – $175 million
- Port of Oakland Outer Harbor Intermodal Terminals – $110.0 million
- Union Pacific track and tunnel improvements at Donner Summit – $43 million
- I-880 freeway reconstruction in Oakland – $73.0 million
- Highway 4 Cross-Town Freeway extension in Stockton – $96.8 million
- I-580 freeway eastbound truck climbing lane – $64.3 million
- Tehachapi trade corridor rail improvements – $54.0 million
- Stockton Ship Channel dredging – $17.5 million
- Sacramento River channel dredging – $10.0 million
- National City Marine Terminal Wharf Extension, San Diego Port – $15.0 million
- Port of San Diego grade separations – $81.6 million

VIII. Key East/West Rail Exchanges

1. Expedite the Chicago CREATE rail project that facilitates major east/west freight movement and local congestion relief. This project includes 25 new roadway overpasses or underpasses at locations where auto and pedestrian traffic currently crosses railroad tracks at grade level, six new rail overpasses or underpasses to separate passenger and freight train tracks, viaduct improvements, grade crossing safety enhancements, and extensive track, switch and signal system upgrades.

2. Support the New Orleans gateway infrastructure improvement projects that create grade separated multiple track corridors through this vital chokepoint. This public-private partnership between the Nation's six Class I railroads and state and local government will include replacing track, eliminating one underpass and several grade crossings and upgrading junction switches.

* Note: Port projects marked with an asterisk (*) were identified by the Department of Defense as rail capacity improvements in individual port master plans that will prove beneficial to military operations. Department of Defense Report to Congress on Projected Requirements for Military Throughput at Strategic Seaports, Under Secretary of Defense (Acquisition, Technology & Logistics), April 2007.

United States Department of Transportation
Maritime Administration

1200 New Jersey Avenue, SE
Washington, DC 20590